

A SUSTAINABLE OPERATIONS MANAGEMENT MODEL IN A NON-PROFIT ORGANISATION

by

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Though I speak with the tongues of men and of angels, but have not love, I have become sounding brass or a clanging cymbal. And though I have the gift of prophecy, and understand all mysteries and all knowledge, and though I have all faith, so that I could remove mountains, but have not love, I am nothing.

– 1 Cor.13:1-2

I deeply appreciate the guidance of my Heavenly Father and the following companionship along this journey:

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- The anonymous participating NPO who made this journey possible
- The University of Pretoria for their substantial financial support
- Persons who introduced me to action research, design research in education, action design research, sustainability, ecological worldview, operations management, heuristic principles, systems thinking, and all things else I know
- My dearest husband, children, parents, family and friends for their continuous prayer and encouragement
- And Pippin

DECLARATION

I declare that the thesis, which I hereby submit for the degree PhD (Industrial Systems) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

ETHICS STATEMENT

The author, whose name appears on the title page of this thesis, has obtained the required research ethics approval for the research described in this work. The author declares that she has observed the ethical standards required in terms of the University's Code of ethics for scholarly research.

SYNOPSIS

The sustainability of a non-profit organisation (NPO) in the South African education and research sector must be improved. Previously they had significant impact, but became under severe stress especially during COVID-19. This is an instance of NPOs in general whose sustainability is at risk. Although NPOs can improve their sustainability through operations management, the implementation of sustainable operations management requires further investigation. They can apply various models to improve the implementation of sustainable operations management, but a gap remains to develop such models.

The purpose of this study is to develop an appropriate sustainable operations management model (SOMM) in the specific NPO. By following an action design research approach, the purpose of the study simultaneously is to develop a theory of how appropriate SOMMs can be developed in other NPOs. Most applications of action design research however involve information systems and technology. This study applies a less technologically orientated approach based on design research in education. Starting from a problem formulation phase, the actual problem is identified, conceptualised, and formulated as a case study that represents a class of research problems. Concepts are analysed through a literature review, and long-term commitment is obtained from the NPO. A building, intervention and evaluation phase starts with the contextualisation of a SOMM in the participating NPO, a research procedure is developed to address the actual problem, an interpretive framework and design ecology are developed to address the class of research problems, and effectiveness criteria are established. A SOMM is then iteratively developed through building, intervention and evaluation cycles until it is sufficiently refined. A reflection phase is executed in parallel with the previous two phases to capture the learning that occurs. Lastly, a formalisation phase addresses the reflexivity of the researcher and a design theory is formulated of how appropriate SOMMs can be developed in other NPOs.

A practical contribution is made towards a SOMM in the NPO based on a definition of a model as a meta-theoretical framework to develop understanding, facilitate communication, propose improvements and to surface underlying assumptions. Sustainable operations management is defined as the management of human, natural, physical, financial and social capital and processes involved to satisfy self-defined needs and build resilience over the long term. The design starts by evaluating the current sustainability of the NPO, applies an integrated organisational perspective of a SOMM, regards sustainable operations management as an organised complex problem, and implements discordant pluralism. This entails organisational models for sustainability and systems thinking approaches namely a biomatrix entity systems perspective, viable system modelling, system dynamics, soft systems methodology, the Cynefin framework, and dynamic equilibrium modelling. The NPO confirms that the SOMM is effective in providing guidance to address their self-defined needs. These needs evolve through the development of the SOMM due to mutual

influences between the model and the NPO. This ill-defined problem is addressed by changing the perceptions of the NPO to satisfy their needs, identify other needs, and to build resilience over the long term. The SOMM fosters and reinforces commitment to multiple, competing strategies by addressing paradox so that the NPO becomes more fluid, enhances their reflexive self-regulation through supportive capabilities, and becomes more sustainable.

Design principles for the class of SOMMs in NPOs are based on the strategic selection of the case study, the interpretive framework, and the design ecology. A theoretical contribution is made towards sustainable operations management in NPOs in terms of key focus areas identified through content analysis of literature, and towards sustainable operations management in general with reference to the increasing number of hybrid organisations. The study also contributes to the theory of operations management modelling through the development of a research procedure to develop such a model. Furthermore, a contribution is made to a transformative research agenda of sustainability science in a design research mode. The study emphasises that enhanced sustainability does not imply predictability or a homeostatic balance to be achieved and maintained, but continuous tensions that must be creatively addressed. A less technologically orientated approach to action design research is proposed, and future research opportunities are identified.

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LIST OF ABBREVIATIONS

ADR	Action design research
AR	Action research
BBBEE	Broad-based black economic empowerment
BES	Biomatrix entity systems
BIE	Building, intervention and evaluation
CAPS	Curriculum and assessment policy statements
CAS	Complex adaptive systems
COVID-19	Coronavirus disease of 2019
CPTD	Continuing professional teacher development
CSOSI	Civil society organisation sustainability index
DBE	Department of Basic Education
DEM	Dynamic equilibrium modelling
DoE	Department of Education
DR	Design research
DSD	Department of Social Development
EENA	Enabling environment national assessment
ETDP	Education, training and development practices
ICNL	International Center for Not-for-Profit Law
ICT	Information and communication technology
IS	Information systems
MoU	Memorandum of understanding
NPO	Non-profit organisation
OM	Operations management
PBO	Public benefit organisation
SACE	South African Council for Educators
SARS	South African Revenue Service
SD	System dynamics
SEM	Structural equation modelling
SETA	Sector education and training authority
SNA	Social network analysis
SOM	Sustainable operations management
SOMM	Sustainable operations management model
SSM	Soft systems methodology
USAID	United States Agency for International Development
VSM	Viable system modelling
WCED	World Commission on Environment and Development

LIST OF DEFINITIONS APPLIED IN THE STUDY

Operations management	The management of resources, and the processes involved to convert the resources into required products and services and to deliver them to the customers (§2.2)
Operations management model	A meta-theoretical framework to develop understanding, facilitate communication, propose improvements and to surface underlying assumptions in the management of resources, and the processes involved to convert the resources into required products and services and to deliver them to the customers (§2.3)
Sustainable operations management	The management of human, natural, physical, financial and social capital and the processes involved to satisfy self-defined needs and to build resilience over the long term (§2.4)
Non-profit organisation	A self-governing organisation separate from government and business, whose main purpose is not profit generation only (§2.5)

CHAPTER 1 PROBLEM FORMULATION

1.1 SUSTAINABILITY OF NON-PROFIT ORGANISATIONS

A non-profit organisation (NPO) in the South African education and research sector has to become more sustainable. Currently they have a footprint in 7 out of 9 provinces in 37 early childhood development centres, 145 primary schools and 7 secondary schools. 56 000 learners were impacted, 1 500 teachers trained, 56 employment opportunities created, and 7 franchisees established. However, it became increasingly difficult to obtain new donations so that they had to downsize drastically with a severe decline in income and employees. When the Coronavirus disease of 2019 (COVID-19) pandemic struck, the NPO required even more funding. Significant donors had to withdraw, the NPO had no reserve funds, teachers and learners had to be supported online, and preparations had to be made to assist schools once they would re-open. Social distancing affected the service delivery of the NPO directly and also their relations with donors.

Sustainability was put on the global development agenda by the World Commission on Environment and Development [WCED] (1) as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (2, 3). Since then, organisations increasingly are compelled to operate more sustainable by customers, society and regulators (4, 5). NPOs are among the noticeable stakeholders responsible for pressure on organisations to operate more sustainable (6, 7). Besides this advocacy role, NPOs also improve the sustainability of society by supporting education, health, social services, recreation, cultural activities, interpersonal relations, development, and the natural environment (6, 8-13). The demand for NPOs to lobby and to offer services is increasing, which was highlighted during the pandemic caused by COVID-19 (9-12).

Since the global financial crisis of 2008 less NPOs are established (10, 14-19). Many NPOs are under pressure due to political and economic challenges and disasters such as COVID-19. While NPOs experience an urgent need to generate income, stricter regulations are introduced regarding tax exemptions, financing, religion, advocacy, and cross-border operations. Furthermore, the legitimacy of NPOs is questioned so that the sustainability of NPOs is at issue (20).

In South Africa, small to medium enterprises – including NPOs – contribute around 30% to employment (21). However, the United States Agency for International Development [USAID] (18) does not identify any country among 31 Sub-Saharan African countries where NPOs score high on sustainability, while NPOs score average in 67% of the countries and low in 33% of the countries. Furthermore, the impact of COVID-19 on South African NPOs was aggravated by the downgrading and poor performance of the economy where the gross domestic product fell 16.4% in the second quarter of 2020, which amounts to an annualised rate of 51% (10, 22, 23). While the

need for the services of NPOs is increasing, 66% of NPOs experienced a decline in income by September 2020 and 35% temporarily laid off employees or reduced working hours (10, 17).

1.2 SUSTAINABLE OPERATIONS MANAGEMENT

NPOs can apply operations management (OM) to become more sustainable. OM principles and strategies include for example the connection of actions to outcomes, adaption and alignment of processes, execution of strategy, integration of activities to achieve goals, and inter-functionally and interdisciplinary co-operation (4, 24-26). Such capabilities are critical for NPOs to address increasingly complex societal and natural problems while competing for tightening resources (27-29). It can help NPOs to balance the upholding of their mission and values on the one hand, with flexible operations on the other hand to align with environmental opportunities and threats (30). OM capabilities furthermore can assist NPOs to address human, financial, infrastructure and cultural resource challenges such as fostering desirable behaviours and required skills to achieve the mission of the NPO through training and appropriate governance structures (31, 32).

The focus of OM shifted through the years from craft production to high volume industrial production, quality, the internet, globalisation, and sustainability (2, 5, 24, 25, 33, 34). Sustainable operations management (SOM) refers to integrated approaches to social, environmental and economic factors (2, 4, 5, 35, 36). These factors entail, for example, total cost of operation, and behavioural and human factors concerning individuals, organisations including small businesses, the service sector and the public sector, countries including developing and low-income countries, and global effects including economic recessions and growth. Although SOM therefore offers capabilities for NPOs to become more sustainable, SOM needs to be further researched (2, 5, 24, 37).

OM is explicitly utilised by some NPOs (7, 25, 38, 39). It is acknowledged however that OM in NPOs is more challenging due to more, complex and often conflicting objectives (20). Furthermore, NPOs provide complex types of products and services, they operate in uncertain environments, and cooperate with multiple stakeholders including government, business and society (32, 40, 41). The operations of NPOs grow in complexity as they try to become more sustainable by increasing their product and service offerings, combining various product and service lines, and developing synergies across organisational units. A gap remains to research SOM in the context of small businesses, the service sector, the public sector, and NPOs (5).

NPOs understand, communicate and improve the management of their operations based on the OM model which they apply (42-44). To improve SOM in NPOs, the model which NPOs apply therefore must be investigated to understand how they deal with the complexities that surround

their operations (45, 46). Some NPOs apply conventional business OM models, but their sustainability deteriorates if they apply these models inappropriately (45, 46). Customised models also exist, for example, to sustain an innovation-based competitive strategy (47), implement good governance (48), raise funds efficiently (49), or to foster donor loyalty (50). However, an integrated organisational perspective is required for a sustainable operations management model (SOMM) in NPOs (51). A gap therefore remains to develop models of OM in general (52), of SOM (2), and of OM in NPOs (2, 45).

1.3 RESEARCH QUESTION

The sustainability of NPOs in general is at risk. Although NPOs can improve their sustainability through OM, the implementation of SOM requires further investigation. NPOs apply various models to improve the implementation of SOM, but a gap remains to develop such models. A problem therefore remains for the NPO in the South African education and research sector to find an appropriate OM model to become more sustainable. To address this problem, the following primary research question is posed:

“What is an appropriate sustainable operations management model in an NPO in the South African education and research sector?”

As evident from the sustainability of NPOs in general (§1.1), the above problem is an instance of a class of problems for NPOs in general to find appropriate OM models to become more sustainable. To address the class of research problems, the following research question is posed:

“What are appropriate sustainable operations management models in NPOs?”

1.4 RESEARCH APPROACH

An action design research (ADR) study, which entails an action research (AR) approach towards design research (DR) (53), is applicable to answer the posed research questions (54, 55). DR involves an ongoing process of designing and evaluating prototypes of a tool until it is sufficiently refined, through experimentation in collaboration with an organisation (56). Theories also are developed of how other organisations may address similar problems by applying similar tools (57). An AR approach entails an investigation of the operations of the organisation, their understanding of their operations, and the situation in which they operate (58). This study proposes a less technologically-orientated ADR approach by applying an AR approach towards DR in education instead of DR in IS.

An ADR approach is relevant to OM since it aims to improve the efficiency and effectiveness of the operations of an organisation (59). It also allows for the development of a model to improve the understanding of the operations of an organisation, enable communication, propose improvements and to surface underlying assumptions (53, 56). However, a need exists to further investigate the use of ADR in the field of OM (57, 60). Furthermore, an ADR approach is appropriate to consider the sustainability of an organisation through a future orientation towards the long term (53, 61). Further investigation however are required of the use of design approaches in the field of sustainability (62). ADR also is applicable in an NPO context since it allows for the investigation of multiple, complex and often conflicting objectives, complex performance evaluations, uncertain environments, and multiple stakeholders (53, 61). However, no literature could be found where ADR is applied to integrate the above aspects such as by developing an OM model to address the sustainability of NPOs. Furthermore, most applications of ADR are in the context of information systems (IS) (63).

An ADR approach addresses an actual problem in an organisation by formulating it as a research problem as shown in Figure 1-1. A tool is developed through cycles of building, intervention and evaluation – informed by theory – which the organisation can use to address the problem. The research process is continuously reflected upon, and a theory is proposed of how other organisations may address similar problems by applying similar tools (53). The original organisation serves as a case study to apply theory to have an actual impact and to refine theory through empirical testing (64).

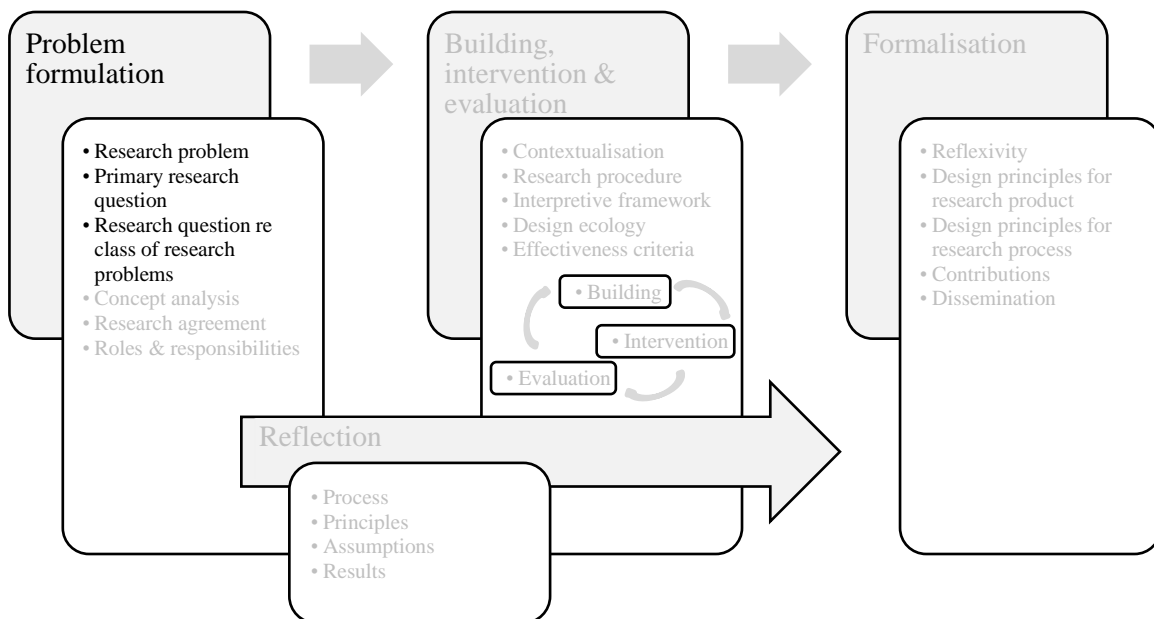


Figure 1-1 Chapter 1 in context of the research design

In order to subsequently develop new theory, a class of research problems must be addressed based on the case study (53, 65). This study positions the case study as an information-orientated sample based on its expected information content, instead of a random sample where the sample size would have been decisive for generalisation (65). The NPO in this study offers valuable information for the class of research problems. They represent a typical case of a current South African NPO with a footprint throughout South Africa and in operation for almost fifteen years. The NPO also is regarded as an extreme case who had significant impact but is currently under severe stress. By documenting a systematic reflection on how the NPO applies a SOMM in their particular context, theories are developed of how other NPOs may apply a SOMM in other contexts.

A case study approach is appropriate in an NPO context due to the extensive process needed to build rapport with an NPO in order to conduct a research project (66). Furthermore, the complex reality of NPOs requires a flexible research process with frequent interruptions and postponements which poses a challenge for the completion of a research project within a limited timeframe.

1.5 SCIENTIFIC CONTRIBUTION

The theoretical contribution of the study aims to address the class of research problems in terms of a design theory of SOMMs that NPOs in general can use to address their sustainability. The theoretical contribution of the study furthermore aims to contribute to the investigation of SOM, the development of OM models, and a transformative research agenda for sustainability science to create more sustainable outcomes (61). Theoretical contributions are made by systematically reflecting on how a specific NPO applies a SOMM in their particular context. Furthermore, the study endeavours to investigate the use of ADR in the integrated field of SOM, an OM model, sustainability, and an NPO. A less technologically-orientated ADR approach is proposed by applying an AR approach towards DR in education instead of DR in IS.

The practical contribution of the study aims to address the primary research question in terms of a SOMM that a specific NPO can use to address their sustainability.

The study therefore aims to make a praxial contribution. On the one hand, a practical contribution is informed by theory when a literature review is conducted to determine the characteristics of an appropriate SOMM in an NPO, plausible paths for the study, criteria for the application of concepts, and appropriate factors to ascribe research results to. On the other hand, the study entails more than project work or problem solving by developing a theory of how and why an OM model achieves sustainability in an NPO. Existing theories also are refined through empirical testing to impact the actual operations of an NPO.

1.6 DOCUMENT STRUCTURE

With reference to an ADR approach as shown in Figure 1-1 and further explained in the discussion of the research methodology in Chapter 3, the problem formulation phase is introduced in this chapter. Chapter 2 continues the problem formulation phase through the analysis of relevant concepts to identify contributing theories and existing models.

Chapter 4 completes the problem formulation phase through a research agreement between the researcher and the NPO in the South African education and research sector who commits to participate in the study. The building, intervention and evaluation (BIE) phase also is introduced in Chapter 4 through the contextualisation of a SOMM with reference to the NPO, development of a research procedure to address the primary research question, development of an interpretive framework and design ecology to address the research question concerning the sustainability of NPOs in general, and the establishment of effectiveness criteria to decide when the model is sufficiently refined.

Chapter 5 completes the BIE phase by documenting cycles until the NPO decides to adopt or reject the SOMM and the contribution of an additional cycle would be marginal in terms of refinement of the SOMM in the NPO. Chapter 6 documents the reflection phase which is executed in parallel with the previous two phases. It includes a reflection on the research process, evaluation of the adherence to research principles, a retrospective analysis of assumptions and implications thereof, and analysis of the research results to address the primary research question.

Chapter 7 introduces the formalisation phase including the summative evaluation of the study with reference to the reflexivity of the researcher, and the abstraction of reflections into a design theory for the designed tool and a research process in general. Chapter 8 concludes the formalisation phase and the research project by indicating contributions of the study and future research projects. Based on the above, research results are formalised for dissemination.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

To address the research questions posed in the problem formulation phase (Chapter 1), an action design research (ADR) study is conducted as shown in Figure 2-1 and further explained in the exposition of the research methodology (Chapter 3).

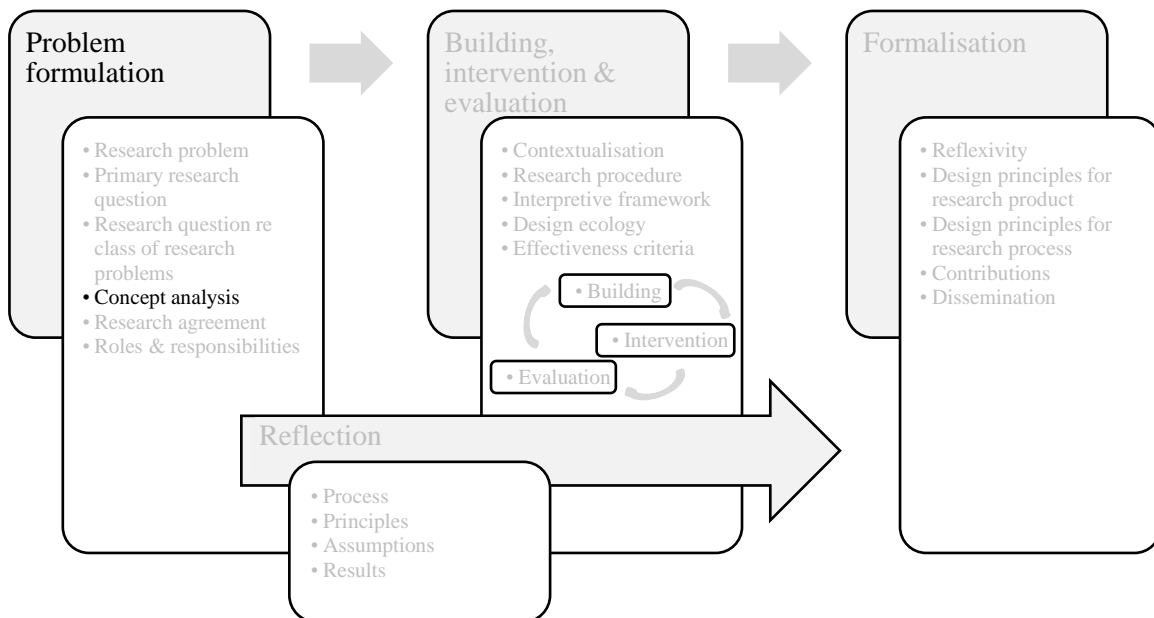


Figure 2-1 Chapter 2 in context of the research design

This chapter continues the problem formulation phase by identifying contributing theories and existing models in literature, to determine characteristics of an appropriate SOMM in the participating NPO and ways to develop it (67, 68). Criteria for applying relevant concepts are clarified, characteristic instances of SOMMs in NPOs are investigated – including important instances thereof – and appropriate factors are identified to ascribe results to. Concepts are analysed as culturally and historically moulded, based on the research philosophy as explained in Chapter 3, to enable the design of a culturally relevant model that builds on historically collected experience, skill and recognised limitations. Relevant concepts include operations management (OM) (§2.2), models (§2.3), sustainability (§2.4), non-profit organisations (NPOs) (§2.5), sustainable operations management (SOM) in NPOs (§2.6), and sustainable operations management models (SOMMs) in NPOs (§2.7). The validity of the concept analysis is formatively evaluated in §2.8 to be summatively addressed in Chapter 7. The chapter is concluded with a reflection in §2.9 which contributes to the documentation of the parallel reflection phase in Chapter 6 (69).

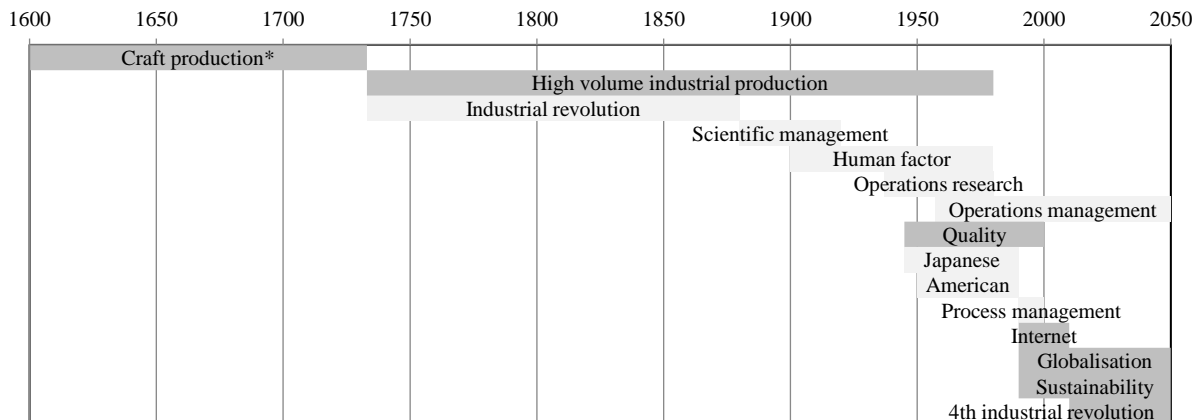
2.2 CONCEPTUALISATION OF OPERATIONS MANAGEMENT

The study is conducted in the field of OM. Although there is extensive literature on OM, there exists fair agreement on the definition thereof. Wild (70) defines OM as the management and

deployment of the primary physical resources of an organisation, to ensure the adequate utilisation thereof and the acquisition and retention of sufficient customers. Schonberger and Knod (71) confirm the customer focus, but also emphasise the management of the operations that transform the resources into services and goods. They also claim that all organisations apply OM. Davis and Heineke (33) define OM from an organisational perspective similar to (70), and from an operational perspective similar to (71) referring to inputs, namely materials and customers, that are transformed into outputs, namely services and goods. Galloway, Rowbotham and Azhashemi (72) agree with (33) from an operational perspective and elaborate on the inputs as resources such as people, materials, technology and information, and the outputs as services and products. Stevenson (73) offers a comparable definition, indicating that all organisations apply OM, and details output goods as raw materials, parts, subassemblies and final products. Russell and Taylor (74) define OM likewise in all types of organisations, describing management to include the design, operation and improvement of processes, and inputs to include material, machines, labour and capital. Heizer, Render and Munson (4) provide a similar definition with a focus on value creation. Krajewski, Malhotra and Ritzman (75) define OM likewise, elaborating management as the systematic design, direction and control of processes, and emphasising internal and external customers. Slack et al (25) define OM in terms of the resources and processes involved. Jacobs and Chase (76) offer a corresponding definition of operations and supply chain management, describing management like (74). These definitions emerge from a history of OM which is commonly described in terms of three periods of production namely craft production, high-volume industrial production or cost reduction, and lean production or quality revolution (4, 33, 74, 77-80).

The high-volume industrial production period is subdivided into five subperiods namely industrial revolution or early concepts and process, scientific management, human factor or relations or Hawthorne studies and mass production or moving assembly line, operations research, and the emergence of OM as a field (4, 33, 71, 73-75, 77, 78, 81). The quality period is subdivided into three subperiods (34, 73, 74, 78, 82-87). A Japanese subperiod started after the Second World War when Japan contested traditional mass production approaches, an American subperiod started in the 1950s when various American authors such as Juran, Crosby, Feigenbaum and Deming further developed and published on quality concepts, while a process management subperiod started in the 1990s with the application of the above quality concepts to nonmanufacturing processes.

The above three periods are augmented with three more periods namely internet revolution or merging of OM and information and communication technology (ICT), globalisation or integration of manufacturing and services, and sustainability or green revolution (4, 33, 73-75). In addition, industry currently is at the forefront of a fourth industrial revolution (88-90). These periods and subperiods are illustrated in Figure 2-2.



*From the stone age

Figure 2-2 A history of operations management

To clarify the concept of OM in the investigation of characteristic instances of SOMMs in NPOs, OM is defined in this study in context of a history of OM as the management of resources, and the processes involved to convert the resources into required products and services and to deliver them to the customers. Since OM emerged as a field in the high-volume industrial production period, this definition is supplemented with concepts from the quality period, internet period, globalisation period and the sustainability period to develop a definition of SOM in §2.4.

2.3 CONCEPTUALISATION OF MODELS

Definitions of OM are based on a transformation model of OM (25, 72). Processes, which constitute an organisation's operations and other functions, are modelled as transformation systems that transform inputs through process resources into outputs. These resources must be managed in terms of how they are directed, designed, developed and improved, and how delivery is planned and controlled. However, the sustainability of NPOs deteriorates if they apply conventional business OM models inappropriately (45, 46). It is important to develop a better understanding of how NPOs deal with the complexities that surround their operations.

A history of models is interlinked with a history of science, since models have played an important role in science throughout the ages (44). Instead of conceptualising models in terms of time periods found in literature, which therefore would entail a comprehensive account, different model uses and types are employed as summarised in Table 2-1.

It is shown in Table 2-1 that models are used to gain a better understanding of situations, data or theories (44). Research often is conducted on models that represent situations, data or theories – rather than on such situations, data or theories themselves – to make new discoveries or to confirm

theories. Harwood (43) adds that models are used as conventions in order for people to communicate about situations, data or theories in an understandable and useful way. Ulrich and Reynolds (42) furthermore argue that models are used to propose improvements to situations, data or theories. Such understanding, communication and improvements are based on certain assumptions (42-44). These assumptions must be explained as part of the model in order to determine applicability, indicate limitations, test the assumptions as hypotheses, and surface further implicit assumptions through the application of the model. Therefore Ulrich and Reynolds (42) indicate that models also are used as meta-theoretical frameworks to surface underlying theoretical assumptions. These different model uses are not mutually exclusive.

Table 2-1 Model uses and types

Model uses	Model types
<ul style="list-style-type: none"> • Improve understanding through representation of situations, data or theories • Convention to communicate about situations, data or theories • Propose improvements of situations, data or theories • Meta-theoretical framework to surface assumptions about situations, data or theories 	<ul style="list-style-type: none"> • Physical model • Fictional model • Mathematical model <ul style="list-style-type: none"> • Set-theoretic structure • Equations e.g. linear programme or stochastic simulation • Data or statistical model • Descriptive model

Table 2-1 furthermore indicates different types of models (43, 44). These model types also are not mutually exclusive and may be used in combination.

To develop an appropriate SOMM in an NPO, an OM model is defined in this study as a meta-theoretical framework to develop understanding, facilitate communication, propose improvements and to surface underlying assumptions in the management of resources, and the processes involved to convert the resources into required products and services and to deliver them to the customers.

2.4 CONCEPTUALISATION OF SUSTAINABILITY

In contrast to OM, there does not exist agreement on a definition of SOM in literature but it is defined in terms of focus areas for organisations to become more sustainable (4, 25, 34). These include lean OM (34), green and innovative product and process design and development (2, 4, 24, 34, 36), cleaner and advanced process technologies (2, 24, 36), product life extension and closed-loop supply chains (2, 34, 36), an integrated approach along global supply chains (4, 5, 35, 36), an integrated approach to social, environmental and economic factors including total cost of operation (2, 4, 5, 35, 36), behavioural and human factors (5), the importance of management systems (2, 26), and sustainable business model innovation (36).

The above focus areas of SOM emerge from a history of OM (§2.2). In a human factor subperiod of a high-volume industrial production period, the emphasis on work incentives, motivational theories and other human aspects expands through social awareness to include the health, safety and welfare of employees (2). These motivations and social awareness are based on self-defined basic needs also called legitimate needs which are further explored in this study (2, 34, 91-95).

In a quality period, the initial focus on statistical quality control of individual processes expands through total quality management to include customer requirements and supplier operations, and further through an environmental perspective to include stakeholder requirements and avoidance of any form of waste (96, 97). In a globalisation period, initial optimisation of inventory control by a single planner extends to entire supply chains involving multiple organisations, conflicting objectives, private information, reverse flows and end-of-life product disposal (96). Sustainability becomes important when considering global population growth, increasing per capita consumption, climate change and other social and natural concerns (2, 5, 24, 25, 34). A history of SOM is summarised in Figure 2-3 (98-103).

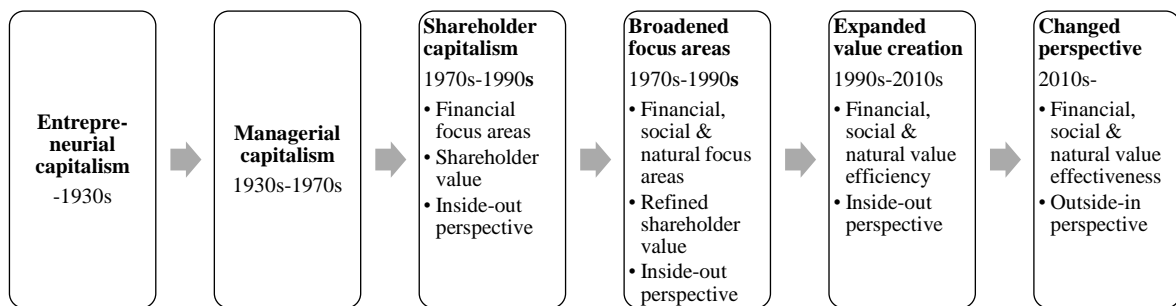


Figure 2-3 A history of sustainable operations management

The focus areas of SOM also arise from a history of sustainability (24, 104-119). Although hunter-gathering societies such as the Bushmen are practicing sustainable living for thousands of years (119), Pliny the Elder authored the first guide on the topic in 77-79 (118) and the concept of *nachhaltend* or sustainable appears for the first time in literature in 1713 (104). Sustainability is put on the global development agenda in 1987 as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (1-3). However, Heizer, Render and Munson (4), Linton, Klassen and Jayaraman (2) and Walker et al (5) indicate that different interpretations evolve from this broad definition in attempts to operationalise sustainability. Elkington (100) integrates the social and financial dimensions of sustainability in business terms as a triple bottom line to establish social, natural and financial values – also known as *people, planet, profit* – to measure organisational success. Emerson (102) also emphasises integration as a blended value orientation where an optimal application maximises social, natural and financial value. Porter and Kramer (101) propose the concept of shared value that involves

creating economic value in a way that also creates value for society by addressing their needs and challenges. De Haan (120) offers an alternative definition of sustainability in terms of how people use their capabilities and tangible and intangible assets to satisfy their self-defined basic needs and build resilience. To achieve sustainable livelihoods, people require human, natural, physical, financial and social resources which De Haan refers to as five capitals to incorporate various terms like capabilities, assets and resources.

In order to incorporate the different focus areas of SOM which emerge from a history of OM and a history of sustainability, SOM is defined in this study as the management of human, natural, physical, financial and social capital and the processes involved to satisfy self-defined needs and to build resilience over the long term. Human capital includes employment, skills, experience, knowledge, creativity and inventiveness, natural capital includes resources such as land, water, clean air and minerals, physical capital includes food, housing, roads, substances and facilities, financial capital includes money, credit and shares, and social capital includes quality of relationships in families and among colleagues and partnerships between businesses, government and civil society (120, 121). Resilience over the long term involves adaptive capabilities, flexible capacities and motivation to respond to shocks and stresses (120, 122). Such a definition therefore assumes integrated human, natural, physical, financial and social value, while avoiding monetisation and acknowledging dynamic interplay between capital application and effect (102, 123, 124). Furthermore, it is assumed that sustainability is not a status quo but that various fields such as OM co-develop a fluid definition of sustainability (109).

Different sustainability impact evaluation metrics exist in literature (24, 26, 34, 100, 102, 125, 126). Nonetheless, Bonini and Emerson (127) suggest that instead of the development and standardisation of metrics, the focus should be on the development of a culture of evaluation and learning. Adams (111) furthermore emphasises the involvement of stakeholder groups in evaluation and decision-making.

2.5 CONCEPTUALISATION OF NON-PROFIT ORGANISATIONS

Focus areas of SOM arise from a history of OM with an increased emphasis on sustainability. This development is associated with stakeholders – especially NPOs – who increasingly advocate for organisations to operate more sustainable (4-7). NPOs also contribute to the sustainability of society (6, 8-13).

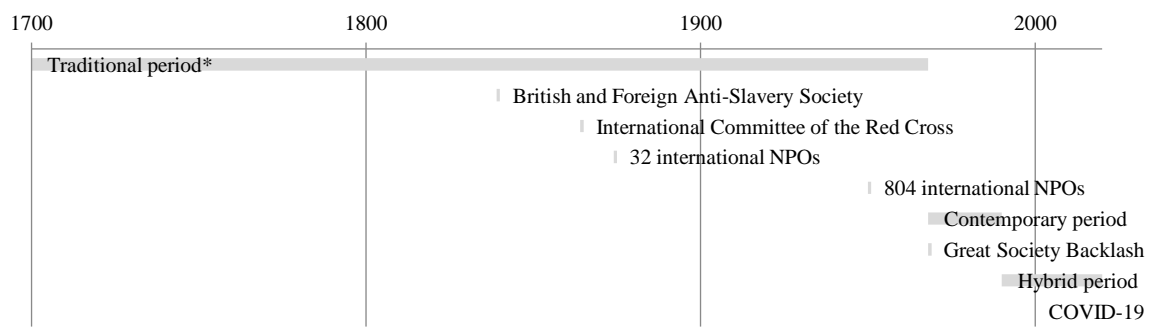
In South Africa, any organisation may register as an NPO if they are a corporate body with an identity and existence distinct from their members, are not part of government, have assets which

are not distributable to their members even on dissolution, have a constitution, and if their financial transactions are conducted through a banking account (128, 129).

Internationally, Salamon and Anheier (7) characterise an NPO as a private self-governing organisation with an institutional presence and structure, who does not distribute profit to their owners, has voluntary membership, and attracts voluntary contributions of time or money. Presoto, Mantovani Fontana and Souza (28) characterise an NPO similar and add that NPOs are established by civil society to assist government to guarantee citizenship and democracy, sometimes executing on behalf of government. They also emphasise that NPOs invest their profits in their purpose instead of transferring it to their owners. McDonald et al (38) describe an NPO in terms of the exchange theory of marketing where NPOs typically satisfy needs which are neglected by business, because they cannot be addressed profitably, and by government, due to insufficient statutory basis or public support. NPOs therefore often pursue missions that are financially or politically non-viable. Feng and Shanthikumar (40) likewise distinguish an NPO from government and business, but mention that business also performs not-for-profit operations such as fundraising while an NPO also performs for-profit operations such as generating revenue.

To clarify the concept of an NPO in the investigation of characteristic instances of SOMMs in NPOs, an NPO is defined in this study as a self-governing organisation separate from government and business, whose main purpose is not profit generation only. AN NPO is used synonymously with a non-government, voluntary, civil society, third sector, or independent sector organisation and may include a non-profit company or a social enterprise although these organisations can be differentiated from one another (28, 128-131).

Definitions of an NPO are based on a history of NPOs which interlinks with a history of sustainability where business becomes increasingly interested in the creation of blended or shared value. Such a history may be viewed in three periods namely a traditional period, contemporary period, and a hybrid period as illustrated in Figure 2-4 (19). A traditional period emphasises philanthropy, volunteerism, collective engagement to solve social problems, empowerment, and concern for public good (19, 132). A contemporary period embraces business management practices such as strategic planning, evaluation and reporting, performance measurement, financial resource management, and environmental analysis (19). A hybrid period combines social passion with business acumen to generate social and financial value (19, 51, 125). An event which is not recorded in a history of NPOs yet, is the pandemic caused by Coronavirus disease of 2019 (COVID-19).



*from the Middle Ages

Figure 2-4 A history of non-profit organisations

Throughout a history of NPOs, various initiatives are undertaken to promote the sustainability of NPOs as summarised in Table 2-2. Many tools also are developed to evaluate the sustainability of NPOs (133).

Table 2-2 Promotion of sustainability of non-profit organisations

Date	Organisation	Initiative
1987	Article 19	Promote Article 19 of the Universal Declaration of Human Rights
1990	Johns Hopkins Comparative Nonprofit Sector Project	Empirical studies about the NPO sector based on the United Nations International Standard Industrial Classification system
1992	International Center for Not-for-Profit Law (ICNL)	Tools to monitor and evaluate civic space
1993	CIVICUS	World alliance for citizen participation
1995	ICNL, World Bank	Handbook on laws relating to NPOs
1997	United States Agency for International Development (USAID)	Index to measure the sustainability of the NPO sector internationally
1997	CIVICUS	New Civic Atlas
1999	CIVICUS, London School of Economics and Political Science	Indices to measure and analyse NPOs in terms of socio-economics, legal and political space, values, and function and impact
2001	World Bank	ARVIN framework to assess how enabling an environment is for civic engagement
2003	United Nations, Johns Hopkins Center for Civil Society Studies	Handbook on Nonprofit Institutions based on the System of National Accounts including volunteer work
2012	CIVICUS, ICNL, Article 19, World Movement for Democracy	Foster an enabling legal environment for NPOs through worldwide national assessments

2.6 SUSTAINABLE OPERATIONS MANAGEMENT IN NON-PROFIT ORGANISATIONS

SOM requires further research with no agreement on a definition in literature as yet (2, 5, 24, 37).

Furthermore, the increased emphasis on sustainability is associated with stakeholders – especially NPOs (4-13) – so that a need exists to research SOM in the context of NPOs (5). SOM in NPOs

however is still an emerging field (45, 134). This study follows an ADR approach so that SOM is defined with reference to a history of OM and a history of sustainability. AN NPO is likewise defined based on a history of NPOs which also interlinks with a history of sustainability. To clarify the criteria for applying relevant concepts, investigate characteristic instances of SOMMs in NPOs, include important instances thereof, and to ascribe results to appropriate factors (67, 68), OM literature therefore is organised according to key focus areas to facilitate sensemaking by the NPO (63, 135). Summative content analysis is applied (136, 137) as proposed by Davies (138). Frequently cited references on OM in NPOs are used as a starting point, followed by a snowballing search procedure until a point of saturation is reached (139, 140). A hundred references over the past fifty years, supplemented with references on OM in general and SOM are consequently analysed with the support of the qualitative data analysis software ATLAS.ti (141). At a manifest level, keywords as identified by authors and main findings are analysed manually (137, 142). The grounding of each keyword is determined by critically searching all references while the density of each keyword is determined through a concept listing. Keywords with a 0 density are consolidated with other keywords.

At a latent level, key focus areas of SOM in NPOs are derived from the above keywords supplemented with theory (137, 142). Feng and Shanthikumar (40) identify five key focus areas namely the management of fundraising, revenue, resources, products and services with regard to offering, source and allocation, and performance. Berenguer et al (134) identify four key focus areas to make sense of the vast literature on OM in NPOs and overlapping fields namely fundraising, revenue management, resource management, and distribution. These focus areas are supplemented with the key focus areas identified by Pomerantz (51) regarding evolutionary social enterprises focusing on sustainability namely commercial activity to support a social mission, regenerative technology, and transcendental leadership. Strang (143) identify eight focus areas for NPO effectiveness namely leadership and structure, strategic planning, documented procedures and training, human and technology resource management, financial management and accountability practices, ethics and professional communications policies, collaborative fundraising and marketing initiatives, and performance effectiveness evaluation. Key focus areas of SOM are identified in §2.4. Furthermore, key focus areas of OM in general are identified in §2.2.

The key focus areas identified through the above summative content analysis are shown in order of groundedness in Table 2-3. The concept of SOM also is further explored through the above analysis as summarised in Table 2-4. More detail is available in Addendum A.

Table 2-3 Key focus areas of sustainable operations management in non-profit organisations

Key focus area	Keywords
Products & services	Capability, Marketing, Organisational growth, Organisational processes, Organisational structure, Product and service affordability, Product and service design, Product and service distribution, Product and service management, Product and service offering, Product life, Products and services, Resource management, Supply chain management, Total cost of operation, Value creation, Value-based management, Waste management
Stakeholders	Advocacy, Beneficiaries, Business, Collaboration, Communication, Competition, Confidentiality, Customer, Customer categorisation, Donors, Government, Interdependence among NPOs, Lobbying, Organisational environment, Partnerships, Policy, Professional support, Responsibility, Social media, Society, Stakeholder relations, Trusting
Governance	Accountability, Benchmarking, Causal relationships, Clarity, Complexity, External threats, Global trends, Impact assessment, Innovation, Internal threats, Knowledge management, Legitimacy, Organisational governance, Organisational learning, Organisational synergies, Outcomes, Performance management, Power, Quality management, Risk management, Social return on investment
Leadership	Board effectiveness, Leadership, Mission, Organisational strategy, Personal attributes, Vision
Funding	Financial management, Funding model, Funding sources, Fundraising expenditure, Philanthropic funding, Profit, Revenue
Human resources	Change management, Employees, Human resource management, Organisational commitment, Recognition, Recruitment, Retention, Training and development, Volunteers
Organisational culture	Contemporary orientation, Decoupling, Diversity, Market orientation, Organisational culture, Organisational identity, Organisational values, Societal orientation
Technology	Appropriate technology, Clean process technology

Table 2-4 Sustainable operations management in terms of non-profit organisations

Key focus area	Keywords
Sustainable operations management	Agency, Capitals, Corporate social responsibility, Economic prosperity, Energy security, Industrial ecology, Low-carbon economy, Natural environmental management system, Operations, Operations control, Operations design, Operations improvement, Operations planning, Social capital, Social economy, Social manufacturing, Trade-off, Triple bottom line

2.7 SUSTAINABLE OPERATIONS MANAGEMENT MODELS IN NON-PROFIT ORGANISATIONS

The identified key focus areas of SOM in NPOs can be utilised to categorise various existing models such as to sustain an innovation-based competitive strategy (47), implement good governance (48), raise funds efficiently (49), or to foster donor loyalty (50). However, the definition of SOM in this study encompasses different focus areas which emerge from a history of OM and a history of sustainability. Such a definition is supported by an industrial systems approach

which includes the context, resources, activities, processes, actors and interdependencies that support the creation and delivery of products and services (144). This is also in line with the integrated organisational perspective required for a SOMM in NPOs as indicated by Pomerantz (51) and Thompson (145).

Morris, Schindehutte and Allen (146) define a business model as a strategic framework for conceptualising any value-based enterprise. A business model for sustainability in NPOs then may interpret value as involving human, natural, physical, financial and social value (27, 101, 102, 120). To distinguish such a model from only the utilisation of business values by NPOs (19), the model is referred to as an organisational model for sustainability in NPOs (99). Applicable organisational models for sustainability are identified in literature as listed in Table 2-5.

Table 2-5 Organisational models for sustainability

Model	Reference	Description
Technological, social and organisational models for sustainability	Bocken et al (147)	Technological, social and organisational innovation must be combined to drive innovation for sustainability, embed sustainability into organisational aims and processes, and to drive competitive advantage
Modification of general organisational models for sustainability	Davies and Chambers (148)	Significant effort is required to integrate the capturing of financial, social and natural value
Sustainable organisational model for mature organisations	Jablonski and Jablonski (149)	An appropriate sustainability strategy is determined by organisational attributes such as their growth phase (150). It involves synergy among social, economic and environmental long-term value, symbiosis among all stakeholders, and symmetry between creating unique value for customers and ensuring long-term value. It also involves durability among management, stakeholders and governance, balance between physical and human capital, and a relationship between social, economic and environmental aspects and stakeholder value.
Customised organisational models for sustainability	Maletic, Maletic and Gomiscek (151)	Appropriate organisational sustainability capabilities are determined by environmental factors such as competition and uncertainty. These capabilities concern the efficient deployment of current sustainability practices, and also the development of new concepts and capabilities related to sustainability innovation.
Instrumental and integrative organisational models for sustainability	Van Bommel (152)	Integrated value is created by applying paradoxical thinking between instrumental and integrative approaches

Furthermore, SOM in an NPO is regarded as an organised complex problem with a significant number of factors interrelated in an organic whole (153, 154). It is not a simple problem with a limited number of variables behaving in predictable ways, which is addressed through standard

procedures. Neither is it a disorganised complex problem with a very large number of variables behaving in unpredictable ways while the whole displays orderly properties, which is statistically analysed. An organised complex problem requires participative research where participants try to understand activity from within that activity through descriptive and explanatory content-rich models that are not prescriptive (155). Systems thinking therefore also is applied to develop a SOMM in an NPO (153).

Many different systems thinking approaches exist which could be applied (156, 157). Likewise, many different directives exist on how to select appropriate systems thinking approaches (158-161). This study refers to approaches mentioned by Williams (162) in an international development context as listed in Table 2-6, with references to Reynolds (163). Additional approaches are added as referred to in literature on applications in NPOs, the NPO inquired about scenario planning, the biomatrix model is added based on the researcher's experience, and dynamic equilibrium modelling is added as an approach to address paradox as surfaced by other approaches.

An appropriate SOMM in the participating NPO is developed in this study based on the conceptualisation of OM (§2.2), an OM model (§2.3), SOM (§2.4) and an NPO (§2.5). The separate key focus areas identified in §2.6 can be utilised to select from many different alternative modelling approaches, but an integrated organisational perspective is required. Applicable organisational models for sustainability therefore are identified. Furthermore, SOM in an NPO is conceptualised as an organised complex problem so that relevant systems thinking approaches also are identified. These modelling approaches provide a basis to develop a research procedure in the building, intervention and evaluation (BIE) phase to address the primary research question (53, 164).

2.8 CHAPTER VALIDATION

To ensure the quality of the study, content validation in terms of the actual need for a SOMM in the participating NPO is confirmed in the motivation of the study (165-167). Content validation also entails the currency of the SOMM developed in the NPO. A basic language of the concepts of OM, an OM model, SOM, and an NPO is used to characterise a SOMM in an NPO (167-169).

Therefore, content validation is established by defining OM, an OM model, SOM, and an NPO with reference to current literature.

Furthermore, it is acknowledged that the above concepts are culturally and historically moulded (170) so that the content validation of the study not only concerns the currency of concepts, but is strengthened by cultural relevancy and historical experience, skill and recognised limitations. In addition, content validation is promoted through the participation of the NPO in making sense of

relevant concepts. The extensive literature on SOM in NPOs is organised according to key focus areas identified through summative content analysis with the support of qualitative data analysis software, involving a hundred references over the past fifty years on SOM in NPOs, supplemented with references on OM in general and SOM.

Besides the definition of relevant concepts with reference to current literature, content validation is strengthened through the identification of current organisational models for sustainability and systems thinking approaches to determine criteria for developing an appropriate model and to refine probable paths for the study.

The reflexivity of the researcher is addressed by defining relevant concepts based on current literature, and an awareness of the cultural and historical situatedness of these concepts. The NPO participates in making sense of relevant concepts through key focus areas. These focus areas are identified with a detailed description of data gathering and the rationale for categories which provides for replicability, reliability and validation through transparency and rigour (171). Furthermore, various organisational models for sustainability and systems thinking approaches are identified in literature to supplement the researcher's experience.

Table 2-6 Systems thinking approaches to model sustainable operations management in NPOs

Approach	Reference	Theoretical underpinnings	Questions	Operations management example	Sustainability example	NPO example
Structural equation modelling (SEM)	Fan et al (172)	Path analysis, factor analysis and Bayesian modelling	<ul style="list-style-type: none"> • What are the interrelationships and interdependencies of the organisation? 	Paraschi, Georgopoulos and Kaldis (173)	De Giovannia and Vinzi (174)	Gazley and Nicholson-Crotty (175)
Social network analysis (SNA)	Borgatti et al (176)	Graph theory	<ul style="list-style-type: none"> • How can the social structure and positions in the organisation be characterised? • How can dyadic properties and distributions in the organisation be characterised? • How do dyadic properties and distributions affect the social structure and positions in the organisation? • What opportunities are available to the different positions, how are they constrained, and what outcomes can be expected? • What is the structural importance of each position? 	Kim et al (177)	Marais and Vannini (178)	Espinosa and Walker (179)
Viable system modelling (VSM)	Beer (180)	Cybernetics, avoiding a reductionist focus on parts instead of the whole	<ul style="list-style-type: none"> • What is the nature of the interrelationships within the organisation? • What is the structure of these interrelationships? • What are the processes between them? • What are the patterns that emerge from these processes, with what consequences and for whom? • Why does this matter, to whom and in what context? 	Espinosa and Porter (181)	Tavella and Papadopoulos (182)	Walker (183)

Approach	Reference	Theoretical underpinnings	Questions	Operations management example	Sustainability example	NPO example
System dynamics (SD)	Forrester (184)	Cybernetics, avoiding a reductionist focus on parts instead of the whole	<ul style="list-style-type: none"> • How is organisational performance affected by delayed impacts? • How is organisational behaviour affected by feedback patterns? • How is the flow of resources through the organisation controlled? How does this affect performance? • Which structural leverage points in the organisation can advance self-organising processes? 	Sterman et al (185)	Singh (186)	Singh (186)
Systems diagrams	Senge (187)	Cybernetics, avoiding a reductionist focus on parts instead of the whole	<ul style="list-style-type: none"> • Which generic pattern of structure occurs in this situation? • What leverage opportunities can change the thinking that produces the situation? 	Ellram, Tate and Carter (188)	Singh (186)	Singh (186)
Complex adaptive systems (CAS)	Chaffee and McNeill (189)	Open systems approach	<ul style="list-style-type: none"> • What bottom-up innovation and learning processes exist in the organisation? • What tools are available to observe and understand the dynamics and co-evolution of organisational networks? • How does management orchestrate top-down empowerment for bottom-up innovation and learning processes? 	Espinosa and Porter (181)	Espinosa and Porter (181)	Moeller and Valentinov (190)
Soft systems methodology (SSM)	Checkland and Poulter (191)	<ul style="list-style-type: none"> • Interpretivism, avoiding a dogmatic privilege of one particular perspective • Critical realism, balancing theory building and the improve- 	<ul style="list-style-type: none"> • What are different ways in which the organisation can be understood? • How are these different understandings going to affect the way in which people judge the success of the organisation? • How will it affect people's behaviour, especially when things go wrong from their perspective? What will be the result and significance? 	Galloway, Rowbotham and Azhashemi (72)	Palmer et al (192)	Checkland (193)

Approach	Reference	Theoretical underpinnings	Questions	Operations management example	Sustainability example	NPO example
		ment of a problem situation				
Scenario planning	(194)	<ul style="list-style-type: none"> • Mathematical models, statistics, simulation • Cybernetics, avoiding a reductionist focus on parts instead of the whole • Structuralism 	<ul style="list-style-type: none"> • What is the focal issue? • Who (and what) are the stakeholders? • Which trends will affect the issue? Which uncertainties may affect the issue? • What are three or four alternative scenarios in which the issue could evolve? Are they consistent and plausible? • How would existing strategies fare under different scenarios? 	Slack et al (25)	Clemens (195)	Allison and Kaye (196)
Weickian model	Weick, Sutcliffe and Obstfeld (197)	Interpretivism and pragmatism, avoiding a dogmatic privilege of one particular perspective and addressing a partial understanding of a situation	<ul style="list-style-type: none"> • What issue is noticed that warrants closer attention? • What is it about? 	Su (198)	Van der Heijden, Cramer and Driessen (199)	Gilstrap et al (200)
Cynefin framework (CF)	Kurtz and Snowden (201)	CAS, pragmatism and critical theory, addressing a partial understanding of a situation and partiality among different stakeholders	<ul style="list-style-type: none"> • How are we framing the situation? • What are the implications of this framing for how we investigate the situation? • What are appropriate ways of managing the situation on the basis of this framing? 	Shalbafan et al (202)	Spofford (203)	Guijt (204)
Critical systems heuristics (CSH)	Ulrich and Reynolds (42)	Pragmatism and critical theory, addressing a partial understanding of a situation and	<ul style="list-style-type: none"> • Who or what is being excluded, marginalised or victimised by the way in which a situation is viewed or managed? 	Parker and Byrne (205)	Buse (206)	Brennan (207)

Approach	Reference	Theoretical underpinnings	Questions	Operations management example	Sustainability example	NPO example
		partiality among different stakeholders	<ul style="list-style-type: none"> • What does this reveal about stakeholders' values in this situation? • What are the consequences of boundary setting decisions? How can negative effects of such decisions be mitigated? 			
Biomatrix	Dostal, Cloete and Jaros (208)	CAS, pragmatism and critical theory, addressing a partial understanding of a situation and partiality among different stakeholders	<ul style="list-style-type: none"> • How are we framing the situation? • What are the implications of this framing for how we investigate the situation? • What are appropriate ways of managing the situation on the basis of this framing? 	Buthelezi (209)	Dostal, Cloete and Jaros (208)	Wigger (210)
Dynamic equilibrium modelling (DEM)	(211)	Paradox theory, addressing a partial understanding of a situation and partiality among different stakeholders	<ul style="list-style-type: none"> • Who, what, when, where, why and how of the situation? • How do others experience the situation? • What are the implications of current perceptions and actions? What other options are available? • Is the proposed resolution practical? 	Van Bommel (152)	Van Bommel (152)	Gowrisankaran and Town (212)

2.9 CHAPTER REFLECTION

Time periods found in literature are used as a framework to conceptualise relevant concepts (213). A history of OM indicates that OM emerged as a field late during the high-volume industrial production period. In their application of SOM, it is therefore important for the NPO to supplement concepts from the sustainability period with concepts from the quality period, internet period, globalisation period – and fourth industrial revolution. A history of sustainability indicates the growing need for interdisciplinary research and impact, integrated sustainability, and inclusivity (36). It therefore motivates the applied definition of sustainability which guides the study and evaluation of the effectiveness thereof (214). Furthermore, different model uses and types identified in the literature review form the basis for the definition of a SOMM which determines the execution of the study and the construct validation thereof. The research methodology must allow for the definition of concepts to address the research questions.

A history of NPOs also is constructed from literature. However, time periods and events found in literature do not only conceptualise NPOs historically, but also socially and politically (215). Traditional, contemporary and hybrid approaches, for example, are evident in different geographical locations (7, 13, 48, 216). This causes tension and conflict in the NPO sector (8, 19) and involves a multitude of tools that attempt to make sense of the worldwide sector (7, 13, 48, 216, 217). Various classifications exist to decide on which tools to apply (133, 218).

There does not exist a common definition of SOM in NPOs and various authors emphasise different aspects thereof. To make sense of the vast literature on SOM in NPOs and overlapping fields, key focus areas are identified through a summative content analysis of literature. These focus areas can be utilised to categorise various existing OM models in NPOs, but an integrated organisational perspective is required. Relevant organisational models for sustainability are identified in literature. Furthermore, systems thinking approaches are applied to model SOM in an NPO as an organised complex problem. While many different systems thinking approaches could be selected based on many different directives, this study considers approaches mentioned in an international development context supplemented with a few additional approaches.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

To address the research questions identified and conceptualised in the problem formulation phase (Chapter 1), an appropriate research approach is fundamental (219, 220). Besides being appropriate to develop a sustainable operations management model (SOMM), the chosen approach must consider the challenges faced by non-profit organisations (NPOs) in the execution of operations management (OM) (7, 20, 25, 32, 38-40). The research approach must allow for the definition of concepts to address the research questions.

Research methodology involves a research design (§3.2), a research philosophy (§3.3), and compatible research methods (§3.4) (221-224). The chapter is concluded with a reflection in §3.5.

3.2 RESEARCH DESIGN

A research design provides a logical structure or plan to answer a research question (225). Such a plan is structured in a design mode, a science mode, or a humanities mode (54, 221). In a science mode, a research question is addressed by discovering general patterns and forces that explain a phenomenon such as in physics and other natural sciences. In a humanities mode, a research question is addressed by describing, understanding and critically reflecting on human experience such as in aesthetics, history, cultural studies, literature studies and philosophy. In a design mode, a research question is addressed by creating a tool to achieve a specific goal such as in engineering, architecture and information systems (IS). A research design structured in a design mode therefore is appropriate to address the research questions in this study through the development of a SOMM in an NPO.

A case study is used in a design mode to apply theory to have an actual impact through the development of a tool and assessment by practitioners (226-228). On the other hand, theory is refined through empirical testing based on content-rich data from the real world (64, 155).

3.2.1 Design research

Design research (DR) is based on the work of Simon (229). It entails an ongoing process of designing prototypes of a tool through abductive reasoning, and evaluating the prototypes through experimentation in collaboration with an organisation until it is sufficiently refined (56). Theories also are developed of how other organisations may address similar problems by applying similar tools (57). DR has been applied to address ill-defined problems in OM (230) of which the development of a SOMM in an NPO is a novel example. It has been applied to develop OM models (231) and explore the achievement of sustainability goals (61, 62, 232).

However, although DR has been applied in NPOs especially to design platforms to interlink technical and social networks such as food networks and urban regeneration programmes (231, 233), it is argued that DR does not sufficiently incorporate the organisational context in shaping a design as required in this study (53, 234). Furthermore, a stage-gate process is followed where prototype development is separated from prototype evaluation, and controlled evaluation is applied which is difficult to design and conduct (53). It is also challenging to develop a theory of how other organisations may apply similar tools (235).

3.2.2 Action research

Alternatively, action research (AR) also is rooted in a design mode (55). It entails an investigation of the operations of an organisation, their understanding of their operations, and the situation in which they operate (58). AR has been applied to address OM problems (57), develop an OM model (182), explore the achievement of sustainability goals (58), and has been regularly applied in the NPO sector (236).

However, AR tends to focus on understanding the current situation without attention to an ideal future (55, 237), which is problematic if the sustainability of the NPO must be addressed (232). Furthermore, the social group interactions typical of AR requires an extended period of time which poses a challenge for the completion of a research project within a limited timeframe (238, 239).

3.2.3 Action design research

To address the challenges posed by DR and AR, different approaches are taken such as by Schwabe and Krmar (240) through the use of a piloting approach of innovation to AR. Romme (55) takes a systems design approach (54) to AR in order to realise the emancipatory intentions of AR. Cole et al (241) propose a research process to integrate DR and AR in IS, referred to as action design research (ADR) by Iivari (242). Hevner (243) suggests that AR can be utilised to design and evaluate a tool in an organisational IS context. Holmström, Ketokivi and Hameri (235) encourage DR in OM with reference to the work of Simon (229) and postulate how an AR approach towards the refinement of a design can incorporate the development and testing of theoretical hypotheses. Hüner, Ofner and Otto (244) actually utilises AR to evaluate the design of a corporate data quality maturity model. Fendt and Kaminska-Labbé (245) suggest how design-driven AR may bridge the gap between management theory and management practice. Sein et al (53) develop and apply a complete ADR process based on an AR approach towards DR.

ADR has been applied in an OM context (57), to develop a model utilised in OM (60), in the context of sustainability (246), and in NPOs (64, 246-249). It can be utilised to investigate the application of theory to impact the actual management of organisational operations, refining theory

through empirical testing, and developing new theory (53, 57, 60, 65, 164, 250). ADR also is appropriate to develop a model to improve understanding, enable communication, propose improvements and surface underlying assumptions (53, 56, 167-169, 251). The achievement of sustainability goals can be explored through ADR since it is future orientated towards possible diverse futures, which serve as a basis for critical thinking, social learning and constructive action (232).

However, ADR is mostly applied in the context of information systems (IS) (63). Although Haj-Bolouri et al (63) indicate that ADR is used in other fields as well, these applications concern IS in health by Weeding and Dawson (252) and Castro, Lefebvre and Lefebvre (253), in education by Ractham, Kaewkitipong and Firpo (254), in government by Zuiderwijk et al (255), in smart city studies by Maccani, Donnellan and Helfert (256), in enterprise engineering by De Vries and Berger (257), and in organisational research by Henriques and O'Neill (258). Although Wing, Andrew and Petkov (259) consider a soft design science methodology (260) in the application of ADR, Alles, Kogan and Vasarhelyi (261) apply collaborative DR, Haj-Bolouri, Bernhardsson and Rossi (262) apply participatory ADR, Briggs et al (263) apply a piloting approach of innovation to ADR, and Mullarkey and Hevner (264) propose elaborated ADR, these studies all involve IS. This also holds for ADR applications in NPOs.

To develop a SOMM in an NPO, a less technologically-orientated approach is required which focuses on the improvement of the quality of experience for stakeholders of the organisation (265). Such an approach is proposed by applying an AR approach towards DR in education instead of DR in IS. DR in education is less technologically orientated, well established (266) and a detailed research process is described by Plomp (167) and others. Since Sein et al (53) propose specific ADR phases to address the challenges posed by DR, these phases are used as a framework to apply an AR approach to DR in education as summarised in Figure 3-1.

3.2.4 Research phases

3.2.4.1 Problem formulation

During the problem formulation phase shown in Figure 3-1, an actual problem is identified regarding the sustainability of an NPO (53). The problem is conceptualised as worthwhile to be researched and a research question is posed in terms of the development of a SOMM which the NPO can apply to address their sustainability.

Subsequently, the research problem is formulated as a case study that represents a class of research problems to enable a theoretical contribution in terms of a design theory of how NPOs in general can address their sustainability by applying similar SOMMs (53). Instead of random sample

selection, information-orientated sample selection is applied where a single case is selected based on its expected information content (65).

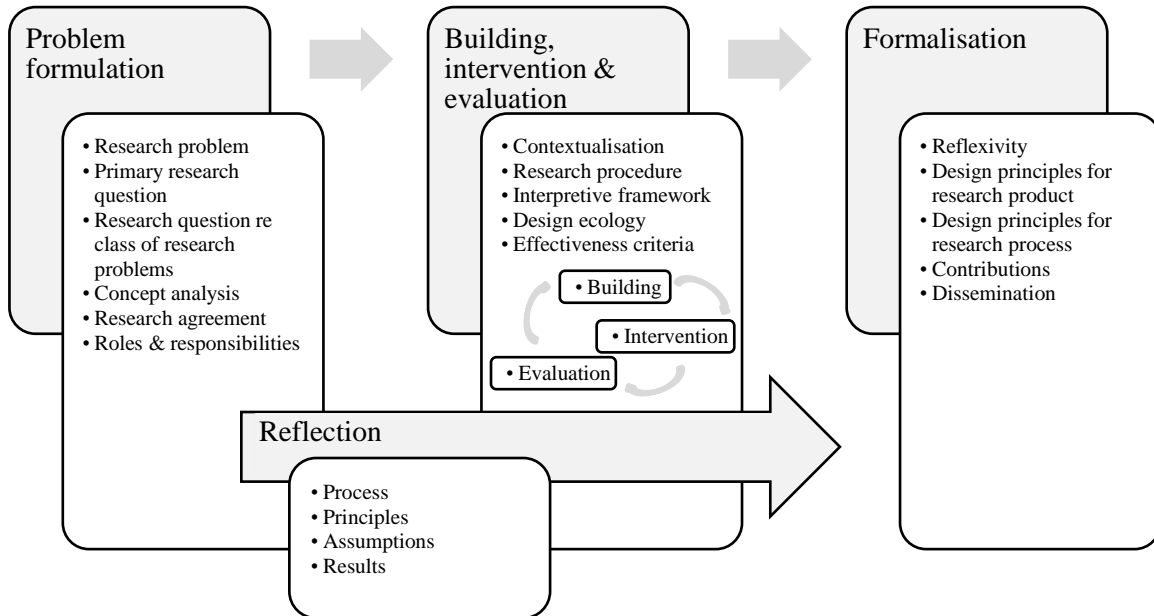


Figure 3-1 Research design

While the study is motivated from an actual problem in practice and not from literature, concepts are analysed through the literature review to provide a supplementary theoretical foundation (68). The literature review does not presuppose the class of research problems but analyses relevant concepts as culturally and historically moulded. This enables the design of culturally relevant SOMM that builds on historically collected experience, skill and recognised limitations.

Lastly, long-term commitment is obtained from the NPO in a written agreement between the researcher and the NPO, including roles and responsibilities (267).

3.2.4.2 Building, intervention and evaluation

The building, intervention and evaluation (BIE) phase in Figure 3-1 starts with the contextualisation of a SOMM in terms of the participating NPO (166). Next, a research procedure is developed to address the primary research question (53, 164), while an interpretive framework is developed to address the research question concerning the sustainability of NPOs in general (164). The framework must be coherent and transparent to avoid relativism by clearly stating research principles and implied assumptions (268). Relevant field-specific theories also must be indicated (164). Furthermore, the framework must explain how prototypes are conceptualised, structured, applied and evaluated (269). Lastly stakeholders must be indicated who may benefit from or be affected by the design prototypes (270). A design ecology also is required to address the research question concerning the sustainability of NPOs in general (164).

After effectiveness criteria are established to decide when the SOMM is sufficiently refined (267), a SOMM is developed through BIE cycles based on historically collected experience and skill and existing limitations identified in literature, and the contextualisation in terms of the NPO (68). Reasons for a transition from one cycle to the next are documented (271) until the NPO decides to adopt or reject the SOMM and when additional cycles would make a marginal contribution towards the efficacy of the SOMM (53).

3.2.4.3 Reflection

The reflection phase in Figure 3-1 is a continuous phase which is executed in parallel with the problem formulation phase and the BIE phase (53). It involves a reflection on the research process, assessment of adherence to research principles, a reflection on assumptions and the implications thereof (164), and analysis of the research results (53). The development of the SOMM therefore is informed by the literature review and contextualisation, and also the continuous evolvement of the design process, principles, assumptions and results, additional literature, and the reciprocal shaping of the SOMM and the NPO context (56). A systematic approach is followed throughout and thoroughly documented including failures and successes, procedures followed, and reasons for choices made (164).

3.2.4.4 Formalisation

Although the NPO participates in the research project and the SOMM is shaped by their context from the start, the last phase in Figure 3-1 involves the sharing of research results and evaluations with the NPO to separate the researcher's voice from that of the NPO to address the reflexivity of the researcher (53, 268). A design theory is formulated by abstracting reflections into design principles for the designed tool and a research process in general by referring to the strategic selection of the case study, the interpretive framework and the design ecology (53, 164). This includes contributions in terms of relevant theories and also future studies. Finally, research results are formalised for dissemination (53, 167).

3.2.4.5 Continuous validation

The quality of an ADR project is determined in terms of effectiveness (54, 214, 272). However, a logical hierarchy of content validation, construct validation and utility is required to achieve effectiveness as shown in Table 3-1 (53, 165, 167, 268, 273). Ecological validation also is required for the model to be adaptable to other organisations (53, 164, 165). While a summative evaluation determines the utility, effectiveness and ecological validation of the final model, formative evaluations surface anticipated and unanticipated consequences to contribute to the refinement of the model (53, 267, 274). Since efficacy refers to internal validity or the capability for

effectiveness, while not referring to ideal conditions in ADR (275), formative criteria include efficacy to lead to effectiveness (191).

Table 3-1 Action design research evaluation criteria

Phase		Evaluation	Criteria	Description
Reflection	Problem formulation	Formative	Content validation	<ul style="list-style-type: none"> The NPO needs a SOMM The SOMM is based on current theories
	Building, intervention and evaluation		Construct validation	<ul style="list-style-type: none"> SOMM development is consistent with the interpretive framework SOMM development is trackable and virtually replicable
			Utility	<ul style="list-style-type: none"> The NPO will use the SOMM in everyday practice The NPO will have the capability, capacity and motivation to use the SOMM The SOMM will be efficiently delivered, supported and maintained
			Efficacy	<ul style="list-style-type: none"> The SOMM will address the actual problem of the NPO
			Ecological validation	<ul style="list-style-type: none"> The SOMM will be adaptable to other NPOs through an empirically grounded design theory
Formalisation	Summative	Reflexivity	Utility	<ul style="list-style-type: none"> The NPO uses the SOMM in everyday practice The NPO has the capability, capacity and motivation to use the SOMM The SOMM is efficiently delivered, supported and maintained
			Effectiveness	<ul style="list-style-type: none"> The SOMM addresses the actual problem of the NPO
			Ecological validation	<ul style="list-style-type: none"> The SOMM is adaptable to other NPOs through an empirically grounded design theory

All other validations rely on addressing the reflexivity of the researcher (268). It refers to the researcher's worldviews, backgrounds, assumptions, beliefs and values and their impact on the model and design theory (65, 165, 268). It also refers to the researcher's location throughout the research process which varies between that of insider and outsider, similar and different, engaged and distanced, and political activist and neutral although the researcher may never fully experience the location of insider. The researcher's voice must be separated from the voice of the NPO which are filtered and shaped by the researcher. Since the researcher develops the model and design theory, evaluates them and is involved in interventions, the reflexivity of the researcher is strengthened through all other validations and the systematic documentation of the BIE cycles.

Content validation is addressed in terms of the need for and currency of the model in the problem formulation phase and reflection phase (165). Construct validation is addressed in the BIE phase and reflection phase in terms of the logical development of the model with reference to the interpretive framework (167, 276). Utility, referring to the usability of the model by the NPO, is formatively addressed in the BIE phase and reflection phase and summatively in the formalisation phase (165-167, 267, 277). Efficacy is addressed in the BIE phase and reflection phase. Ecological validation is formatively addressed through the development of a model and design theory in the BIE phase and reflection phase and summatively in the formalisation phase with reference to the strategic selection of the case study, the interpretive framework and the design ecology (68, 164, 165, 278). Effectiveness is addressed in the formalisation phase (54, 121, 166, 214, 277). The reflexivity of the researcher is addressed in all phases of the study (268).

3.3 RESEARCH PHILOSOPHY

Besides a research design that provides a logical structure to answer a research question, research methodology entails a research philosophy to indicate the validity of a study (221, 224). A research philosophy refers to the applied worldview, paradigm, ontology, epistemology, axiology and rhetoric (219, 279-281).

3.3.1 Worldview

The worldview associated with the research design emphasises the particular, temporal, unique and pre-theoretical (279). It refers to an intellectual conception of the universe and one's place in it from a certain perspective (282, 283). Different philosophical theories, experiences of reality and actions are supported by different worldviews (219).

ADR is associated with a participatory worldview (284). Although critics of ADR maintain that it holds an idealistic worldview which is naive and optimistic, a view of social improvement is linked to the participatory worldview. This further implies a context-bound worldview (285) with relevant worldviews for this study entailing the context of OM, models, sustainability and NPOs.

Worldviews associated with OM vary according to the organisation and individuals involved (286). In this study, the worldview of a specific NPO is explored in the BIE cycles with reference to applicable worldviews described by Gebser (287), Perry (288), Graves (289), Smart (290) and Torbert and Taylor (291).

Worldviews associated with modelling involve that models are representations of reality (44), models are used as conventions in communication (43), models are used to propose improvements (42), and that models are meta-theoretical frameworks that surface underlying assumptions (158).

The worldview associated with sustainability involves an ecological worldview (111, 292-294).

3.3.2 Paradigm

The paradigm associated with the research design is derived from the related worldview (295-298). It entails a set of meta-theoretical assumptions, concepts, mode of theorising and modus operandi or tools for a scientific community to study phenomena or to solve puzzles.

A paradigm for ADR is based on critical theory and involves praxis and emancipation to critique the status quo and build a more just society (299, 300). If ADR is applied to effect organisational change but does not go beyond the organisational context, praxis and emancipation address the relation between practice and theory but the structural status quo is maintained (299). An equitable society is built if social structures are confronted beyond the organisational context to address power relations. Such an approach is relevant for the design of a SOMM in an NPO since their sustainability is at stake due to business competing to provide the same services, government reducing their support, and society losing their confidence in NPOs (7).

A paradigm for ADR also is based on pragmatism which concerns a dialectic relationship between knowledge and action to improve existence (301). Starting from a problematic situation, knowledge develops prototypically through an inquiry process involving observation, evaluation in terms of utility, effectiveness and appropriateness of ends, reasoning, and intervention (301, 302). Furthermore, an interpretive approach supports the surfacing of multiple socially constructed meanings.

3.3.3 Ontology

The ontology that supports a research design states what objects or kind of objects must exist for the research design to be executable (281, 303-306). On the other hand, the epistemology associated with a research design indicates how the researcher gains knowledge about these objects through the research design and the relationship between the researcher and the objects. Although ontology and epistemology therefore are related, there is not agreement on how they are related (307, 308). Parmenides (308) reduces ontology to epistemology by restricting objects that exist only to objects of knowledge that can be shown to be truthful and a notion of truth as to what in a phenomenon is the same for everyone. Constructivism and poststructuralism maintain that ontology is grounded in epistemology since it enables claims about the structure of the world (304, 307, 309, 310). Kant, Hegel and Heidegger however separate epistemology from ontology by maintaining that truth implies contingency and an ongoing interpretive process of understanding and

comprehension (308). In this study, the ontological theory of the research design is explicitly stated while acknowledging that it may be contested (268, 307, 311).

ADR has a critical realist ontological orientation (234, 312-314). It neither privileges the subject with an action theory nor the object with a structural theory (307, 311, 313, 315-317). However, action and structure are distinguished as closely linked entities and the nature of the subject and representations of the object are deeply reflected upon. This supports an emancipatory interest with reference to knowledge constitutive interests as defined by Habermas (203, 204, 318, 319). A technical interest entails a preferred situation which is taken for granted or involves only the views of those in power. Diagnostic organisational development promotes a technical interest through a reinforcing cycle of planning that dictates a controllable process of projectable change. A practical interest entails a discussion of possible actions and preferred situations in terms of value content, where those with less power are assisted. Dialogic organisational development promotes a practical interest through an adaptive process where planning evolves over time (320). An emancipatory interest entails a consideration of possible actions and preferred situations not only in terms of power structures internal to an organisation, but also at societal level (203, 204, 318, 319). Such an ontological orientation is relevant to develop a SOMM in a specific NPO while considering situational effects on the operations of the NPO, the effect of organisational changes, and the effects of their operations on external parties and society (313, 317).

ADR also has an existential ontological orientation where existentialism is concerned with the nature of human beings through ontology (257, 321, 322). The authentic nature of being human is explored, not the true nature as in natural sciences or the good and right nature as in moral theories. Such an orientation is appropriate to conduct research with the objects of OM, models, sustainability and NPOs. Furthermore, the research question emerges from an existential crisis that NPOs experience between what they do to prosper and grow on the one hand, and conditions for support from society on the other hand (12, 20, 323).

3.3.4 Epistemology

The epistemological orientation of ADR is idealistic, existential phenomenological, pragmatic and constructivist in support of its ontological orientation (257, 312, 314, 317, 324, 325).

Epistemological idealism holds that a priori concepts such as beauty and purpose do not follow from an analysis of objective judgements (326). A research procedure to develop a SOMM in the NPO is correspondingly designed through abductive reasoning, to be evaluated through experimentation and further refined in collaboration with the NPO (56).

Existential phenomenology involves a common-sense view of the world which is prior to any justification of our taken-for-granted beliefs, although our beliefs stay open for revision (326). The reflexivity of the researcher is addressed through a dialectic process between a reductive focus that brackets pre-understandings, and a reflexive self-awareness that exploits pre-understandings as a source of insight (314, 327). Furthermore, the SOMM is adapted through BIE cycles which involve continuous reflection on the reciprocal effect of the SOMM and the NPO through a normative process that is culturally and historically conditioned.

Pragmatism focuses on methods of inquiry that contribute to fallible progress instead of absolute certainty (328). It allows for an OM model to be applied congruently with the circumstances of the NPO to address the existential crisis that they experience (8). The NPO contributes to the design of the SOMM and design theory based on their practical needs where errors can be identified and rectified through further discussion and investigation, instead of an attempt to establish a foundation of unquestionable knowledge.

Social epistemology involves a pragmatic and constructivist inclination which contextualises knowledge socially, historically and politically (329). Constructivism allows for knowledge to be constructed when theories are no longer contested but come to be accepted, instead of knowledge to be discovered by science (330). Social epistemology is required to explore sustainable operations management (SOM) (111, 293).

3.3.5 Axiology

The axiology that underlies the research design refers to the role of values and ethics in the research design (281). ADR is associated with a utilitarian, interpretive and critical ethical orientation (53, 234).

Utilitarianism involves actions that fulfil the utility of actors, while different forms of utilitarianism can be distinguished (331). Such as in the case of ADR, it involves expected utility (232). ADR therefore is future orientated towards possible diverse futures which serve as a basis for critical thinking, social learning and constructive action. It therefore is proposed as an approach to investigate sustainability, not as an instrument to inform and implement policies and decisions designed by those in power, but to address multiple, complex and often conflicting objectives, complex performance evaluations, uncertain environments, and multiple stakeholders. Human, natural, physical, financial and social value are integrated in the design of a SOMM in the NPO. Social and environmental ethics therefore also are applied which mainly concern justice and obligations to future generations (293, 294). Although this study is conducted over a limited time period (332), a SOMM is developed for the longer term.

Design is interpretive since it is shaped by the researcher's interests, values and assumptions and that of other stakeholders (53). It therefore is intrinsically ethical with reference to teleological goals, deontological rules, and prudent applications (310, 333). Goal statements follow action rather than preceding it to give meaning to the action (234). While the efficiency and effectiveness of the OM of the NPO are improved, such an approach involves the design of an innovative OM model with reference to the context and organisational learning of the NPO to improve understanding of actions.

A critical approach analyses stated goals by identifying and removing domination and ideological practice (234). ADR promotes an emancipatory interest through organisational changes but also through accountability to external parties and society that encourages responsibility and learning (203, 204, 315, 318, 319, 334). Organisational design is based on an understanding of organisations as human activity systems (193, 319).

3.3.6 Rhetoric

Rhetoric relates to the dissemination of research results by persuading an audience to make a decision based on credibility, emotions and persuasive arguments (335, 336). Rhetoric is broader than argumentation and is distinguished from dialogue where new understanding may emerge through shared meaning among participants (337), dialectics where logical reasoning is used with an explicit and trans-situational focus (320, 338, 339), and paradox where opposing yet interrelated dualities are embedded in rhetoric which may be juxtaposed through environmental situations (211, 339).

ADR emphasises dialogue more than rhetoric through praxis (335). If practice is emphasised more than theory, ADR becomes project work or problem solving in collaboration between the researcher and the NPO. If theory is emphasised more than practice, ADR becomes humanities research without realising an emancipatory intention (55). Praxis is required to transform practice and to contribute to theory. On the other hand, the assessment of the quality of the study involves a dialogical and a rhetorical aspect (340).

In this study, an OM model is developed as a convention for stakeholders to improve understanding and communicate about a situation and to propose improvements in an understandable and useful way, and as a meta-theoretical framework to surface underlying assumptions of stakeholders (43, 158). Modelling therefore emphasises dialogue more than rhetoric. However, rhetoric improves the model by paying attention to the technique of presentation (341). This includes the situation in which the model is used namely the specific NPO and the NPO sector in general (342). It also

involves the credibility of the study, probable consequences of applying the model, how the model is presented, form of the model, structure of the model, language choices of the model, and delivery of the model.

3.3.7 Research principles

A set of research principles that the study must uphold are based on the chosen research design and the associated worldview, paradigm, ontological, epistemological and axiological orientations and the applied rhetoric (343). Sein et al (53) stipulate such a set of research principles.

A principle that research is inspired by practice emphasises that actual problems are theory-creation opportunities. The aim is not only to solve the problem or to conduct an organisational intervention, but to develop theory that can be applied to a class of research problems represented by the specific research problem.

A principle that tools are theory ingrained entails that the tools which are created and evaluated through ADR, are informed by theory.

A principle of reciprocal shaping refers to the inseparable influences mutually exerted by the tool and the organisational context. This iterative process can be used to address ill-defined problems.

A principle of mutually influential roles points to the importance of mutual learning among different research participants. The researcher, for example, contributes knowledge of theory and modelling approaches, while the NPO contributes practical hypotheses and knowledge of organisational work practices. Although these roles may not be mutually exclusive, a clear assignment of roles and responsibilities is important to enable reflection on the project by each participant.

A principle of authentic and concurrent evaluation entails that evaluation is not a separate stage of the research process only after building a tool. Instead, decisions about designing a tool and intervening in organisational work practices are interwoven with ongoing evaluation. This includes formative evaluations which contribute to the refinement of the artifact, and summative evaluations which assess the value and utility of the outcomes.

A principle of guided emergence emphasises that the tool does not only reflect the preliminary theory-ingrained design created by the researcher, but also its reciprocal shaping between the tool and the organisational context, mutual influences of different research participants, and outcomes of authentic and concurrent evaluation.

A principle of generalised outcomes refers to the generalisation of the problem instance by formulating the original research problem as an instance of a class of research problems. The generalisation of the designed tool entails a re-conceptualisation of the specific tool as an instance of a class of tools. The generalisation of the design process furthermore requires a re-conceptualisation of the specific design process as an instance of a design process in general.

This study applies an ADR approach to develop a SOMM in an NPO. It therefore must uphold the above research principles and continually evaluate adherence thereto (53).

3.4 RESEARCH METHODS

ADR concerns the intentional planning of action to create tools or to change situations to achieve specific goals (42, 54, 69). Research methods therefore involve ways to perform these goal-directed activities (168). Since the tool being created in this study entails a SOMM in an NPO, research methods refer to various modelling approaches as identified in the literature review.

3.5 CHAPTER REFLECTION

The research methodology of the study concerns a research design as a logical structure to address the research questions, justified by a research philosophy, and the compatibility of various research methods. In a design mode of research, theory is applied to create a tool in order to have an actual impact, refine theory through empirical testing, and to develop theories of how other organisations may address similar problems by applying similar tools. It is therefore appropriate to address the research questions through the development of a SOMM to improve the sustainability of NPOs. This study applies ADR phases proposed by Sein et al (53) as a framework to implement an AR approach towards DR in education. It is important to explain the research philosophy which supports the proposed ADR approach since it determines how the study is validated. Compatible research methods to address the research questions entail various modelling approaches as identified in the literature review.

CHAPTER 4 MODELLING APPROACH

4.1 INTRODUCTION

With reference to the action design research (ADR) approach followed in the study as shown in Figure 4-1, the problem formulation phase is introduced in Chapter 1 which explains the research problem and poses the research questions. The phase continues in Chapter 2 through the analysis of relevant concepts in a literature review. This chapter concludes the problem formulation phase by securing long-term commitment from a specific South African non-profit organisation (NPO) through a written agreement which includes roles and responsibilities (§4.2).

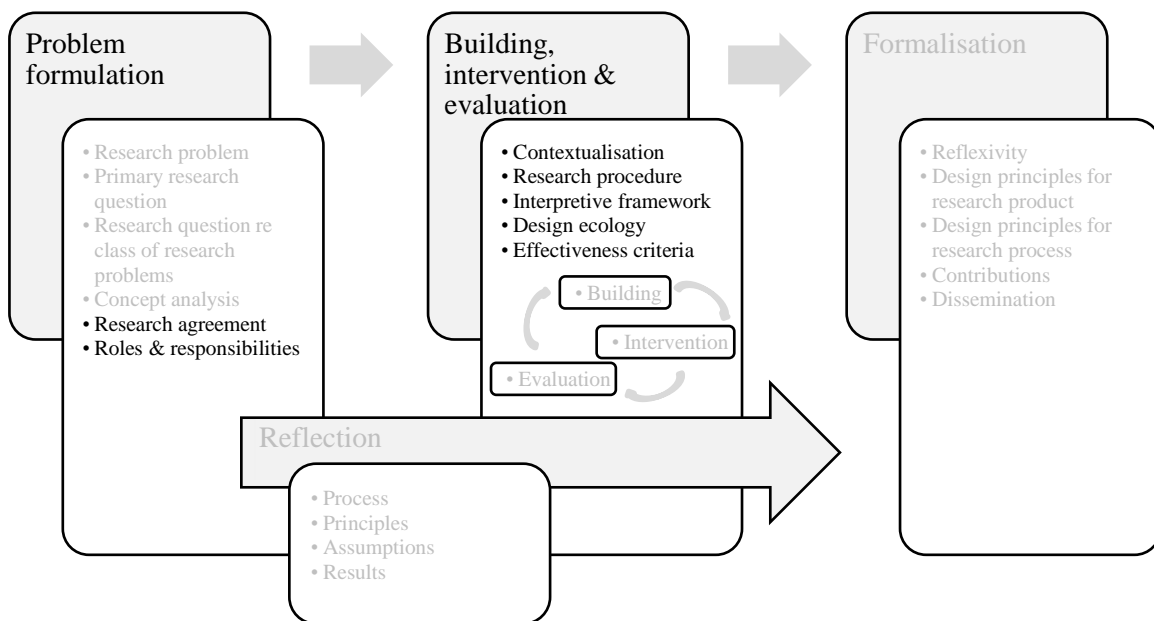


Figure 4-1 Chapter 4 in context of the research design

The building, intervention and evaluation (BIE) phase also is introduced in this chapter through the contextualisation of a sustainable operations management model (SOMM) in terms of the NPO (§4.3). Next, a procedure is developed to address the primary research question in terms of a SOMM in the participating NPO in §4.4 (53, 164). An interpretive framework (§4.5) and design ecology (§4.6) are developed to ensure that the research question is addressed concerning the sustainability of NPOs in general. Effectiveness criteria are established in §4.7 to decide whether the model is sufficiently refined, or whether another BIE cycle is required. The validity of the research agreement, contextualisation, research procedure, interpretive framework, design ecology and effectiveness criteria is formatively evaluated in §4.8 to be summatively addressed in Chapter 7. The chapter is concluded with a reflection in §4.9 to capture the learning that occurs and contribute to the documentation of the parallel reflection phase in Chapter 6 (69).

4.2 RESEARCH AGREEMENT

The participation of an actual NPO in the study requires that the NPO agrees to a long-term commitment based on the need for a SOMM (267, 344). Such a commitment is jointly articulated

in a written agreement between the researcher and the NPO as set out in Addendum B. The agreement includes a clear assignment of roles and responsibilities per research phase and task as indicated in Figure 4-1. The researcher and the NPO endeavour to work in a supplementary way and to learn from each other (53).

4.3 CONTEXTUALISATION

Key focus areas, as identified through a summative content analysis of literature, are applied to contextualise a SOMM and definitions of basic concepts with reference to the participating NPO. Since a SOMM is a tool or artefact that is constructed to achieve a specific goal (229), existing artefacts of the NPO are analysed based on social epistemology that underpins ADR. This enables the design of a SOMM which builds on the historically collected experience and skill of the NPO, and which is culturally appropriate to them. Current achievement of goals also is evaluated (53). Artefacts include trust deeds, minutes of meetings, community engagement programme documents, memoranda of understanding, tax certificates, reports, websites of the NPO and other NPOs involved in the same field, articles in newspapers, magazines and journals, newsletters of the sport organising bodies, government publications, and social media (267, 344). Electronic, telephonic and face-to-face discussions also are conducted with trustees, the general manager, administrative employees and members of the public involved with the NPO for further clarifications.

4.3.1 Organisational culture

Organisational culture is understood as assumptions based on certain norms, values and behaviour that over time have helped the NPO to interpret events in order to adapt externally and integrate internally and therefore transferred to newcomers (208, 345-349). Organisational culture is closely linked to the concept of organisational identity which is described as a sense of coherence and distinctiveness (350). It dynamically informs the desired future of the NPO through past and present active formation, adaption, maintenance, strengthening or revision and passive routine processes. The development of the organisational culture of the NPO is described in Addendum C through a narrative about actions in concrete social, historical and political situations based on social epistemology that underpins ADR (306, 322, 351-353).

The espoused values of the NPO are education integrity, human capacity building, accountability, relationship building, and sense of identity and self-esteem. However, the description of the organisational culture of the NPO surfaces a value clash between the trustees and the NPO.

4.3.2 Leadership

The key focus area of leadership, which is identified for sustainable operations management (SOM) in NPOs, refers to board effectiveness, leadership, mission, organisational strategy, personal

attributes and vision. While board effectiveness and personal attributes are discussed as part of the organisational culture of the NPO, board effectiveness and leadership in terms of structure are discussed in §4.3.2.1. The mission, organisational strategy and vision of the NPO are discussed in terms of the aims of the NPO in §4.3.2.2.

4.3.2.1 Structure

The trust, which registered the NPO, was established with three trustees to receive donations to coordinate, develop and administrate sport as such and as an educational aid, organise and host sport events, and to enhance learning through participation in organised sport. While the original trust deed does not specify a maximum number of trustees, the amended trust deed stipulates a maximum number of five trustees.

Five years after establishment, the programme of the trust grew to such an extent that a general manager was appointed. He has the mandate to take decisions on the operations of the NPO while contacting the trustees when advice or input is required. Subsequently, the leadership structure expanded to include programme managers who ensure that regional coordinators, area coordinators and facilitators follow correct procedures. A product manager furthermore is responsible for programme training for all coordinators, facilitators, trainers and coaches.

4.3.2.2 Aims

The objects of the trust, which indicate the reason for its creation (354), are to conduct public benefit activities in education and development, human welfare and/or sport through the establishment and administration of a fund. Based on these objects, the overall aim of the NPO is to empower learners and teachers to give children a head-start in life. Both their vision which describes their desired outcome, and their purpose statement which describes the reason for their existence (208), are to ignite confidence and talent through learning and development. Their mission accordingly elaborates on what they want to do for their external and internal stakeholders and for themselves, as to educate future mindsets to enable and develop individuals to become exemplary citizens, to be equipped for the challenges of the work place, add value, and contribute towards the good of their communities in general. Their vision, mission and ethos are externally presented through their brand promise (355) as to educate future mindsets.

The goals of the NPO entail a national programme which is dominant in all schools by 2030 (more than 60% of all schools), quality education that exceeds expectation, enterprise development learning centres, modernisation of their approach, pioneering of 21st century skills in learners, impact on the largest number of learners where all participants benefit, impact at an extremely low cost, impact at the age where it matters most, establishment of fundamental mathematics, science

and life skills concepts, learning through play, teacher empowerment through lesson planning and execution strategies, measurement and continuous improvement, and the active involvement of the community, parents, schools and learners in collaboration with the NPO programme. The objectives of the NPO indicate what must be achieved when, where and by whom (208). These entail the achievement of programme goals within required timeframes, fostering of effective communication skills, delivering to high work standards, demonstration of applied learning, fostering of life skills through activity, job readiness of young people, support of the broader schooling curriculum and education system, maximum community participation, and for beneficiaries and communities to see opportunities and hope.

Each policy document of the NPO contains the purpose and scope of the policy, a policy statement, NPO objectives, policy objectives, NPO programme goals, policy goals, methodology, the policy content, delivery, a general section, reference material, the effective date and revision dates, and a section signed by each employee in acknowledgement of the policy.

4.3.3 Products and services

The keywords of the focus area of products and services identified for SOM in NPOs are summarised in terms of need identification (§4.3.3.1), development (§4.3.3.2) and delivery (§4.3.3.3) (25).

4.3.3.1 Need identification

Most learners in South Africa perform significantly below the national curriculum requirements, irrespective of subject or grade, and often fail to acquire functional numeracy and literacy skills (356, 357). One of the main goals of the National Development Plan introduced by government in 2012 therefore is to increase the quality of education (358). In alignment with the National Development Plan, the Department of Basic Education (DBE) develops five-year action plans (359). Priority goals are to improve access to quality early childhood development, continuously improve the professionalism, teaching skills, subject knowledge and computer literacy of teachers, ensure that every learner has access to a minimum set of required textbooks and workbooks, ensure that basic annual management processes take place at all schools to contribute towards a functional school environment, and to improve the monitoring and support services provided to schools by district offices.

The trust was established to help address the major challenges in education in South Africa through sport. Their programme refers to the skills and character traits required for the 21st century such as respect, teamwork and work ethics, supported by information and communication technology (ICT), as indicated by numerous international studies (360-365).

4.3.3.2 Development

Process design, and product and service design, are two interrelated conceptual activities which must be treated together especially regarding services (25). Process design usually involves process mapping as shown in Figure 4-2 for the NPO.

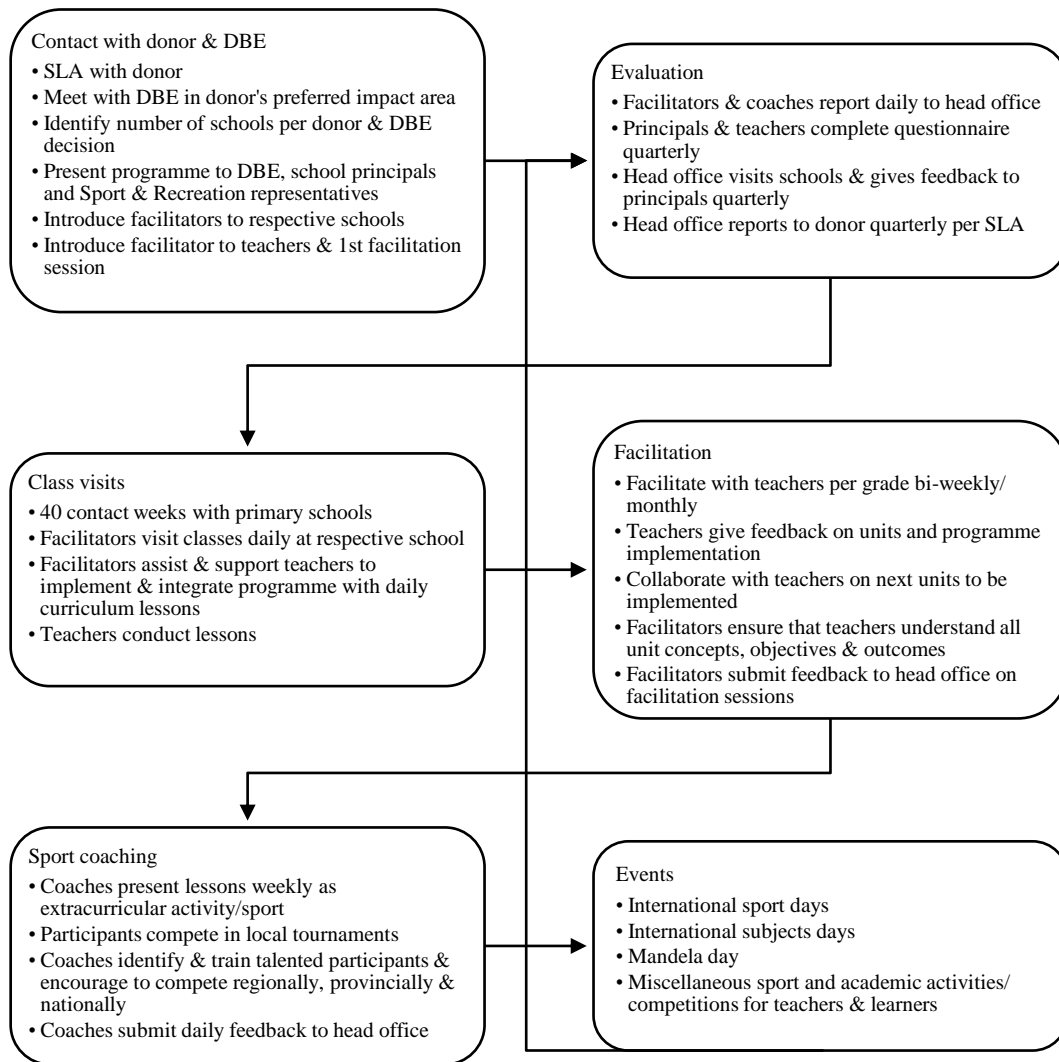


Figure 4-2 Process mapping

Organisational structure is regarded as a pattern of relations among organisational actors, the distribution of functions of management, control and communication, activities, and other resources for strategy implementation (208, 366-368). The formal organogram of the NPO is shown in Figure 4-3 while their actual organogram is shown in Figure 4-4. With reference to the original social enterprise orientation of the trust based on a hybrid conceptualisation of an NPO, the formal organogram of the NPO does not include any volunteers.

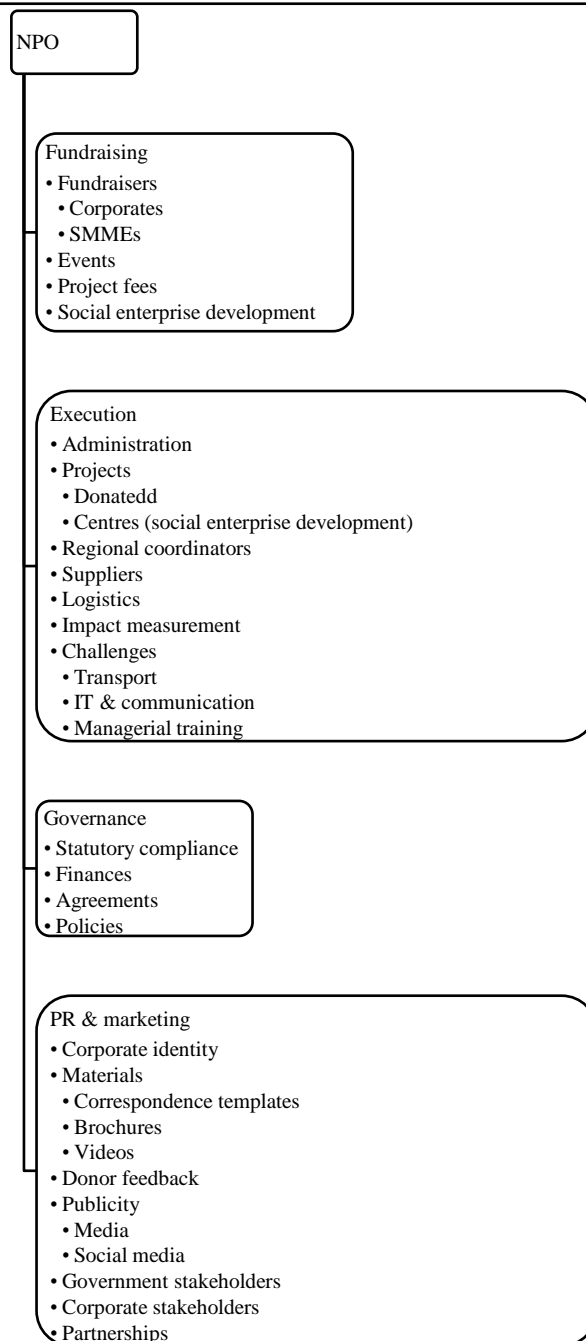


Figure 4-3 Formal non-profit organisation's organogram

The NPO offers different programmes. An in-class programme supports the national curriculum and assessment policy statements (CAPS) from the foundation, intermediate and senior phase to the further education and training phase (Grade 1 – 12). Teacher training is conducted which is accredited by the South African Council for Educators (SACE) on which teachers earn continuing professional teacher development (CPTD) points. An interactive e-learning platform is used as a visual aid and teaching aids are provided such as sport equipment and workbooks for each learner. Job creation occurs through the recruitment and training of facilitators and coordinators. The NPO continuously monitors and evaluates the programme.

Another programme that is implemented at all phases involves sport as an extracurricular activity at beginner, intermediate and advanced level and participation in sport tournaments. Job creation occurs through training and employment of sport coaches. All coaches are equipped to coach children individually for extra income. Again, the NPO continuously monitors and evaluates progress.

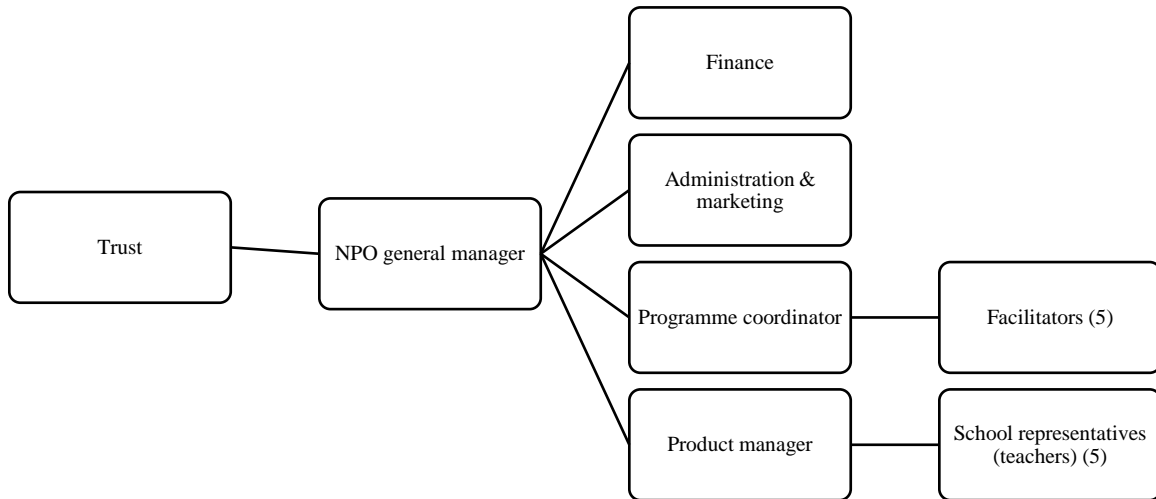


Figure 4-4 Actual non-profit organisation’s organogram

A third programme involves learning centres. This includes a weekly in-school educational intervention to improve mathematics, science, problem-solving and language development in early childhood development (Grade RR – 3) and weekly structured sport education from Grade 4 to 12. A well-planned curriculum aligned to the national CAPS is followed. The NPO cooperates with other organisations to offer grade and subject specific tutoring classes including mathematics, science, accounting, informal music sessions, and a business game and to operate a school kitchen and vegetable garden. The NPO conducts monthly accredited teacher training for centres.

Holiday programmes are two- to five-day small business opportunities or funded by donors during which learners are equipped with essential life skills along with academic competencies such as mathematics and science, especially focusing on remedial teaching. Volunteers conduct a structured programme with interactive games and activities through sport with academic and life skills components. This initiative is designed for community impact and typically leads to the establishment of a sport club with ongoing support from the NPO.

Adult training and recreational projects are paid for by participants or funded by donors and are hosted at schools or businesses to equip people with life skills through sport. It also involves an accredited teacher training course and coaching conducted by a registered life coach and change activator.

Donor benefits include brand exposure through equipment, materials, events and marketing platforms, broad-based black economic empowerment (BBBEE) scores and income tax benefits, enterprise development, SACE accredited training, corporate social investment, community development and the creation of safe social structures, human development based on international 21st century attitudes and skills, and impact on job readiness. The NPO performs project management, public relations and marketing, monitoring and evaluation to confirm the value and impact of the investment, case studies to support success claims, comprehensive quarter and annual reports to donors, DBE and schools on progress and impact, and continuous research.

The key success drivers of the programme are as follows:

- The programme was developed in South African classrooms linking with the national CAPS
- A teacher multiplication principle
- A practical and user-friendly programme that builds on the existing knowledge and experience of teachers
- Immediate impact
- Impact on teacher effectiveness and learners' learning
- Impact on parent and community involvement
- Introduction of the programme in the foundation phase as part of the weekly teaching schedule or after school at a learning centre

4.3.3.3 Delivery

The delivery of products and services on an ongoing basis entails the planning and control of activities to reconcile supply and demand (25). The annual planning of the NPO is shown in Table 4-1. The recursivity of the process of the NPO to design, source and create products and services and to reconcile the supply and demand of these products and services is low since a high volume of products and services is delivered with low variety. Typically, the planning and control of activities to reconcile supply and demand involve loading in terms of required volume, sequencing in terms of prioritisation, scheduling in terms of timing, and monitoring and control which links to governance.

4.3.4 Governance

The keywords of the focus area of governance identified for SOM in NPOs are summarised in terms of monitoring and evaluation (§4.3.4.1), and organisational learning (§4.3.4.2) (369).

Table 4-1 Non-profit organisation's calendar

Term	Proposed dates	Activity
Term 1 (10 weeks)	January/February	Awareness week 1
	February	Problem solving pre-test
		Unit 1 & 2 facilitation
		Unit 3 facilitation
	February/March	Unit 4 facilitation
	March	Unit 5 facilitation
2 nd last week	Teacher and principal questionnaires, unit updates and school letters submitted	
Term 2 (12 weeks)	April	International mathematics awareness month competitions
		Unit 6 facilitation
		Unit 7 facilitation
	May	Unit 8 facilitation
		Unit 9 facilitation
	June	Unit 10 & 11 facilitation
	2 nd last week	Teacher and principal questionnaires, unit updates and school letters submitted
Last week	Sport awareness week 2	
Term 3 (11 weeks)	July	International sport day
		Awareness week 3
		Unit 12 facilitation
	July/August	Unit 13 facilitation
	August	Unit 14 facilitation
		Unit 15 facilitation
	September	Unit 16 & 17 facilitation
2 nd last week	Teacher and principal questionnaires, unit updates and school letters submitted	
Term 4 (9 weeks)	October	Unit 18-19 facilitation
		Unit 20 facilitation
		International mathematics day
	October/November	Awareness week 4
		Teacher & learner sport tournament
		Problem solving post-test
2 nd last week	Teacher and principal questionnaires, unit updates and school letters submitted	

4.3.4.1 Monitoring and evaluation

Donors increasingly request evidence of the impact of the NPO programme to demonstrate that their funds are well invested and that beneficiaries receive the value that the NPO has promised. Subsequently, the NPO developed a monitoring and evaluation process as shown in Figure 4-5. Pre-intervention tests for learners entail mathematical problems, questions on life skills, and sport assessment. Teachers and trainers keep record of participating learners' progress regarding overall scholastic performance and sport. Learner reaction measurements entail questions to evaluate their attitude towards the programme. The principal questionnaire entails average mathematics percentages and questions regarding benefits of the programme, impact on learners' behaviour and life skills, and benefits for foundation phase teachers. The teacher questionnaire entails questions

regarding support from the programme, the overall development of learners, and learners' interest in sport. The programme is adapted based on feedback received.

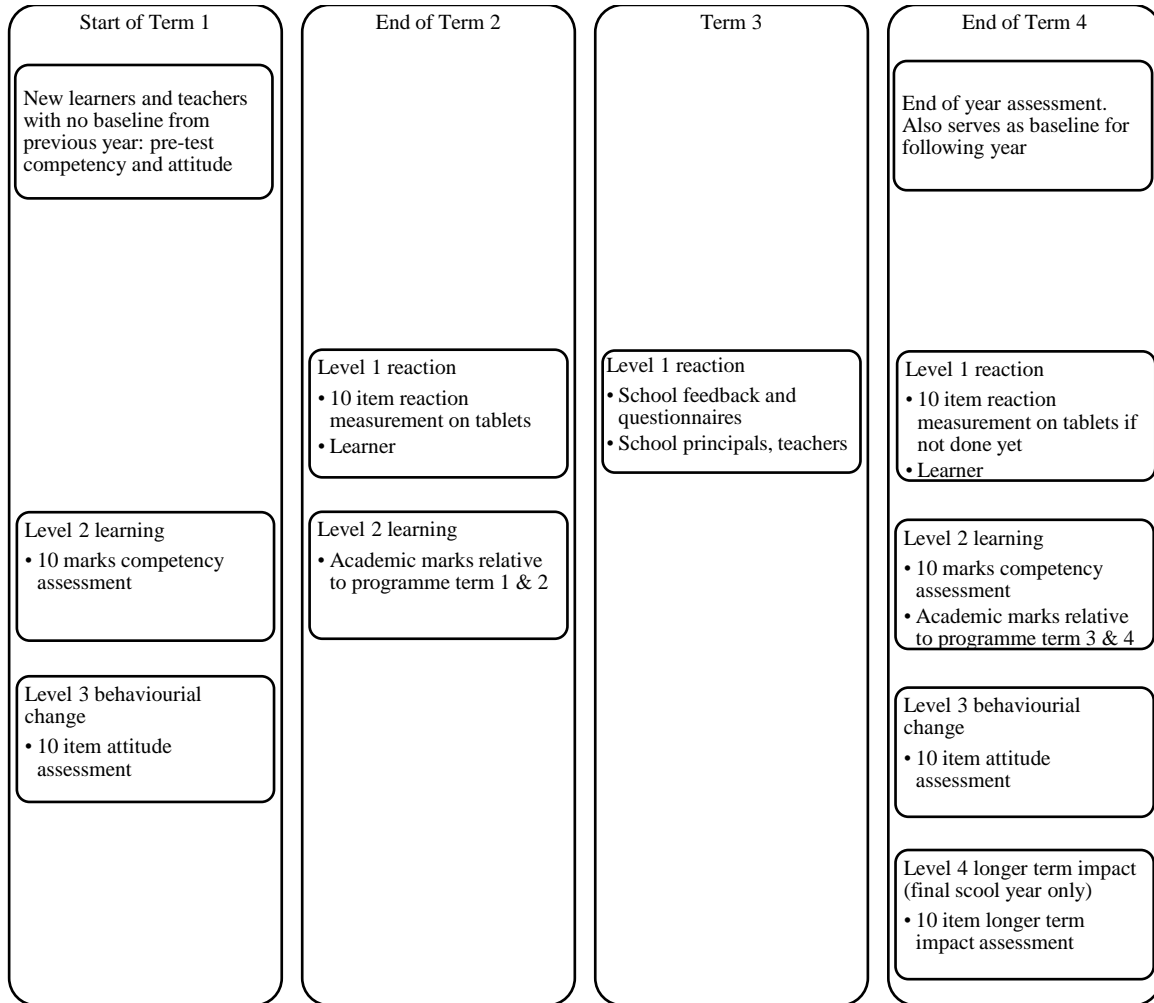


Figure 4-5 Monitoring and evaluation process

4.3.4.2 Organisational learning

Organisational learning is significantly influenced by the internal training and development approach of an organisation (370). The internal training and development programme of the NPO continuously develop the quality of engagement and general competency of employees. It includes an annual needs assessment and a career and skills development plan for each employee with reference to the requirements indicated in Table 4-2. The product manager conducts programme training for all coordinators, facilitators, trainers and coaches while coordinators monitor facilitator sessions to ensure quality. The NPO continuously searches for donations and generate revenue to establish demand for new job opportunities, but employees also are motivated to look for and accept work when their contract with the NPO expires.

Furthermore, training and facilitation sessions are conducted for teachers and learning centre managers. To encourage them to attend, the NPO developed recognition structures instead of paying transportation or providing food in order not to create dependencies.

Table 4-2 Non-profit organisation's positions, requirements and duties

Position	Minimum requirements	Duties
Junior facilitator / facilitator-in-training	<ul style="list-style-type: none"> • In first probation year as NPO employee 	
Facilitator	<ul style="list-style-type: none"> • Matric certificate with mathematics • Competency in at least one NQF level 5 course • Previous work experience and referral letters • Own transport and valid driver licence • NPO certificate level 1 with at least 80% 	<ul style="list-style-type: none"> • Schedule formal training, school visits and facilitation sessions • Offer guidance and consultation to help teachers plan their curriculum
National facilitator	<ul style="list-style-type: none"> • NPO certificate level 2 sector education and training authority (SETA) Unit Standard 117871: National Facilitator with at least 80% • NPO certificate level 4 (5 days, 10 credits) with at least 80% • 100 national facilitation hours using a variety of methodologies • 3-star award 	<ul style="list-style-type: none"> • Maintain official attendance registers for all training and facilitation sessions, occasionally observe lessons in the classroom, check learner workbooks and compile daily, weekly and monthly reports to conduct monitoring and evaluation
Trainer	<ul style="list-style-type: none"> • Matric certificate • NPO certificate level 1 with at least 80% • NPO certificate level 2 SETA Unit Standard 117871: National Facilitator with at least 80% • Teacher recommendations • Favourable reporting • Favourable staff and management evaluation • General manager and programme manager recommendations 	<ul style="list-style-type: none"> • Conduct formal training for teachers
Programme manager / senior trainer	<ul style="list-style-type: none"> • Matric certificate • NPO certificate level 1 with at least 80% • NPO certificate level 2 SETA Unit Standard 117871: National Facilitator with at least 80% • NPO certificate level 3 SETA Unit Standard 115753: Conducting Outcomes Based Assessment with at least 80% • Teacher recommendations • Favourable reporting • Favourable staff and management evaluation • General manager and programme manager recommendations 	<ul style="list-style-type: none"> • Ensure that coordinators and facilitators follow correct procedures • Guide facilitators in proper planning • Monitor facilitation sessions to ensure quality

Position	Minimum requirements	Duties
Coach	<ul style="list-style-type: none"> • Matric certificate • Sport participant • Proof of sport accolades is an advantage • Previous work experience and referral letters • NPO certificate level 1 with at least 80% • NPO sport coaching certificate level 3 (4 days) with at least 80% • One year effective duty • Success stories • 3-star award 	<ul style="list-style-type: none"> • Support or establish and run sport clubs • Coach sport as an extracurricular activity • Coordinate tournaments • Provide sport guides • Act as point of contact for NPO activities • Record learners' progress, incorporate feedback from parents and submit daily, weekly and monthly reports to conduct monitoring and evaluation
National assessor	<ul style="list-style-type: none"> • NPO certificate level 2 SETA Unit Standard 117871: National Facilitator with at least 80% • NPO certificate level 3 SETA Unit Standard 115753: Conducting Outcomes Based Assessment with at least 80% • NPO certificate level 5 (NQF level 5, 2 days, 15 credits) with at least 80% • 150 national facilitation hours using a variety of methodologies • 4-star award 	<ul style="list-style-type: none"> • Conduct all assessments of programme training by product manager for all coordinators, facilitators, trainers and coaches

4.3.5 Funding

The key focus area of funding identified for SOM in NPOs refers to financial management, funding model, funding sources, fundraising expenditure, philanthropic funding, profit and revenue. The financial management of the NPO is discussed in §4.3.5.1. Their funding model and funding sources are discussed in §4.3.5.2 in terms of philanthropic funding, and in §4.3.5.3 in terms of revenue and profit. Their fundraising expenditure is discussed in §4.3.5.4.

4.3.5.1 Financial management

All financial matters must be recorded in the books of the trust in terms of good financial governance as prescribed by law, the South African Institute of Chartered Accountants, and the Independent Regulatory Body for Auditors. The founder has unlimited signing powers on a current trust account, investment trust account and foreign currency trust account. The general manager has signing power of up to a certain amount on a separate business trust account. Subsequent to the registration of the private company with the general manager as the only director, he also has unlimited signing power on the business account of the company.

4.3.5.2 Fundraising

The trustees have a crucial role in securing donations for the continuation and expansion of the NPO. The trust deed provides for commission to trustees subject to it being disclosed to donors, budget permitting, alignment with the aim of the trust, and approval by the trust. Fundraisers who are not trustees or employees of the NPO also obtain donations for the NPO at commission. The NPO usually approaches a donor after contact was made by a trustee or a fundraiser.

It becomes increasingly difficult to obtain new donations since businesses already are committed in long-term partnerships with other NPOs who often are in the education domain. Business increasingly refines their corporate social responsibility strategies to better align with their business strategies. Furthermore, other countries are more attractive than South Africa for international investments. The NPO therefore undertake various initiatives to generate funds, for example, the sponsoring of sportswear which is cost efficient, offers good exposure and involves big businesses so that many enquiries are received. Crowd funding also was attempted but further research is required, and air time on radio and articles in community newspapers require a communication plan still to be developed. Donations are urgently searched for by the general manager by following up on references including local and international foundations, and domestic and international businesses.

When the Coronavirus disease of 2019 (COVID-19) pandemic hit South Africa, the NPO required additional funding since significant donors had to withdraw. The NPO had to continue paying salaries, renting equipment and paying short-term insurance to keep supporting teachers and learners online through previously developed capacity and to develop plans to assist schools once they would re-open. Various measures were taken based on advice from National Small Business Chamber (371). Employees of the NPO who lost income due to reduced working hours were entitled to short-term Unemployment Insurance Fund benefits while employees who had to self-quarantine for fourteen days or longer were entitled to illness benefits (372). Letters were addressed to the supplier of the rented printer and short-term insurer to request relief of payments(373). Security was available in terms of funding from remaining donors and sport equipment for sale through the online shop.

4.3.5.3 Revenue

The NPO generates revenue by offering adult training workshops mentioned as one of the programmes that they have developed (§4.3.3.2). They also offer accredited short courses through academic institutions. Furthermore, the NPO can offer online training as summarised in Table 4-3. A blended learning school also was developed by the NPO but did not realise as yet.

Table 4-3 Training that can be offered by the non-profit organisation

Teachers		Blended learning (BL) centres		Adult training	
Mathematics and sport for centres and in-class use		Home schooling or blended learning		Soft skills and personal development	
Teacher training (SACE 10 CPTD points) Sport as mathematical tool	2-4 hours	Introduction to basic BL use in the classroom	2-4 hours	Personal mastery and leadership development through sport	1-3 days
Training of the trainer (School centre) Sport as mathematical tool	5 days	Basic BL principles to use in the classroom, blended reality and virtual reality	5 days	Skills mastery - Top management - Middle management - Ground-level staff	1-3 days
Learning centre manager training	3 months	Coding and virtual reality	5 days / 1 month	Responsible leadership in the 4 th industrial revolution	1-3 days
ECD centre carer training (0 – 4 years)	5 days / 3 months				

4.3.5.4 Fund allocation

South African law requires an NPO to distribute at least 50% of their funds to beneficiaries (374). Fund allocation of the NPO is indicated per cost element in Table 4-4. 82% of the funds received by the NPO directly benefits learners, teachers and school management and indirectly impacts parents and the community. Donors receive tax benefits and BBBEE scoring. However, currently a lack of funds causes understaffing, the implementation of the programme through less qualified persons, too little equipment provided to schools, and worksheets provided to learners instead of workbooks.

Table 4-4 Fund allocation per cost element

Cost element	Percentage of total cost
Training and support for facilitators and coaches including recruitment	44%
Training of teachers	23%
Competitive play facilitation	9%
Trust administration	9%
Equipment	5%
Coordinators	5%
Publicity, marketing and public relations	4%
Monitoring and record keeping	1%

4.3.6 Resources

The key focus area of human resources identified for SOM in NPOs is discussed in terms of the NPO in §4.3.6.1, while the focus area of technology is discussed as a resource of the NPO in §4.3.6.2.

4.3.6.1 Human resources

The NPO believes that they will realise their aims only through their employees and therefore must ensure that they acquire the necessary knowledge, skills and conduct through appropriate training and development as set out in §4.3.4.2. The NPO regards their employees as the most significant resource to differentiate their products and services in a competitive environment. The positions in the NPO are summarised in Table 4-2. No positions exist for volunteers.

4.3.6.2 Technology

Technology including hardware, software and data mediate employees' relation to an organisation in context of institutional practices and culture and in turn mould the organisation (147, 345, 375, 376). In NPOs specifically, technology is tied to their mission and enables communication, marketing of products and services, data collection and analyses required for fundraising, partnerships to address shared issues, cost savings, improved efficiency, and organisational learning and growth as emphasised during the COVID-19 pandemic (247, 377-380). Technology also mediates the way people think in the wider community, how people relate to one another, and the culture of the society (381, 382).

The programmes offered by the NPO include ICT training to prepare learners for an unknown future with a focus on 21st century skills and the fourth industrial revolution (360). To generate revenue, the NPO therefore has the capability to offer online training or training through blended reality including training on how to conduct home schooling through blended reality as indicated in Table 4-3. They also developed a blended learning school based on advanced technology.

The NPO streamlines operations, improves time efficiency of employees, and improves the timeliness of reporting by issuing tablets to all programme facilitators with the main donor donating tablets for all their projects and the NPO and employees sharing the cost equally on all other projects. Application software was custom-developed for the NPO which enables real time reporting at schools so that heads of department can sign off on reporting and all data such as inventory data is available at hand. An online system also was developed and financed by the main donor to implement a monitoring and evaluation process for all their corporate social responsibility projects. The system did not realise however due to the scaling down of projects by the main donor and the impact of COVID-19. Furthermore, the NPO utilises standard accounting software to perform financial management, maintains a website, and is active on social media to communicate with stakeholders.

4.3.7 Stakeholders

The keywords of the focus area of stakeholders identified for SOM in NPOs are summarised in terms of stakeholder relations (§4.3.7.1) and communication (§4.3.7.2) (383).

4.3.7.1 Stakeholder relations

The main beneficiaries of the NPO are preschool children and primary school learners. Other stakeholders include the founder of the trust, the initial programme developer and all other past and present trustees, past and present employees of the NPO including the general manager, the patron of the NPO, the DBE at national, provincial and district level, the Department of Sport, Arts and Culture (previously the Department of Sport and Recreation), the Department of Social Development (DSD), the South African Revenue Service (SARS), the Companies and Intellectual Property Commission, sport federations at international, national, provincial and district level, past and present donors, past and present suppliers, past and present participating schools including governing bodies, school principals, teachers, parents and learners, past and present participating learning centres, other international and local NPOs whom the NPO cooperates or competes with, academic institutions whom the NPO cooperates with, businesses and individuals whom the NPO cooperates with, and legal and financial advisors.

Before COVID-19 the NPO sector in South Africa has grown significantly in terms of the total number of registered NPOs with the number of NPOs registered in the education and research sector increasing by almost 50% as indicated in Figure 4-6.

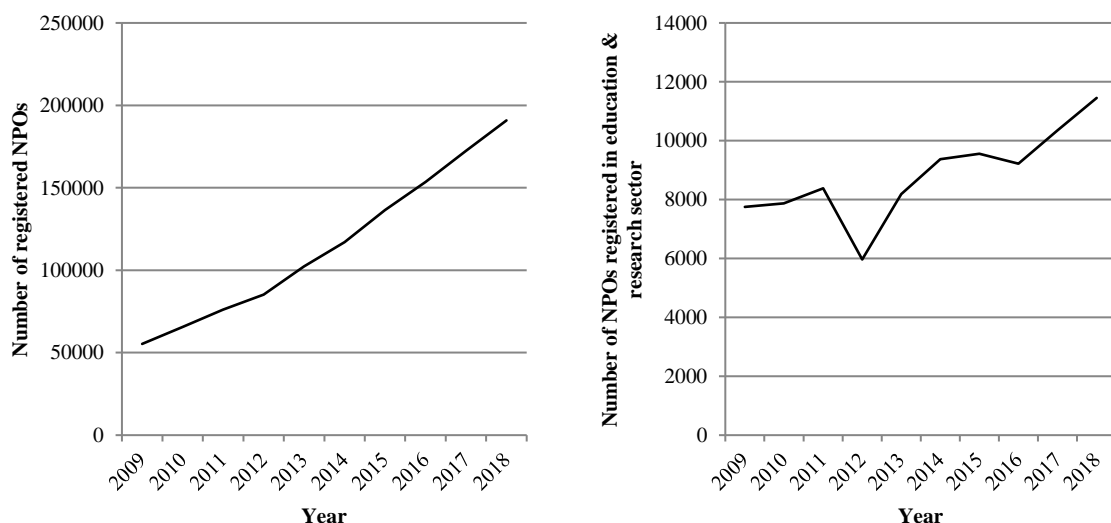


Figure 4-6 Number of registered NPOs in South Africa (131)

The NPO maintains good relationships with the DBE at national, provincial and district level. Chief Education Specialists recommend the programme and Departments of Education (DoEs) at district

level approve, accredit and recommend the programme. The NPO also has contributed to government strategy to ensure the overall development of children. Furthermore, schools regularly submit letters of recommendation and thanks. Academic institutions continuously collaborate with the NPO in research and development projects, perform quality assurance of their programmes, and underwrite the programmes of the NPO.

27 donors have supported the programme since its initiation and readily endorse the programme. Signed contracts with donors are in place for 70% of projects while only written communication between the NPO and the donor exists for the remaining projects since some donors prefer not to process donations through procurement. Most often donors support 1 to 3 schools. Based on successful outcomes, 70% of the projects of the NPO was expanded by donors to include more beneficiaries and extended for additional time periods. However, sometimes projects were expanded without additional funds and some donors were in arrears with payments although the NPO already incurred costs to deliver material according to contract. Sometimes delivery is interrupted by wider labour actions and political situations in areas where the NPO is operating.

4.3.7.2 Communication

Like other NPOs, the NPO utilises one-way communication to inform stakeholders about their products, services and activities, spread awareness of the NPO, and disseminate information about fundraising efforts (384). Since the establishment of the NPO, a website is maintained to disseminate information about the organisation, their programme and learning centres, their track record, impact and success stories, news articles, video clips, and contact detail including social media links for potential donors and other stakeholders. Furthermore, the NPO has always been active on social media including YouTube, Facebook, Instagram, Twitter, Pinterest and LinkedIn and previously through a blog. They also appear regularly in print media and on television and radio. The responsible employees attended valuable training earmarked for NPOs regarding communication, social media and the production of promotional material such as videos.

The NPO also employs two-way communication through regular meetings, emails and telephonic conversations with potential donors and partners. Feedback is continuously received from stakeholders through the monitoring and evaluation process of the NPO.

4.4 RESEARCH PROCEDURE

The contextualisation enables the development of a procedure to design a SOMM which builds on the historically collected experience and skill of the NPO, is culturally appropriate to them, and addresses their needs (170). The procedure also is based on contributing theories and modelling approaches identified in literature.

Principles of the research procedure are summarised in the interpretive framework (Figure 4-8). These entail a model which is developed as a meta-theoretical framework to develop understanding, facilitate communication, propose improvements and surface underlying assumptions with reference to the definition of an operations management (OM) model in this study (153, 155, 156, 385). Furthermore, an ADR project starts from the current reality of an organisation (53). This also holds for organisational development and specifically for NPOs (204, 386), strategy development (387), and a systems thinking perspective (42, 184, 191, 201, 208, 388). The design of a SOMM in the NPO therefore starts from an evaluation of the current sustainability of the NPO in §4.4.1. A model is subsequently developed based on the sustainability evaluation, an integrated organisational perspective of a SOMM in an NPO, and regarding SOM in an NPO as an organised complex problem. Different organisational models for sustainability and systems thinking approaches therefore are considered. To provide an enriched understanding of the research questions, discordant pluralism is implemented which entails supplementing and challenging different approaches with one another without fusing them into a single algorithm (153, 162, 389, 390). The theoretical underpinnings and typical questions addressed by each modelling approach as identified through the literature review, together with implied knowledge constitutive interests as defined by Habermas (318, 319), are considered to indicate relevance to addressing the primary research question.

The resulting procedure is summarised in Figure 4-7 with the selection of specific approaches and the order of these approaches explained in subsequent sections.

4.4.1 Sustainability evaluation

Different sustainability evaluation tools exist in general and specifically for NPOs as surfaced through the literature review. However, the focus should be on learning from evaluations over time and involving stakeholders (111, 127), which are supported by the existing training and development programme and evaluations from stakeholders of the NPO. Furthermore, none of these tools were specifically developed in a South African context so that it is also important to be able to contextualise results (133). Sustainability evaluation tools are available for self-evaluation by NPOs, but most of these instruments lack quantitative output for comparability over time and for contextualisation (133). The civil society organisation sustainability index (CSOSI) developed by the United States Agency for International Development [USAID] (18) therefore is adapted to develop an interview with the general manager of the NPO in Addendum D. This index evaluates sustainability dimensions in the worldwide NPO sector on an annual basis for comparison over time since 1997 and in South Africa since 2009 (218). Since a preferred situation according to the USAID is taken for granted, a technical interest is promoted (203, 318, 319).

The CSOSI can be supplemented with other sustainability evaluation tools such as the CIVICUS indices which provide a detailed and broad evaluation which is internationally supported by the NPO sector (133). It can also be supplemented with the South African enabling environment national assessment (EENA) to further contextualise the evaluation (391, 392).

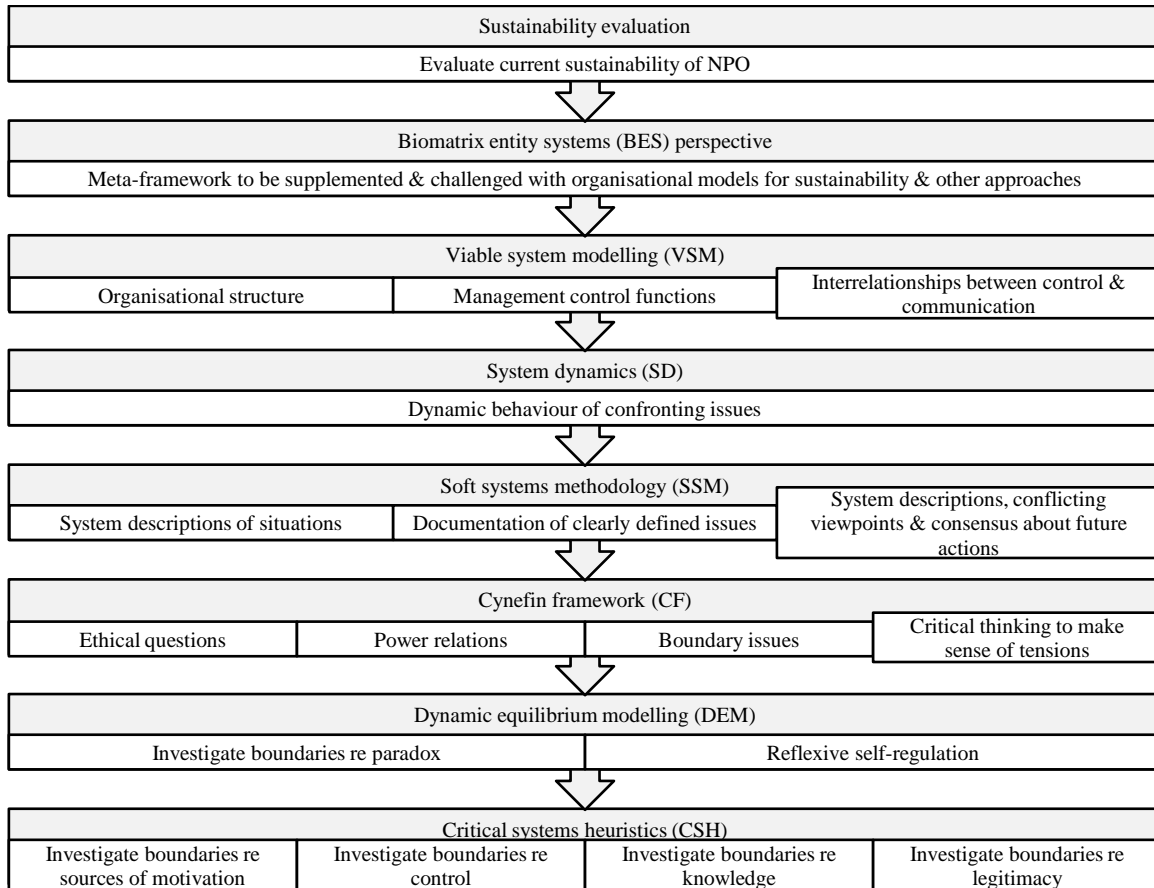


Figure 4-7 Research procedure

4.4.2 Biomatrix model

The evaluation of the current sustainability of the NPO is followed by the design of a biomatrix model. It provides a meta-theoretical framework to develop understanding, facilitate communication, propose improvements and surface underlying assumptions (389). Furthermore, a biomatrix model supports discordant pluralism by providing a meta-framework for inquiry to be supplemented and challenged with different other approaches without fusing them into a single algorithm to develop an appropriate way to improve a situation. Since preferred situations and possible actions are considered in terms of power relations internal to the NPO and in society, an emancipatory interest is promoted (208, 389).

4.4.3 Viable system modelling

The governance field of a biomatrix entity systems (BES) perspective can be supplemented with viable system modelling (VSM) to focus on the capability of the NPO to improve sustainability through their organisational structure, management control functions, and interrelationships between control and communication (181, 208, 366, 393). This includes the capability of the NPO to maintain their ethos and interactions with their transactional environment, to address confronting issues, and to improve self-regulation. VSM takes a desired state for granted or as determined among those who hold power in the NPO, so that a technical interest is promoted through diagnostic organisational development (203, 318, 319, 366).

4.4.4 System dynamics

While VSM emphasises organisational structure and context, the content of confronting issues involves dynamic behaviour due to interactions between the NPO and their environment over time (366). Therefore, a BES perspective can be further supplemented with system dynamics (SD) to reveal incompleteness and contradictions in the above system descriptions and test dynamic assertions (184). This includes systems diagrams to raise awareness of fundamental structures at play and of leverage opportunities in those structures (187). SD involves a reinforcing cycle of planning which dictates a controllable process of projectable change, so that a technical interest is promoted through diagnostic organisational development (203, 318, 319, 394, 395).

Espinosa and Walker (179) also proposes to supplement VSM with social network analysis (SNA) to evaluate the dynamics of self-organising processes in an NPO. However, SNA only characterises model structure while SD explains the relation between model structure and behaviour (396). The identification of leverage points in a SD model can be improved through the inclusion of attributes of organisational structure, positions and dyadic properties and distributions (397). SD furthermore recognises that dynamic behaviour emerges from an underlying structure so that structural changes may be required to improve behaviour (396).

Structural equation models (SEMs) (172) also has been applied in the non-profit context to understand the interrelationships and interdependencies of an organisation (173). However, a one-directional SEM can be transformed into a SD model through deductions and inductions from the basic framework provided by a SEM (398). Such a SD model adds feedback loops through dependent and independent relationships among all variables and additional variables if required to implement reinforcing and balancing loops.

4.4.5 Soft systems methodology

Soft systems methodology (SSM) supplements VSM in describing situations that affect organisational performance and documenting specific and clearly defined issues (179, 399). It also supplements SD by eliciting and organising a relevant system description, and addressing different viewpoints to reach consensus about future action (184). SSM promotes a practical interest by considering the value content of possible actions and preferred situations, current organisational constraints on communication, how stakeholders make sense of the situation of the NPO under and around these constraints, and alternative ways of communication (203, 315, 318, 319, 334, 394).

Espinosa and Porter (181) also propose to supplement VSM with a complex adaptive system (CAS) model. However, SSM does offer an open systems approach with a focus on learning and enrich the concept of self-organisation with a focus on culture and power (193). CAS furthermore is fundamental to the biomatrix model (189, 389) and the Cynefin framework (CF) (163, 189, 201, 400).

4.4.6 Cynefin framework

The governance field of a BES perspective addresses matters concerning power issues (208). While it can be supplemented with VSM to focus on improved sustainability (181, 208, 366, 393), CF can supplement VSM and thereby a BES perspective to explore and reconcile ethical questions, power relations and boundary issues (163, 189, 201, 346, 400). The dynamic behaviour of confronting issues as surfaced through SD furthermore may reveal organisational turbulence (389). CF can be utilised to instil innovative critical thinking to make sense of tensions (163, 203, 208). Preferred situations and possible actions are considered in terms of power relations internal to the NPO and in society, so that an emancipatory interest is promoted (203, 315, 318, 319, 334).

Instead of CF, the Weickian model can be applied to make sense of the situation of the NPO (401). However, CF is based on a CAS approach, pragmatism and critical theory which explore and reconcile ethical questions, power relations and boundary issues associated with a partial understanding of a situation and partiality among different stakeholders (163, 189, 201, 400). In comparison, the Weickian model is based on interpretivism and pragmatism which avoid a dogmatic privilege of one particular perspective and address a partial understanding of a situation (197, 402). Therefore CF is preferred to supplement other models.

4.4.7 Dynamic equilibrium modelling

CF emphasises that different processes continuously pull an organisation in opposite directions (201). Dynamic equilibrium modelling (DEM) harnesses the benefits of such tensions by seeking more fluid, reflexive and sustainable strategies through juxtaposition, which intensifies experiences

of tension, demands creative sensemaking and challenges stakeholders (211). The intension is not to maintain homeostatic balance, but to enhance reflexive self-regulation (315) where reflexive self-regulation is required for the NPO to become more sustainable (295, 315, 403). Sense is made of the situation of the NPO through dialogue, so that intended changes take internal and external organisational tensions into account (201, 308, 334, 401, 404, 405). An emancipatory interest therefore is promoted (211, 320, 337, 338).

Instead of DEM, scenario planning can be applied to enhance reflexive self-regulation through dialogue about an unfolding sequence of events over time, indicating the significance of events, the influence of people, and other influencing forces. However, it does not necessarily promote an emancipatory interest (406-411) or address paradox.

4.4.8 Critical systems heuristics

Critical systems heuristics (CSH) can supplement all of the above models by investigating boundaries in terms of sources of motivation, control, knowledge and legitimacy (158). Sense is made of a situation technically through the boundary judgements and their implications, practically through improvement of the situation involving people with different perspectives, reflexively through an awareness of the meaning and validity of the selectivity at play, and emancipatory through a disclosure and review of the boundary judgements of those involved and those affected but not involved (42).

4.4.9 Organisational models for sustainability

The above systems thinking approaches can be supplemented with technological, social and organisational models for sustainability to drive innovation for sustainability, embed sustainability into organisational aims and processes, and to drive competitive advantage (147). Modification of general organisational models for sustainability can supplement other approaches to integrate the capturing of financial, social and natural value (148). Furthermore, a sustainable organisational model for mature organisations can supplement other approaches to determine an appropriate sustainability strategy (149). Other approaches also can be supplemented with customised organisational models for sustainability to determine appropriate organisational sustainability capabilities in terms of the efficient deployment of current sustainability practices, and the development of new concepts and capabilities related to sustainability innovation (151). Lastly, instrumental and integrative organisational models for sustainability can supplement other approaches to create integrated value by applying paradoxical thinking between instrumental and integrative approaches (152).

4.5 INTERPRETIVE FRAMEWORK

The research question concerning the sustainability of NPOs in general is addressed with reference to an interpretive framework which provides trackability and virtual replicability in terms of the research procedure and the interpretation of research results (164, 269, 270, 280). The research procedure therefore must be executed consistent with the interpretive framework.

The interpretive framework for this study is shown in Figure 4-8. It is developed iteratively throughout the study where each of the ADR phases informs aspects thereof (270). The problem formulation phase determines the purpose of the interpretive framework and the literature review situates the framework in the field of SOM in NPOs to identify and conceptualise key themes and the characteristics of an OM model (269, 270). The research principles of the interpretive framework are defined by explicitly stating an appropriate research methodology to address the primary research question including a research philosophy (269, 270, 280). These principles guide the research process such as the research questions being asked, data collected, methods and techniques used to analyse data, and how results are interpreted. During the BIE phase of the research design, a SOMM and definitions of basic concepts are contextualised in terms of the NPO so that the interpretive framework is informed by their experiences. Effectiveness criteria and principles of the research procedure to develop a SOMM in an NPO also are established. The framework is further refined during subsequent BIE cycles to confirm the characteristics of the model and thereby strengthening the credibility of the framework.

Interpretive frameworks are represented in different ways such as diagrams or figures together with discussions of key elements, tables with relationships between various elements, possible actions and outcomes, full documents that describe the background theory, list the elements and contextualise the framework through case studies, or descriptions of various elements (270, 412). This study represents the complex and high volume of information contained in the interpretive framework through a diagram to support engagement, understanding and recollection (413).

4.6 DESIGN ECOLOGY

Besides an interpretive framework, a design ecology is required to address the research question concerning the sustainability of NPOs in general (164).

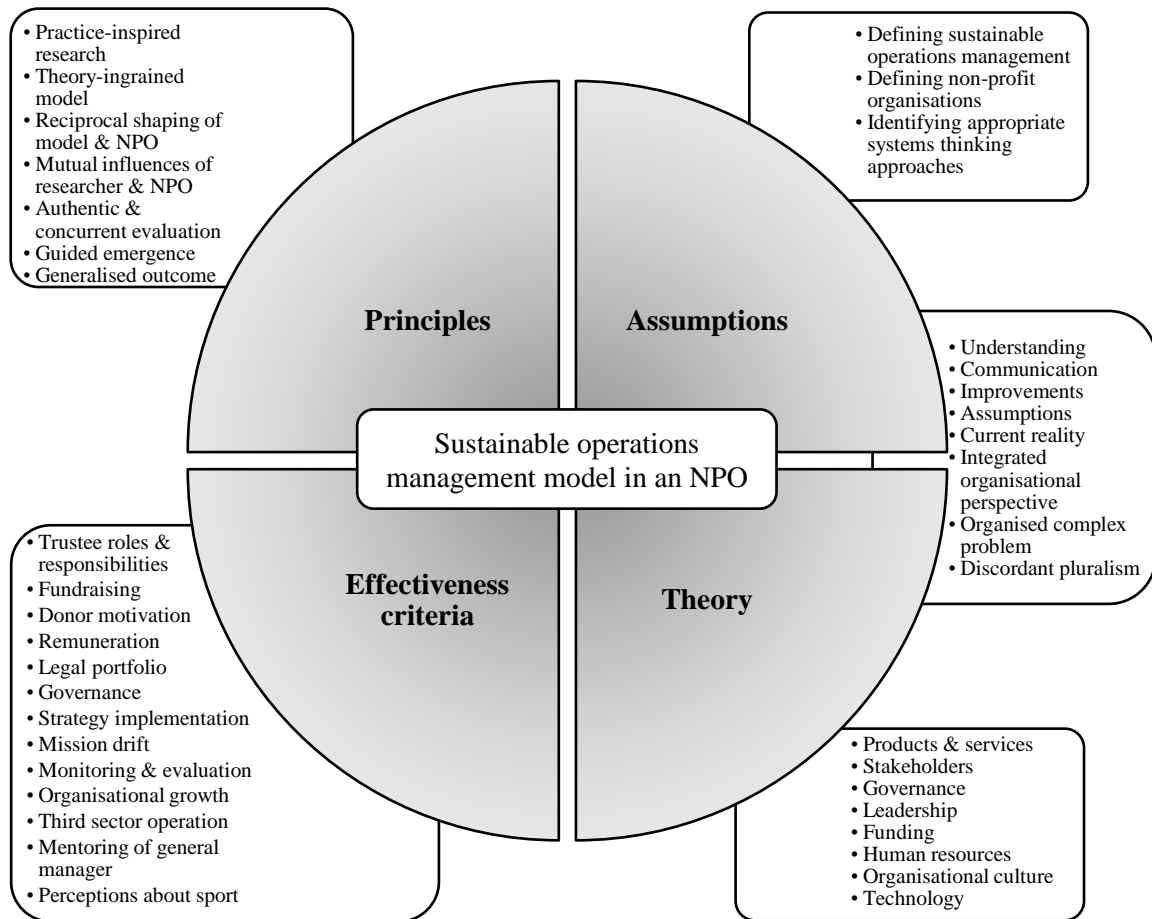


Figure 4-8 Interpretive framework

To realise societal relevance and impact, an ADR project explores the applicable design ecology through multiple designers, contexts, cycles or prototypes which leads to a better understanding of how the design can be adapted to other ecologies (164, 325). Ecology concerns the complex interactions of individual organisms and populations with other species and their biotic and abiotic environment (414). The study therefore involves multiple entities of different types and levels in a complex interacting system of an organisation and their environment, and how these entities function together (415). A design ecology is conceptualised in terms of different time periods in the development of organisation theory from sociology, economics, political science, psychology and management as summarised in Table 4-5 (416, 417).

A SOMM in NPOs requires an integrated organisational perspective (51). This study furthermore is conducted from an industrial systems perspective which includes the context, resources, activities, processes, actors and interdependencies that support the creation and delivery of products and services by organisations (144). Therefore, the above perspectives are combined to understand the NPO and their environment as a complex interacting system (416). Based on the proposed research procedure, the design ecology is investigated in terms of the entities summarised in Table 4-6.

Table 4-5 A history of design ecology (416, 417)

Year	Perspective	Contribution
1848	Karl Marx	Organisation alienates, exploits and dominates employees while employees can forge revolutionary class consciousness
1893-1912	Emile Durkheim	Increasing specialisation of organisations marks a transition from traditional to modern societies with interdependency forms of solidarity rather than similarity
1919	Max Weber	Rational-legal bureaucratic organisation embodies rationalisation of human activities
1911	Scientific management	Prioritise management goals and optimise employee productivity and organisational efficiency
1950-1955	Georg Simmel	Processes of affiliation and hierarchy (current network analysis and resource-dependence theory)
1947-1963	Carnegie School	Constraints on information and decision-making, and bounded rationality of decision-makers and the organisations they design
1961-1973	Contingency theories	Complexities, uncertainties and inter-dependence in the environment influence organising processes and organisational outcomes
1962-1988	Relational	Relationships determine patterns of action by defining opportunities and constraints
1977-1989	Demographic	Position in social and physical space determines patterns of action by defining opportunities and constraints
1977-1997	Cultural	Shared understandings or mental models determine patterns of action by defining opportunities and constraints

Table 4-6 Design ecology

Perspective	Entities
Sustainability evaluation	<ul style="list-style-type: none"> • Legal environment • Organisational capacity • Financial viability • Advocacy • Product and service provision • Sectoral infrastructure • Public image
BES perspective	<ul style="list-style-type: none"> • Environment • Ethos • Aims • Processes • Structure • Resources • Governance
VSM	<ul style="list-style-type: none"> • Operational units • Units maintaining harmony among operational units • Units supporting self-regulation • Units monitoring performance • Units scanning the environment for opportunities and threats • Units developing the NPO identity, representing the NPO in the wider environment, formulating policies
SD	<ul style="list-style-type: none"> • Feedback loops
SSM	<ul style="list-style-type: none"> • Transforming processes • Worldviews • Actors • Customers • Environmental constraints

Perspective	Entities
	<ul style="list-style-type: none"> • Owners • Activities • Underlying mechanisms
CF	<ul style="list-style-type: none"> • Communities of the NPO in a historical, cultural and situational context • Ethical issues and power relations among communities of the NPO • Boundary issues • Turbulence
DEM	<ul style="list-style-type: none"> • Implicit tensions of learning, identity, organising and performing • Explicit tensions surfaced through plurality, change, scarcity or contradictory demands • Acceptance of paradox through paradox mindsets and organisational dynamic capabilities • Addressing paradox
CSH	<ul style="list-style-type: none"> • Sources of motivation, control, knowledge and legitimacy • Normative ideal versus descriptive actual • Beneficiaries, decision makers, experts and witnesses • Those involved and those affected but not involved • Different contexts

4.7 EFFECTIVENESS CRITERIA

Effectiveness criteria are established to decide whether the SOMM in the NPO is sufficiently refined, or whether another BIE cycle is required (267). The aim of these successive formative evaluations is to improve the quality of the model in terms of effectiveness (53, 167, 267). In this study, effectiveness is determined with reference to the definition of SOM. Therefore, the self-defined needs of the NPO are documented in §4.7.1 as they emerge through the contextualisation a SOMM in terms of the NPO.

Reasons for a transition from one BIE cycle to the next are documented, where design changes mark the borders between cycles (271). The cycles end when the NPO decides to adopt or reject the SOMM and when the contribution of an additional cycle would be marginal in terms of refinement of the model (53).

4.7.1 Self-defined needs

Valuable lessons were learned in the process of expanding the initial programme and sport development for all learners on a national level, including the establishment of an NPO. Firstly, the NPO relies on voluntary contributions. It is therefore critical that trustees add value for the NPO. They must be committed to the aim of the NPO, be available, be well connected, collaborate, and assist in identifying donors. Although DoEs approve, accredit and recommend the programmes of the NPO, financial support is not forthcoming. Networking however is expensive. There must be some incentive for trustees, for example, research opportunities for academia or an opportunity to give back to the community for retirees. Since the NPO relies on voluntary contributions, the incentives for trustees most probably exclude financial benefits. For example, after one of the

trustees won a national competition and big domestic businesses became interested in donations to the trust, about 80% of the income of the trust was spent on buying material from this trustee at a markup of more than 100%. Trustees lost interest in identifying donors when they stopped receiving commission. More clarity is required regarding the role of trustees and whether they may earn commission. Although business background is key for trustees, it is important to have a diverse team who are good team players with a strong leader and who can engage in critical dialogue. A profile must be established for trustees, trustees must have assigned roles, proposed trustees must be invited for interviews before being appointed, and there must be limits on tenure.

Another way to raise funds is through cooperation with other NPOs, for example, with the African foundation established by the world champion. However, little financial advantage realised for the trust while the trust made large investments, for example, for African delegates not associated with the trust to attend meetings of the international sport federation. A lot of politics also were involved such as a campaign by the world champion to become the president of the international federation. The world champion's political connections posed a challenge for the support of the DBE.

Fundraisers who are not trustees or employees of the NPO also are contracted to identify donors. However, they charge a founder's fee or referral fee of between 5% and 25% of the total donation amount and are not always effective while some businesses do not want to work through them. Instead of fundraisers, well-connected references are a valuable source for donations.

Businesses make donations if they can earn BBBEE scores although this changed during the study. Another motivation is if the cause is in line with current social trends, for example, education, reducing gender-based violence, recognising diverse gender identities and expressions, or supporting minority groups. Few businesses make donations because they can deduct the amount from income tax. Most businesses want to arrange donations with a black representative, do not want to work through fundraisers, do not want to give donations for overheads and do not want donations to be invested in reserve funds while some businesses insource social investment. It is important therefore to explain benefits, overheads and reserve funding when a potential donor is approached. The general manager of the NPO speculates whether he might be driving away potential donors in his desperation to obtain donations.

Another challenge for the NPO is a remuneration system. According to the trust deed trustees are entitled to reimburse expenses that occur due to the execution of their duties. However, any remuneration paid to trustees or any other person must correspond with products or services actually delivered, may not be excessive relative to what is generally considered as reasonable in the specific sector, and may not benefit a person inconsistent with the objects of the trust.

The legal portfolio of the trust also proves to be a challenge. Legal advice is of the utmost importance since any suspicion, for example, that trustees are involved in fraud easily tarnishes the name of the NPO. Furthermore, previous employees who referred disputes with the NPO to the Commission for Conciliation, Mediation and Arbitration costed the trust around R800 000. However, the legal representative of the trust was notified that, instead of the retainer which would have been financially and otherwise more beneficial to the trust, his services would be utilised on an ad hoc basis.

Another big challenge is governance. When the trust deed was amended, the general manager made an appointment with judge Mervyn King regarding the governance of NPOs due to issues such as that trust meetings were not minuted, attempts to lay off the general manager when complaints were lodged by employees regarding policies and procedures preventing inappropriate benefits to employees, requests for an internal audit which never realised, and trustees indicating to legal advisors that they are above the law. Commissions are not disclosed to donors and agreed upon in the proposal stage of a project and past commissions are not discussed with concerned donors. It helped that only the founder and general manager had signing rights on accounts.

The NPO believes that they should have a business orientation in terms of effective strategy implementation which requires commitment from all involved and supporting organisational processes and structures to utilise resources efficiently (39, 40, 418-423). They also want to establish organisational processes before growing the organisation. When the COVID-19 pandemic hit, the NPO did not have any reserve funds which require a high level of innovation to meet established goals in set timeframes (38).

The NPO may be experiencing mission drift. The initial objects of the trust are to receive donations to conduct public benefit activities in a non-profit manner with an altruistic intent through the coordination, development and administration of sport as such and as an educational aid, the organisation and hosting of national and international sport events, and the enhancement of learning through participation in organised sport. When the trust deed was amended the objects of the trust are stated as to conduct public benefit activities in education and development, human welfare and/or sport through the establishment and administration of a fund. Originally the mission of the NPO was to improve the cognitive and analytical abilities of children by exposing them to the mental discipline provided by sport. Later the mission of the NPO was redefined as to educate future mindsets for individuals to take up citizenship and be equipped for challenges at work, add value and contribute towards the greater good.

Monitoring and evaluation also prove challenging. It does not only involve quantitative data and statistical analyses as would have been implemented through an online system developed by a business for all the corporate social responsibility projects of the main donor. This system never realised. Although the NPO implements a well-developed monitoring and evaluation process, donors often require return on invest over a very short period of time while the programme is designed for long-term sustainable impact. There also is a need to make contact with persons who had participated as learners or teachers in the programme in the past to evaluate longer term impact.

Another challenge entails organisational growth. It is important to establish organisational processes before growing the organisation. The NPO believes that they should rather grow more slowly while keeping in line with relevant government priorities, for example, the priority goals set out in the action plan of the DBE. However, businesses require a wide footprint in order to invest.

Furthermore, it is challenging for the NPO to operate in a *third sector* between business and government (38). It is, for example, a challenge to compete against other organisations who are better connected with government or against government themselves. Good relationships with local and provincial government result in substantial support financially and otherwise.

The general manager of the NPO is concerned about the trust investing only in his skills development and that there are no other employees with the required capabilities for succession planning. Simultaneously he indicates a need for mentoring which he experienced as not being available. More clarity is required regarding the mentoring role of trustees. The trust believes that one of the best decisions they made was to appoint a fulltime general manager based on a rigorous process. The continued operation of the NPO is attributed to the general manager. However, the general manager struggles to find work-life balance. He works excessively long hours at office and at home, neglecting his family in the process. He also has used his private funds to sustain the NPO.

One of the biggest challenges is perceptions about sport. Politics and financial matters of local and international sport bodies also pose challenges for cooperation. For example, a national sport federation sold the rights to the South African junior championships to a local business to pay their debtors including membership of the international federation and referees of a championship. Later the national sport federation unilaterally cancelled the contract with the business, but an interdict was granted against the federation. Another national sport federation had to reschedule the election of their executive board because the South African Sports Confederation and Olympic Committee was not represented by an elections officer. Subsequent discrepant court rulings resulted in more

than one executive board. The international sport federation and the African sport federation formally decided to take a neutral stand and allow both executive boards to represent South Africa which causes uncertainty.

4.8 CHAPTER VALIDATION

To ensure the quality of the study, content validation in terms of the actual need for a SOMM in the NPO is strengthened through the research agreement which entails a long-term commitment by them based on their need for a SOMM (165-167). It is further strengthened through the contextualisation of a SOMM in the NPO.

Construct validation concerns the logical development of the model with reference to the interpretive framework (167, 276). The framework represented in Figure 4-8 is coherent and transparent with regards to a clear statement of underpinning worldviews, paradigms and philosophical commitments as represented by research principles, relevant concepts, and implied assumptions to avoid relativism or an anything-goes logic. Furthermore, the framework is based on contemporary theories discussed in the literature review. The framework explains how a SOMM in the NPO is conceptualised based on the stated assumptions, structured in terms of relevant concepts, applied, and evaluated in terms of effectiveness criteria. Although stakeholders are not indicated explicitly, they are included in relevant concepts and the effectiveness criteria.

Further to construct validation, the appropriateness of an ADR approach is explained in the exposition of the research methodology and adherence is confirmed in every phase and cycle through continuous reflections (53, 424, 425). The research question is conceptualised through the literature review and relevant concepts are contextualised with reference to the NPO. Research methods are subsequently selected that support the research question through different perspectives.

Utility, referring to the usability of the model by the NPO, is addressed through the contextualisation of a SOMM in the NPO with reference to existing artefacts. This enables the design of a SOMM which builds on the historically collected experience and skill of the NPO, and which is culturally appropriate for them. Utility also entails efficiency which is established in the research agreement between the researcher and the NPO. This includes the provision of resources to the extent feasible to complete the research project such as time, funds, facilities, equipment, access, support and cooperation while honouring the limitation thereof, and a realistic plan that accommodates the realities of an operating NPO.

Efficacy is addressed in terms of the effectiveness criteria to decide whether the SOMM in the NPO is sufficiently refined, or whether another BIE cycle is required. With reference to the definition of SOM in the study, the self-defined needs of the NPO are documented as they emerge through the contextualisation of a SOMM in terms of the NPO. Furthermore, theoretical underpinnings and typical questions addressed by each modelling approach as identified through the literature review together with implied knowledge constitutive interests are considered to indicate relevance to addressing the primary research question.

Ecological validation is addressed through the development of a design theory with reference to the interpretive framework. Furthermore, the design ecology is required to consider the role of specific characteristics of NPOs to address similar problems by applying similar SOMMs. A comprehensive design ecology is developed by combining different perspectives from sociology, economics, political science, psychology and management to understand the NPO and their environment as a complex interacting system with reference to the research procedure.

The reflexivity of the researcher is addressed in the research agreement through voluntary informed consent by the NPO, regular progress reports by the researcher, the NPO asking questions, requesting information and providing comments throughout the project, maintenance of integrity and transparency, regular communication and correspondence executed effectively and with the necessary preparation. It is also addressed in the contextualisation through a review by the NPO. The interpretive framework addresses the reflexivity of the researcher by providing trackability and virtual replicability in terms of the research procedure and the interpretation of research results. The design ecology is developed with reference to the research procedure, based on modelling approaches identified through the literature review, with clear motivation for inclusion and exclusion of specific approaches. Effectiveness criteria to decide whether the SOMM in the NPO is sufficiently refined, are based on self-defined needs of the NPO which emerge through the contextualisation and confirmed by them. Throughout the process, the researcher's location remains different from the NPO, engaged, and neutral. During the contextualisation, the researcher's location is that of a critical researcher while it changes to that of a creative designer in the development of the research procedure, interpretive framework, design ecology, and effectiveness criteria. In the research agreement, research procedure, interpretive framework and design ecology the researcher's location is that of outsider. During the contextualisation and the establishment of effectiveness criteria, the location of the researcher is that of insider although the researcher never fully experiences it as such.

4.9 CHAPTER REFLECTION

Looking for an account of the OM model applied by the NPO, organisational policies are clearly identified and also an OM process mapping, an annual schedule, a monitoring and evaluation process, instruments and results, internal and external training procedures, proposals to generate revenue, a fund allocation policy, a human resource structure including positions, requirements and duties, and reward systems. Various versions of an organogram also are identified. The NPO incorporates state-of-the-art technology in their product and service offerings including training, they utilise tablets and customised application software to deliver products and services, and are involved in the development of monitoring and evaluation software. They also maintain a website and are active on social media. However, gaps exist and the NPO does not apply an explicit SOMM.

With reference to the interpretive framework, the procedure starts with a sustainability evaluation of the NPO through an interview based on the CSOSI. The evaluation of the current sustainability of the NPO is followed by a BES perspective of the NPO which provides a meta-framework for inquiry to be supplemented and challenged with different other approaches. The research procedure proposes which modelling approaches from the literature review may supplement and challenge a BES perspective and one another without fusing them into a single algorithm. An informed decision is taken based on the theoretical underpinnings, typical questions addressed and knowledge constitutive interests of different approaches to determine which approaches most closely relate to the research question.

The interpretive framework contains a high volume of complex information which is diagrammatically represented to support engagement, understanding and recollection to evolve the framework as the study progresses. The framework is coherent and transparent by clearly stating research principles, implied assumptions, field-specific theories, and an indication of how a SOMM in the NPO is conceptualised, structured, applied and evaluated. Stakeholders are included in field-specific theories and in context of the NPO. A comprehensive design ecology is explicitly explored through the research procedure. Based on an integrated organisational perspective of a SOMM in an NPO and regarding SOM in an NPO as an organised complex problem, the NPO and their environment are regarded as a complex interacting system.

Effectiveness criteria, to decide whether the SOMM in the NPO is sufficiently refined, involve the self-defined needs of the NPO as they emerge during the contextualisation of a SOMM in the NPO as summarised in the interpretive framework.

CHAPTER 5 BUILDING, INTERVENTION AND EVALUATION

5.1 INTRODUCTION

In context of the action design research (ADR) approach followed in the study (Figure 5-1), the building, intervention and evaluation (BIE) phase addresses the primary research question by contextualising a sustainable operations management model (SOMM) with reference to the participating NPO, and establishing a research procedure and effectiveness criteria in Chapter 4. An interpretive framework and a design ecology also are developed to address the research question concerning the sustainability of NPOs in general.

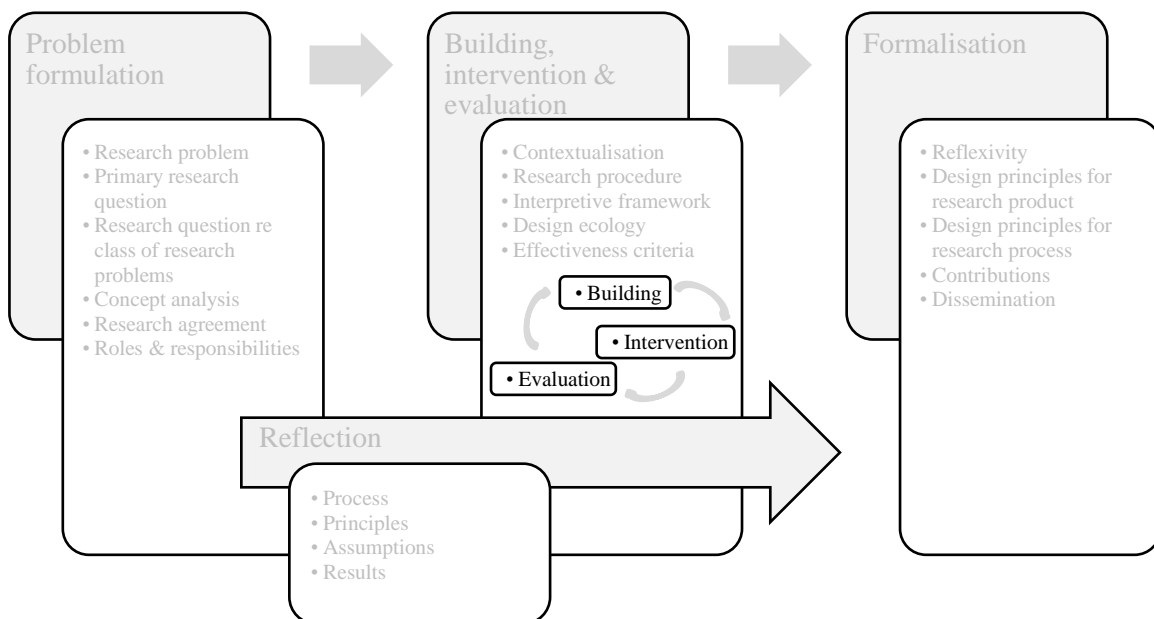


Figure 5-1 Chapter 5 in context of the research design

This chapter addresses the remaining part of the BIE phase through cycles to develop a SOMM in the NPO (53, 164, 165, 167, 274). Each cycle from §5.2 to §5.8 is executed according to the research procedure and consistent with the interpretive framework while contributing to the design ecology. The cycles are contextualised with reference to the research procedure at the start of each section. More detail on cycles is available in Addendum D to Addendum K. The validity of the BIE cycles is formatively evaluated in terms of construct validation, utility, ecological validation and the reflexivity of the researcher in §5.9, to be summatively addressed in Chapter 7. The chapter concludes with a reflection on the efficacy of each cycle and how the SOMM can be further refined, with more detail available in Addendum L.

5.2 SUSTAINABILITY EVALUATION

5.2.1 Civil society organisation sustainability index

As indicated in Figure 5-2, the research procedure starts from an evaluation of the current sustainability of the NPO. This is done through an interview with the general manager based on the civil society organisation sustainability index (CSOSI) (18). The index measures the sustainability

of the NPO in terms of seven dimensions namely the legal and regulatory environment, organisational capacity, financial viability, advocacy, product and service provision, sectoral infrastructure, and public image. A national panel of NPO practitioners and researchers agrees on an overall score for each of the dimensions. Scores range from 1 (the most enhanced level of sustainability) to 7 (the most impeded level of sustainability) based on the impact of various indicators in terms of their relative scope and duration. The dimension scores are then averaged to produce an overall sustainability score for the NPO sector of a given country. An average score between 1 and 3 indicates the highest level of sustainability, between 3.1 and 5 indicates an evolving sustainability, and between 5.1 and 7 indicates the lowest level of sustainability. An editorial committee reviews each panel's scores and corresponding narrative reports to maintain consistency across countries and over time.

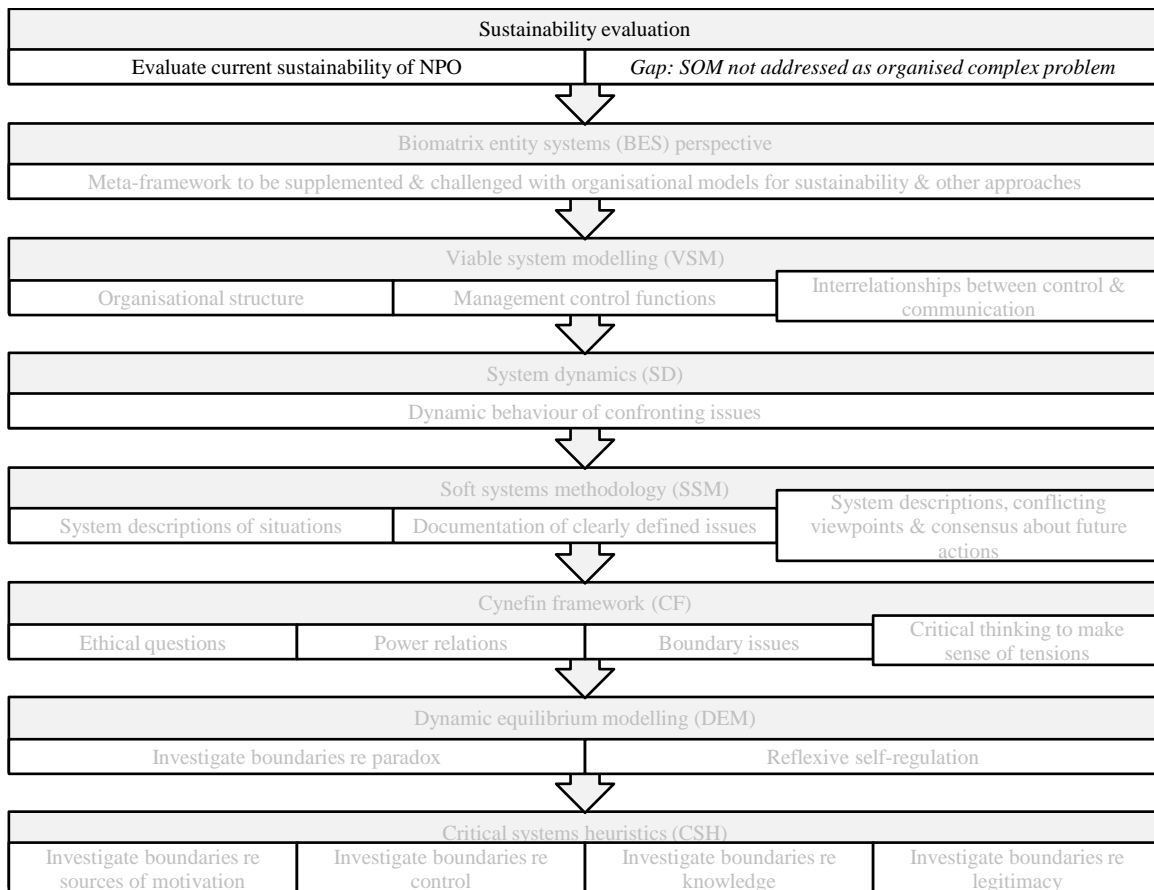


Figure 5-2 Sustainability evaluation in context of the research procedure

Questions are adapted for self-evaluation by the NPO where an interview is conducted only with the general manager of the participating NPO instead of including a diverse range of NPO representatives. To support efficiency as established in the research agreement between the researcher and the NPO, other stakeholders do not participate in the interview but their feedback from the existing monitoring and evaluation process of the NPO is incorporated as specific examples to explain answers. Since the NPO did not participate previously in a panel to evaluate

and rate the sustainability dimensions of the index, a visual-analogue scale between 1 and 7 is utilised instead of an interval scale between 1 and 7 (426). Furthermore, scores are not determined in terms of the level of change from a previous year, but in terms of how well they match descriptions for scores of 1 and 7 respectively for each dimension. The NPO can undertake self-evaluations and track and compare progress in future by utilising the questions in Addendum D and published results of the CSOSI (427).

The outcome of the interview is summarised in Figure 5-3. The average sustainability score for the NPO indicates an evolving level of sustainability. Scores for the legal environment of the NPO, organisational capacity, product and service provision, and public image indicate the highest level of sustainability. Scores for the financial viability of the NPO and sectoral infrastructure indicate an evolving level of sustainability. The score for the advocacy of the NPO indicates the lowest level of sustainability.

Scores for the NPO are compared to the scores for the South African NPO sector for 2019 (428) as shown in Figure 5-3. Although NPOs worldwide are impacted by the pandemic caused by Coronavirus disease of 2019 (COVID-19) and scores and situations changed significantly since 2019, these are the latest available (14, 428, 429). Nonetheless, it is noted that the average sustainability score for the NPO and that for the NPO sector both indicate an evolving level of sustainability with the average sustainability score of the NPO more enhanced by 7% (428). This is a good correlation relative to other countries in sub-Saharan Africa where the closest score is 8% more impeded than the average score for the South African NPO sector.

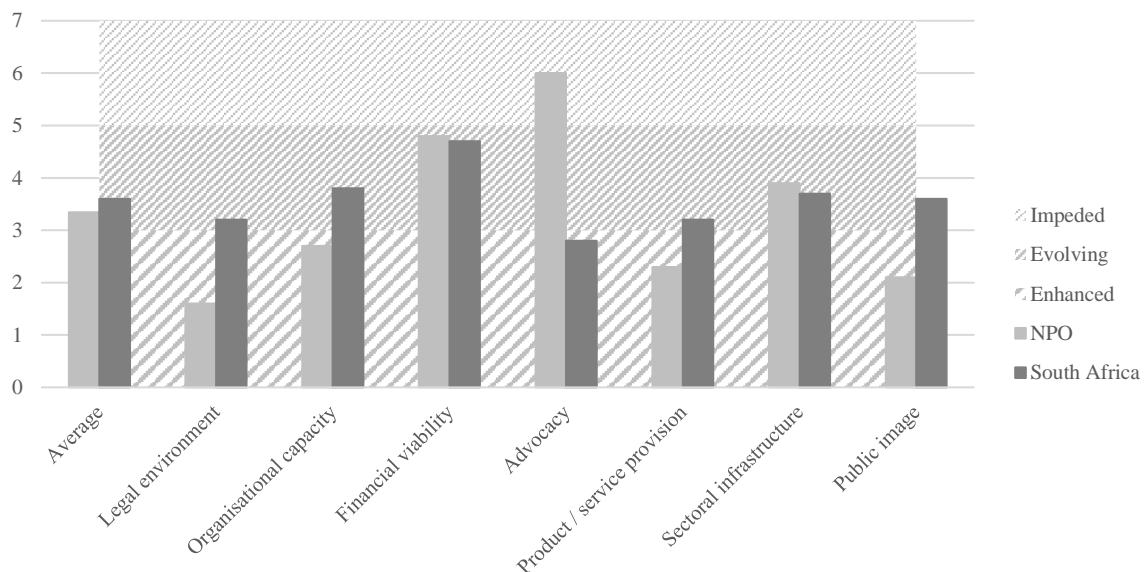


Figure 5-3 Sustainability of the NPO relative to South African NPO sector

Scores for the financial viability and sectoral infrastructure for the NPO and that for the NPO sector also both indicate an evolving level of sustainability and correlates well, with the scores for the NPO more impeded by 2% and 5% respectively (428). Financial viability is the weakest dimension of NPO sustainability in sub-Saharan Africa although the South African NPO sector scores the highest in the region together with Botswana. The sectoral infrastructure in sub-Saharan Africa in general is underdeveloped although it improved slightly in 2019 including in South Africa (428).

Scores for product and service provision, organisational capacity, public image, and the legal environment for the NPO are more enhanced by 28%, 29%, 42% and 50% respectively compared to that for the NPO sector whose scores indicate evolving sustainability (428). Product and service provision is one of the stronger dimensions of NPO sustainability in sub-Sahara Africa and improved slightly in South Africa in 2019. Organisational capacity strengthened in 38% of reporting countries in sub-Sahara Africa in 2019 based on better relationships with constituencies and capacity-building programmes while it remained stable in South Africa. The public image of NPOs in sub-Sahara Africa recorded the second largest improvement of all dimensions in 2019 based on expanded media coverage of analyses by NPOs and leadership in moments of crisis while it improved slightly in South Africa in 2019. The legal environment of NPOs deteriorated in 31% of reporting countries in sub-Sahara Africa in 2019 which represents a slow-down in deterioration, while the legal environment of NPOs in South Africa improved for the first time in ten years based on improved policies affecting NPOs and legal services which are more available.

The largest deviation between the scores for the NPO and that for the NPO sector is for advocacy (428). The score for advocacy is 114% more impeded for the NPO while the score for the NPO sector indicates enhanced sustainability. In sub-Sahara Africa, NPO advocacy is the strongest dimension of sustainability and advanced significantly in 2019 which suggests a growing appreciation of NPO contributions. In South Africa, the score for advocacy improved for the second year in a row in 2019 based on an expansion of efforts against gender-based violence defined in terms of gender minority groups.

5.2.2 CIVICUS indices

The above outcome of the evaluation of the current sustainability of the NPO is supplemented with the preferred organisational indicators of the CIVICUS indices (391) as summarised in Addendum E. The enhanced sustainability score for the legal environment of the NPO is supported in the legal, political or constitutional space dimension by an indicator of the overall fiscal and regulatory environment, but an indicator of corruption perceptions is below average. The enhanced sustainability score for the organisational capacity of the NPO is supported in the socio-economic or structural dimension by an indicator of paid employment relative to sector average. However, indicators of donations and resource dependency regarding revenue and the public sector support

the evolving sustainability score for financial viability of the NPO. The impeded sustainability score for advocacy of the NPO is supported in the legal, political or constitutional space dimension by an indicator of corruption perceptions. The ratio of advocacy to service-providing activities of the NPO nonetheless correlates with that of the education and research NPO sector. The enhanced sustainability score for the product and service provision of the NPO is supported in the functional or impact-related dimension by an indicator of fulfilled commitment. The enhanced sustainability score for the public image of the NPO also is supported in the functional or impact-related dimension by indicators of perceived impact and media coverage.

The sectoral infrastructure of the NPO is not addressed by any preferred organisational indicators of the CIVICUS indices but standard indicators for the education and research NPO sector can be added (391). On the other hand, the CSOSI does not explicitly consider a normative or value-related dimension. This is a challenge in terms of the values focus of NPOs (19, 40) and sustainable operations management (SOM) (97, 100).

5.2.3 Enabling environment national assessment

The outcome of the evaluation of the current sustainability of the NPO is further supplemented with the South African enabling environment national assessment (EENA) (392) also summarised in Addendum E. Besides the six mandatory dimensions namely freedom of association in terms of the formation of NPOs, their operations, and access to resources, freedom of assembly, freedom of expression, and relations with government, the EENA for South Africa also includes an optional dimension namely NPO cooperation and coalition as recommended by the advisory panel participating in the project (430).

The enhanced sustainability score for the legal environment of the NPO is supported in all the dimensions. Although the enhanced sustainability score for the organisational capacity of the NPO is not addressed in any dimension, the evolving sustainability score for the organisational capacity of the South African NPO sector is supported by the disabling environment in the NPO coalition and cooperation dimension. The evolving sustainability score for the financial viability of the NPO is supported by the disabling environment in the freedom of association in terms of access to resources dimension. The product and service provision of the NPO is not addressed in any dimension. The evolving sustainability score for the sectoral infrastructure of the NPO is supported by the disabling environment in the NPO coalition and cooperation dimension. The public image of the NPO is not addressed in any dimension of the enabling environment assessment except for the reputation of the NPO with government in the relations with government dimension. However, the disabling environment does not support the enhanced sustainability score for the public image of the NPO.

The disabling environment in the relations with government dimension and in the freedom of association in terms of access to resources dimension support the impeded sustainability score for the advocacy of the NPO. It however does not support the enhanced sustainability score for advocacy of the South African NPO sector. This may be explained partially by comparing the results of the CSOSI of 2014 – when the EENA was done – with the results of the CSOSI of 2019. The score for advocacy of the NPO sector improved over this period from evolving sustainability to enhanced sustainability (18, 428). A further explanation may entail the NPOs who participate in the EENA compared to those who participate in the CSOSI.

5.3 BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

To explore SOM in the NPO as an organised complex problem, a BES perspective of the NPO is applied as indicated in Figure 5-4 (208).

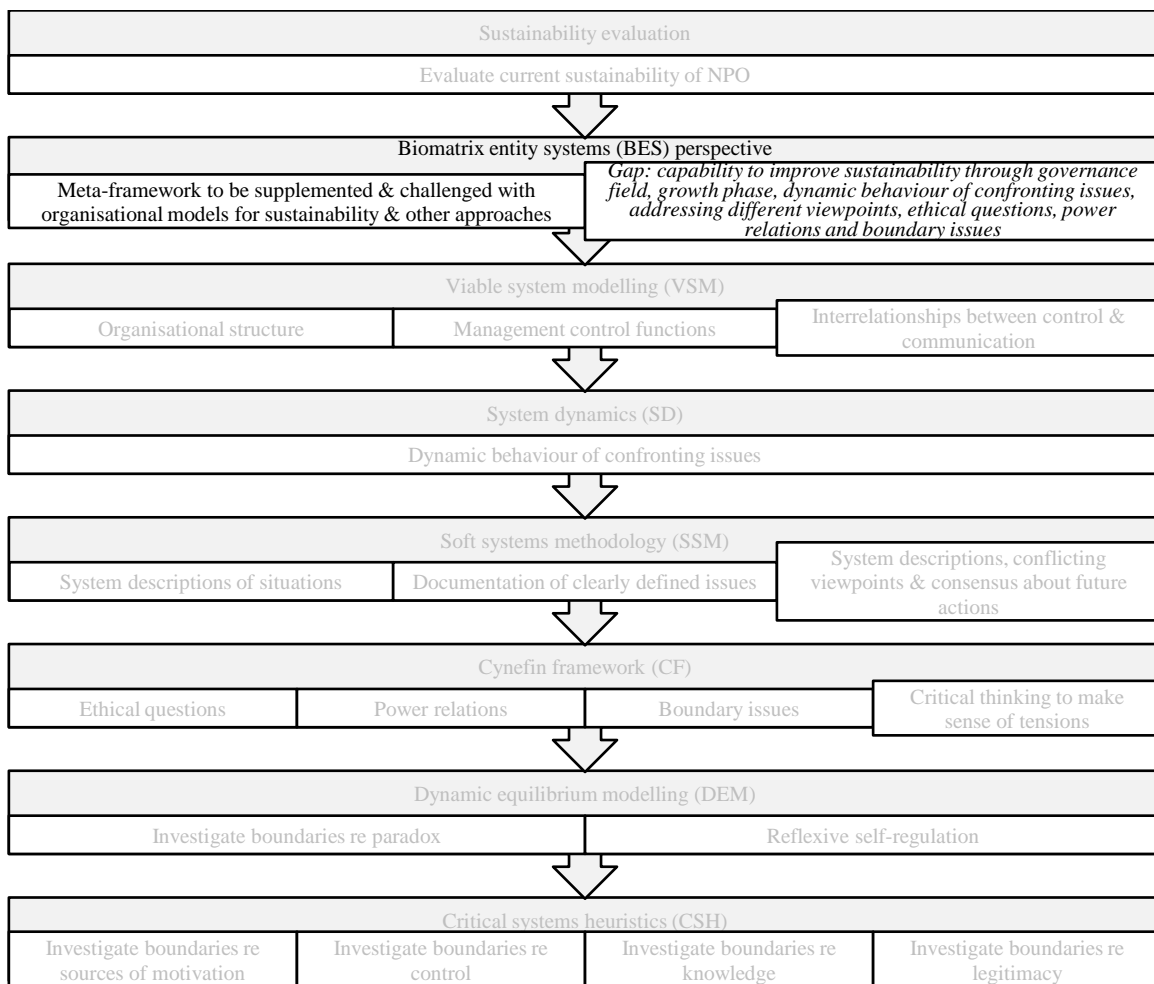


Figure 5-4 A biomatrix entity systems perspective in context of the research procedure

An activity systems perspective would focus on one functional or business process such as logistics, marketing or production (389), whereas operations management (OM) and specifically SOM considers multiple processes that cross internal functional boundaries (431). A BES

perspective in terms of the seven fields of organisation of the biomatrix model starts with the environment of the NPO and then the ethos, aims, process, structure, governance and ending with resources for all levels of the NPO as presented in Figure 5-5 (208). More detail is available in Addendum F.

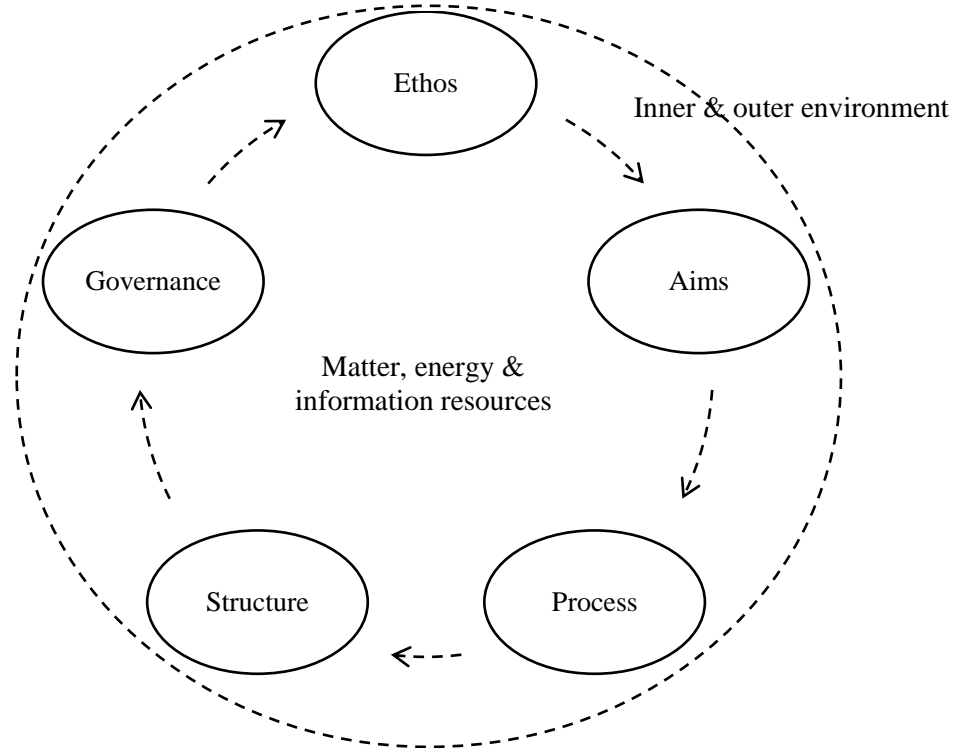


Figure 5-5 Biomatrix generic entity systems perspective (208)

5.3.1 Environment

The outer and inner environment of the NPO is indicated by boundaries where the NPO connects with external and internal stakeholders and where resources are transformed (208). The NPO has less influence in their contextual environment and must adapt to it, so that opportunities and threats in different dimensions are considered (208, 210). To design a SOMM, the human, natural, physical, financial and social capital of the contextual environment of the NPO is considered in terms of the natural, psycho-social and technological dimensions of the biomatrix approach (120, 208). The NPO has more influence in their transactional environment and must adapt less to it, so that the distinction with the contextual environment is fuzzy and dynamic (208, 210). Stakeholder influence and satisfaction also are considered (208).

The NPO may work with surrogate beneficiaries since preschool children and primary school learners may be regarded as powerless beneficiaries (432, 433). The NPO realises however that if parents (or guardians) are held as surrogate beneficiaries, the need for the NPO programmes would not exist if parents can address the challenges in education in South Africa (433). There is a perception that the NPO takes employees as surrogate beneficiaries to effect change in education,

but the NPO realises that they then become their own customer which proves ineffective and donors do not approve. Internal and external stakeholders and the NPO themselves therefore must be clear on the reasons why they are involved and a framework to address less powerful beneficiaries is offered through agreeing a satisfactory contract between stakeholders.

Furthermore, the NPO addresses a sense of powerlessness among preschool children and primary school learners, which may have the same effect as an actual lack of power, by providing opportunities for them to experience success and developing 21st century skills in them (432). In this way, the NPO supports the priority goals of the Department of Basic Education (DBE) for 2024 (359). The original social enterprise intention of the trust, based on a hybrid conceptualisation of an NPO, however was not for their programme to be adopted by the DBE and currently the programme is not prioritised by the DBE (434).

Stakeholders struggle to make sense of the complexity of sustainability through an integrative approach rather than an instrumental win-win approach according to organisational models for sustainability (152). Some donors, for example, want to create financial value through other sustainability measures and are not interested in creating financial, natural, human, social and physical value integratively through their involvement with the NPO.

5.3.2 Ethos

According to a BES perspective, the ethos of the NPO is considered next (208). Focalised field-like entities form in the field of matter, energy and information of the biomatrix model when processes are attracted by nuclei (208, 389). The set of organising principles in a nucleus that attracts processes to form an entity is the ethos. It then gives the entity an identity that is separate from its outer and inner environment. In the NPO, ethos refers to the organisational culture that guides the organisation through worldviews, models, theories, metaphors, beliefs and values.

The NPO experiences a value clash since the original social enterprise orientation of the trust based on a hybrid conceptualisation of an NPO. However, later the trust was approved as a public benefit organisation (PBO), the trust registered their programme as an NPO, and a general manager was appointed based on a contemporary conceptualisation of an NPO (19, 51). The value clash may also be caused by trustees' mimicry of an NPO. Although a hybrid conceptualisation involves significant international scope, budgets, political influence and responsibility, social missions are not pursued through donations but through alternative sources of funding to generate social and financial value (20, 38, 434). The NPO relies on voluntary contributions, but it seems that the trustees are financially incentivised.

In order for a nucleus, with the ethos as its set of organising principles, to attract processes in the field of matter, energy and information and form focalised field-like entities, the ethos must be attractive to the processes, for example, in a social, historical and political context. The ethos of stakeholders from different contexts such as trustees, employees, donors, government and cooperating NPOs however is not necessarily aligned. This includes incentives for being involved and fund allocation. Such misalignments cause cultural entropy such as appointments based on race or through nepotism instead of competency, lacking work ethics, racial and gender issues, contract breaking, legal action, public slandering, and lack of funding (435). In future this may be addressed through the application of cultural transformation tools.

5.3.3 Aims

After the ethos, the aims of the NPO are considered according to a BES perspective (208, 389). While the ethos refers to a set of organising principles that attracts processes and gives an entity an identity which remains distinguishable over time, aims refer to a projection that directs processes over time and are shared by more than one entity if they make sense to each of these entities in terms of their ethos. The aims of the NPO can be unattainable such as an ideal, broad and long term such as a vision, more specific and medium term such as objectives, or specific and short term such as a goal.

Trustees do not drive the aim of the NPO and do not render the required support in strategic planning. Although the NPO realises that they should not chase numbers, align with relevant government priority goals and have an impact over the long term, they formulate goals according to business requirements for a wide footprint and short-term change. The goals also do not indicate what must be achieved, when, where and by whom and it is not clear what the goal entails to modernise their approach.

Furthermore, it seems that mission drift occurs as aims are reformulated over time. NPOs are driven by their long-term mission and all fields must be closely aligned with their mission since stakeholders become involved with the NPO because of their mission statement (10, 145, 378, 436-439). Only if the need that the NPO addresses is not perceived as significant enough to attract sufficient stakeholder support, the NPO can redefine their mission (38). However, if tensions among different types of value are not managed well in a hybrid conceptualisation of an NPO, financial value may be prioritised over human, natural, physical and social value in the mission statement especially when different forms of value capture are unrelated (148).

The lack of guidance, moving targets, misalignment and lack of clarity increase the uncertainty that the NPO will achieve their aims, referred to as telentropy (389).

5.3.4 Processes

Next, processes of the NPO are considered according to a BES perspective (208, 389). Process thread-like entities form in the flow of matter, energy and information of the biomatrix model to form activity threads if directed towards a specific aim. These processes then are attracted by the ethos in a nucleus to form a focalised field-like entity. The focalised field-like entity therefore involves activity threads directed towards outer aims, its own aims and inner aims, and also linking activity threads or tapping which connects the entity with activity threads from its outer and inner environment. It follows that the process field refers to the ethos of the NPO, the aims of processes, continuity, tapping and multifunctionality (208). It also entails the structure of processes and sub-processes (§5.3.5), the processing of matter, energy and information (§5.3.6), and the regulation of processes and sub-processes (§5.3.7). The process field is explored with a focus on the need identification, development of products and services, and delivery of products and services of the NPO (25). Other key focus areas of SOM in NPOs are explored through other fields of organisation according to a BES perspective.

The process mapping of the NPO must be completed to document all their objectives, programmes, and obtaining the buy-in of all relevant stakeholders. Furthermore, continuity in the process field of the NPO is examined in terms of the aims of stakeholders, regulations, resource flow, relations and the desirability of output (208). It reveals stakeholder relations of empowerment and of power over the NPO, which must be addressed through additional BIE cycles.

Tapping also affects the continuity of the process field of the NPO in terms of the intention and ability of processes to utilise opportunities, mitigate risks and influence the environment of the NPO. Regarding opportunities for tapping through the website of the NPO and social media, proper naming rights were updated on all platforms except for the blog, some links to social media were added on the website, a subscription option was added on YouTube, the Facebook site was cleaned up and the LinkedIn site updated through the study. It is important for the NPO to establish two-way tapping through social media since social capital created through social media tends to predict offline social capital (440). Measurable goals must be set for social media usage and evaluated (367). Furthermore, information on the website is not up to date, video material and photos are not smoothly integrated, and awareness is not raised of how the NPO continues to support learners, teachers and parents during the COVID-19 pandemic. While the Instagram and Pinterest sites are sparse, the Twitter site and blog contain interesting information but none of these sites are up to date. Keywords on all platforms must be updated to obtain more visits from internet searches. It is not clear on any platform which products and services are offered by the NPO.

The NPO believes that marketing is very important to positively influence stakeholder perceptions and to generate revenue from products and services. However, they find it challenging to create

excitement about education and research with long-term impact. Although they trained employees responsible for communication, social media and the production of promotional material, currently the NPO prioritises administration above marketing due to lack of funding. The external presentation of their vision, mission and ethos therefore is lacking (355, 441). The NPO does not celebrate the positive impact on children's lives enough in their communications with relevant stakeholders. In order to do so, the NPO may explain how these accomplishments demonstrate their espoused values and celebrate it as such.

SOM implies multifunctionality of processes to create synergies by sharing the same activities to achieve different aims associated with human, natural, physical, financial and social capital. By supplementing the BES perspective with instrumental and integrative organisational models for sustainability (152), it is shown that the NPO shares the same activities to achieve different sustainability aims through an integrative approach. They create financial value through other sustainability measures rather than following an instrumental win-win business case approach where financial value is created while addressing other sustainability issues. However, the NPO experiences tension, ambiguity and uncertainty to make sense of the complexity of sustainability due to ethos issues.

SOM also implies multifunctionality in terms of achieving the same aim through different activities to develop capabilities and competencies for sustainability-related innovation and to embed sustainability into organisational aims and processes. Although the NPO is repurposed for society, their funding structure depends on donations which challenges their long-term financial viability. This can be addressed by recognising the centrality of the entrepreneurial function and achieving competitiveness on markets through effective planning and management.

The NPO improves human capital as a learning organisation and physical capital by promoting improved quality of products and services through sustainability and maximising material and energy efficiency although funding challenges are experienced. Although organisational models for sustainability indicate opportunities to improve natural capital by creating value from waste or utilising renewable technologies or natural processes (147), the NPO does not waste resources. Challenges are indicated for financial capital due to not enough marketing, lack of funding, and sport issues such as attempts to link sustainable impact directly to commercial success. Social capital also is under stress due to challenges regarding organisational ethos and governance, access to government decision-making processes, and cooperation with other parties. It seems that trustees lack social capital to be well connected, collaborate, and assist in identifying donors. Opportunities for improvement are indicated in terms of delivering functionality rather than ownership, and adopting a stewardship role.

5.3.5 Structure

The structure of the NPO is seen as a collective endeavour unfolding through emergent actions and activities as evident in the contextualisation of a SOMM in the NPO (306, 322, 351-353).

Therefore, the structure of the NPO is considered next according to a BES perspective (208). Such an organisational structure comprises a matrix with core processes, support that provides resources for core processes, and organisational support. However, SOM in NPOs entails a whole organisational perspective (51) so that the distinction is less clear between a core organisational structure, support structure, and organisational support structure. Similar to the process field, the core structure of the NPO is explored by focusing on the need identification, development, and delivery of products and services (25).

Although a formal organogram was developed by involving all employees over many years, it differs from the actual organogram of the NPO. The formal organogram indicates the core structure of the NPO only as one out of seven substructures of one out of four main functions, the support structure in all four main functions, and the organisational support structure in two out of four main functions. The actual organogram indicates the core structure as two out of four main functions, the support structure as a substructure in one main function, and the organisational support structure in two out of four main functions. The NPO emphasises the importance of marketing in their organogram as a support function not only for donations, but also for generating revenue. They increase accountability and transparency to support their marketing through their monitoring and evaluation process.

The current actual organogram of the NPO therefore is better streamlined in terms of core processes, support that provides resources for core processes, and organisational support.

5.3.6 Resources

Next, the resources of the NPO are considered according to a BES perspective (208). The biomatrix model consists of a hierarchy of process thread-like entities and focalised field-like entities embedded in a field of inseparable resources namely matter, energy and information that are in flux in physical and conceptual space (389, 442-444). The process field of organisation (§5.3.4) is formed by the flow of matter, energy and information that extend into time and space which is directed towards an aim (§5.3.3). The structure field of organisation (§5.3.5) forms in the field of matter, energy and information when processes are attracted by the ethos (§5.3.2) in a nucleus. Therefore, the ethos of the NPO and also their aims, processes and structure are supported through the tapping or acquisition, distribution, development, maintenance and discharge of organisational resources (208).

The NPO manages their resources well to satisfy their self-defined needs and build resilience over the long term with reference to distribution, development and maintenance. These resources include physical resources namely material and technology resources, financial resources, human resources, knowledge resources, social resources namely internal and external stakeholder relations, and natural resources through the integration of renewable products and services. However, the NPO experiences challenges regarding the acquisition of financial resources, which affects the acquisition of physical and human resources. This confirms the evolving sustainability score for the financial viability of the NPO in the sustainability evaluation. It also supports the challenges indicated for the continuity in the process field of the NPO and for tapping (§5.3.4), which require additional BIE cycles. Furthermore, the NPO does not manage the discharge of resources explicitly but improves the end-of-life management of their resources through the BES perspective. Additional BIE cycles are required to manage exit strategies, for example, the tenure of trustees and projects for which donations are received (445).

5.3.7 Governance

The environment, ethos, aims, process, structure and resource fields of the NPO are informed by their organisational governance according to a BES perspective (208). It involves implicit governance through the organisational structure of the NPO (§5.3.5) and through power relations and conflict resolution which are indicated in §5.3.4 but require further investigation.

Explicit governance is implemented through the strategic performance management of the NPO which includes planning, decision-making, regulation and performance evaluation. An organisational strategy was facilitated through the main donor, but for an ideal future and not from the current reality of the NPO while trustees did not contribute. To further explore the driving forces of the strategy of the NPO, a BES perspective is supplemented with a sustainable organisational model for mature organisations (149, 208). While a strategy that focuses on symbiosis and balance is proposed for an NPO, the most appropriate strategy depends on their environment (§5.3.1), structure (§5.3.5) and resources (§5.3.6). It also depends on the growth phase of the NPO which can be described with reference to a history of NPOs described in the literature review. The ethos of the participating NPO (§5.3.2) fluctuates between a contemporary period and a hybrid period and currently the NPO deals with the effects of the pandemic caused by COVID-19. The growth phase of an NPO is a key focus area that must be added to the areas identified through the literature review of SOM in NPOs.

5.4 VIABLE SYSTEM MODELLING

VSM supplements the governance field of a BES perspective to focus on the capability of the NPO to improve sustainability through their organisational structure, management control functions, and

interrelationships between control and communication as indicated in Figure 5-6 (181, 208, 366, 393).

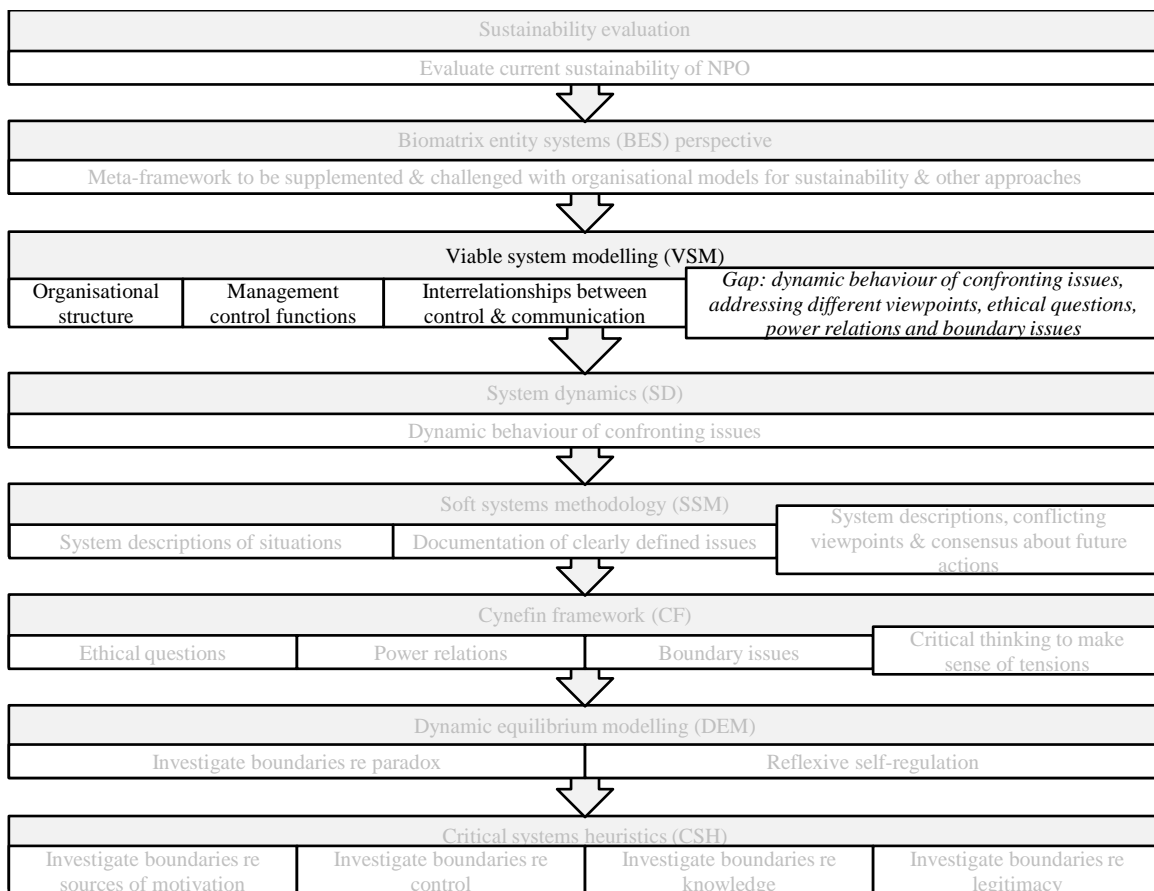


Figure 5-6 Viable system modelling in context of the research procedure

VSM maps interaction patterns among agents including responsibilities and communication mechanisms, and indicates how a self-organising system can co-evolve towards self-regulation and improved sustainability (181). The mapping is done in terms of five dynamic systems that operate recursively, execute specific functions, and link with one other to monitor and balance information that flows between them and the environment as indicated for the NPO in Figure 5-7 (179, 180). System 1 – at the lowest level of recursion – represents operational units that execute operations to implement an organisational purpose (446). Each such system contains the same five dynamic systems and is autonomous to make decisions and interacts with its local environment, which is embedded in a larger environment. System 2 represents units that coordinate activities in System 1 through communication to ensure harmony and to dampen uncontrolled oscillations. System 3 represents units that maintain stability through the interpretation and implementation of policies and the allocation of resources to operational units. It includes a System 3* which represents units that monitor and audit activities. System 4 represents units that scan the total environment for opportunities and threats, distribute information to relevant units, integrate internal and external information to perform long-term planning, and rapidly transmit urgent information from System 1,

2 and 3 to System 5 through an algedonic signal. System 5 represents units that formulate policies, respond to significant signals from other units, arbitrate between demands from System 3 and System 4, develop the identity of an organisation, and represent the organisation in the wider environment. A VSM of the NPO is developed with terminology adapted to the context of the NPO (162, 179, 388). More detail is available in Addendum G.

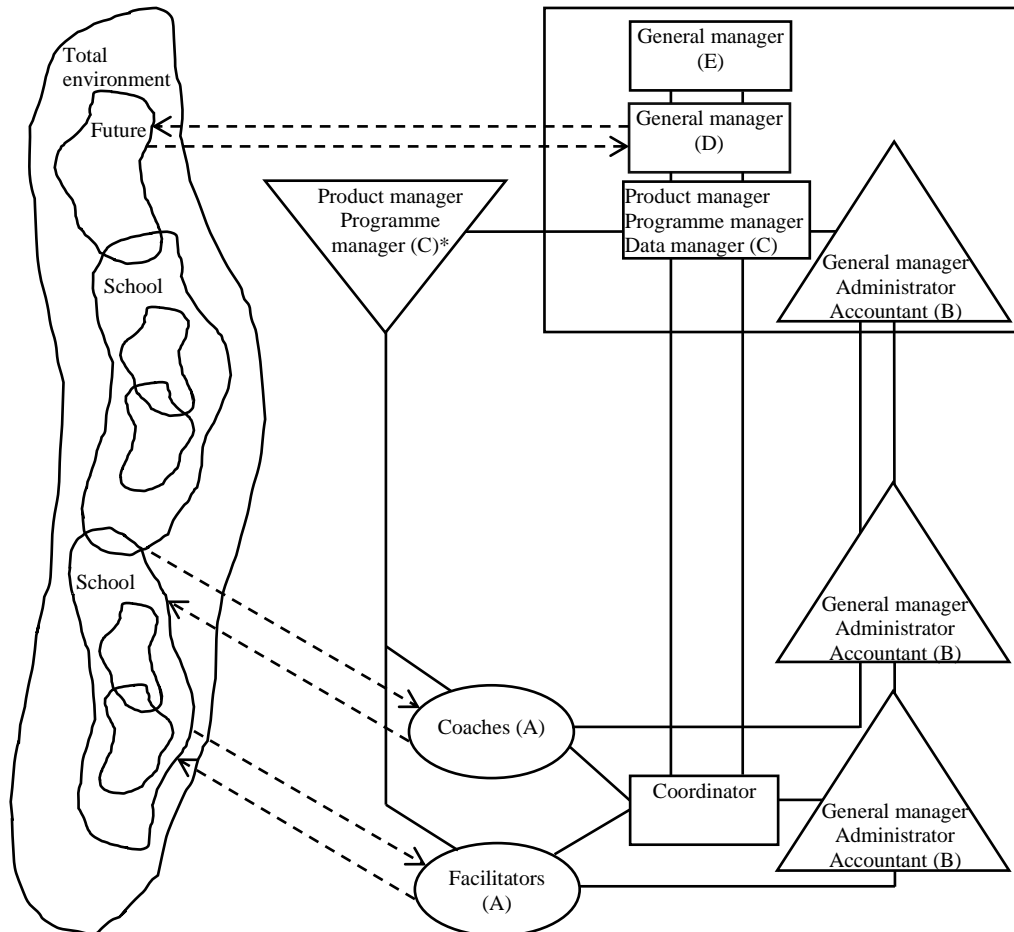


Figure 5-7 Viable system model of the non-profit organisation

Similar to other NPOs (179), it is shown in Figure 5-7 that some individuals fulfil more than one role and incoherence is indicated with reference to the subsystems in the NPO, for example, in the maintenance of harmony among operational units to prevent continuing conflict, support of self-regulation to improve performance, and performance monitoring. Furthermore, trust meetings are indicated to balance present and future orientations and internal and external perspectives, maintain interactions with the transactional environment, raise awareness of environmental changes, and to initiate special interventions. The trust however is not indicated as making sense of environmental changes to shape strategy and long-term orientation nor as creating organisational identity and policies to provide a consistent framework for operational units.

The NPO emphasises opportunities between operational units, and units optimising effectiveness and efficiency, to properly prepare for a project after planning is completed but before implementation. During implementation, the NPO can adapt their strategy or objectives to become more sustainable as indicated for the sustainable organisational model for mature organisations (447, 448). They can however also adjust their operations to achieve their objectives through control activities (25). Besides control and communication, VSM furthermore facilitates accountability and learning to strengthen systemic strategic performance management (204).

To further develop an appropriate strategy for the NPO with reference to a sustainable organisational model for mature organisations (§5.3.7), the growth phase of the NPO can be described with reference to a history of SOM described in the literature review. VSM shows that the NPO has moved through broadened organisational focus areas and through expanded organisational value creation – being an NPO – but not yet through a changed organisational perspective from inside-out to outside-in. The growth phase of the NPO can furthermore be described in terms of the organisational growth phases identified by Greiner (150) as referred to by the sustainable organisational model for mature organisations (449, 450). The NPO has moved through a creativity phase, direction phase, delegation phase, coordination phase and evolves through a collaboration phase which entails strategic performance management (150, 208). However, a leadership crisis still persists from the creativity phase and the NPO prematurely goes through a growth crisis. Instead of finding outside partners or finding an opportunity to sell itself to a bigger organisation, the NPO declines. From this contraction phase and with experience in scalability, the NPO can implement a strategy that focuses on synergy through a value-based management concept to focus on stakeholder relationships (149, 449). Instead of focusing all fields of the NPO towards shareholder wealth maximisation, all fields of the NPO must focus on the mission of the NPO (145). The strategy of the NPO must be flexible as part of systemic strategic performance management to ensure that they survive, to address uncertainties, to realise objectives, and to become more sustainable (447, 448).

5.5 SYSTEM DYNAMICS

Based on the sustainability evaluation of the NPO, SD models are developed to improve understanding of the dynamic behaviour of confronting issues as indicated in Figure 5-8 (186). Models therefore are developed to explore organisational capacity (§5.5.1), financial viability (§5.5.3), and product and service provision (§5.5.5) (18). Through these models, SD also addresses the dynamic behaviour of issues raised in a BES perspective and VSM due to interactions between the organisation and their environment over time. A SD model therefore also is developed to specifically explore human resources (§5.5.2) which are included in organisational capacity in the CSOSI (18) and indicated as paid employment by the preferred organisational indicators of the CIVICUS indices (391). Furthermore, advocacy entails relationships with various stakeholders (18,

451). The legal and regulatory environment entails relationships with government (18, 130, 391, 452, 453). The NPO sectoral infrastructure mainly entails relationships with other NPOs but also influences relationship with government (18, 452, 453). Public image entails relationships with society in general (18, 391, 452). Advocacy, the legal and regulatory environment, sectoral infrastructure, and public image as measurements of the sustainability of the NPO therefore are modelled together as stakeholder relations (§5.5.4).

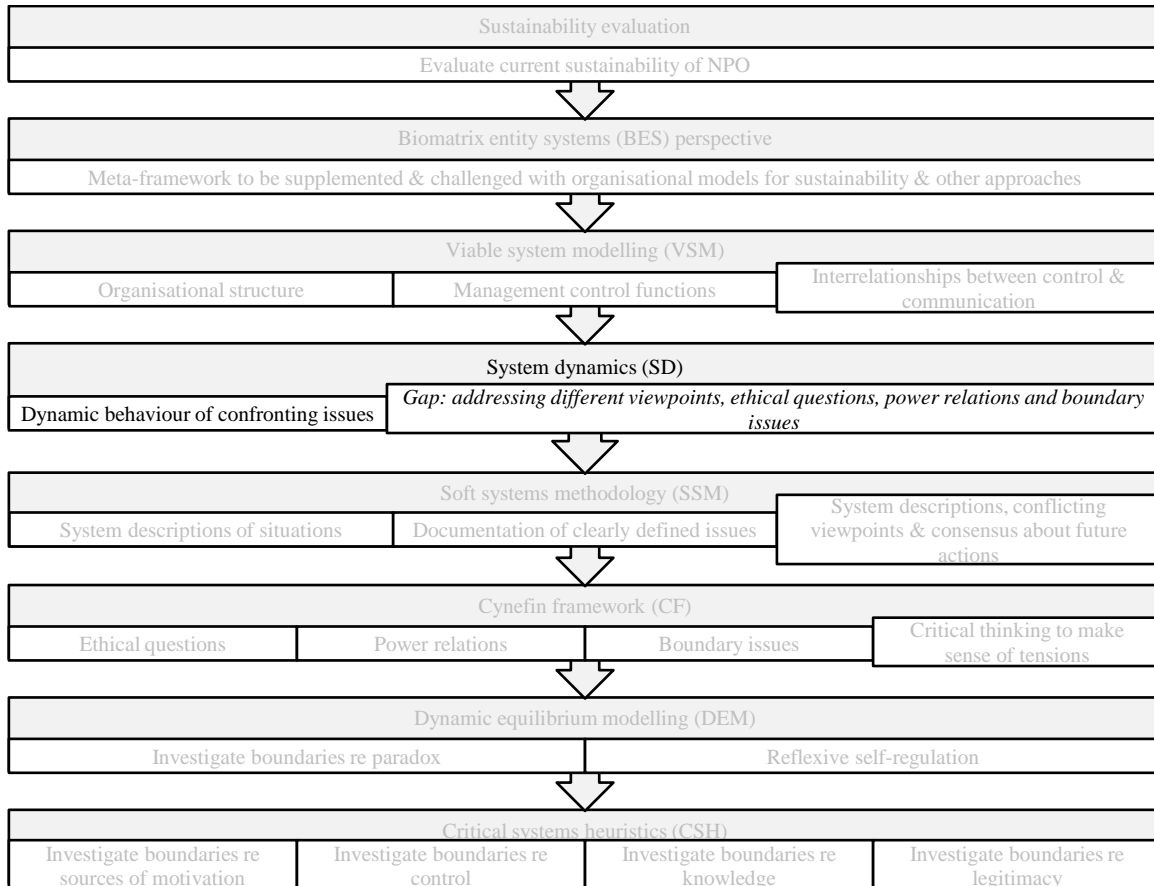


Figure 5-8 System dynamics in context of the research procedure

As illustrated in Figure 5-9, SD models are conceptualised by diagrammatically describing the contextualised situation of the NPO through systems diagrams developed by means of Vensim software (454) as shown in Addendum H. Since the contextualisation is based on key focus areas identified through a summative content analysis of literature, systems diagrams are included in Addendum H by applying axial coding subsequent to the content analysis. The qualitative data analysis software ATLAS.ti (141) is utilised (142, 455, 456), indicating only the most relevant links for eligibility. Through ADR, the systems diagrams are developed abductively and then are compared with diagrams from literature (186) to inductively develop a theory of how the situation of the NPO is generated (56, 184, 187, 456, 457). More detail is available in Addendum H.

Next, the above diagrams are converted into stock and flow diagrams to develop quantitative simulation models and deductively refine the theory of how the situation is generated (184, 187, 456-458). Credible quantitative estimates are available for stocks and flows for a product and service provision model. For other models, some non-numeric stocks can be quantified, for example, organisational culture and perceptions of corruption (435, 459, 460). Credible quantitative estimates however are not available for all non-numeric stocks and flows, for example, the flow from good governance through productive partnerships, stakeholder influence, advocacy, and legislation and regulations back to productive partnerships in the conceptual model of stakeholder relations. The development of other quantitative simulation models therefore requires oversimplifications and disputed estimates which will lead to disputed results and waste the cost and time of the NPO (457, 461, 462). Although systems diagrams are not formally testable and optimal solutions cannot be identified, the diagrams develop the capability of the NPO to address their self-defined needs and build resilience over the long term through better understanding, communication, proposals of improvements, and surfacing of underlying assumptions. It is therefore decided to develop conceptual models to explore organisational capacity, human resources, financial viability and stakeholder relations, and a quantitative simulation model to explore product and service provision (61, 463).

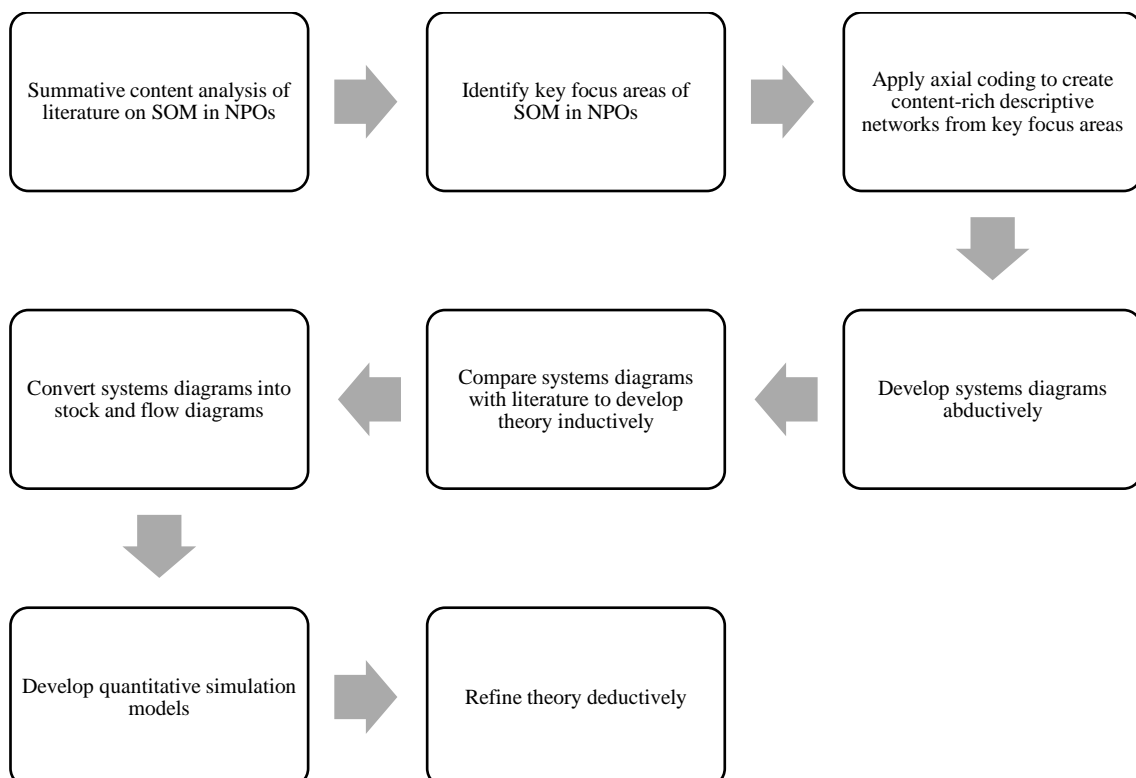


Figure 5-9 System dynamics process to develop theory on the situation of the NPO

5.5.1 Organisational capacity

It is indicated in the conceptual model of the organisational capacity of the NPO (Figure 5-10) that the status quo of the NPO is maintained through reinforcing feedback loops, while feedback loops in the opposite direction effect change. The situation of the NPO therefore is not regulated by an entity such as the trustees, but by continuous processes.

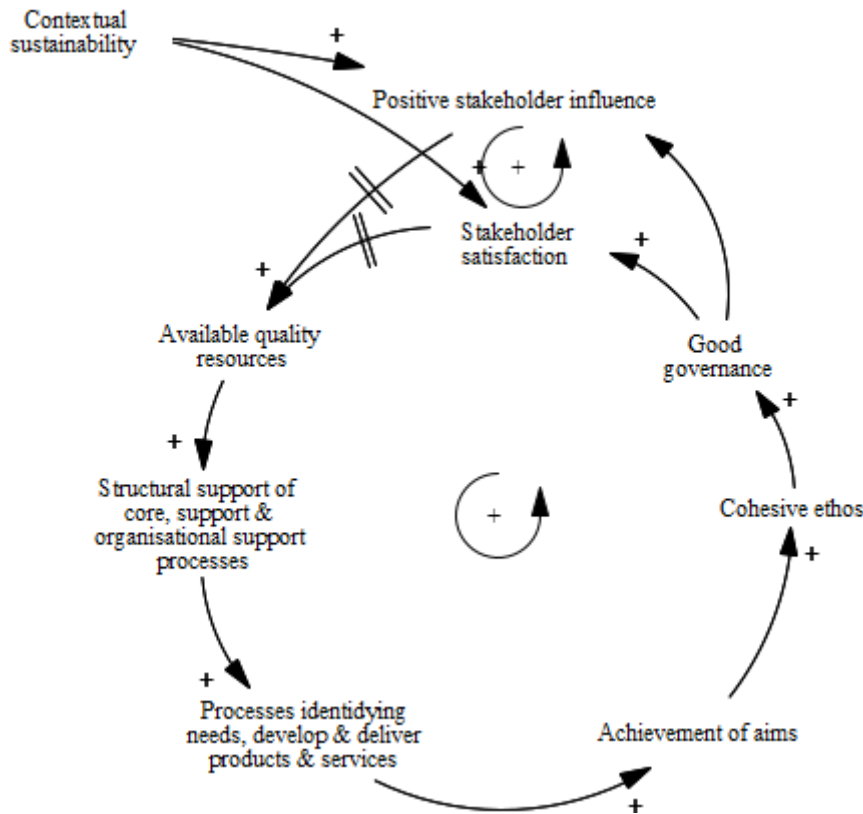


Figure 5-10 Conceptual system dynamics model of the organisational capacity of the NPO

5.5.2 Human resources

With reference to the conceptual model of human resources of the NPO, diagrams from literature are adapted to indicate that the attractiveness of the NPO and retention are not only influenced by remuneration and recursively by human resources themselves, but also by recognition and allocation of other resources including material, broader financial resources, knowledge and technology. Employee commitment and qualified employees furthermore not only contribute to quality products and services, but also to systemic strategic performance management with a delay between marketing and reporting, and achieving the aims of the NPO. However, an increase in organisational attractiveness does not always lead to increased organisational commitment. This may indicate decoupling where good governance to positively influence stakeholders becomes loosely linked to actual activities (464, 465). It may also indicate mimicry of an NPO (466).

5.5.3 Financial viability

In the conceptual model of the financial viability of the NPO, a balancing feedback loop is identified for donations which acts as a limits to growth archetype, regulated by the number of available funding sources. While diagrams from literature refer to the prosperity of the NPO, this study refers to the prosperity of the country where the influence of the NPO is negligible. The systems diagram for financial viability in this study furthermore assumes a contemporary conceptualisation of an NPO since a hybrid conceptualisation does not focus on survival from a financial point of view but on addressing environmental pressures while responding to the needs of society. Competition for revenue then is not determined by the income status of the country, the number of NPOs or funding sources, but by the market in which the NPO operates.

5.5.4 Stakeholder relations

In the conceptual model of stakeholder relations of the NPO, a reinforcing feedback loop that acts as a success to the successful archetype occurs when more enabling legislation and regulations strengthen productive partnerships, which strengthens positive stakeholder influence, which strengthens advocacy, which in turn strengthens enabling legislation and regulations. Since the NPO emphasises service-providing activities rather than advocacy, the success to the successful archetype benefits other NPOs, business and government departments while the influence of the NPO is further eroded. While diagrams from literature indicate a limits to growth archetype when NPOs attempt to remain apolitical, NPOs are always embedded in a political environment and partnerships rather impair the NPO's reputation, credibility and funding if the political orientations of partners are not aligned.

5.5.5 Product and service provision

The development of a quantitative simulation model of product and service provision is discussed in detail in Addendum H. Although simplification assumptions are made with reference to the conceptual model, the modelling of only the product and service provision in one NPO quickly becomes complicated. This is because the intention of SD is to take a high-level view of an issue to avoid a reductionist focus on parts instead of the whole (467). The most challenging aspect to quantify is the flow from good governance, through stakeholder influence and satisfaction, to resources. With reference to the high reliance on donations by the NPO and the number of years in operation, a quantitative model is applied of donations as a function of overheads. Although the model developed by Jacobs and Marudas (468) does not include fundraising, the model is applied with reference to the education sector and other organisational factors of the NPO. However, donation amounts are fixed based on the project supported so that a quantitative model is required to determine the probability that a donor will support a project. Such a model cannot be identified in literature and the probability therefore is implemented as an input parameter.

Verification of the model includes confirmation that the simplified conceptual systems dynamic model is correctly translated into the simulation model (469). A systematic procedure is followed to select appropriate software to develop the quantitative simulation model. Programming errors are removed through repetitive execution with default parameter values, extreme values, and values out of bounds.

Validation of the model includes boundary adequacy as confirmed through the prior development of a conceptual systems dynamic model (470). Structure verification is confirmed through a systematic translation of the simplified conceptual model into the simulation model. Dimensional consistency is confirmed by defining units for all parameters and checking units for all output values. Parameter verification is confirmed by the NPO. Extreme conditions are tested with extreme parameter values and values out of bounds. In addition, structurally orientated behaviour validation is confirmed by varying alternative parameter values, one at a time, and comparing model behaviour with the product and service provision behaviour anticipated by the NPO (471).

The quantitative simulation model results in Addendum H show a 91% improvement in terms of funds available over a three-year period if the NPO does not develop any new programmes, increase their markup on costs to 200%, half their staff establishment, half salaries and does not appoint any contractors. The NPO only has a surplus of funds available over a three-year period if they have startup funds available to the amount of R18M, which they believe is unrealistic. The aim of the quantitative simulation model – similar to the conceptual models – however is to develop the capability of the NPO to address their self-defined needs and build resilience over the long term through better understanding, communication, proposals of improvements, and surfacing of underlying assumptions. The quantitative simulation model is verified and validated, a user manual is developed in Addendum H, and the NPO can change parameter values, run experiments and download output values in the ready-to-use cloud environment.

5.6 SOFT SYSTEMS METHODOLOGY

SSM elicits and organises relevant system descriptions of the situation and issues that affect SOM in the NPO as surfaced through VSM and SD, and to address different viewpoints as surfaced through a BES perspective as indicated in Figure 5-11 (179, 184, 399). It entails action-orientated learning cycles from finding out about a situation, discussions structured around models to explore the situation, to taking action to improve it (191). The finding out phase is documented in §5.6.2 as a rich picture to capture the main entities, structures and viewpoints in the situation, processes, the current recognised issues and any potential issues. Activity models explore the situation of the NPO in §5.6.3 including root definitions, transforming processes, worldviews, actors, customers, environmental constraints, owners, criteria for efficacy, efficiency and effectiveness, primary tasks and issue-based tasks, and underlying mechanisms. However, the worldview of the NPO first is

explored in §5.6.1 to develop an activity model of SOM in the NPO. More detail is available in Addendum I.

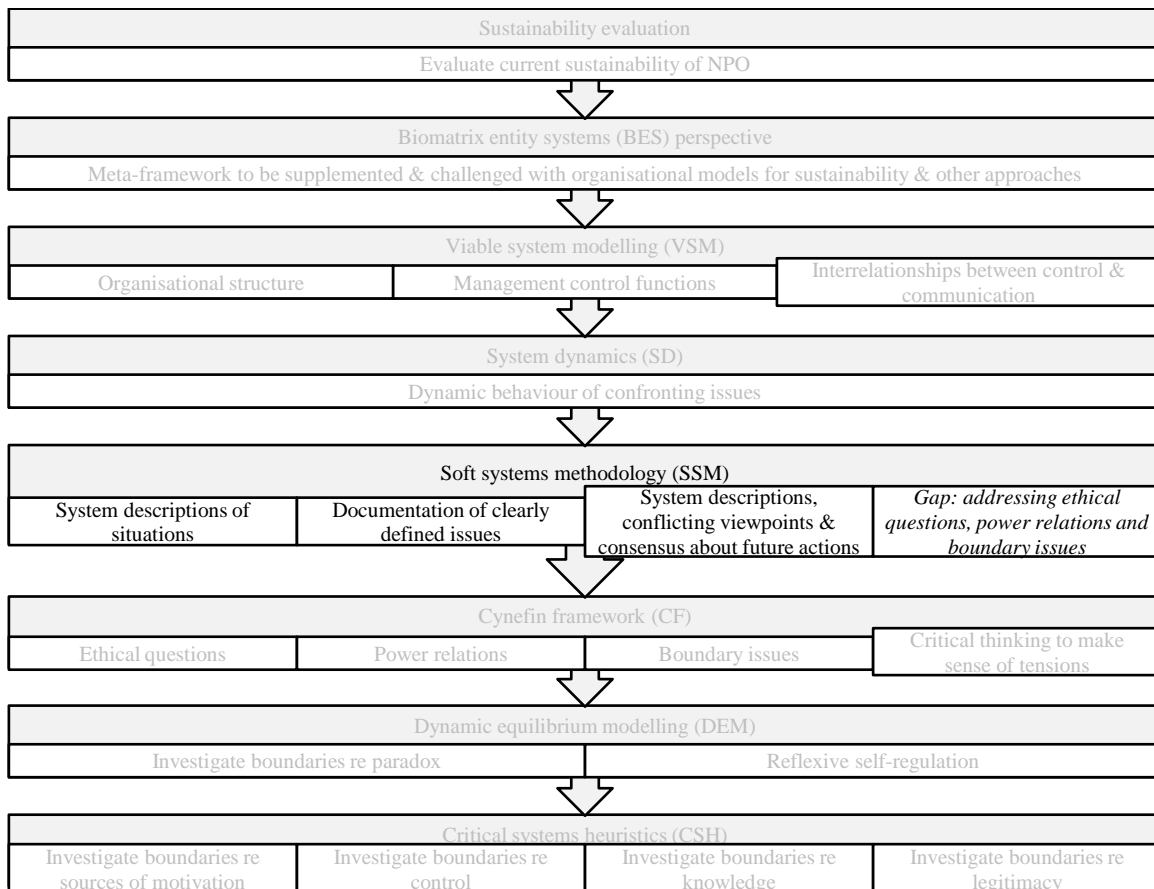


Figure 5-11 Soft systems methodology in context of the research procedure

5.6.1 Worldview

Four worldview theories are considered and although some of them refer to the intellectual conception of the world and one's place in it from an individual perspective, worldviews permeate organisational culture (287-289, 472, 473). The worldview of the NPO entails a mythical awareness, commitment, organisation, hierarchy, reliability, dependability, self-sacrifice, an external focus on the collective, egalitarianism, social awareness, care, friendliness and achievement. The worldview of an NPO is a key focus area that must be added to the areas identified through the literature review of SOM in NPOs. However, worldviews continuously evolve and reciprocally shape and is shaped by the organisational life cycle so that they could be described in terms of each other (474).

5.6.2 Finding out

An anonymised rich picture of the situation of the NPO is shown in Figure 5-12 as drawn by the NPO to emphasise their perspective. It correlates well with the contextualisation of a SOMM in the NPO, although in a condensed format. The NPO uses a schematic diagram such as used by

Armstrong (317) rather than a pictorial diagram such as used by Checkland and Poulter (191). The concept of a rich picture was used metaphorically when SSM was initially developed, but quickly became a literal description of a situation to show multiple interacting relationships as a basis for discussion. In their schematic diagram, the NPO indicates that their operations are structured by their products and services and specific stakeholders. This suggests the implementation of a value-based management concept (149, 449).

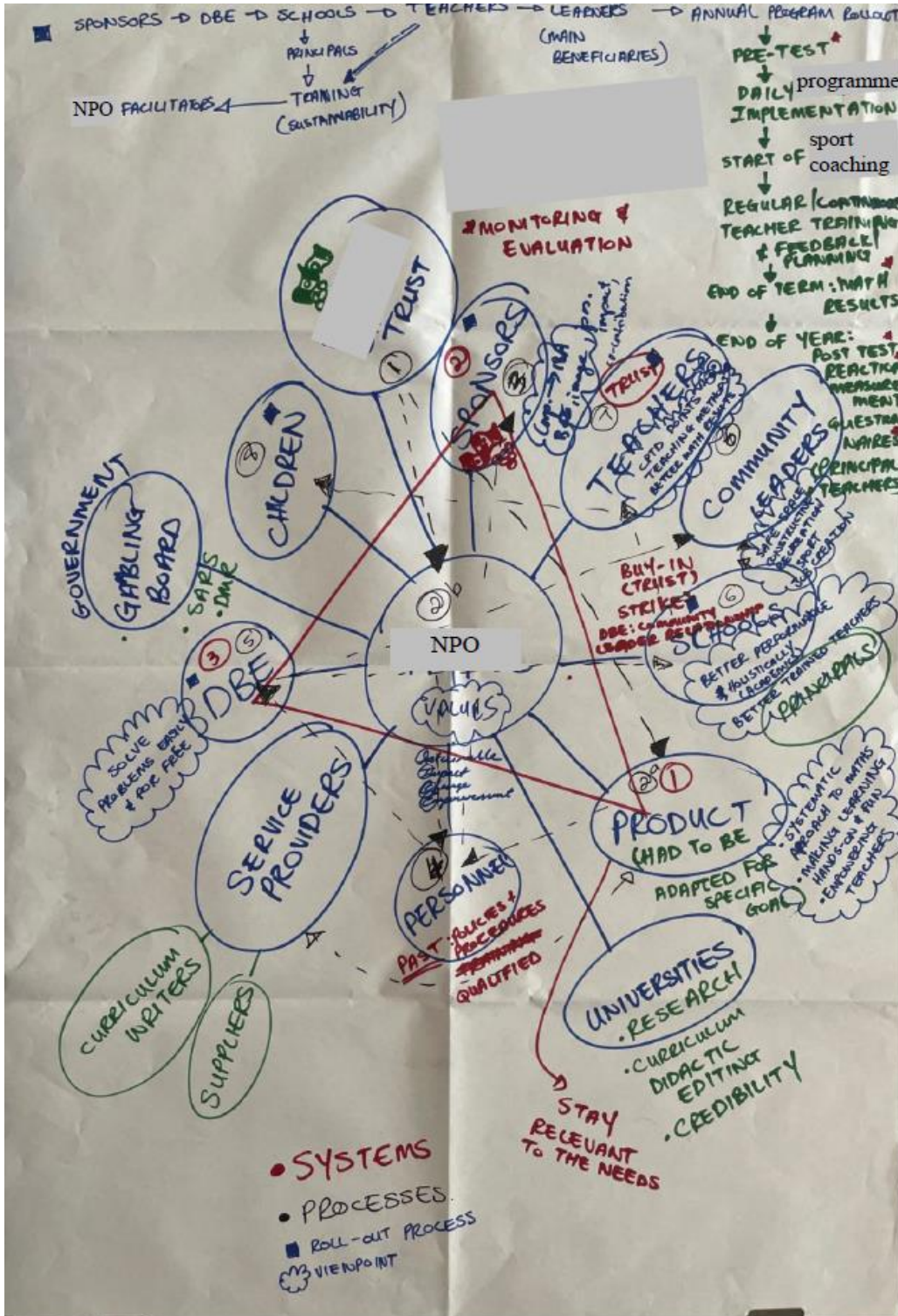


Figure 5-12 Rich picture of the situation of the non-profit organisation

5.6.3 Activity models

Based on a critical realist approach (317), the activity model in Figure 5-13 serves as a basis for further discussion about the viewpoints of other stakeholders and underlying mechanisms referring to human, natural, physical, financial and social capital. The surfacing of mechanisms which underlie the activity model leads to fruitful discussions. Furthermore, SSM supplements a BES perspective which describes the continuity of the processes of the NPO with reference to coherent aims and regulations with stakeholders, optimisation of resource flow according to these aims and regulations, external and internal relations, and the desirability of output. SSM includes the viewpoints of stakeholders and the implications thereof for the activity model in based on the perspective of the NPO as summarised in Table 5-1.

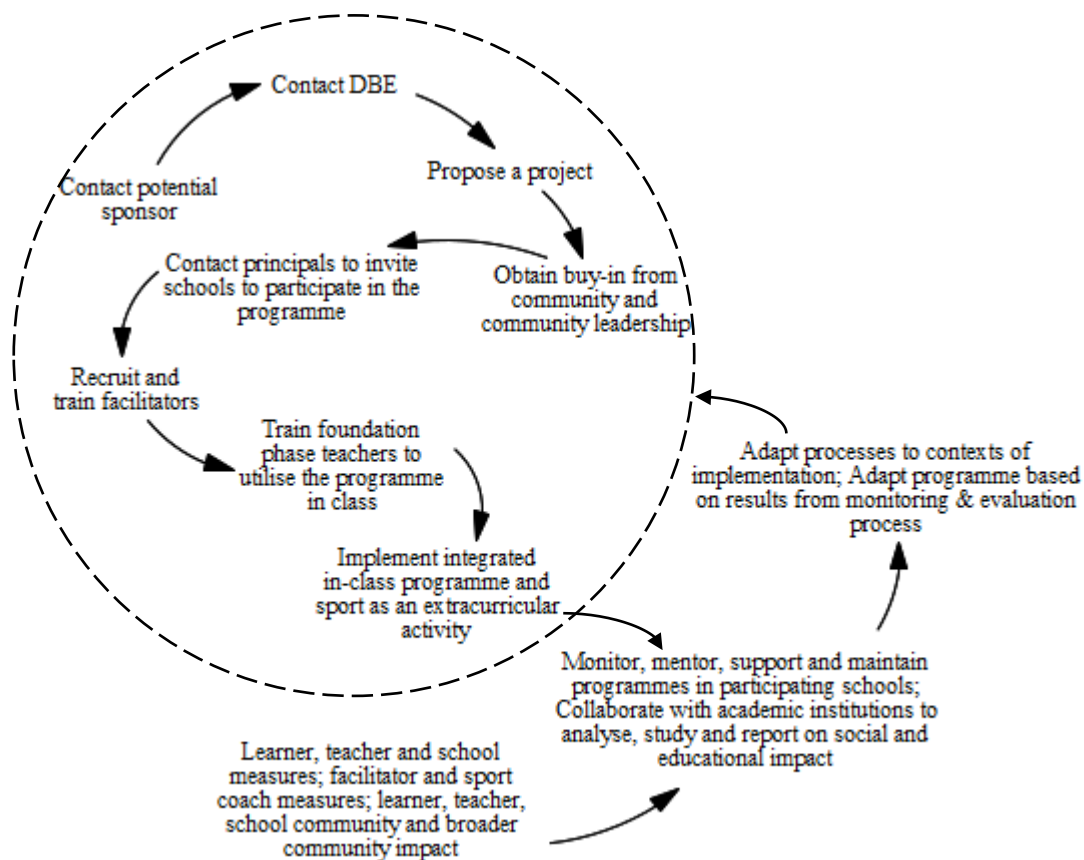


Figure 5-13 Activity model of sustainable operations management in the NPO

Different viewpoints in Table 5-1 emphasise the sustainability risk of the NPO. The viewpoint of the DBE is described as to solve problems quickly and for free. In the contextualisation it is indicated that the NPO maintains good relationships with the DBE, but SSM shows that the NPO effectively addresses the aims of the DBE while they have fairly high influence over the NPO. Although this viewpoint differs from the contextualisation, it correlates with issues surfaced through a BES perspective. For example, it is indicated in the continuity of processes that the output of the NPO is required the DBE while the DBE has power over the NPO and regulates most of the stakeholders of the NPO. The viewpoint also correlates with issues raised through SD, for

example, the role of government as regulator and main funder of the NPO sector. The same holds for the viewpoint of teachers. Furthermore, the self-described viewpoint of the NPO (sustainability, impact, change, and empowerment) differs from the espoused values in the contextualisation (education integrity, human capacity building, accountability, relationship building, and sense of identity and self-esteem), but it is in line with the worldview of the NPO as described above. These described viewpoints demonstrate the practical interest promoted by SSM (203, 315, 318, 319, 334, 394) and of how the discussion of worldviews, SSM, and more broadly the research project, affect the NPO.

Table 5-1 Alternative viewpoints and underlying mechanism of the activity model

Owner	Viewpoint	Implications
DBE	<ul style="list-style-type: none"> • Solve problems quickly • Solve problems for free 	<ul style="list-style-type: none"> • Problems for DBE as represented by their priority goals are supported by the model
Products & services	<ul style="list-style-type: none"> • Systematic approach to mathematics • Make learning hands-on and fun • Empower teachers 	<ul style="list-style-type: none"> • Systematic approach to mathematics and make learning hands-on and fun included in the implementation of the in-class programme • Empowerment of teachers included in the training of teachers
Donors	<ul style="list-style-type: none"> • Income tax benefits • Broad-based black economic empowerment (BBBEE) score • Personal interests • Positive impact and co-contributions 	<ul style="list-style-type: none"> • Existing donor brand exposure and issuing of tax certificates and BBBEE certificates by the NPO must be added to the model • Positive impact and co-contributions supported by recruitment and training of facilitators, accredited teacher training, sport tournaments and performance monitoring
Schools	<ul style="list-style-type: none"> • Better overall academic performance • Better trained teachers 	<ul style="list-style-type: none"> • Accredited training of teachers included in the model • Assessment and reporting of overall academic performance of learners are included in the model
Teachers	<ul style="list-style-type: none"> • Continuing professional teacher development (CPTD) points • More effective teaching methods • Better mathematics results 	<ul style="list-style-type: none"> • CPTD points, more effective teaching methods and improvement of mathematical results are included in accredited teacher training in the model • Assessment and reporting of mathematics results of learners are included in the model
Community leaders	<ul style="list-style-type: none"> • Safe space for community members • Constructive recreation and sport • Job creation 	<ul style="list-style-type: none"> • A safe space is created for learners through the extracurricular sport programme. Learning centres, which also create safe spaces for learners, can be added to the model. • Constructive recreation and sport are realised through the extracurricular sport programme including tournaments • Job creation is realised through the recruitment and training of facilitators. Sport coaches can also be added to the model in this regard.

5.7 CYNEFIN FRAMEWORK

CF explores and reconciles ethical questions, power relations and boundary issues, and instils innovative critical thinking to make sense of tensions as shown in Figure 5-14 (163, 189, 201, 203, 208, 346, 400).

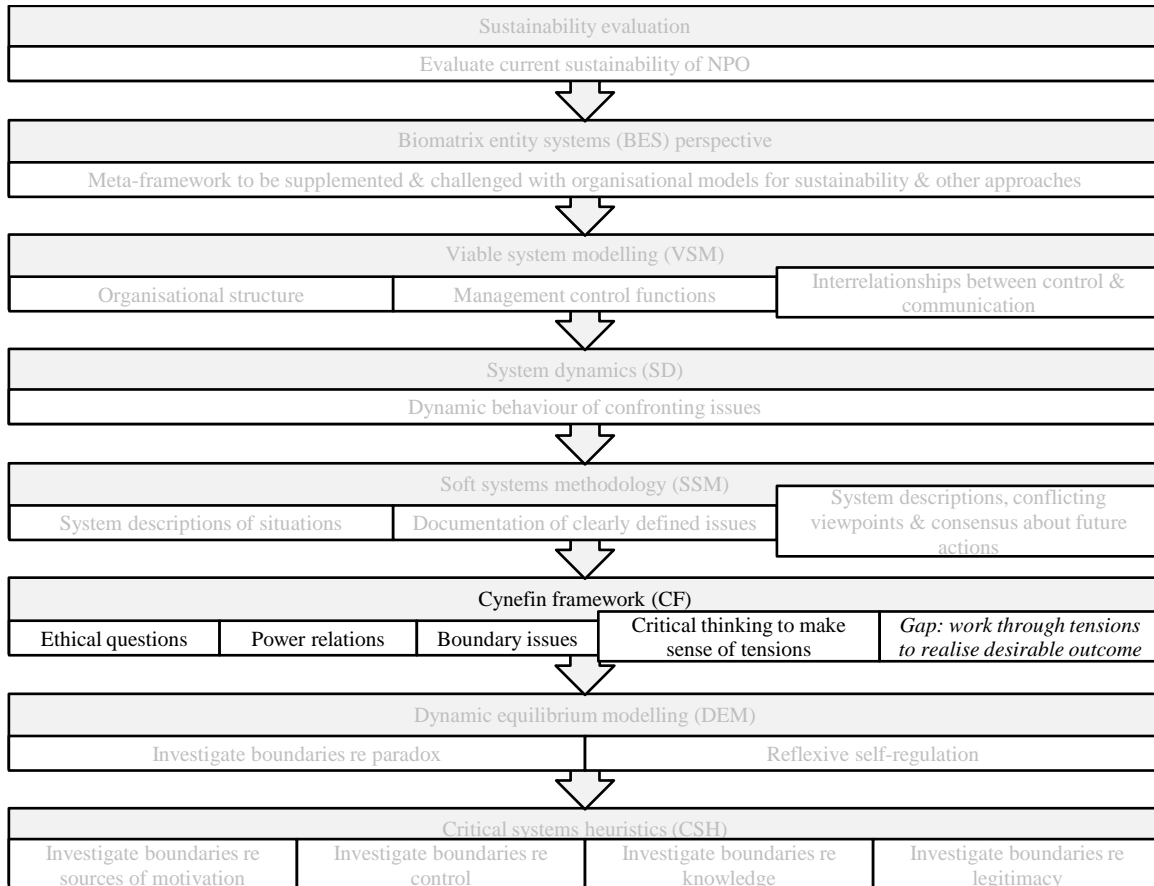
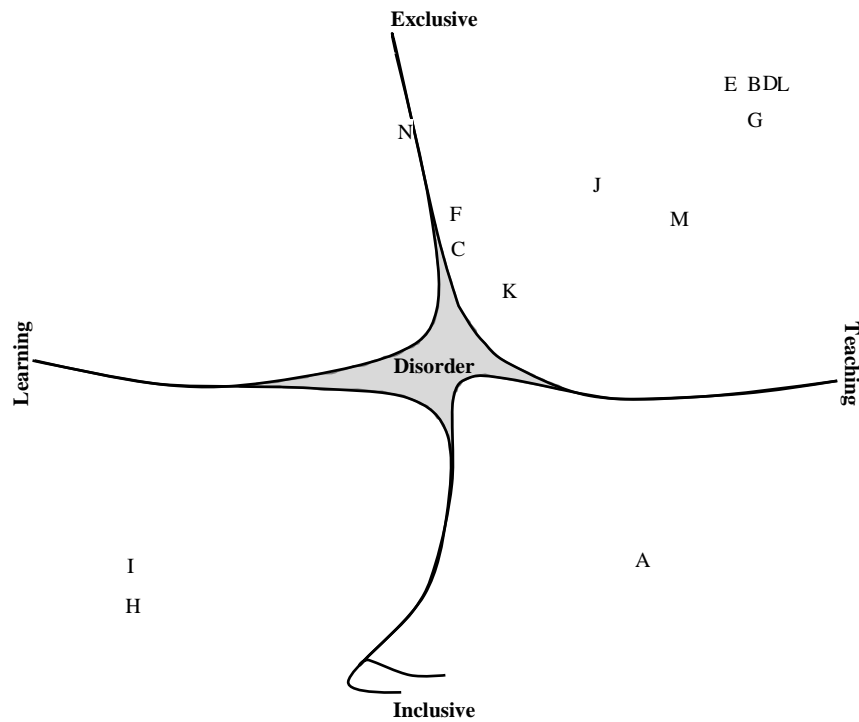


Figure 5-14 Cynefin framework in context of the research procedure

The shared history of the NPO enables them to adapt to conditions of uncertainty, but it also limits their perceptions (346). The organisational culture of the NPO therefore is moulded over time to interpret events in order to adapt externally and integrate internally, varying between a teaching culture and a learning culture indicated on the horizontal axis in Figure 5-15 (208, 345-349). In a teaching culture, explicit knowledge is transferred through training about the use of tools to retain certainty and about how to create, distribute and utilise assets (346). In a learning culture, implicit concepts, rules and meanings are shared through organisational learning to deal with uncertainty. The situational context of the NPO also is shaped by their historical context and varies between exclusivity and inclusivity indicated on the vertical axis in Figure 5-15. Sense is made of a situation exclusively through an expert language based on an acquired skill set, or through a private symbolic language based on common experience. On the other hand, sense is made of a situation inclusively by using the language of the dominant culture of the NPO, or by including everyone since no expert language has developed yet. In the centre of Figure 5-15, a space of disorder is

indicated where there is not agreement on how explicit knowledge or implicit meanings are shared and how sense is made of a situation (201).



A Accountants, administrators & marketers	F General manager	K Teachers, coaches & learning centre owners
B Business, donors	G Network operators	L Teacher unions
C Coordinators, facilitators, product managers & programme managers	H Preschool children	M Technical support
D Community leaders	I Primary school learners	N Trust
E Education district & circuit offices	J School principals & governing bodies	

Figure 5-15 Communities of the non-profit organisation

In Figure 5-15 the communities identified through VSM are regarded as a complex ecology in a historical, cultural and situational context (346). These communities have compatible aims but also a degree of dissonance necessary for growth. CF supplements a BES perspective, VSM, SD and SSM in exploring and reconciling ethical questions and power relations among these communities and other stakeholders (§5.7.1) (163, 189, 201, 346, 400).

CF also supplements VSM in exploring boundary issues associated with partiality among the above communities and other stakeholders, and also partial understandings of the situation of the NPO (§5.7.2) (163, 189, 201, 346, 400). CF further explores boundary issues in a BES perspective in terms of tapping as determined by regulation, resource flow, the alignment of aims, the format of resources, and the transfer of power to govern (208). Furthermore, CF emphasises organisational turbulence implied by a BES perspective and SD (§5.7.3) (163, 203, 208, 389). More detail is available in Addendum J.

5.7.1 Ethics and power

According to a BES perspective, power relations among the communities in Figure 5-15 and other stakeholders influence the continuity of the process field of the NPO. CF can be used to develop more empowering relations by considering the dynamics of situations, decisions, perspectives, conflicts, and changes as summarised in Table 5-2 (201, 208). For example, some businesses, education district and circuit offices, teacher unions, community leaders, school principals and governing bodies, founder and other trustees, network operators and technical support have power over the NPO in the sense that they dominate the will of the NPO and can withhold, for example, funding or approval if the NPO does not submit to their will. These power relations also are surfaced in the conceptual SD models as vicious feedback loops acting as a success to the successful archetype. Figure 5-15 shows that the power over the NPO is exerted through exclusivity – a private symbolic language and associated stories used by the trust, and an expert language and associated skill sets used by business, some donors, education district and circuit offices, and school principals and governing bodies. More empowering relations therefore can be developed when communities identify with one another, share language, stories and skills, and behave ethically to promote an emancipatory interest (201, 208, 319, 335). The process starts from the alignment of the ethos and aims of the communities including tolerance of different worldviews (208, 435).

Power relations according to a BES perspective furthermore involve empowerment relations where some businesses, teacher unions, community leaders, school principals and governing bodies, network operators, technical support and a life coach transfer the power to govern to the NPO (208). The NPO also transfers the power to govern to the general manager, sport and life coaches, learning centre owners, teachers, accountants, administrators, marketers, coordinators, facilitators, product managers and programme managers. The intention to use the power to govern depends on the alignment of aims while the ability to use the power to govern depends on regulation, resource flow and the format of resources. It also entails recursive governance as set out through VSM where each community governs themselves within the context of the NPO (162, 204, 388).

Recursive governance furthermore links the governance of the NPO to global governance through adherence to and promotion of national legislation and regulations, and power delegation from government including BBBEE (120, 131, 162, 179). Here the NPO transfers the power to govern specifically to black coaches, learning centre owners, teachers and employees. The overall aim of the NPO also involves the empowerment of learners with a focus on preschool children and primary school learners. In this case the transfer of power to govern entails self-governance with reference to VSM (446) which correlates well with skills and character traits required for the 21st century as mentioned in the contextualisation.

Table 5-2 Power relations in the non-profit organisation

Power relation	Community	Approach
Power over NPO	Some businesses, education district & circuit offices, teacher unions, community leaders, school principals & governing bodies, founder and other trustees, network operators, technical support	<ul style="list-style-type: none"> • Consider dynamics of situations, decisions, perspectives, conflicts and changes • Align ethos and aims of communities including tolerance of different worldviews • Identify with one another, share language, stories and skills, and ethical behaviour to promote an emancipatory interest • Address transcendental leadership and social capital
Empower NPO	Some businesses, teacher unions, community leaders, school principals & governing bodies, network operators, technical support, life coach	<ul style="list-style-type: none"> • Intention to use power to govern depends on alignment of aims • Ability to use power to govern depends on regulation, resource flow and format of resources
Empowered by NPO	<ul style="list-style-type: none"> • General manager, sport & life coaches, learning centre owners, teachers, accountants, administrators, marketers, coordinators, facilitators, product managers and programme managers • BBBEE • Preschool children and primary school learners 	<ul style="list-style-type: none"> • Recursive governance • Address transcendental leadership, financial capital and social capital
Intrinsic power	Accountants, administrators and marketers	<ul style="list-style-type: none"> • Open communication channels • Connect with actual situation of NPO

VSM furthermore surfaces leadership issues with reference to the co-evolution of the NPO with their environment, global governance and contextual sustainability. This involves the trust who is regarded as a voluntary community in Figure 5-15. Since they are responsible for environmental effectiveness as indicated in a BES perspective, VSM and a sustainable organisational model for mature organisations (149, 346, 475), they must learn what to do in ambiguous and uncertain situations regarding human, natural, physical, financial and social opportunities and threats in the contextual environment. However, SD and SSM show that the trust first must address cultural entropy but lacks the required transcendental leadership and social capital (476). Coordinators, facilitators, the product manager, programme manager and general manager, teachers, coaches and learning centre owners also have a responsibility to monitor changes and produce organisational responses. Although they continue to seek feedback from external and internal stakeholders and experiment to stimulate innovation, they too lack transcendental leadership, and experience challenges regarding financial and social capital.

CF supplements a BES perspective to surface relations of intrinsic power (208). Such relations entail implicit governance through organisational structure which may surface as organisational turbulence when the status quo is disrupted. CF also supplements SD which focuses on dynamic behaviour but acknowledges that such behaviour emerges from an underlying structure (396). For example, a quality improvement intervention may create turbulence and fail to achieve the desired transformation if it does not deal with reactions in the opposite direction. The bureaucratic community formed by the accountants, administrators and marketers of the NPO maintains the status quo by using the language of the dominant culture of the NPO. VSM and SD indicate that they have allocated responsibilities based on implicit governance within the organisational structure, but it seems that communication channels are not open and there is a disconnect with the situation of the NPO.

5.7.2 Boundaries

Boundaries do not only exist among communities, but also in framing the situation of the NPO (163, 189, 201, 346). Boundaries may involve gradual transitions open for interpretation so that negotiations are required on what they mean and where they are placed. In examining boundary issues, sense is made of how a situation is framed, the implications of this framing, and appropriate ways of addressing the situation based on this framing (162). Boundaries and perceptions about them are managed and awareness is raised of when a boundary is crossed and how to respond, or when a boundary is approached and how to prepare to cross it purposefully or to avoid it (201). With reference to Figure 5-15, the teaching-inclusive domain is referred to as a clear domain and concerns simple problems with a limited number of variables (201, 475). The teaching-exclusive domain is referred to as a complicated domain and concerns disorganised complex problems with a very large number of variables. The learning-exclusive domain is referred to as a complex domain and concerns organised complex problems with a significant number of interrelated factors. The learning-inclusive domain is referred to as a chaos domain and also concerns organised complex problems with a significant number of interrelated factors.

The NPO does not examine the boundaries of their situation or manage boundaries and perceptions about them. These include, for example, boundaries between a hybrid and a contemporary conceptualisation of the NPO, a mimicry of an NPO, the implementation of BBBEE, between the development of sport as such and the development of sport as an educational aid to enhance learning, and cooperation with different stakeholders.

Another boundary not managed well by the NPO is the end-of-life of their resources as indicated in a BES perspective where the discharge of resources only is indicated after numerous attempts. They also do not manage exit strategies as indicated, for example, by their self-defined need to address incentives for and the tenure of trustees (445). Funding also is limited for any project. The

NPO can address power relations at play between them and trustees, and them and donors, through contracts (343: 30, 477, 478). Contracts must then include clear exit strategies (479). Furthermore, power relations can be addressed by minimising uncertainty and dependence and maximising autonomy which again implies exit strategies (432, 433: 175, 480). Currently the NPO attempts to extend alliances formed during projects and incorporates feedback to the Department of Education (DoE), but they can explicitly include their contributions in various forums, such as the Mining Charter, as part of their exit strategies (481). Other OM elements as contextualised can also be included in exit strategies such as project goals, measurable benchmarks to assess progress towards goals, action steps, roles and responsibilities, a time line, potential challenges such as funding shortfalls, transition of ownership to other stakeholders, legal and ethical issues, stakeholder support, and transfer of resources (479, 482: 29). Only a few NPO resources may not be transferable at the end of a project such as workbooks as indicated in a BES perspective. However, similar to other NPOs (482: 65-90), transition of ownership is a challenge as shown, for example, through the expanded role of facilitators.

Business and government typically regard some societal needs as beyond their boundaries because they neither can be addressed profitably nor have sufficient statutory basis or public support (38, 483). NPOs question and span these boundaries and internalise the needs not addressed. However, a contemporary conceptualisation of NPOs involves business management practices to improve operations and enhance financial performance so that NPOs compete against business while losing the support of society (7: 279-280, USAID18, 19). A contemporary conceptualisation of NPOs also involves government as the main funder so that NPOs become agents of government (130, 483).

NPOs therefore must question their own boundaries to internalise societal issues revealed by the boundary critique of business and government through reflexive self-regulation. A boundary then is established by effectively creating human, natural, physical, financial and social capital from an outside-in organisational perspective to contribute to the common good (98, 99, 103).

5.7.3 Turbulence

CF supplements a BES perspective in highlighting turbulence which occurs when intended changes in the situation of the NPO challenge the status quo in the opposite direction to which the seven fields of organisation maintain a coherent whole and reinforce one another (203, 208). The dynamic behaviour of these intended changes is surfaced through the conceptual SD models where the daily operations of the NPO are indicated as counter-clockwise reinforcing feedback loops while quality improvement through strategic performance management is indicated as clockwise balancing feedback loops (208). Furthermore, a BES perspective is supplemented with a sustainable organisational model for mature organisations which focuses on symbiosis to prevent some stakeholders to experience uncontrolled loss of value while others are benefiting, and balance

between human, natural, physical, financial and social capital (149). VSM maintains balance between current and future orientations and internal and external perspectives to maintain the ethos of the NPO and interactions with their transactional environment through weekly management meetings and quarterly trust meetings involving the general manager and the product manager, programme manager and data manager. Maintaining the ethos of the NPO and interactions with their transactional environment also involve causal loops where unintended consequences of actions feed back to reconstitute the ethos and interactions (315).

CF emphasises that the above tensions continuously pull the NPO in opposite directions (201). Before any attempt to address these tensions, sense must be made of the underlying dynamics in the NPO. CF clarifies diversity of context, negotiates differences, addresses power dynamics, and frames situations.

5.8 DYNAMIC EQUILIBRIUM MODELLING

DEM investigates boundary issues in terms of paradox to enhance the reflexive self-regulation of the NPO in order to become more sustainable as indicated in Figure 5-16 (484).

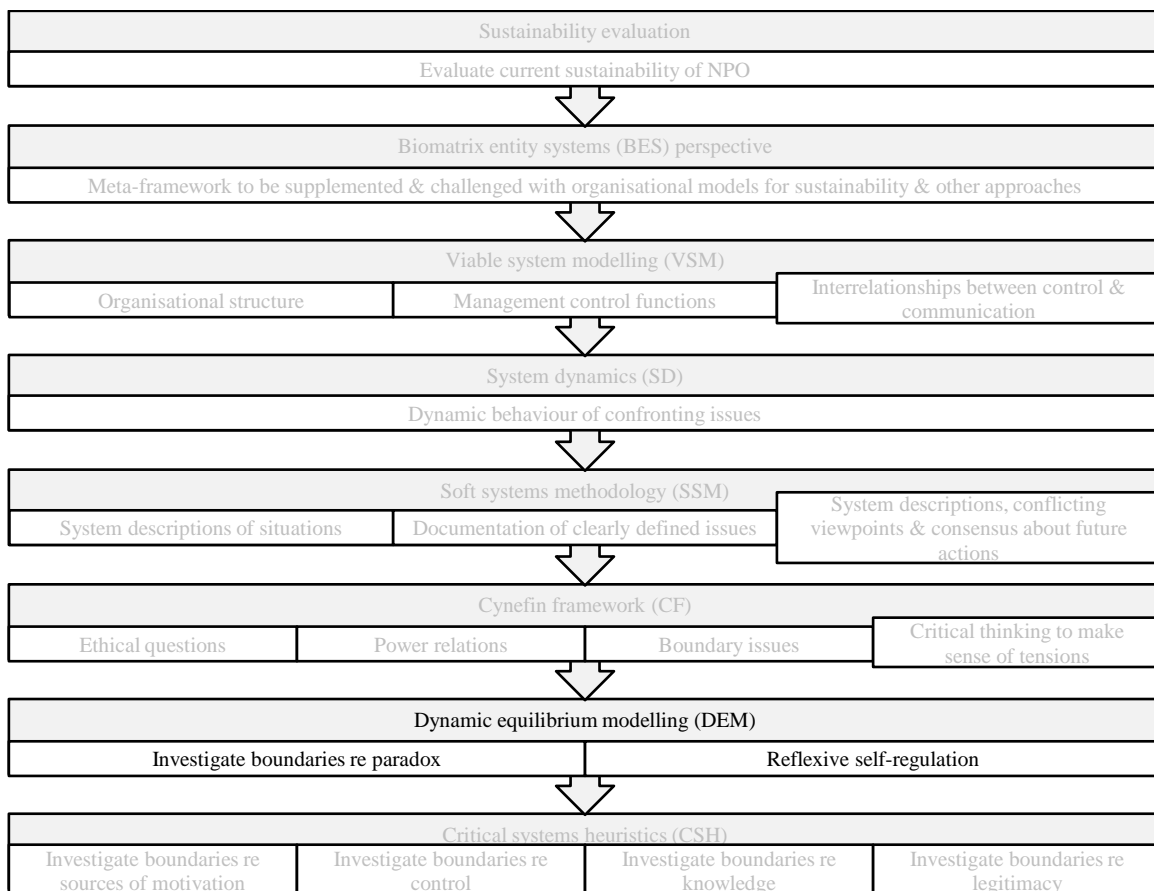


Figure 5-16 Dynamic equilibrium modelling in context of the research procedure

In this study, implicit tensions are surfaced through the SOMM in the NPO as indicated in the BES perspective, VSM, SD, SSM and CF. Dynamic organisational capabilities to accept paradox are included in instrumental and integrative organisational models for sustainability (152).

The DEM process proposed by Smith and Lewis (211) is depicted as a systems diagram in Figure 5-17 (454). The implicit tensions which the NPO continuously experiences, are categorised as learning, identity, organising, and performing tensions, and also tensions between these categories (211, 339). These tensions remain implicit until they are surfaced to reveal paradox through plurality, change or scarcity in the environment. Tensions also are explicated when stakeholders recognise and juxtapose contradictory demands. Acceptance of paradox is supported by a paradox mindset among stakeholders (204, 211, 485) and by dynamic organisational capabilities. If paradox is accepted, it can be addressed over the long term by purposefully iterating between spatial separation of alternatives, temporal separation of alternatives, and integration of alternatives (204, 211, 448). Such an approach fosters and reinforces commitment to multiple competing strategies so that, through supportive capabilities, the NPO becomes more fluid, enhances their reflexive self-regulation through supportive capabilities, and becomes more sustainable.

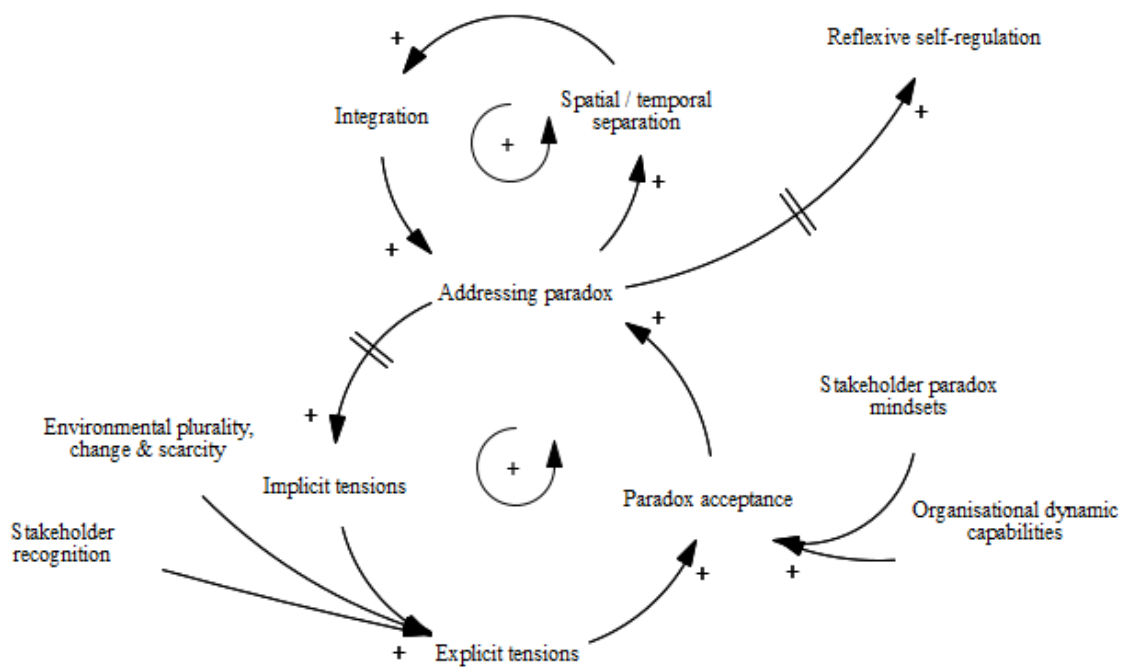


Figure 5-17 Dynamic equilibrium model (211)

5.8.1 Paradox mindset

A paradox mindset is instilled through dialogue (337, 339, 405). Luscher and Lewis (339) propose the utilisation of interventive questions from systemic therapy where any question embodies some intent, arises from certain assumptions, and has different effects on the respondent and the questioner (486, 487). The underlying intention and assumptions of questions are considered to

indicate relevance to a specific situation to be addressed. Luscher and Lewis (339) propose to start the dialogue from broadly bracketing an ill-defined problem in terms of boundaries for exploration (197). From this base, questions with an investigative intent surface current understanding and help to clearly state the problem to be addressed (339). Investigative questions also help respondents to realise when current understandings oversimplify an issue. Next, questions with an explorative intent surface underlying dilemmas with multiple solutions, each posing different benefits and limitations. Questions with a facilitative intent then encourage current understanding to be critiqued and altered and paradox to be accepted. Lastly, questions with a corrective intent challenge the premature implementation of simplistic solutions while supporting the address of paradox through different approaches.

Systemic therapy addresses issues of ethics, power and boundaries similar to CF (153).

Furthermore, Tomm (486) considers the underlying intention and assumptions of questions to indicate relevance to a specific situation to be addressed. This is similar to the research procedure applied through the BIE cycles which considers the theoretical underpinnings, typical questions addressed, and implied knowledge constitutive interests (318, 319) of different systems thinking approaches to indicate relevance to addressing the primary research question. Therefore, a paradox mindset can also be instilled through dialogue with reference to different framings of the situation of the NPO according to CF, and typical questions addressed by different systems thinking approaches as shown in Table 5-3 (201).

Starting from an ill-defined problem similar to Luscher and Lewis (339), the disorder domain of CF is applied since it concerns disagreement on which of the other domains is predominant (488).

Typical questions addressed by the Weickian model (197) are applied as proposed by Luscher and Lewis (339). Next, the clear domain of CF is applied since it concerns simple problems with a limited number of variables so that investigative questions are appropriate (153, 154, 201).

Although this contrasts with a BES perspective which addresses partial understandings of a situation and partiality among different stakeholders (208, 389), a BES perspective proves valuable in the ADR project to surface and reflect upon underlying assumptions, and to clearly describe the situation of the NPO with reference to a BES perspective of the NPO in terms of the seven fields of organisation. A meta-framework for inquiry is furthermore provided to be supplemented with other approaches.

Subsequently, the complicated domain of CF is applied since it concerns disorganised complex problems with a very large number of variables and therefore explorative questions are appropriate (153, 154, 201). VSM, SD and systems diagrams entail such questions based on similar assumptions (153, 162, 163). The complex domain of CF is applied next since it concerns organised complex problems with a significant number of interrelated factors so that facilitative

questions are appropriate (153, 154, 201). Although SSM is based on different assumptions (317, 489, 490), it also has a generative effect on the NPO by involving similar questions (162).

Lastly, boundary crossings of CF is applied to make sense of how situations are framed, the implications of this framing, how to address situations based on this framing, how to respond when boundaries are crossed, and how to prepare to cross boundaries or to avoid it when boundaries are approached (162). Although the assumptions underlying CF contrast with the assumptions of corrective questions (163, 189, 201, 400), boundary crossings pose similar questions to challenge premature implementations of rigid solutions while addressing paradox through different approaches.

DEM, supplemented with framings of the situation of the NPO according to CF and typical questions addressed by different systems thinking approaches, is summarised in Addendum K.

5.9 CHAPTER VALIDATION

5.9.1 Construct validation

Construct validation is confirmed in each BIE cycle with reference to the interpretive framework.

The sustainability evaluation is in general consistent with the interpretive framework, but does not address SOM as an organised complex problem and further BIE cycles are required. Product and service provision and financial management are explicitly evaluated. Organisational leadership and resources are addressed as part of organisational capacity, performance is implicitly addressed in product and service provision and public image, and stakeholder relations are addressed in advocacy, sectoral infrastructure and public image. Although the CSOSI does not refer to organisational culture, it is supplemented in this study with preferred organisational indicators of the CIVICUS indices which include a values-related dimension.

A BES perspective improves construct validation especially by addressing SOM as an organised complex problem. A BES perspective also explicitly addresses organisational culture in the ethos field, leadership and performance in the governance field, products and services as the focus of the process field, financial and other resources as part of the resource field, and stakeholders in the environment field. Since the process field refers to the organisational ethos and aims, continuity, tapping and multifunctionality and also the structure and regulation of processes and the processing of resources, it is supplemented with organisational models for sustainability which address these aspects. The governance field also is supplemented with VSM and a sustainable organisational model for mature organisations to emphasise the capability of the NPO to maintain their ethos and interactions with their transactional environment, address confronting issues, and to improve self-regulation and sustainability.

Table 5-3 Instilling a paradox mindset

CF domain	Interventive questions			Systems thinking approaches		
	Intent	Assumptions	Questions	Approach	Aspects of complexity	Questions
Disorder	Demarcation	Bracketing	<ul style="list-style-type: none"> • What issue is noticed that warrants closer attention? • What is it about? 	Weickian model	Interpretivism and pragmatism, avoiding a dogmatic privilege of one particular perspective and addressing a partial understanding of a situation	<ul style="list-style-type: none"> • What issue is noticed that warrants closer attention? • What is it about?
Clear	Investigative	<ul style="list-style-type: none"> • Reductionism • Dormitive principles • Causal determinism 	Who, what, when, where, why and how of the situation?	BES perspective	Complex adaptive systems (CAS), pragmatism and critical theory, addressing a partial understanding of a situation and partiality among different stakeholders	<ul style="list-style-type: none"> • How are we framing the situation? • What are the implications of this framing for how we investigate the situation? • What are appropriate ways of managing the situation on the basis of this framing?
Complicated	Explorative	<ul style="list-style-type: none"> • Cybernetics • Interactional principles • Structure determinism 	How do others experience the situation?	VSM	Cybernetics, avoiding a reductionist focus on parts instead of the whole	<ul style="list-style-type: none"> • What is the nature of the interrelationships within the organisation? • What is the structure of these interrelationships? • What are the processes between them? • What are the patterns that emerge from these processes, with what consequences and for whom? • Why does this matter, to whom and in what context?
				SD	Cybernetics, avoiding a reductionist focus on parts instead of the whole	<ul style="list-style-type: none"> • How is organisational performance affected by delayed impacts? • How is organisational behaviour affected by feedback patterns? • How is the flow of resources through the organisation controlled? How does this affect performance? • Which structural leverage points in the organisation can advance self-organising processes?

				Systems diagrams	Cybernetics, avoiding a reductionist focus on parts instead of the whole	<ul style="list-style-type: none"> • Which generic pattern of structure occurs in this situation? • What leverage opportunities can change the thinking that produces the situation?
Complex	Facilitative	<ul style="list-style-type: none"> • Cybernetics • Interactional principles • Structure determinism 	<ul style="list-style-type: none"> • What are the implications of current perceptions and actions? • What other options are available? 	SSM	<ul style="list-style-type: none"> • Interpretivism, avoiding a dogmatic privilege of one particular perspective • Critical realism, balancing theory building and the improvement of a problem situation 	<ul style="list-style-type: none"> • What are different ways in which the organisation can be understood? • How are these different understandings going to affect the way in which people judge the success of the organisation? • How will it affect people's behaviour, especially when things go wrong from their perspective? What will be the result and significance?
Boundary crossings	Corrective	<ul style="list-style-type: none"> • Reductionism • Dormitive principles • Causal determinism 	Is the proposal practical?	CF	CAS, pragmatism and critical theory, addressing a partial understanding of a situation and partiality among different stakeholders	<ul style="list-style-type: none"> • How are we framing the situation? • What are the implications of this framing for how we investigate the situation? • What are appropriate ways of managing the situation on the basis of this framing?

VSM focuses on the capability of the NPO to improve sustainability through their organisational structure, management control functions, and interrelationships between control and communication. Furthermore, stakeholders are indicated in the definition of the system in focus. Organisational culture is addressed through units creating organisational identity and policies providing a consistent framework for operational units, human resources and leadership through the different subsystems modelling the NPO, and product and service provision through the operational units. Different issues regarding funding are surfaced through the evaluation of subsystems and interactions of the NPO. Technology is not explicitly addressed, but is implied in the interactions among subsystems.

The conceptual SD models address organisational culture through the cohesion of the ethos of the NPO, leadership through good governance, product and service provision, performance through human resources, financial viability, availability and quality of resources, and stakeholder relations. With reference to the quantitative simulation model, a detailed description is given of the selection of an appropriate model to quantify resources (represented by donations) as a function of performance measures, the derived quantitative model, software selection, assumptions, and results.

The rich picture of the NPO, root definitions and the basic activity model of SSM address organisational culture, leadership, governance, products and services, funding, human resources, technology, and stakeholders except for the rich picture which does not include technology. The organisational culture is supplemented with the worldview of the NPO through the finding-out process. Performance measures, monitoring and control are explicitly included in the activity model.

CF and DEM specifically address organisational culture, leadership, governance, and stakeholders, and the impact thereof on the products and services, funding, and technology of the NPO. Human resources are included as stakeholders.

5.9.2 Utility

The sustainability evaluation addresses utility by ensuring that the NPO can undertake self-evaluations and track and compare progress in future by utilising the questions in Addendum D and published results of the CSOSI. The index evaluates sustainability dimensions in the worldwide NPO sector on an annual basis for comparison over time since 1997 and in South Africa since 2009 (218). Efficiency of the sustainability evaluation is improved by utilising a visual-analogue scale between 1 and 7 instead of an interval scale. Furthermore, scores are determined in terms of how well they match descriptions for scores of 1 and 7 respectively instead of the level of change from a previous year. Only the general manager of the NPO is interviewed while feedback from other

stakeholders is incorporated from the existing monitoring and evaluation process of the NPO. The instrument and results also are discussed in detail with the NPO.

Subsequent BIE cycles improve the expected sustainable use of the SOMM and the efficiency thereof by explaining modelling approaches with reference to applications by other NPOs. Based on initial models developed by the researcher, the NPO adjusts the SOMM through numerous micro cycles and thereby develops the capability to use the model. References to literature are provided, the rationale of modelling approaches is explained, and typical questions addressed by modelling approaches are emphasised. A diagrammatic summary is provided, gaps are indicated, and during additional BIE cycles a track record is shown of all modelling approaches applied up to that stage. If needed, different diagrammatic representations are tested to adhere to the preferences of the NPO.

SD addresses efficiency in terms of time spent and training required through discussions of conceptual models to develop an understanding of the dynamic behaviour of confronting issues, and also of the perceptions of the NPO about their situation (186). With reference to the quantitative simulation model, model demonstrations are conducted with the NPO, training is provided, a user manual is developed, and the NPO can change default values, run experiments and download output values in a ready-to-use cloud environment. The aim of the quantitative simulation model – similar to the conceptual models – is to develop the capability of the NPO to address their self-defined needs through discussions.

The rich picture of SSM is drawn by the NPO with facilitation by the researcher. The rest of the modelling process is based on this rich picture. SSM also supplements the expected sustainable use of the SOMM through references and summaries of applicable worldview models as requested by the NPO.

DEM enhances utility by explaining the modelling process through a systems diagram which the NPO already is familiar with. The NPO is aware of explicit tensions surfaced in previous BIE cycles. They make sense of these tensions by reviewing all models developed up to this stage. The NPO also recognises dynamic organisational capabilities as indicated by organisational models for sustainability.

5.9.3 Ecological validation

Ecological validation is addressed in each BIE cycle with reference to the role of specific characteristics in the design ecology as summarised in Addendum M.

5.9.4 Reflexivity

The sustainability evaluation addresses the reflexivity of the researcher by supplementing the CSOSI with other well-established instruments. The NPO furthermore reviews the documentation of their responses in the interview. The researcher's location varies between that of creative designer and critical researcher. It remains mainly different from the NPO, engaged, neutral, and that of insider although the researcher never fully experiences it as such.

Subsequent BIE cycles address the reflexivity of the researcher by developing initial models based on the contextualisation of a SOMM in the NPO which the NPO adjusts through numerous micro cycles. The quantitative product and service provision simulation model is developed by the researcher based on the conceptual SD model where the NPO can change default values, run experiments and download output values in a ready-to-use cloud environment.

The rich picture of SSM is drawn by the NPO and facilitated by the researcher. The rest of the SSM process is based on the contextualisation of a SOMM in the NPO and this rich picture. A reflection on their worldview is especially empowering to the NPO. Furthermore, DEM addresses the reflexivity of the researcher by building on the awareness of the NPO of explicit tensions as surfaced through previous BIE cycles. Through discussion, the NPO makes sense of these tensions with reference to the study and develops a paradox mindset.

The researcher's location varies between that of creative designer and critical researcher. It remains mainly different from the NPO, engaged, neutral, and that of insider although the researcher never fully experiences it as such.

5.10 CHAPTER REFLECTION

BIE cycles improve the efficacy of the SOMM by addressing the self-defined needs of the NPO. Through these interventions, the perceptions of the NPO change. This enables them to satisfy their needs and identify other needs so that their self-defined needs evolve. An example is the realisation that the environment of the NPO does not impose rigid constraints – the NPO can offer products and services online by addressing lacking infrastructure in underdeveloped areas of the country in cooperation with network operators to the benefit of local communities. Through this dialogical process the NPO builds resilience for the long term.

5.10.1 Sustainability evaluation

The sustainability evaluation based on the CSOSI, supplemented with the preferred organisational indicators of the CIVICUS indices and the EENA, confirms the self-defined needs of the NPO. However, it does not address SOM as an organised complex problem and additional BIE cycles are required.

5.10.2 Biomatrix entity systems perspective

A BES perspective addresses all the self-defined needs of the NPO and enables them to build resilience over the long term except for organisational growth, *third sector* operation and perceptions about sport. However, additional BIE cycles are required to focus on the capability of the NPO to improve sustainability through their governance field, further explore the growth phase of the NPO, consider the dynamic behaviour of confronting issues, address different viewpoints, and to explore and reconcile ethical questions, power relations and boundary issues.

5.10.3 Viable system modelling

VSM addresses all the self-defined needs of the NPO and enables them to build resilience over the long term except for remuneration, donor motivation, the legal portfolio, *third sector* operation and perceptions about sport. It specifically supplements the governance field of a BES perspective to focus on the capability of the NPO to improve sustainability through their organisational structure, management control functions, and interrelationships between control and communication. However, further BIE cycles are required to consider the dynamic behaviour of confronting issues, address different viewpoints, and to explore and reconcile ethical questions, power relations and boundary issues.

5.10.4 System dynamics

SD addresses all the self-defined needs of the NPO and enables them to build resilience over the long term except for *third sector* operation, mentoring of general manager and perceptions about sport. It specifically supplements the sustainability evaluation, a BES perspective and VSM by improving understanding of the dynamic behaviour of confronting issues. However, further BIE cycles are required to consider different viewpoints, to explore and reconcile ethical questions, power relations and boundary issues, and to address anxiety and uncertainty created by the paradox of the status quo and quality improvement by working through tensions towards a desirable outcome.

5.10.5 Soft systems methodology

SSM addresses all the self-defined needs of the NPO and enables them to build resilience over the long term except for remuneration, the legal portfolio and mentoring of the general manager. It specifically supplements VSM and SD by prompting and organising a relevant system description of the situation and issues that affect SOM in the NPO, and a BES perspective by addressing surfaced conflicting viewpoints. However, further BIE cycles are required to explore and reconcile ethical questions, power relations and boundary issues, and to work through tensions towards a desirable outcome.

5.10.6 Cynefin framework

CF addresses all the self-defined needs of the NPO and enables them to build resilience over the long term except for remuneration and perceptions about sport. It supplements a BES perspective, VSM, SD and SSM in exploring and reconciling ethical questions, power relations and boundary issues. Furthermore, CF supplements a BES perspective, VSM, SD and organisational models for sustainability by making sense of tensions through innovative critical thinking. However, further BIE cycles are required to work through tensions in order to realise a desirable outcome.

5.10.7 Dynamic equilibrium modelling

DEM addresses all the self-defined needs of the NPO and enables them to build resilience over the long term except for mentoring of the general manager. It supplements the sustainability evaluation, a BES perspective, VSM, SD, SSM and CF by investigating boundary issues in terms of paradox to enhance the reflexive self-regulation of the NPO in order to become more sustainable.

The NPO decides to adopt the SOMM based on their capability and motivation to use the model. The NPO appreciates the distinctive opportunity to develop reflexive self-regulation to gradually address their sustainability through a hands-on approach to adjust the SOMM through numerous micro cycles. Although they experience constant turbulence, they start to reflect on how their perspective impact their self-regulation and realise that they no longer can postpone to address tensions by accepting paradox as indicated by the SOMM. They also have started to implement the insights that they have gained through the SOMM. Furthermore, the NPO have started to build capacity to facilitate and utilise the SOMM beyond the research project.

The SOMM is efficiently delivered through explanations of modelling approaches with reference to applications by other NPOs. References to literature are provided, the rationale of modelling approaches is explained, typical questions addressed by modelling approaches are emphasised, and diagrammatic summaries are provided according to the preferences of the NPO. However, support and maintenance continue beyond the completion of the research project. The future-orientated axiology of ADR provides for this, and the NPO requests the researcher to stay involved. The request is not regarded as a dependency on the researcher, but as the utilisation of the services of advisors and volunteers as proposed through the developed SOMM. However, the relationship must be carefully managed.

Furthermore, additional cycles would make a marginal contribution towards the efficacy of the SOMM since all initial self-defined needs of the NPO are addressed as shown in Addendum K. By following a pragmatic approach, evolving self-defined needs of the NPO also are addressed such as a marketing strategy, a trustee profile, a communication strategy, and possible expansions of their

product and service offering. Through application of the SOMM, the perceptions of the NPO change and they build resilience for the long term to address future needs.

No more gaps are identified with reference to the interpretive framework. In terms of the research procedure, the SOMM can be further supplemented with CSH to further investigate boundaries. However, a balance is struck between the goal of theory building and the relevance of theory within the study, and the goal to improve the sustainability of the participating NPO through their sensemaking and addressing their own self-defined needs (317). The SOMM addresses different viewpoints, ethical questions, power relations and boundary issues and works through tensions towards a desirable outcome. Following a pragmatic approach, it is therefore decided that the contribution of an additional cycle would be marginal in terms of refinement thereof (162).

CHAPTER 6 REFLECTION

6.1 INTRODUCTION

With reference to the action design research (ADR) approach followed in the study as shown in Figure 6-1, the problem formulation phase is addressed in Chapter 1 which explains the research problem and poses the research questions, Chapter 2 which analyses relevant concepts through a literature review, and Chapter 4 which refers to the research agreement between the researcher and the participating non-profit organisation (NPO), including roles and responsibilities. Chapter 4 also introduces the building, intervention and evaluation (BIE) phase to address the primary research question through the contextualisation of a sustainable operations management model (SOMM) in terms of the NPO and the development of a research procedure and effectiveness criteria. To ensure that the research question is addressed concerning the sustainability of NPOs in general, an interpretive framework and a design ecology are established. Chapter 5 completes the BIE phase through BIE cycles to develop a SOMM in the NPO until it is adequately improved. These cycles are systematically described to capture the learning that occurs (53, 69, 164, 165, 274).

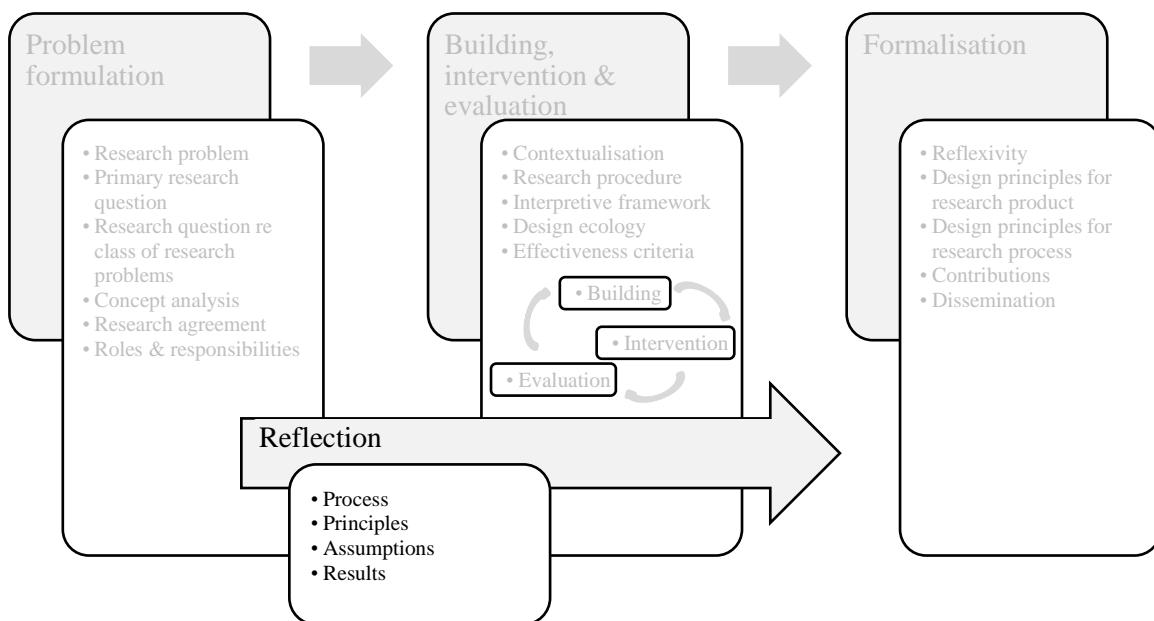


Figure 6-1 Chapter 6 in context of the research design

This chapter documents the reflection phase which is executed in parallel with the problem formulation phase and the BIE phase (53, 164). The research process is reflected upon in §6.2. Adherence to research principles, which all ADR projects must follow as stipulated in Chapter 3, is considered in §6.3. Assumptions and implications thereof are reflected upon through a retrospective analysis in §6.4 (164). In §6.5, research results are reflected upon in terms of the SOMM in the participating NPO. The chapter is concluded with a general reflection in §6.6.

Reflections are abstracted into a design theory of how NPOs in general can address their sustainability by applying similar SOMMs in Chapter 7. For this purpose, the reflections on the Department of Industrial and Systems Engineering

research process, research principles, assumptions and implications, and research results refer to existing theories in literature to provide a framework for the development of a design theory (250).

6.2 RESEARCH PROCESS

6.2.1 Literature review

The point of departure for the literature review entails an ADR perspective which refers to action in actual situations (306). These include social, historical and political situations (322). Time periods found in literature are used therefore as a framework to conceptualise relevant concepts (213).

In order for the NPO to be able to make sense of the extensive literature on sustainable operations management (SOM) in NPOs, key focus areas are identified through summative content analysis of a hundred references on operations management (OM) in NPOs over the past fifty years, supplemented with references on OM in general, and references on SOM. At a manifest level, keywords as identified by authors and main findings are analysed manually. At a latent level, key focus areas of SOM in NPOs are derived from the above keywords supplemented with theory.

6.2.2 Methodology

Research methodology concerns a research design – justified by a research philosophy – and the compatibility of various research methods. In terms of the research design, a design mode of research is distinguished from a science mode and a humanities mode and identified as appropriate to address the research questions through the development of a SOMM in an NPO. Design research (DR) is conducted in a design research mode, but does not sufficiently incorporate the organisational context in shaping a design, prototype development is separated from prototype evaluation, controlled evaluation is difficult to design and conduct, and it is challenging to develop a theory of how other organisations may apply similar tools. The organisational context is appropriately incorporated in action research (AR) which is also historically rooted in a design research mode. However, it is largely conducted in a humanities mode and science mode (55), tends not to consider an ideal future, and requires an extended timeframe. These challenges can be addressed through an ADR process based on an AR approach towards DR, but ADR is mostly applied in the context of information systems (IS). This study proposes a less technologically-orientated ADR design by applying an AR approach towards DR in education instead of DR in IS.

A clear research philosophy as part of the research methodology is important to guide the execution of the research design. Based on the research philosophy, different modelling approaches are identified and a responsible decision is taken on which ones to apply and how. The research principles, indicated in the interpretive framework, are defined based on the research philosophy to guide the research process including the research questions being asked, data collected, methods and techniques used to analyse data, and how results are interpreted. All other validations of the

study rely on addressing the reflexivity of the researcher which includes the research philosophy and its impact on the research project (491).

6.2.3 Modelling approach

The contextualisation of a SOMM in the NPO in terms of key focus areas, identified through the literature review of SOM in NPOs, contribute to the design of the model. Moreover, the validity of these focus areas, which are developed in other contexts, are investigated for the NPO (167, 277). Artefacts of the NPO are analysed to contextualise the model with reference to social epistemology that underpins ADR. Discussions are then conducted for further clarification. This contextualisation surfaces detail which may not have been highlighted through interviews or workshops (346). It also is more time-efficient, not only for the NPO but also for the researcher since potential rework is reduced (492, 493). Although almost the same amount of time is spent by the NPO on the contextualisation as on the development of the SOMM, the detailed contextualisation facilitates the development of a SOMM in the NPO through BIE cycles and improves the time efficiency thereof.

A research procedure is informed by theory from the literature review and by practice from the contextualisation of a SOMM in the NPO (250). The procedure considers the theoretical underpinnings, typical questions addressed, and knowledge constitutive interests of different organisational models for sustainability and systems thinking approaches to determine which approaches most closely relate to the research questions (162). Principles of the research procedure therefore contribute to the interpretive framework to indicate why specific data is collected and methods applied and how results are interpreted (164, 269, 270, 280). On the other hand, the procedure is refined through empirical testing in the BIE cycles which is guided by and validation with reference to the interpretive framework (250). The design ecology is explicitly explored through the research procedure.

The interpretive framework and design ecology, together with the strategic selection of the case study, support the development of a design theory in the formalisation phase to address the sustainability of NPOs in general.

Effectiveness criteria, to decide whether the SOMM in the NPO is sufficiently refined, are established with reference to the applied definition of SOM. Therefore, the self-defined needs of the NPO are documented as they emerge in discussions with the NPO during the contextualisation of a SOMM.

6.2.4 Building, intervention and evaluation

Thorough documentation of the BIE cycles enhances the quality of the study (53, 494). Authenticity is addressed by documenting every meeting with the NPO and their review thereof. Credibility is addressed through the systematic and detailed documentation of procedures followed, the interpretive framework, reasons for choices made, and failures and successes to provide an empirical grounding for final assertions (164, 165). It is further enhanced through the prolonged engagement with the NPO, detailed descriptions of modelling results including the effect of different stakeholders, utilising qualitative and quantitative data, reflection on existing literature, and critique through publication and by other researchers (164, 165, 246). Reliability is supported in terms of trackability and virtual replicability similar to credibility (164).

The sustainability evaluation supplements the existing learning culture of the NPO to undertake self-evaluations and to track and compare progress in future by utilising the questions in Addendum D and published results of the civil society organisation sustainability index (CSOSI) (427). Although the NPO experiences the evaluation as a performance evaluation compared to the NPO sector, they find opportunities to reflect and improve their sustainability since they have the right to refuse to participate in the interview and control the course of the interview by choosing what they want to reveal (495).

Throughout the BIE cycles, explanations of modelling approaches improve the expected sustainable use of the SOMM by the NPO – where possible with reference to applications by other NPOs. Explanations of conceptual models instead of quantitative simulation models improve the efficiency of system dynamics (SD) in terms of time spent and training required. The quantitative SD simulation model is demonstrated to the NPO, training is provided, a user manual is developed, and the model is available in a ready-to-use cloud environment. The rich picture developed by the NPO enhances the expected sustainable use of soft systems methodology (SSM), while an explanation through a systems diagram enhances the expected sustainable use of dynamic equilibrium modelling (DEM). Based on initial models developed by the researcher, the NPO adjusts the SOMM through numerous micro cycles and thereby develops the capability to use the model. References to literature are provided – including references and summaries of applicable worldviews in the case of SSM, the rationale of modelling approaches is explained, questions addressed by modelling approaches are emphasised, gaps are indicated, and a track record is shown of all modelling approaches applied up to that stage. Diagrammatic summaries are also provided to represent the complex and high volume of information contained in each modelling approach so that engagement, understanding and recollection are supported during BIE cycles.

Efficacy is addressed by following a pragmatic approach which allows for flexibility to address the evolving self-defined needs of the NPO (496). This is realised through the comprehensive research procedure.

6.3 RESEARCH PRINCIPLES

6.3.1 Literature review

The literature review supports the principle that the study is motivated from an actual need for a SOMM in a specific NPO as stipulated by Sein et al (53). Furthermore, contributing theories and existing models are identified to determine the characteristics of an appropriate SOMM in an NPO, refine reasonable routes for the study, criteria for the application of concepts, and to establish a basis for authentic evaluation. Theoretical reciprocal effects of a SOMM in the context of an NPO are emphasised, to be further explored in practice. Similar, mutual influences of authors as research participants are considered in the literature review, to be supplemented by the NPO as research participant through key focus areas which are identified in the vast literature on SOM in NPOs and overlapping fields. Summative content analysis proved valuable in the process. The literature review therefore lays a foundation for a SOMM to be shaped by the participating NPO and to eventually contribute theories of how other NPOs may apply a SOMM in other contexts.

6.3.2 Methodology

Since a novel ADR approach is proposed, it is important to explain the research philosophy in order to validate the study. It is indicated that the research principles of ADR are based on a participatory worldview, a paradigm of critical theory and pragmatism, an ontological orientation of critical realism and existentialism, an epistemological orientation of idealism, existential phenomenology, pragmatism and constructivism and therefore also a social epistemology, an axiological orientation of utilitarianism, interpretivism, critical theory, a future orientation, and praxis.

6.3.3 Modelling approach

The written agreement between the researcher and the NPO supports a principle of mutually influential roles. While the agreement includes a clear assignment of roles and responsibilities per research phase and task indicated in Figure 6-1, the researcher and the NPO work in a supplementary way and learn from each other.

The contextualisation of a SOMM in terms of the NPO is practice inspired through analyses of existing artefacts of the NPO. It is also informed by theory based on key focus areas of SOM in NPOs identified through a summative content analysis of literature. Furthermore, the contextualisation process involves mutual influences between the model and the NPO as demonstrated by comments by the NPO that the process is an emotional experience for them, they

become aware of lessons learnt to be applied in future, they want to know more about OM processes, and they reconfirm the need for a SOMM in NPOs. Mutual influences between the researcher and the NPO occur through the analyses of artefacts of the NPO, clarifications through discussions, and review by the NPO.

The research procedure, interpretive framework, design ecology and effectiveness criteria are practice inspired by being informed by the contextualisation and self-defined needs of the NPO. They are also informed by theory based on contributing theories and modelling approaches identified in the literature review. Simultaneously the study contributes to theory on SOM in NPOs through the self-defined needs, the interpretive framework, and the design ecology.

Authentic and concurrent formative evaluation occurs through the establishment of construct validation, utility and efficacy of the study, ecological validation and the reflexivity of the researcher regarding the contextualisation, research procedure, interpretive framework, design ecology and effectiveness criteria.

6.3.4 Building, intervention and evaluation

The aim of the BIE cycles is not only to develop a SOMM in the NPO or to conduct interventions in the NPO, but to develop a design theory that can be applied to develop similar SOMMs in other NPOs. Such a theory is developed through this reflection which is abstracted into design principles for the designed tool and a research process in general in the formalisation phase.

An ill-defined problem (497) is posed through the development of the SOMM to address the self-defined needs of the NPO, while these needs evolve through the development of the SOMM due to mutual influences between the model and the NPO. This problem is addressed through interventions that change the perceptions of the NPO. They demonstrate agility to satisfy their needs, identify other needs, and to build resilience over the long term. Examples include the self-described viewpoint of the NPO in SSM which differs from their espoused values but is aligned with their worldview as surfaced through the study. The NPO also realises that they can include secondary school learners as beneficiaries. The lacking infrastructure in underdeveloped areas of the country can be addressed in cooperation with network operators to offer their products and services online while benefitting local communities. Sport is marketable as a game and not as formal sport to support their innovative, integrated, interactive, fun and play-based approach to education. The SOMM can be applied to address the power relation with trustees. The general manager must balance present and future orientations and internal and external perspectives, and maintain interactions with the transactional environment. He maintains however an unsustainable work-life balance which he decides through this study to change to a more balanced lifestyle. It is

challenging however to document such an ill-defined problem, since when the NPO reviews the documentation to maintain authenticity, they adapt it to their changing reality.

Mutual influences between the researcher and the NPO occur when the NPO learns to apply different modelling approaches, and the researcher learns about the context of application which involves the NPO sector, education, school management, blended reality, and life coaching. The researcher also improves important research capabilities such as flexibility (268). It is important to acknowledge the NPO as research participant and not as research subject.

Authentic and concurrent formative evaluation occurs through the examination of construct validation, utility and efficacy of the study, ecological validation and the reflexivity of the researcher for each of the BIE cycles.

The principle of generalised outcomes includes a re-conceptualisation of the SOMM in the NPO as an instance of a class of SOMMs in NPOs, and also a re-conceptualisation of the process of applying different modelling approaches to develop the SOMM in the NPO as an instance of such a process in general. A clear distinction is made between the tool designed in this ADR study namely a SOMM in the NPO, and the research process to develop the SOMM namely different modelling approaches (42, 54, 69).

The principle that the SOMM in the NPO is informed by theory, entails principles of systems thinking as applied through the BIE cycles. While there are many different systems thinking approaches which could be applied and many different directives on how to decide on appropriate systems thinking approaches, there also are many different sets of principles which could be taken into account (385, 498, 499). Since this study incorporates systems thinking approaches mentioned by Williams (162) with references to Reynolds (163), principles set out by these authors are adhered to. Besides the applied systems thinking approaches mentioned by the authors, Williams (162) refers to activity systems to address different perspectives. This is addressed in the study through a similar concept in ADR namely set meetings (500). Reynolds (163) furthermore proposes to supplement the application of a range of systems thinking approaches with ideas from other traditions. The research philosophy of the ADR project allows for different approaches to supplement one another (390) as demonstrated in the literature review which includes concepts of OM, sustainability and NPOs.

Systems thinking principles indicated by Jaradat (498) are included in the principles above, except for flexibility which is adhered to through the pragmatic paradigm of ADR and the principle of reciprocal shaping. Principles proposed by Arnold and Wade (499) also are adhered to in terms of the systems thinking approaches applied in the study. A principle of sustainable system decision

making despite uncertainties in their outcomes, is adhered to through the research philosophy of the ADR project. A principle to allow time to appreciate the complexity of the model, is adhered to through the BIE cycles. However, this study does not adhere to the principle to predict future behaviour with a high degree of accuracy over a long timescale. In a design research mode instead, the model heuristically satisfies the self-defined needs of the NPO (501). Lastly, principles indicated by Richmond (385) are included in the principles indicated by Arnold and Wade (499).

6.4 ASSUMPTIONS

6.4.1 Literature review

Social epistemology that underpins ADR emphasises the cultural-historical situatedness of concepts in the literature review. Such a perspective results in definitions which are theoretically in conflict, so that theoretical commensurability is assumed based on the pragmatic orientation of ADR (301). For example, the definition of OM regards organisations as hierarchical systems governed by general laws and systematically controlled, whereas the definition of a model does not include simplifying assumptions to predict and optimise organisational performance.

Various focus areas of SOM emerge from a history of OM and different interpretations of sustainability evolve from the broad definition by World Commission on Environment and Development [WCED] (1) (2, 4, 5). In this study SOM is defined as the management of human, natural, physical, financial and social capital and processes involved to satisfy self-defined needs and build resilience over the long term. This definition assumes integrated human, natural, physical, financial and social value while monetisation is avoided and the dynamic interplay between capital application and the effect thereof is acknowledged (502, 503). It also assumes that sustainability is not a status quo but that OM and other fields co-develop a fluid definition of sustainability. Furthermore, the definition of SOM requires an integrated organisational perspective to develop a SOMM in the NPO, which is in line with an industrial systems approach (144) and confirmed in literature (51, 145).

NPOs are differently conceptualised over time, socially and geographically (7, 13, 48, 215, 216), which explains some tensions and conflicts experienced by the participating NPO. This study assumes that an NPO is a self-governing organisation separate from government and business, whose main purpose is not profit generation only. AN NPO is used synonymously with a non-government, voluntary, civil society, third sector, or independent sector organisation and may include a non-profit company or a social enterprise although these organisations are differentiated from one another (28, 128-131).

The above definition of SOM, together with the definition of an NPO, implies that SOM in NPOs is an organised complex problem with a significant number of factors interrelated in an organic

whole (153, 154). Systems thinking approaches therefore are applied to develop descriptive and explanatory content-rich models that are not prescriptive through participative research (153, 155). There are however many different systems thinking approaches which could be applied (156, 157) and many different directives on how to select appropriate systems thinking approaches (158-161). This study refers to approaches mentioned by Williams (162) in an international development context, with references to Reynolds (163). Additional approaches are added as referred to in literature on applications in NPOs. Furthermore, approaches are added as inquired about by the participating NPO, based on the researcher's experience, and to address gaps as surfaced by other approaches.

The definitions of SOM and an NPO also imply a comprehensive design ecology which combines perspectives from sociology, economics, political science, psychology, and management. Such a design ecology regards the NPO and their environment as a complex interacting system.

6.4.2 Building, intervention and evaluation

The sustainability evaluation applies one out of many tools developed to evaluate the sustainability of NPOs. However, each of these tools is founded on various assumptions which determine the outcome of an evaluation (7, 13, 48, 216, 217). The CSOSI developed by the United States Agency for International Development (USAID) is applied since it evaluates sustainability dimensions in the worldwide NPO sector on an annual basis since 1997 and in South Africa since 2009. It is stated that the CSOSI is based on empirical observations rather than a causal theory of development (18). The CIVICUS indices and the South African enabling environment national assessment (EENA) then supplements the CSOSI. CIVICUS was established in Portugal as a world alliance for citizen participation and currently headquartered in South Africa (504). The EENA is initiated by CIVICUS, the International Center for Not-for-Profit Law (ICNL) which was established in the United States to monitor and evaluate civic space worldwide, Article 19 which was founded in the United Kingdom with reference to the Universal Declaration of Human Rights, and the World Movement for Democracy which was initiated in India by the National Endowment for Democracy from the United States (505-507). It is realised however that all these tools tend to entail a United States perspective (508).

With reference to the quantitative simulation model, all considered quantitative models of donations as a function of overheads assume that higher non-programme costs, such as administration, bookkeeping and marketing, are evidence of inefficiency (509-511). This assumption significantly minimises the effect of support functions on the sustainability of an NPO. NPOs, for example, believe that the quality of their human capital is the most important determinant of organisational efficiency in terms of their mission. Park and Matkin (509) maintain that administrative costs of about 40% of total organisational costs tend to optimally promote

organisational sustainability. An overarching measure of NPO efficiency does not exist in literature and therefore requires a multidimensional approach (511).

As mentioned in §6.2.3, the research procedure considers appropriate modelling approaches identified in literature with reference to theoretical underpinnings, typical questions addressed, and knowledge constitutive interests. Each of these approaches also implies the ordering and organisation of reality in terms of an ontology of the NPO, which varies across a Heraclitian and a Parmenidian view (351, 512). According to a Heraclitian view, an NPO is a composition of organising processes that maintain the organisation by continuously structuring it and maintaining its boundaries in a field of other processes that are continuously destructing the organisation and its boundaries. This is contrasted with a Parmenidian view of an NPO as an entity or social actor with unique attributes such as identity, structure, culture, performance and a social context.

Modelling approaches also imply an epistemology for studying change in the NPO, which varies across diagnostic and dialogic organisational development (351, 512). Dialogic organisational development involves the disruption of the status quo followed by possibility questions, diversity and dialogue to create new possibilities and opportunities for bottom-up engagement with conflict and complexity so that a new more complex coherence may emerge through interaction (203).

Diagnostic organisational development entails a pre-defined linear process with clear goals involving unfreezing, movement, and refreezing with emphasis on data collection, evaluation and diagnosis of the current state against pre-determined models with all organisational elements in alignment, identification of clearly defined problems, and solutions of the problems through top-down interventions (203, 513).

The research procedure applies discordant pluralism to supplement and challenge different approaches with one another (153, 162, 389, 390). Similar to dialogic organisational development, dialogue among diverse modelling approaches create new possibilities and opportunities to engage with conflict and complexity so that a new more complex coherence may emerge. On the other hand, pluralist frameworks are similar to diagnostic organisational development (153, 162, 390, 514). Although the procedure applies discordant pluralism, modelling approaches are included which involve diagnostic or dialogic organisational development.

Table 6-1 supplements appropriate systems thinking approaches identified in the literature review and the approaches proposed by the research procedure with underlying ontological and epistemological orientations as applied in BIE cycles. This summary does not imply a pluralist framework, but indicates how discordant pluralism indeed provides an enriched understanding of the research question.

Table 6-1 Questions and theoretical assumptions of modelling approaches applied in BIE cycles

	Questions	Theoretical underpinnings	Knowledge constitutive interests	Ontological orientation	Epistemological orientation
Sustainability evaluation	<ul style="list-style-type: none"> • How would you score the legal and regulatory environment governing the NPO? • How would you score the internal capacity of the NPO to pursue their goals? • How would you score the access of the NPO to various sources of financial support? • How would you score the ability of the NPO to influence public opinion and policy? • How would you score the ability of the NPO to provide products and services? • How would you score support services available to NPO? How would you score society's perception of the NPO?	Empirical, United States perspective	Technical	Heraclitian	Diagnostic organisational development
Biomatrix entity systems (BES) perspective	<ul style="list-style-type: none"> • How are we framing the situation? • What are the implications of this framing for how we investigate the situation? What are appropriate ways of managing the situation on the basis of this framing?	Complex adaptive systems (CAS), pragmatism and critical theory, addressing a partial understanding of a situation and partiality among different stakeholders	Emancipatory	Parmenidian, Heraclitian	Diagnostic & dialogic organisational development
Viable system modelling (VSM)	<ul style="list-style-type: none"> • What is the nature of the interrelationships within the organisation? • What is the structure of these interrelationships? • What are the processes between them? • What are the patterns that emerge from these processes, with what consequences and for whom? Why does this matter, to whom and in what context?	Cybernetics, avoiding a reductionist focus on parts instead of the whole	Technical	Parmenidian	Diagnostic organisational development
System dynamics (SD)	<ul style="list-style-type: none"> • How is organisational performance affected by delayed impacts? 	Cybernetics, avoiding a reductionist focus on parts instead of the whole	Technical	Heraclitian	Diagnostic organisational development

	Questions	Theoretical underpinnings	Knowledge constitutive interests	Ontological orientation	Epistemological orientation
	<ul style="list-style-type: none"> • How is organisational behaviour affected by feedback patterns? • How is the flow of resources through the organisation controlled? How does this affect performance? Which structural leverage points in the organisation can advance self-organising processes?				
Soft systems methodology (SSM)	<ul style="list-style-type: none"> • What are different ways in which the organisation can be understood? • How are these different understandings going to affect the way in which people judge the success of the organisation? • How will it affect people's behaviour, especially when things go wrong from their perspective? What will be the result and significance? 	<ul style="list-style-type: none"> • Interpretivism, avoiding a dogmatic privilege of one particular perspective • Critical realism, balancing theory building and the improvement of a problem situation 	Practical	Heraclitian	Dialogic organisational development
Cynefin framework (CF)	<ul style="list-style-type: none"> • How are we framing the situation? • What are the implications of this framing for how we investigate the situation? What are appropriate ways of managing the situation on the basis of this framing?	CAS, pragmatism and critical theory, addressing a partial understanding of a situation and partiality among different stakeholders	Emancipatory	Heraclitian	Dialogic organisational development
Dynamic equilibrium modelling (DEM)	<ul style="list-style-type: none"> • Who, what, when, where, why and how of the situation? • How do others experience the situation? • What are the implications of current perceptions and actions? What other options are available? Is the proposed resolution practical?	Paradox theory, addressing a partial understanding of a situation and partiality among different stakeholders	Emancipatory	Heraclitian	Dialogic organisational development

6.5 RESEARCH RESULTS

6.5.1 Literature review

A history of OM indicates that OM emerged as a discipline late during the high-volume industrial production period. In their application of SOM, it is therefore important for the NPO to supplement concepts from the sustainability period with concepts from the quality period, internet period, globalisation period and fourth industrial revolution. A history of sustainability indicates the growing need for interdisciplinary research and impact, integrated sustainability, and inclusivity (36). It therefore motivates the applied definition of sustainability which guides the study and evaluation of the effectiveness thereof (214). Furthermore, different model uses and types identified in the literature review form the basis for the definition of a SOMM in an NPO which determines the execution of the study.

A history of NPOs also is constructed from literature, with the addition of the pandemic caused by Coronavirus disease of 2019 (COVID-19). It is shown that NPOs are not only differently conceptualised over time, but also socially and politically (7, 13, 48, 215, 216). This study therefore applies a broad definition of an NPO which implies the execution of the study through systems thinking approaches. Similar to systems thinking, many tools exist to make sense of the evolved worldwide NPO sector and various classifications exist to decide on which tools to apply (7, 13, 48, 133, 216-218). The tool selected to evaluate the current sustainability of the NPO, determines the outcome of the evaluation and therefore is supplemented with two additional tools.

Histories of OM, sustainability, SOM, and NPOs indicate that shareholders own businesses in a shareholder capitalism stage whereas donors own NPOs in a contemporary period. Over time, hybrid organisations reduce shareholder and donor ownership while SOM in such organisations becomes even more complex (20). This study includes the investigation of a hybrid conceptualisation of the participating NPO.

There does not exist a common definition of SOM in NPOs and various authors emphasise different aspects thereof. To make sense of the vast literature on SOM in NPOs and overlapping fields, key focus areas are identified through a summative content analysis of literature as summarised in the interpretive framework. The key focus areas in order of groundedness entail products and services; stakeholders; governance; leadership; funding; human resources; organisational culture; and technology. The focus on products and services make sense from an OM perspective. In order of density, the key focus areas are stakeholders; governance; products and services; human resources; leadership; organisational culture; funding; technology; and sustainability. This makes sense with reference to stakeholders, leaders and human resources as agents, and the emphasis on governance and organisational culture in terms of sustainability. The focus areas are tested in practice through their application to contextualise a SOMM with reference

to the NPO and subsequent BIE cycles. In the process, additional key focus areas are identified namely the growth phase of the NPO as an important focus area in the governance field of a BES perspective and also VSM, supplemented with the sustainable organisational model for mature organisations. The worldview of the NPO and their stakeholders is identified as another important focus area through SSM.

6.5.2 Methodology

A design mode of research involves planning of action to create objects of value that do not exist yet or to change existing situations into situations of preferred value (54, 69, 515). With reference to destiny as defined by Heidegger (516), the purpose of design is to help create an unknown future grounded in history and nurtured by humanity living with care. Although ADR is appropriate to design a SOMM in an NPO, it must therefore be done carefully (232, 234). Risks are reduced where possible while risks due to the untried nature of a SOMM in the NPO are included as an ethical requirement in the agreement between the researcher and the NPO. The agreement is reached with the full, informed, and voluntary consent of the NPO. When prototypes are evaluated, limitations and remaining risks are reported.

This study implements a less technologically-orientated ADR design by applying an AR approach towards DR in education – instead of DR in IS – to investigate a SOMM in an NPO by applying theory to impact the actual sustainability of the NPO, refine theory on a SOMM in an NPO through empirical testing, and develop new theory as shown in Figure 6-1. In the process, a less technologically-orientated ADR approach also is investigated, tested and refined with contributions indicated in italics in Table 6-2. This study provides an instance of an organised complex problem where ADR is applied to review vast literature, consider many different systems thinking approaches, many directives to decide on appropriate approaches, many systems thinking principles, many sustainability evaluation tools, and many directives to decide on an appropriate tool.

During the problem formulation phase, the research problem is positioned as an information-orientated sample – not a random sample – of a class of research problems. The participating NPO is a typical case of a current South African NPO and also an extreme case who had significant impact but is currently under severe stress. This facilitates the development of a theoretical contribution based on a single case study as discussed in the formalisation phase. Furthermore, concepts are analysed as culturally and historically moulded to enable the design of a culturally relevant model that builds on historically collected experience, skill and recognised limitations.

Table 6-2 Contributions of a less technologically-orientated ADR approach

Phase	Tasks
Problem formulation	<ul style="list-style-type: none"> • Identify and conceptualise a research problem • Formulate a research question • <i>Apply information-orientated sample selection</i> for the research problem to represent a class of research problems • <i>Analyse relevant concepts as culturally and historically moulded</i> • Secure long-term organisational commitment • Set up roles and responsibilities
Building, intervention and evaluation	<ul style="list-style-type: none"> • <i>Contextualise relevant concepts with reference to existing organisational artefacts</i> • <i>Develop a research procedure</i> • <i>Develop the interpretive framework</i> • <i>Develop the design ecology</i> • <i>Establish effectiveness criteria</i> • Execute BIE cycle(s) • Assess the need for additional cycles, repeat
Reflection	<ul style="list-style-type: none"> • Reflect on the research process • Evaluate adherence to principles • <i>Reflect on assumptions and implications thereof</i> • Analyse research results according to stated goals
Formalisation	<ul style="list-style-type: none"> • <i>Reflexivity</i> • Abstract reflections into design principles for the designed tool • Abstract reflections into design principles for a research process in general • Articulate contributions in terms of theories selected • Formalise research results for dissemination

The BIE phase starts with the contextualisation of a SOMM in the NPO based on the concept analysis, which emphasises the cultural-historical situatedness of the NPO. Existing artefacts of the NPO are analysed to surface detail which may not be highlighted through interviews or workshops, and which is more time-efficient. Such a contextualisation enables the design of a SOMM which builds on the historically collected experience and skill of the NPO and which is culturally appropriate to them. Next, a research procedure is developed to address the primary research question. The procedure is based on appropriate modelling approaches identified in literature and the above contextualisation. An interpretive framework is developed to address the research question concerning the sustainability of NPOs in general. It is coherent and transparent, indicates relevant SOM theories, explains how a SOMM in the NPO are conceptualised, structured, applied and evaluated, and includes stakeholders in relevant concepts and effectiveness criteria. A comprehensive design ecology also supports a theoretical contribution in terms of the role of specific characteristics of NPOs in addressing sustainability by applying a SOMM. Furthermore, criteria are established to evaluate the effectiveness of the SOMM in the NPO as an indication of when the SOMM is sufficiently refined, or whether another BIE cycle is required. These effectiveness criteria are formulated in terms of the self-defined needs of the NPO with reference to the definition of SOM. A SOMM is developed through BIE cycles based on historically collected

experience and skill and existing limitations identified in literature, and the contextualisation in terms of the NPO. Reasons for a transition from one cycle to the next are documented.

The reflection phase includes reflecting on assumptions and the implications thereof since design is interpretive and shaped by the researcher's interests, values and assumptions and that of other stakeholders. The development of a SOMM in the NPO therefore is informed by a reflection on assumptions and the implications thereof, and the interpretive framework is further refined by it. A reflection on assumptions and the implications thereof proves valuable during the study when opportunities occur for critical discussions, especially when the NPO urgently must address issues.

The formalisation phase starts by addressing the reflexivity of the researcher. All other validations rely on addressing the reflexivity of the researcher which includes assumptions and their impact on the model and design theory, the researcher's location throughout the research process, and the voice of the NPO which is filtered and shaped by the researcher. The reflexivity of the researcher is strengthened through all other validations and the systematic documentation of the BIE cycles.

As part of a less technologically-orientated ADR approach examined through this study, criteria are investigated to evaluate the effectiveness of a tool as an indication of when the tool is sufficiently refined, or whether another BIE cycle is required. While this chapter reflects on the learning that occurs during the study, evaluations are conducted in the problem formulation phase, BIE phase and the formalisation phase as shown in Table 6-3. A logical hierarchy is followed to achieve effectiveness through content validation, construct validation and utility. Ecological validation also is required for the tool to be adaptable to other organisations. While a summative evaluation determines the utility, effectiveness and ecological validation of the final tool, formative evaluations surface anticipated and unanticipated consequences to contribute to the refinement of the tool. Since efficacy refers to the capability for effectiveness, formative criteria include efficacy to lead to effectiveness. All other validations rely on addressing the reflexivity of the researcher.

The ontological theory of the study is explicitly stated and not left as an implicit presupposition of the epistemological theory of the study. However, the epistemological theory of the study includes a constructivist orientation which maintains that ontology is grounded in epistemology (257, 304, 307, 309, 310, 314, 317, 324, 325). With reference to Kant's transcendental dialectics, truth implies contingency and an ongoing interpretive process of understanding and comprehension which may be contested (268, 307, 308, 311).

Although different rhetoric for quantitative and qualitative research methods have developed over time (280), rhetoric in this study does not vary according to the applied research methods namely modelling approaches but focuses on the primary research question posed and the audience who

may make decisions based on how these questions are addressed including the NPO and the research community. It is realised that in general, modelling emphasises dialogue more than rhetoric through praxis although rhetoric improves the model being developed (43, 158, 342). Furthermore, although ADR also emphasises dialogue more than rhetoric through praxis, the quality thereof involves a dialogue and a rhetoric aspect and the concepts and processes of rhetorical invention and judgement can be used in the BIE phase (335, 340, 341). ADR is normative and requires that authentic actions are documented and not covered up in rhetoric. This requires enabling conditions for the researcher and the NPO to observe, document, understand and change the detail of actions and to learn individually and collectively.

Table 6-3 Contribution of the ADR approach towards evaluation criteria

Phase		Evaluation	Criteria	Description	
Reflection	Problem formulation	Formative	Content validation	<ul style="list-style-type: none"> The NPO needs a SOMM The SOMM is based on current theories 	
	Building, intervention and evaluation		Construct validation	<ul style="list-style-type: none"> SOMM development is consistent with the interpretive framework SOMM development is trackable and virtually replicable 	
			Utility	<ul style="list-style-type: none"> The NPO will use the SOMM in everyday practice The NPO will have the capability, capacity and motivation to use the SOMM The SOMM will be efficiently delivered, supported and maintained 	
			Efficacy	<ul style="list-style-type: none"> The SOMM will address the actual problem of the NPO 	
	Ecological validation		<ul style="list-style-type: none"> The SOMM will be adaptable to other NPOs through an empirically grounded design theory 		
Formalisation		Summative	Reflexivity	Utility	<ul style="list-style-type: none"> The NPO uses the SOMM in everyday practice The NPO has the capability, capacity and motivation to use the SOMM The SOMM is efficiently delivered, supported and maintained
				Effectiveness	<ul style="list-style-type: none"> The SOMM addresses the actual problem of the NPO
				Ecological validation	<ul style="list-style-type: none"> The SOMM is adaptable to other NPOs through an empirically grounded design theory

6.5.3 Modelling approach

During contextualisation of a SOMM in the NPO, the development of the organisational culture of the NPO is documented through a narrative about actions in concrete social, historical and political situations (306, 322, 352, 353). The NPO appreciates the document as their first recorded history.

Furthermore, trying to identify the OM model applied by the NPO, organisational policies are

clearly indicated and also an OM process mapping, an annual schedule, a monitoring and evaluation process, instruments and results, internal and external training procedures, proposals to generate revenue, a fund allocation policy, a human resource structure including positions, requirements and duties, and reward systems. Various versions of an organogram also are identified. The NPO incorporates state-of-the-art technology in their product and service offerings including training, they utilise tablets and customised application software to deliver products and services, and are involved in the development of monitoring and evaluation software. They also maintain a website and are active on social media. However, self-defined needs of the NPO are ignored in the online monitoring and evaluation system developed by a business for all their corporate social responsibility projects. The NPO themselves also experience challenges working with the self-defined needs in communities. For example, some school principals are more interested in receiving funds to address needs in the community rather than receiving the benefits of the programme of the NPO. In such situations the school and the community do not support the programme if implemented. Gaps therefore exist and the NPO does not apply an explicit SOMM.

The research procedure starts with an evaluation of the current sustainability the NPO based on the CSOSI. The evaluation is followed by a BES perspective of the NPO in terms of seven fields of organisation. The BES perspective supports discordant pluralism by providing a meta-framework for inquiry to be supplemented and challenged with different other approaches. The research procedure proposes additional modelling approaches from the literature review which have been applied in the OM field, sustainability context, and the NPO sector. However, only a few of these approaches such as VSM and SD have been applied in the integrated field of SOM in NPOs (45, 182). Furthermore, the approaches are often applied as once-off interventions and not with the intention to develop a tool for continued use by an organisation (186, 193, 210, 212). Although some of these approaches have been applied in combination (162, 163, 195, 517), a need remains to supplement and challenge different approaches with one another in novel ways to address organised complex problems in practice (518).

Interpretive frameworks are represented in different ways. Furthermore, underpinning worldviews, paradigms, philosophical commitments, research principles, relevant concepts and implied assumptions, field-specific theories and theories on specific entities of the design ecology, an evaluative framework, a framework to conceptualise, structure and apply design prototypes, and stakeholders are highlighted or implied in different ways in the different representations of an interpretive framework. In this study, the interpretive framework is diagrammatically represented to support engagement, understanding and recollection. All elements are shown in the diagram, with stakeholders indicated in the field-specific theories and in context of the NPO. A design ecology is developed through the research procedure based on an understanding of the NPO and their environment as a complex interacting system.

Effectiveness criteria, to decide whether the SOMM in the NPO is sufficiently refined, involve the self-defined needs of the NPO. This implies an ill-defined problem as explained in §6.3.4, which has implications for deciding whether the model is sufficiently refined. Furthermore, effectiveness criteria concern the sustainability of the NPO, which cannot be measured conclusively in the time period allowed for the study. The future-orientated axiology of ADR provides for evaluating intentions of the NPO (167), and offers an experiential basis for the NPO and other researchers to explore ultimate indicators in future.

6.5.4 Building, intervention and evaluation

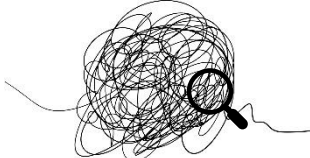
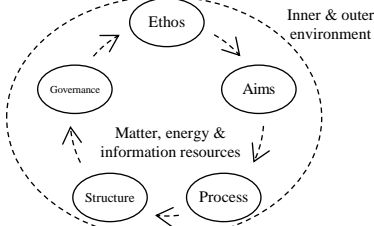
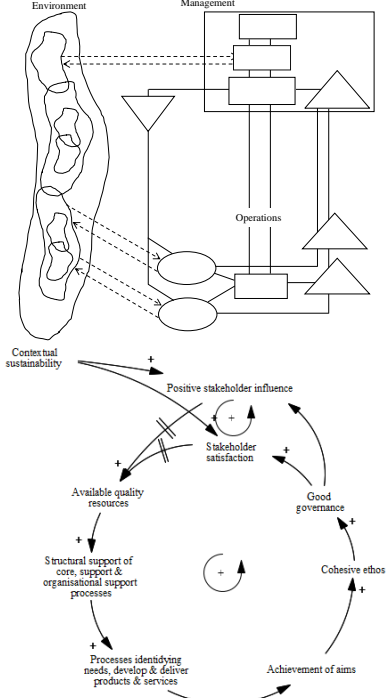
The NPO decides to adopt the SOMM developed through DEM, supplemented with framings of their situation according to CF and typical questions addressed by different systems thinking approaches. They have the capability and motivation to use the model and have started to build capacity to facilitate and utilise the SOMM beyond the research project. The SOMM is also efficiently delivered. However, support and maintenance continue beyond the completion of the research project. Furthermore, it seems that an external facilitator and collaboration are important to maintain a paradox mindset as observed by Luscher and Lewis (339). The NPO therefore requests the researcher to stay involved, but the relationship must be carefully managed so as not to create a dependency on the researcher.

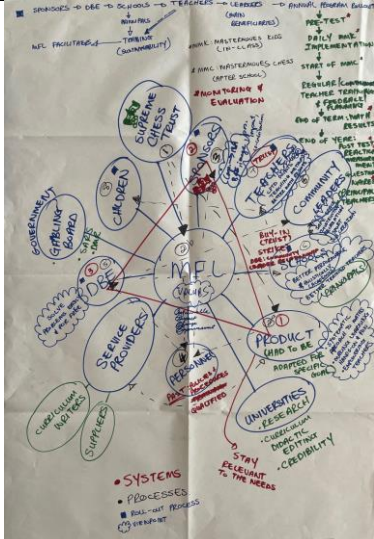
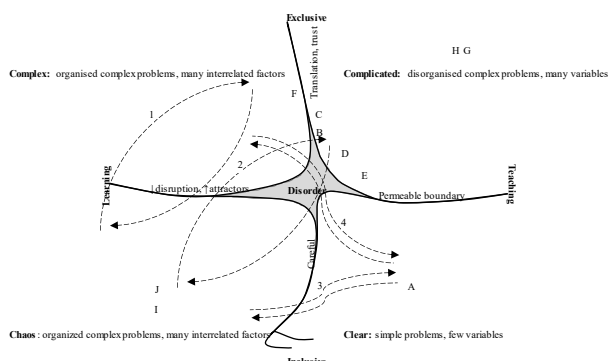
Furthermore, the NPO and researcher decide that the SOMM is sufficiently refined and that the contribution of an additional cycle would be marginal in terms of efficacy. All initial self-defined needs of the NPO are addressed as indicated in Addendum K, and needs that evolved during the study also are addressed. The NPO develops commitment to multiple, competing strategies by applying the SOMM so that their reflexive self-regulation is enhanced and they become more sustainable. Although the NPO is pulled out of their comfort zone and experiences distress, they have control over what is done, how it is done, and if anything is done at all. No more gaps are identified with reference to the interpretive framework. The research procedure however proposes to further supplement the SOMM with critical systems heuristics (CSH). The goal to apply and build theory through the study nonetheless is balanced with the goal to improve the sustainability of the participating NPO through their sensemaking and addressing their own self-defined needs.

The study represents DEM through a systems diagram as shown in Figure 6-2 to emphasise the generic pattern of structure and the leverage opportunities to change the thinking that enhances reflexive self-regulation. The NPO becomes familiar with systems diagrams through the study and finds it useful to model situations. While the process in Figure 6-2 may be prompted at any point along the loop, in this study it is initiated through an awareness of explicit tensions as highlighted through a BES perspective, VSM, SD, SSM and CF. A reflective link (as opposed to flow) is taken

NPO supports this sensemaking process (519). Proposals to address paradox through spatial and temporal separation, and integration, are developed through this sensemaking process. The systems thinking approaches can be used on a high level or developed into detail depending on the situation. Furthermore, as new tensions surface which necessitate paradox to be addressed, the NPO builds on their experience of applying different systems thinking approaches.

Table 6-4 Development of a paradox mindset

Questions	Framing	Understanding
<ul style="list-style-type: none"> • What issue is noticed that warrants closer attention? • What is it about? 	Disorder	
Who, what, when, where, why and how of the situation?	Clear	
How do others experience the situation?	Complicated	

<ul style="list-style-type: none"> • What are the implications of current perceptions and actions? • What other options are available? 	<p>Complex</p>	
<p>Is the proposal practical?</p>	<p>Boundary crossings</p>	

Reinforcing feedback loops in the systems diagram in Figure 6-2 act as a success to the successful archetype (187). Virtuous feedback loops occur if more implicit tensions, together with high plurality, change or scarcity in the environment and fruitful recognition and juxtaposition of contradictory demands by stakeholders, lead to more explicit tensions. More explicit tensions result in paradox to be more readily accepted if interventive questions are addressed through a paradox mindset among stakeholders and dynamic organisational capabilities. The more readily paradox is accepted, the more it can be addressed. The more paradox is addressed through spatial and temporal separation of alternatives, the more it can be addressed through integration and the more paradox is addressed through integration, the more it can be addressed through separation. The more paradox is addressed, the more the NPO becomes fluid, enhances their reflexive self-regulation through supportive capabilities, and becomes more sustainable. Simultaneously more implicit tensions are created which lead to more explicit tensions if high plurality, change or scarcity in the environment and fruitful recognition and juxtaposition of contradictory demands by stakeholders occur. Throughout the process, reflective links can be taken back along the loop as indicated from explicit to implicit tensions. However, the feedback loops may become vicious if high plurality, change or scarcity in the environment or fruitful recognition and juxtaposition of contradictory demands by stakeholders do not explicate tensions or if a paradox mindset among stakeholders and dynamic organisational capabilities do not exist to accept paradox.

6.6 CHAPTER REFLECTION

This chapter documents the learning that occurs during the problem formulation phase and the BIE phase to enable the development of a design theory in the formalisation phase. A less technologically-orientated ADR process is followed by applying an AR approach towards DR in education as summarised in Table 6-2 with a hierarchy of evaluation criteria summarised in Table 6-3. Key focus areas are identified to make sense of the extensive literature on SOM in NPOs. A SOMM is subsequently contextualised in the NPO in terms of these focus areas by analysing artefacts of the NPO. The identified focus areas therefore contribute to the design of the model and are tested in the process. A research procedure is informed by the literature review and the contextualisation, while the procedure in turn contributes to the interpretive framework and design ecology. Efficacy of a SOMM in the NPO is evaluated in terms of their self-defined needs as surfaced through the contextualisation. BIE cycles are subsequently executed according to the research procedure until a SOMM is sufficiently refined in terms of the needs of the NPO as summarised in Figure 6-2 and Table 6-4.

Research principles are adhered to throughout the problem formulation phase and the BIE phase. During the BIE phase, the principle that the SOMM in the NPO is informed by theory is adhered to in terms of principles of systems thinking, except for a principle to predict future behaviour with a high degree of accuracy over a long timescale. In a design research mode instead, the model heuristically satisfies the self-defined needs of the NPO.

The assumed definition of SOM requires an integrated organisational perspective to develop a SOMM in the NPO, which is in line with an industrial systems approach and confirmed in literature. The assumed definition of SOM, together with the assumed definition of an NPO, furthermore implies that SOM in NPOs is an organised complex problem. Systems thinking approaches therefore are applied to develop a SOMM in the NPO. From many different available systems thinking approaches, approaches mentioned in an international development context are considered, with additional approaches added as referred to in literature on applications in NPOs, inquired about by the participating NPO, based on the researcher's experience, and to address gaps surfaced by other approaches. The research procedure proposes which of these approaches most closely relate to the research questions with reference to theoretical underpinnings, typical questions addressed, and knowledge constitutive interests. Underlying ontological and epistemological orientations furthermore are surfaced through the reflection on assumptions and implications thereof. Table 6-1 indicates how discordant pluralism provides an enriched understanding of the research question through the BIE cycles.

CHAPTER 7 FORMALISATION

7.1 INTRODUCTION

In context of the action design research (ADR) approach followed in the study as shown in Figure 7-1, this chapter introduces the last phase of the research project namely the formalisation phase.

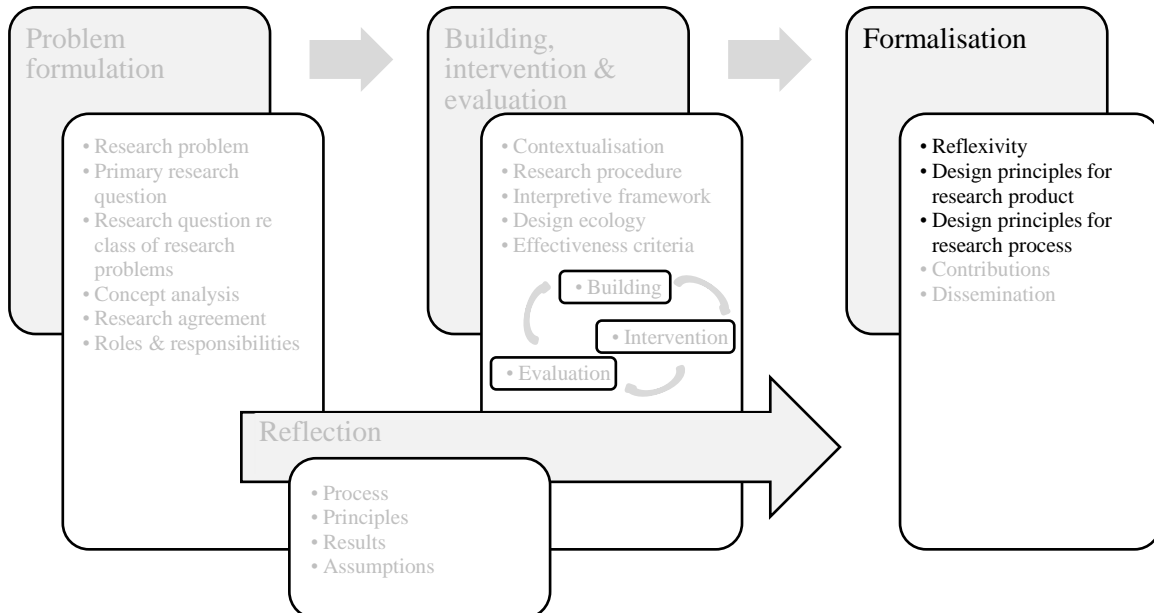


Figure 7-1 Chapter 7 in context of the research design

Validation of the study relies on addressing the reflexivity of the researcher (268). It is therefore considered in the problem formulation phase (Chapter 1, Chapter 2 and Chapter 4), the BIE phase (Chapter 4 and Chapter 5), reflected upon in terms of assumptions and implications thereof (Chapter 6), and summatively addressed in §7.2.

Ecological validation is summatively addressed in §7.3 by abstracting reflections on the research results in terms of the SOMM in the participating NPO (Chapter 6) into design principles for the class of SOMMs in NPOs. Ecological validation also entails a similar development of design principles for a research procedure in general in §7.4 with reference to the reflections on the process of applying different modelling approaches to develop the SOMM in the NPO (Chapter 6). As design principles are developed to design SOMMs in NPOs in general, principles also are developed to execute a less technology orientated ADR project in general in §7.5 with reference to the research methodology as set out in Chapter 3 (251).

By addressing the reflexivity of the researcher and ecological validation, this chapter indicates contributions of the study in terms of ways to supplement the perspective of the researcher, implications of the location of the researcher, ways to improve the utility and effectiveness of a SOMM in an NPO, and also an empirically grounded design theory in terms of a class of SOMMS in NPOs, a research procedure and a less technology orientated ADR approach in general.

Contributions to theory which is applied to create a SOMM in an NPO are discussed in Chapter 8 (53). Indications of future studies and the dissemination of research results also are considered in Chapter 8 (68, 267, 344).

7.2 REFLEXIVITY

The reflexivity of the researcher entails the impact of the researcher's perspective on the study (§7.2.1) and the researcher's location in the study (§7.2.2) (65, 165, 268). Furthermore, the researcher's voice must be separated from the voice of the participating non-profit organisation (NPO) (167). The prioritisation of a theoretical interest of the researcher above the delivery of a sustainable operations management model (SOMM) that the NPO can actually use to address their sustainability, is incoherent with an ADR paradigm of critical theory and pragmatism and the research principle that research is inspired by practice (53, 55, 299). The summative evaluation of the utility of the SOMM in the NPO therefore is discussed in §7.2.3 and its effectiveness in §7.2.4 (165-167, 267, 277).

7.2.1 Perspective of the researcher

Current literature on relevant concepts and modelling approaches supplements the researcher's perspective and experience, although only literature available in English is considered. In this study, the researcher also becomes aware of her location in the cultural and historical forming of these concepts (165) and provides for the NPO to participate in the sensemaking of these concepts. While key focus areas of sustainable operations management (SOM) in NPOs are identified from the researcher's perspective, data gathering and the rationale for categories are described in detail which provides for replicability, reliability and validation through transparency and rigour. The research agreement addresses the researcher's impact on the study through voluntary informed consent by the NPO. This study contextualises a SOMM in terms of the NPO through artefact analysis which enhances the thoroughness and time-efficiency thereof, and it is reviewed by the NPO to supplement the researcher's perspective. The interpretive framework developed explicates the perspective of the researcher. The research procedure is based on the literature review and the design ecology in turn is developed with reference to the research procedure – propagating the impact of the researcher's perspective – although the inclusion and exclusion of specific modelling approaches are clearly motivated. Effectiveness criteria to decide whether the SOMM is sufficiently refined, are based on the self-defined needs of the NPO as they emerge through the contextualisation. Throughout the building, intervention and evaluation (BIE) cycles the reflexivity of the researcher is addressed through discordant pluralism (153, 162, 390). Subsequently, initial models are developed based on the contextualisation of a SOMM in the NPO which the NPO adjusts through numerous micro cycles.

7.2.2 Location of the researcher

The researcher's location remains different from the NPO, engaged, and neutral throughout the study. It also stays that of a critical researcher except during the BIE phase when it varies between that of creative designer and critical researcher. The researcher's location also mainly remains that of insider, although the researcher never fully experiences it as such. In the research agreement, the development of the research procedure, interpretive framework and design ecology, the researcher's location changes to that of outsider. Based on a location of mostly different from the NPO, engaged, neutral, and that of an insider, the study suggests an impact through capacity building (520). The strengthening of human, natural, physical, financial and social capital also requires the researcher to impact the study through collaboration to focus on the long term. The written agreement between the researcher and the NPO provides the mechanism for such collaboration.

7.2.3 Utility

Utility entails that the NPO must have the capability, capacity and motivation to use the SOMM developed in the study. Transparency therefore is important for the NPO to understand the modelling process (521) and they must be empowered to apply the SOMM in everyday practice without a dependency on experts (432, 433). The research agreement between the researcher and the NPO establishes utility by providing for the efficient development of a SOMM in the NPO. Through continuous evaluations, they confirm that the agreement is adhered to throughout the study. The contextualisation of a SOMM in the NPO furthermore enables the design of a model which builds on the historically collected experience and skill of the NPO, and which is culturally appropriate for them. The sustainability evaluation is designed and applied to enable the NPO to undertake self-evaluations and to track and compare progress in future.

Throughout the BIE cycles, the expected sustainable use of the SOMM is improved in this study by explaining modelling approaches with reference to an NPO context. References to literature are provided, the rationale of modelling approaches is explained, questions addressed by modelling approaches are emphasised, diagrammatic summaries are provided, gaps are indicated, and a track record is shown of all modelling approaches applied up to that stage. The NPO indicates appreciation for the above through continuous evaluations. Although the NPO is confused by the initial viable system modelling (VSM) diagrammatic representation, different representations are tested and eventually the NPO utilises VSM to identify actual role players.

Furthermore, the NPO appreciates opportunities provided by this study to engage with initial models developed by the researcher to develop understanding and recollection. Although they initially experience the modelling approaches as theoretical without practical impact, their perception changes. They understand the different approaches and have confidence to apply them

without reliance on experts, which contrasts with their experiences of interviews and questionnaires by consultants and training available through the NPO sector. They indicate however that careful facilitation and collaboration are important to develop the SOMM – similar to observations by López-Garay and Molano (516) and Luscher and Lewis (339).

Through continuous evaluations, the NPO also shows appreciation for an integrated organisational perspective, addressing SOM as an organised complex problem, and different approaches to address different situations. Initially they do not understand the relevance of feedback loops, yet eventually prefers systems diagrams as diagrammatic representations to indicate organising processes (351). A reflection on their worldview is especially empowering to the NPO.

The intention is not to provide a once-off general model to the NPO, but to gently disrupt patterns of thinking to instil innovative critical thinking (163). The NPO appreciates the distinctive opportunity to develop reflexive self-regulation to gradually address their sustainability. Although they experience constant turbulence, they have started to reflect on how their perspective impact their self-regulation and realise that they no longer can postpone to address tensions by accepting paradox as indicated by the SOMM. They are in the process to implement the insights that they have gained through the SOMM, including capacity building to facilitate and utilise the SOMM beyond the research project.

Utility furthermore entails that the SOMM must be efficiently delivered, supported and maintained (272, 277). Support and maintenance however continue beyond the completion of the research project. The future-orientated axiology of ADR provides for this, and the NPO requested the researcher to stay involved. The request however must be carefully managed in order not to develop a dependency on the researcher, but for the NPO to utilise the services of advisors and volunteers as proposed through the developed SOMM.

7.2.4 Effectiveness

Effectiveness criteria are established in this study in terms of the self-defined needs of the NPO with reference to the definition of SOM. These needs are documented as they emerge through the contextualisation of a SOMM in the NPO. Since efficacy refers to the capability for effectiveness, the summative evaluation of the effectiveness of the study is based on formative evaluations of efficacy as detailed in Addendum L. The self-defined needs of the NPO are interconnected so that addressing one need also addresses another need. Different BIE cycles furthermore address needs in similar ways. For example, it is indicated that trustee roles and responsibilities include that they must embody the mission, ethos, obligations and good governance. This however holds for all employees as part of empowerment as indicated in a biomatrix entity systems (BES) perspective and the Cynefin framework (CF). These roles and responsibilities also are included for all

employees in self-regulation indicated in VSM, system dynamics (SD), soft systems methodology (SSM) and dynamic equilibrium modelling (DEM). It is furthermore implied by recursive governance indicated in VSM and CF, and regulation by processes instead of an entity as indicated in SD and SSM.

The NPO confirms that their expectations in terms of the research agreement is satisfied. They also confirm that the SOMM is effective in providing guidance to address their self-defined needs. As mentioned, they are in the process to implement the insights that they have gained through the SOMM, including capacity building. The NPO plans to apply the SOMM to address additional needs already defined. They believe that the SOMM has wider application in the South African NPO sector.

While the efficacy of the SOMM in the NPO is evaluated in terms of the self-defined needs of the NPO, these needs evolve through the development of the SOMM due to mutual influences between the model and the NPO. This ill-defined problem is addressed through the changing perceptions of the NPO who consequently demonstrates agility to satisfy their needs, identify other needs, and to build resilience over the long term. The SOMM fosters and reinforces commitment to multiple, competing strategies by addressing paradox so that the NPO becomes more fluid, enhances their reflexive self-regulation through supportive capabilities, and becomes more sustainable.

7.3 SUSTAINABLE OPERATIONS MANAGEMENT MODELS IN NON-PROFIT ORGANISATIONS

The designed tool in this study is a SOMM in the participating NPO to address the primary research question as summarised in the reflection phase. Design principles for the class of SOMMs in NPOs are based on the strategic selection of the case study (§7.3.1), the interpretive framework (§7.3.2), and the design ecology (§7.3.3) (68, 164, 165, 278).

7.3.1 Case study

This study applies information-orientated sample selection instead of random sample selection. The participating NPO is a typical case of a current South African NPO with a footprint throughout South Africa and in operation for almost fifteen years. They are also an extreme case who had significant impact but is currently under severe stress. The class of NPOs therefore refer to South African NPOs. With reference to the interpretive framework and design ecology, NPOs in South Africa and also abroad may apply a SOMM similar to the one developed in this study.

7.3.2 Interpretive framework

An initial interpretive framework is established at the start of the BIE phase and further developed through the BIE cycles to provide trackability and virtual replicability in terms of the research

procedure and the interpretation of research results. The framework developed in this study is shown in Figure 7-2 with evolvments indicated in italics. Assumptions are clearly indicated to avoid relativism or an anything-goes logic.

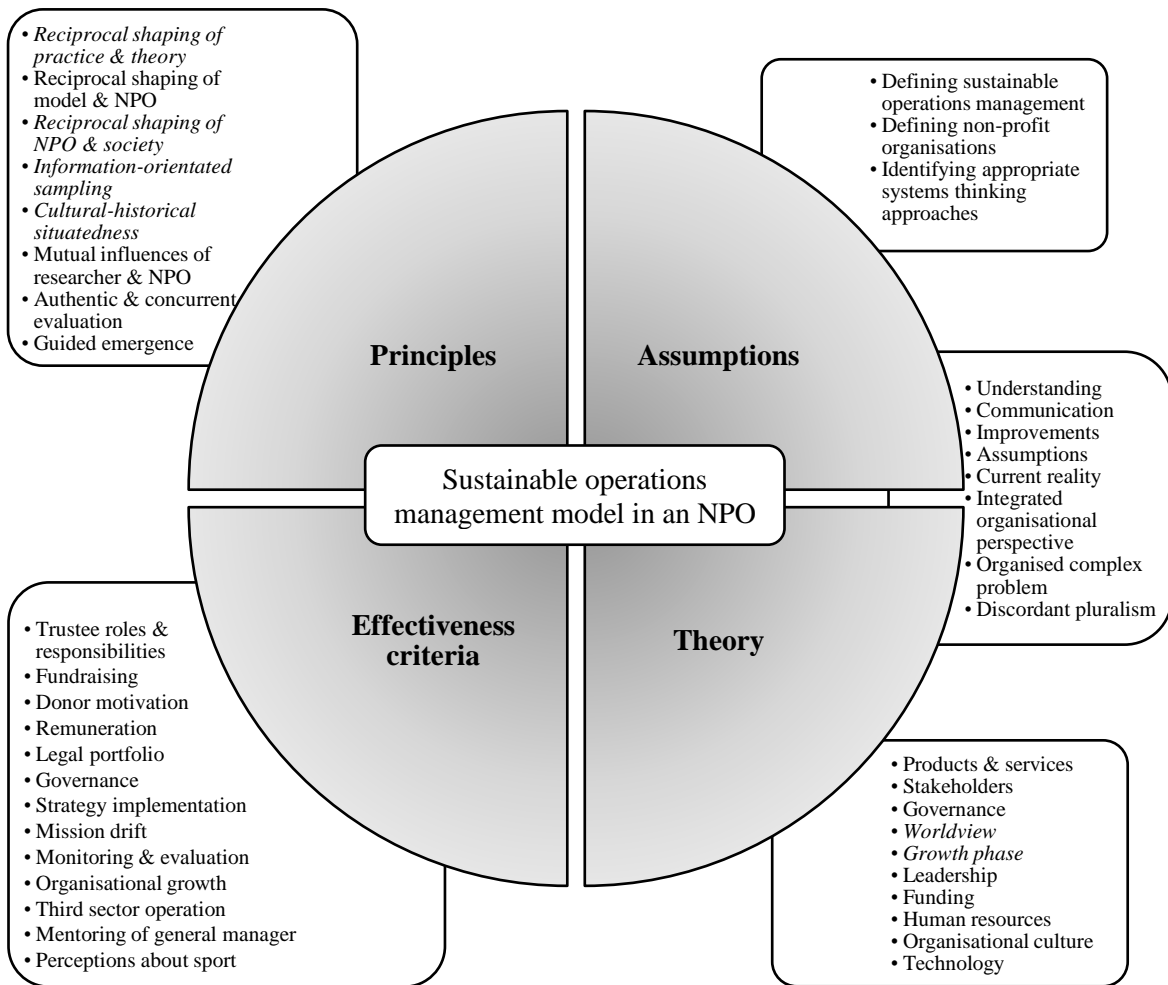


Figure 7-2 Evolved interpretive framework

Principles of the research procedure to develop a SOMM in an NPO as shown in Figure 7-2 and discussed in §7.4, are maintained throughout the BIE cycles. These principles enhance the recognition of paradox mindsets among stakeholders and internal dynamic organisational capabilities through organisational models for sustainability.

Theory which informs the SOMM is summarised in Figure 7-2 in terms of key focus areas of SOM in NPOs. These focus areas are identified through content analysis of literature on operations management (OM), SOM, OM in NPOs, and SOM in NPOs, and tested in practice through their application to contextualise the SOMM and subsequent BIE cycles. In the process, additional key focus areas are identified namely the growth phase of NPOs and the worldview of NPOs and their stakeholders, which are added in the interpretive framework.

Criteria to indicate the effectiveness of the study in Figure 7-2 are formulated in terms of the self-defined needs of the NPO to address their sustainability. The needs of the participating NPO are included in the interpretive framework as they emerge during the contextualisation of the SOMM. Although other NPOs must identify their unique self-defined needs, the listed needs serve as a basis. However, an ill-defined problem is implied since these needs evolve through the development of the SOMM due to mutual influences between the model and the NPO. This problem is addressed through the SOMM by fostering and reinforcing commitment to multiple, competing strategies through paradox. NPOs become more fluid and enhance their reflexive self-regulation to satisfy their needs and identify other needs, build resilience over the long term, and become more sustainable.

The research principles of the research methodology indicated in Figure 7-2 and discussed in more detail in §7.5, are maintained throughout all phases of the research project.

7.3.3 Design ecology

A comprehensive design ecology is developed in this study through the BIE cycles as summarised in Addendum M. The design ecology emphasises the role of specific organisational characteristics to be considered when the SOMM is applied in other NPOs. Although many entities are functioning well, opportunities for improvement through a SOMM are highlighted.

Different perspectives from the development of organisation theory are combined in the design ecology as indicated in Addendum M including sociology, economics, political science, psychology and management. The NPO and their environment therefore is understood as a complex interacting system, which is required to consider the sustainability of the NPO (181). This includes turbulence which occurs when intended changes in the situation of the NPO challenge the status quo. Continuous tension is caused by efforts to benefit all stakeholders simultaneously and to balance human, natural, physical, financial and social capital. Similar tension occurs when the NPO attempts to balance current and future orientations and internal and external perspectives. Addressing the ethos of the NPO and interactions with their transactional environment involves causal loops with unintended consequences of actions which feed back to the ethos and interactions. Turbulence therefore involves underlying dynamics in the NPO such as diversity of context, power dynamics and different framings of situations. The reflexive self-regulation of the NPO must be enhanced for them to become more sustainable. This entails paradox mindsets and organisational dynamic capabilities.

7.4 RESEARCH PROCEDURE

Design principles for a research procedure to develop SOMMs in NPOs in general are empirically grounded in the development of the SOMM in the participating NPO in this study.

7.4.1 Meta-theoretical framework

An OM model is defined as a meta-theoretical framework to develop understanding, facilitate communication, propose improvements and surface underlying assumptions in the management of resources, and the processes involved to convert the resources into required products and services and to deliver them to the customers. This definition is based on the conceptualisation of models in terms of different model uses found in literature which are not mutually exclusive (42-44).

The SOMM surfaces underlying assumptions by reflecting on implicit tensions and the surfacing thereof through plurality, change or scarcity in the environment, and the recognition and juxtaposition of contradictory demands by stakeholders. Further assumptions are surfaced in the process to accept paradox by instilling a paradox mindset, and reflecting on dynamic organisational capabilities. Understanding also is improved in the process to accept paradox by referring to systems thinking approaches and organisational models for sustainability. The systems thinking approaches can be used on a high-level or developed into detail depending on the situation. Furthermore, as new tensions arise which necessitate paradox to be addressed, the NPO builds on their experience of applying different systems thinking approaches. Improvements are proposed over the long term by purposefully iterating between spatial separation of alternatives, temporal separation of alternatives, and integration of alternatives. The whole SOMM process is enabled through communication.

7.4.2 Start from current reality

The design of a SOMM in an NPO starts from an evaluation of the current sustainability of the NPO since an ADR project starts from the current reality of an organisation (53). This also holds for organisational development and specifically for NPOs (204, 386), strategy development (387), and a systems thinking perspective (42, 184, 191, 201, 208, 388).

7.4.3 Integrated organisational perspective

The definition of SOM in the study requires an integrated organisational perspective to conceptualise an NPO as a value-based enterprise where value refers to human, natural, physical, financial and social value (27, 99, 101, 102, 120, 146). This is in line with an industrial systems approach which includes the context, resources, activities, processes, actors and interdependencies of the NPO that support the creation and delivery of products and services (144). Pomerantz (51) and Thompson (145) also indicate that an integrated organisational perspective is required to develop a SOMM in NPOs. This however expands a SOMM towards a comprehensive model which requires careful presentation (162).

7.4.4 Organised complex problem

The definition of SOM in the study, together with the definition of an NPO, implies that SOM in NPOs is an organised complex problem (153, 154). Simple problems with a limited number of variables which behave in predictable ways, are addressed through standard procedures.

Disorganised complex problems with a very large number of variables which behave in unpredictable ways, while the whole displays orderly properties, are statistically analysed.

Organised complex problems with a significant number of variables which are interrelated in an organic whole, require participative research with participants trying to understand activity from within that activity through descriptive and explanatory content-rich models that are not prescriptive (155).

7.4.5 Discordant pluralism

Organisational models for sustainability are required for an integrated organisational perspective of a SOMM in NPOs. Furthermore, systems thinking approaches are appropriate to model SOM in NPOs as an organised complex problem (153). Different organisational models for sustainability and systems thinking approaches are available in literature. To provide an enriched understanding of SOM in NPOs, discordant pluralism is implemented to supplement and challenge different approaches with one another without fusing them into a single algorithm (153, 162, 389, 390).

Clear motivations must be provided for the selection of specific approaches to provide a possible line of action (522). Theoretical underpinnings, typical questions addressed, knowledge constitutive interests as defined by Habermas (318, 319), ontological orientations, and epistemological orientations of different approaches can be considered to determine which approaches most closely relate to the purpose of the model.

7.5 ACTION DESIGN RESEARCH

Design principles for a less technologically orientated ADR process in general also are empirically grounded in the development of a SOMM in the participating NPO. These principles evolve from the initial principles indicated in the interpretive framework which are based on the research philosophy of such an ADR approach (53).

7.5.1 Reciprocal shaping of practice and theory

The initial principle that research is inspired by practice emphasises that actual problems are theory-creation opportunities (53). The principle that tools are theory ingrained entails that the designed tools are informed by theory. These principles supplement one another through this study to develop a design principle of reciprocally shaping practice and theory.

Contributing theories and existing models are identified through the literature review to determine criteria for developing an appropriate SOMM in the participating NPO. A SOMM is subsequently contextualised with reference to the participating NPO through key focus areas of SOM in NPOs identified in literature, from which the self-defined needs of the NPO emerge. Furthermore, the research procedure to develop the SOMM in the NPO is based on appropriate modelling approaches identified through the literature review. The designed tool, research procedure, and structuring of the problem therefore are informed by theory (53). This *informing* refers to giving form to from the original Latin meaning of the word (523).

The theory-informed SOMM is subjected to the actual practices of the participating NPO through BIE cycles. In the process, the application of theory is investigated to impact actual SOM in an NPO (§7.2.4) and theory is refined through empirical testing. An empirically grounded design theory therefore is developed of SOMMs in NPOs (§7.3), a research procedure to design SOMMs in NPOs (§7.4), and an ADR process in general (§7.5).

The design principle of reciprocally shaping practice and theory is coherent with an ADR paradigm of critical theory and pragmatism. It also is supported by the epistemological orientation of ADR which involves idealism, existential phenomenology, pragmatism and constructivism and therefore also a social epistemology. Based on an idealistic orientation, a research procedure to develop the SOMM is devised a priori based on assumptions as indicated in the interpretive framework to select from many different alternative modelling approaches. Pries-Heje and Baskerville (501) propose a design theory nexus to support the selection of an appropriate approach. Contingency theory can be applied to compare the characteristics of various approaches with the characteristics of a specific situation. Challenges however occur if approaches, situations, or both are so fundamentally different that they cannot usefully be compared, especially in emergent situations. Method engineering also can be applied where a method fragment, possibly with its underlying theory, is separated from a methodology to be integrated with method fragments from other methodologies. While such integration is applied in information systems (IS) development, integration of systems thinking approaches may lead to different approaches being subsumed into the perspective of a preferred approach (390). This study applies discordant pluralism to provide an enriched understanding of the research question in terms of different theoretical underpinnings, questions, knowledge constitutive interests, ontological orientations and epistemological orientations (153, 162, 390).

Based on a pragmatic orientation, a design theory is established through the research procedure and is further developed through BIE cycles to address the needs of the NPO. Errors are identified and rectified through discussion and investigation instead of an attempt to establish a theory of unquestionable knowledge. The contextualisation of the SOMM in the NPO does not provide an

undisputable categorisation in terms of key focus areas of SOM in NPOs. The reliability of the BIE cycles in terms of the documentation of procedures followed, the interpretive framework, reasons for choices made, failures and successes, and justifications of final assertions may be interpreted differently. The design theory cannot deterministically predict that the SOMM will satisfy the evolving needs of the NPO (277, 501). However, the most appropriate heuristic principles are selected and applied in the designed tool and research process according to a design mode of research (55).

7.5.2 Reciprocal shaping of tool and organisation

A principle of reciprocal shaping refers to the inseparable influences mutually exerted by the tool and the organisational context (53). This iterative process can be used to address ill-defined problems. The effectiveness of this study is determined in terms of the definition of SOM. The development of the SOMM therefore is informed by the self-defined needs of the NPO so that an ill-defined problem is implied (497). Due to mutual influences between the SOMM and the NPO however, the perceptions of the NPO change through BIE cycles. This enables them to satisfy needs, identify other needs, and to build resilience over the long term. It is challenging however to document the ill-defined problem, since when the NPO reviews the documentation to maintain authenticity, they adapt it to their changing reality. Notwithstanding this challenge which is also mentioned in literature (524), the SOMM is well documented.

The design principle of reciprocally shaping the designed tool and the organisation is coherent with the ontological orientation of ADR in terms of critical realism and existentialism. Such an orientation emphasises that risks due to the untried nature of a SOMM in the NPO must be controlled as careful making (López-Garay and Molano 2017).

7.5.3 Reciprocal shaping of organisation and society

A principle of reciprocal shaping which refers to the influences of the tool and the organisational context on each other (§7.5.2), is supplemented through this study with a principle which refers to the inseparable influences mutually exerted by the organisation and the societal context. The study does not entail a linear process of cycles of data collection, evaluation, and diagnosis of the current SOMM against a pre-determined SOMM to identify well-defined problems to be solved through interventions by the researcher (203, 318). Neither does it only involve an adaptive process of cycles of hypothesising, consideration of diverse SOMMs, and dialogue between the researcher and NPO to develop a mutual understanding and agreement on a SOMM to apply (203, 299, 318). Structures beyond the NPO also are considered through relations of power over the NPO, empowerment by the NPO and of the NPO, and intrinsic power (318). Based on a Heraclitian view (351) of the NPO, an understanding of societal effects on the operations of the NPO and the effect of their operations on society encourages reflexive self-regulation and sustainability. However,

such a comprehensive approach requires careful presentation and a high level of capability, capacity and motivation to apply (162, 344) as explained in the utility of the SOMM (§7.2.3).

The design principle of reciprocally shaping the organisation and society is coherent with an ADR paradigm of critical theory and pragmatism (299, 300).

7.5.4 Cultural-historical situatedness

A principle of reciprocal shaping which refers to the influences of the tool and the organisational context on each other (§7.5.2), is furthermore supplemented through this study with a principle which refers to the cultural-historical situatedness of the tool and the organisation.

A cultural-historical approach to concept analysis through the literature review enables the design of a culturally relevant SOMM that builds on historically collected experience, skill and recognised limitations. It also explains tensions experienced in the NPO sector. However, the cultural-historical approach also leads to definitions of concepts which are theoretically in conflict. The contextualisation of a SOMM in the NPO through artefact analysis also emphasises the cultural-historical situatedness of the NPO. This enhances the design of a SOMM which builds on the historically collected experience and skill of the NPO, and which is culturally appropriate to them. However, since artefacts can be interpreted in different ways with different outcomes, it is critical for the NPO to review the contextualisation. Furthermore, the design ecology is characterised in terms of different time periods in the development of organisation theory. The effectiveness of the study is determined in terms of the definition of SOM which refers to sustainability. However, sustainability cannot be measured conclusively in the limited time period allowed for the study, so that the systematic documentation of the BIE cycles provides an experiential basis for the NPO and other researchers to explore ultimate indicators in future.

The design principle of cultural-historical situatedness is coherent with the epistemological orientation of ADR which involves idealism, existential phenomenology, pragmatism and constructivism and therefore also a social epistemology. The SOMM therefore is flexible to address unique and evolving self-defined needs of different NPOs through a comprehensive research procedure. In this study, for example, a marketing strategy is developed, a communication strategy, and possible expansions of product and service offerings.

Similar to the principle of reciprocally shaping practice and theory (§7.5.1), it is acknowledged that cultural, historical and political situations may be interpreted differently and may have different outcomes in other contexts (311). This includes the categorisation of implicit tensions in the NPO in the process to accept paradox, but raising awareness of the different tensions is emphasised rather than an undisputable categorisation (145).

7.5.5 Generalised outcomes

A principle of generalised outcomes refers to the generalisation of the problem instance by formulating the original research problem as an instance of a class of research problems (53). However, Sein et al (53) indicate that adherence to the principle is challenging. In this study, the principle is refined by positioning the research problem as an information-orientated sample instead of a random sample (65). The participating NPO offers valuable information for the class of research problems since they represent a typical case of a current South African NPO with a footprint throughout South Africa and in operation for almost fifteen years. The NPO also is regarded as an extreme case who had significant impact but is currently under severe stress. This facilitates the development of a theoretical contribution based on a single case study.

Besides information-orientated sampling, the generalisation of research results is facilitated through an interpretive framework, design ecology, and a logical hierarchy of validation of the study. The interpretive framework clearly states research principles and implied assumptions (268), relevant SOM theories (164), stakeholders (270), and explains how the SOMM in the NPO is conceptualised, structured, applied and evaluated (269). The design ecology indicates specific characteristics of the NPO to consider the role of these characteristics in the generalisation of the SOMM (164). A comprehensive design ecology is developed through the BIE cycles to consider the sustainability of NPOs as complex interacting systems. A logical hierarchy of validation involves content validation, construct validation, utility, effectiveness and ecological validation (167, 268).

The design principle of generalised outcomes is coherent with an ADR paradigm of critical theory and pragmatism and an ontological orientation of critical realism and existentialism.

7.5.6 Mutual influences of research participants

A principle of mutually influential roles points to the importance of mutual learning between the researcher and the participating organisation (53). In this study, key focus areas are identified in the vast literature on SOM in NPOs and overlapping fields to facilitate sensemaking by the participating NPO. The written agreement between the researcher and the NPO indicates mutually influential roles and responsibilities. Through the study the NPO learns to apply different modelling approaches, while the researcher learns about the context of application which involves the NPO sector, education, school management, blended reality, and life coaching and also improves important research capabilities such as flexibility. It is important to acknowledge the NPO as research participant and not as research subject.

Similar to the design principle of reciprocally shaping the tool and the organisation, the design principle of mutual influences of research participants is coherent with the critical realist and existentialist ontological orientation of ADR.

A dialogical research approach such as ADR requires a paradox mindset, similar to NPOs who operate in constant turbulence as emphasised through the BIE cycles. In this study, an actual problem in an NPO is addressed through a formal research project with a limited timeframe. Despite continuous postponements of meetings, constant interruptions of meetings, no time for the NPO to prepare for meetings, and no time for the NPO to give feedback except in meetings, the NPO appreciates the distinctive opportunity to develop reflexive self-regulation to gradually address their sustainability. The researcher and the NPO work as a team to develop the SOMM in the NPO mostly through in-person meetings since the observation of emotions and informal discussions help to entrench the modelling approaches in the NPO. To address the long intervals between meetings and excessive revision of matters already discussed, the researcher provides references to literature, explain the rationale, typical questions addressed and diagrammatic summaries of modelling approaches, discuss remaining gaps, and show the track record of all modelling approaches applied up to that stage. Issues associated with different persons participating in consecutive meetings, such as input previously given being challenged and explanations to be repeated, are identified as tensions which are addressed through the SOMM in the NPO.

The application of a paradox mindset to ADR furthermore involves a carefully planned research procedure, but it is flexible to allow for a more complex coherence to emerge by engaging with conflict and complexity through diverse modelling approaches over a prolonged engagement. The procedure is anchored in the current reality of the NPO, yet a SOMM is developed for an ideal future. Throughout the extended engagement, care is taken to reflect on the impact of the researcher's perspective on the development of a SOMM in the NPO as set out in §7.2.1 (525). This includes implications of the location of the researcher as that of insider due to the long engagement (§7.2.2) (526).

7.5.7 Authentic and concurrent evaluation

A principle of authentic and concurrent evaluation entails that evaluation is not a separate stage of the research process only after building a tool (53). This study enhances authentic and concurrent evaluation in terms of a logical hierarchy to achieve effectiveness through content validation, construct validation, and utility. Ecological validation also is required for the generalisation of the problem instance to a class of research problems. While a summative evaluation determines the utility, effectiveness and ecological validation of the final tool, formative evaluations contribute to the refinement of the tool. Reference is made to validation rather than validity to express the

dialogical process of ADR and a design theory in terms of heuristic principles according to a design mode of research (165). Since efficacy refers to the capability for effectiveness, formative criteria include efficacy to lead to effectiveness. All other validations rely on addressing the reflexivity of the researcher.

Authentic and concurrent evaluation is furthermore enhanced through this study by explicitly establishing criteria at the start of the BIE phase to evaluate the effectiveness of the tool as an indication of when the tool is sufficiently refined, or whether another BIE cycle is required. To develop a SOMM in an NPO, these effectiveness criteria involve the self-defined needs of the NPO as they emerge during the contextualisation. Since sustainability cannot be measured conclusively in the limited time period allowed for the study, an experiential basis is provided for the NPO and other researchers to explore ultimate indicators in future.

The design principle of authentic and concurrent evaluation is coherent with an ADR paradigm of critical theory and pragmatism and the dialogical approach of ADR.

7.5.8 Guided emergence

A principle of guided emergence emphasises that the tool does not only reflect the preliminary theory-ingrained design created by the researcher, but also its reciprocal shaping between the tool and the organisational context, mutual influences of different research participants, and outcomes of authentic and concurrent evaluation (53). Furthermore, inseparable influences are mutually exerted by the organisation and the societal context and the design theory emerge through the development of the tool, so that the principle of guided emergence encompasses all the design principles of the research process as discussed. The researcher and the NPO co-project their ideas and requirements to modify the SOMM, not due to discrepancies with reality as in a science research mode, but due to needs that are not addressed and needs that evolve through the development of the SOMM and from discussions (245).

7.6 CHAPTER REFLECTION

The reflexivity of the researcher supports all other validations of the study. In this study, the research agreement lays a foundation to address the researcher's impact on the study and the interpretive framework explicates the perspective of the researcher. The location of the researcher in the study is mostly different from the NPO, engaged, neutral, and that of an insider, which is an indication of capacity building of the NPO. The utility of the SOMM in the NPO is strengthened through explanations with reference to an NPO context, and through adjustments of the SOMM by the NPO. The research project satisfies the expectations of the NPO in terms of the research agreement and the SOMM is effective in providing guidance to address their self-defined needs.

Careful facilitation and collaboration are important to develop the SOMM and support and maintenance continue beyond the completion of the research project.

This study establishes design principles for the class of SOMMs in NPOs with reference to the strategic selection of the case study which represents a typical case and also an extreme case of a current South African NPO. An interpretive framework furthermore is established and further developed through the study to provide trackability and virtual replicability in terms of the research procedure and the interpretation of research results. A comprehensive design ecology is developed to consider the role of specific organisational characteristics when the SOMM is applied in other NPOs. Effectiveness criteria in terms of the self-defined needs of the NPO serve as a basis for other NPOs to identify their unique needs. An implied ill-defined problem is addressed through the SOMM by instilling commitment to multiple, competing strategies through paradox. NPOs become more fluid and enhance their reflexive self-regulation to satisfy their needs and identify other needs, build resilience over the long term, and become more sustainable.

Design principles for a research procedure in general entail a definition of an OM model as a meta-theoretical framework to develop understanding, facilitate communication, propose improvements and surface underlying assumptions in the management of resources, and the processes involved to convert the resources into required products and services and to deliver them to the customers. Furthermore, the procedure starts from the current reality of the NPO. A SOMM in an NPO is developed from an integrated organisational perspective and SOM in NPOs is regarded as an organised complex problem. Lastly, an enriched understanding of SOM in NPOs is provided through discordant pluralism where different approaches are supplemented and challenged with one another without fusing them into a single algorithm.

Design principles to execute an ADR project in general evolve from the initial principles proposed by Sein et al (53). The initial principles that research is inspired by practice and that tools are theory ingrained, supplement one another through this study to develop a design principle of reciprocally shaping practice and theory. The study applies the initial principle of reciprocally shaping the tool and organisation to address ill-defined problems. Furthermore, the initial principle of reciprocally shaping the tool and organisation is supplemented through this study with a principle of reciprocally shaping the organisation and society and a principle of the cultural-historical situatedness of the tool and the organisation. The study enhances the initial principle of mutual influences of research participants through the application of a paradox mindset. The initial principle of authentic and concurrent evaluation is enhanced by a logical hierarchy of validation to achieve effectiveness, and by explicitly establishing effectiveness criteria at the start of the BIE phase. The initial principle of guided emergence is maintained through the study. This study bases all design principles on the research philosophy of an ADR approach.

CHAPTER 8 CONCLUSION

8.1 INTRODUCTION

The study addresses the sustainability of a non-profit organisation (NPO) in the South African education and research sector. Previously they had significant impact, but became under severe stress especially during the pandemic caused by the Coronavirus disease of 2019 (COVID-19). Although the NPO can improve their sustainability through operations management (OM), the implementation of sustainable operations management (SOM) requires further investigation. They can apply various models to improve the implementation of sustainable operations management, but a gap remains to develop such models. This problem is addressed by posing the following primary research question:

“What is an appropriate sustainable operations management model in an NPO in the South African education and research sector?”

Since the sustainability of NPOs in general is at risk, the above problem is an instance of a class of problems for NPOs in general to find appropriate OM models to become more sustainable. To address the class of problems, the following research question is posed:

“What are appropriate sustainable operations management models in NPOs?”

To address the research questions, an action design research (ADR) approach is followed as shown in Figure 8-1 and further explained in the exposition of the research methodology (Chapter 3). This chapter concludes the formalisation phase and the research project by describing contributions to theory which is applied to create a sustainable operations management model (SOMM) in an NPO (§8.2), future research (§8.3), and the dissemination of research results (§8.4). Contributions of the study are listed at the end of the chapter in Table 8-1.

8.2 CONTRIBUTIONS TO APPLIED THEORY

8.2.1 Sustainable operations management

The study contributes to theory on SOM in NPOs through key focus areas indicated in the final interpretive framework (Chapter 7). These focus areas are identified through content analysis of literature on OM, SOM, OM in NPOs, and SOM in NPOs, and tested and supplemented in practice through their application to contextualise the SOMM and subsequent BIE cycles.

A theoretical contribution is made to SOM in general by considering SOM in an NPO as an extreme information-orientated instance of organisations in general. They have namely various, complex and often conflicting objectives, complex operations performance evaluation, complex nature of their products and services, an uncertain environment, cooperation with multiple

stakeholders including government, business and society. A reflection on histories of OM, sustainability, SOM, and NPOs (Chapter 6) emphasises the relevance of this contribution with reference to the increasing number of hybrid organisations who reduce shareholder and donor ownership (19). Emerging organisational models and the fourth industrial revolution reciprocally shape each other (527). As SOM becomes even more complex in hybrid organisations (20) and in the fourth industrial revolution (528), the SOMM developed in this study contributes towards the development of understanding, facilitation of communication, proposals of improvements and surfacing of underlying assumptions.

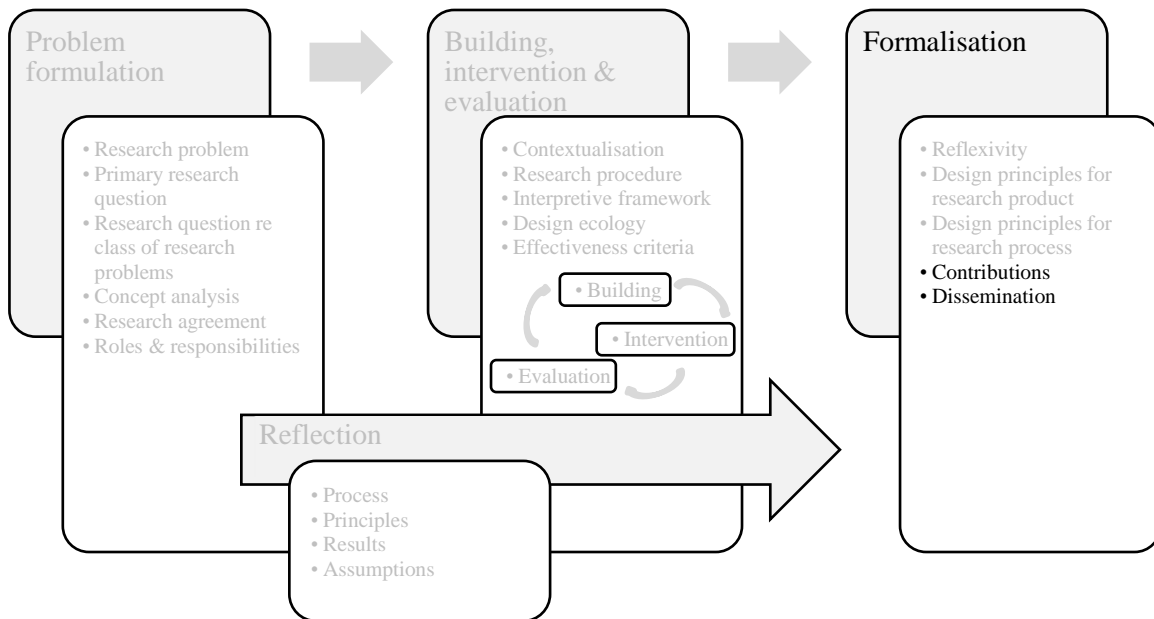


Figure 8-1 Chapter 8 in context of the research design

8.2.2 Operations management modelling

The study contributes to the theory of OM modelling through the development of a research procedure to develop SOMMs in NPOs as discussed in the formalisation phase (Chapter 7). The applied definition of an OM model holds for OM modelling in general. With reference to organisational development (529) and strategy development (387) in general, OM modelling must start from an evaluation of the current situation of the organisation. Discordant pluralism also is relevant with reference to many different OM modelling approaches available in literature. By considering a SOMM in an NPO as an extreme information-orientated instance of OM modelling in general, an integrated organisational perspective is appropriate and OM can be regarded as an organised complex problem.

In OM modelling, the organisation must have the capability, capacity and motivation to use the developed model (344). Transparency therefore is important for those involved in the management of resources, and relevant processes to convert the resources into required products and services and to deliver them to the customers. The organisation must be able to apply the model in everyday

practice without a dependency on external experts, which requires careful facilitation and collaboration and possibly an extended time period. Patterns of thinking must be gently disrupted to instil innovative critical thinking, instead of providing a once-off general OM model. Explanations relevant to the organisational context are useful, and also opportunities to implement modelling approaches, different approaches to address different situations, diagrammatic representations of the complex and high volume of information of modelling approaches, condensed explanations, and typical questions addressed by modelling approaches. Systems diagrams can be utilised as diagrammatic representations to indicate organising processes with reference to a Heraclitian view (351) of an organisation. Furthermore, the model must be efficiently delivered, supported and maintained over a longer time period.

8.2.3 Sustainability

The study contributes to a transformative research agenda of sustainability science in a design research mode (61). Development refers to the process of growing or changing into a more advanced form (530). It is therefore associated with a design mode of research which involves planning of action to create objects of value that do not exist yet or to change existing situations into situations of preferred value (54, 69, 515). Although different theories of development can be distinguished (531, 532), this study refers to development in terms of sustainability (376). As required by the transformative research agenda of sustainability science, the study is empirical, pragmatic, normative, contextual, discordant pluralist, robust and reflexive, and focuses on the design of a model to better understand the sustainability of an NPO and to discuss it with stakeholders. In the process, more desirable futures are created and pursued, sustainability values are mapped and deliberated, desirable social, political, institutional and technological change is explored and fostered, and social learning is enabled for sustainable development.

By addressing the sustainability of NPOs, the study contributes to the sustainability of society. NPOs namely advocate for organisations to operate more sustainable (6, 7) and improve the sustainability of society by supporting, for example, education, health and social services (6, 8-13).

An understanding of the role of values in sustainability is necessary to evaluate sustainability goals. This study evaluates the sustainability of the participating NPO by adapting the civil society organisation sustainability index (CSOSI) (18). The CIVICUS indices and the South African enabling environment national assessment (EENA) supplement the evaluation to indicate possible future adaptations of a sustainability evaluation. This involves a values-related dimension which is important to indicate the value focus of NPOs (19, 40) and of SOM (97, 100). Furthermore, the SOMM developed in the study indicates that power relations in the NPO are addressed through governance, leadership and organisational culture. Since the sustainability evaluation only includes implicit governance as part of organisational capacity, these dimensions also should be added. This

study also indicates that comparisons among different NPOs must consider which NPOs participate in the sustainability evaluations, whether evaluations pertain to the same registered NPO sector, and the focus of participating NPOs.

The worldview associated with sustainability involves an ecological worldview (111, 292-295). This involves concepts of wholeness, relationships and change (533). The definition of sustainability in this study therefore holds that the sustainability of an organisation is more enhanced or more impeded through a continuous dynamic interplay between the application and effect of their integrated human, natural, physical, financial and social capital, and the development of resilience over the long term for the organisation to maintain their ethos and interactions with their transactional environment through reflexive self-regulation. SOM is modelled as an organised complex problem which is not addressed through standard procedures or statistical analysis, but through participative research involving a content-rich SOMM that is descriptive, explanatory and non-prescriptive (153-155). The SOMM is designed to develop understanding, facilitate communication, propose improvements and surface underlying assumptions. This study therefore emphasises that enhanced sustainability does not imply predictability or a homeostatic balance to be achieved and maintained, but continuous tensions that must be creatively addressed.

8.3 FUTURE RESEARCH

It is important to apply the SOMM in other South African NPOs with reference to the information-orientated sample in this study. Other NPOs may also be considered with reference to the interpretive framework and design ecology. This will enhance the SOMM but also enrich an understanding of the sustainability of NPOs. Cognisance must be taken of the extensive process needed to build rapport with an NPO to conduct a research project, and also of the complex reality of NPOs which poses a challenge for the completion of a research project within a limited timeframe. Bhattacharjya and Venable (66) propose to demonstrate to NPOs the usefulness of their input and to build trust in the researcher's ability to lead the study in the right direction.

The self-defined needs of NPOs must be further investigated to supplement the needs that emerged through this study. This will also enrich an understanding of the sustainability of NPOs.

A future research opportunity in terms of sustainability concerns a design mode of research which is associated with development. This study refers to development in terms of sustainability, but different theories of development can be distinguished. One such theory concerns the concept of *buen vivir* which connects with the purpose of design to help create an unknown future grounded in history and nurtured by humanity living with care (516, 532).

Another future research opportunity in terms of sustainability entails the experience of the NPO of the sustainability evaluation as a performance evaluation compared to the NPO sector. This can be addressed in future through an appreciative inquiry approach (534) or an asset-based community development approach (535). Many other sustainability evaluation tools also could be applied, including tools specifically developed for NPOs, but the focus must remain on the development of a culture of evaluation and learning over time involving stakeholder groups (111, 127).

The SOMM can be supplemented and challenged by other modelling approaches to further enrich an understanding of the sustainability of NPOs. Such approaches may include systems thinking approaches including those considered in this study but not applied, for example, critical systems heuristics, systems thinking approaches not included in the literature review such as interactive planning, strategic assumption surfacing and testing and many others, and also many other approaches. Clear motivations however must be provided for the selection of specific approaches to supplement the SOMM.

While a SOMM is contextualised with reference to the participating NPO through key focus areas of SOM in NPOs identified in literature, these focus areas must be further investigated. The study, for example, only considers literature available in English. Data gathering and the rationale for categories are described in detail which provides for replicability, reliability and validation through transparency and rigour. Furthermore, the key focus areas are tested in practice through their application to contextualise the SOMM and subsequent BIE cycles. In the process, additional focus areas are identified namely the growth phase of NPOs and also the worldview of NPOs and their stakeholders. Since worldviews are described at a specific point in time during the study although they continuously evolve (287-289, 472:10-11, 473), and worldviews and organisational growth phases reciprocally shape each other (474), these additional focus areas also warrant further research.

Instead of utilising key focus areas of SOM in NPOs identified through literature to contextualise a SOMM in an NPO, a BES perspective could be applied. An asset-based community development approach also could be applied. Alternatively, an appreciative inquiry can be conducted in terms of the key focus areas of SOM in NPOs, or in terms of a BES perspective. A rich picture from SSM also may be applied to contextualise a SOMM in an NPO. In addition, summative content analysis and axial coding can be applied to support any of these approaches. Nonetheless, it is proposed to combine any alternative approach with artefact analysis to surface detail which may not be highlighted otherwise, and to be more time-efficient.

The research procedure to develop the SOMM can also be supplemented and challenged especially regarding stated principles. However, care must be taken not to claim holism where the whole big

picture is considered and also not to claim pluralism where all perspectives are equitably represented.

The quantitative SD simulation model can be improved through a quantitative model to determine the probability that a donor will fund a project.

The less technologically-orientated ADR approach as summarised in Chapter 6 can be further enhanced through application not only in the fields of SOM, an OM model, sustainability, and an NPO but also in other contexts, especially to address organised complex problems. The design principles as discussed in Chapter 7 can be tested and supplemented through such applications. It will be interesting to track the development of ADR through current developments in industrial design and engineering in terms of the internet of things, for example, digital twinning, computer simulations, advanced computing, and artificial intelligence where the need for prototypes may become obsolete (536).

8.4 DISSEMINATION

To confirm a theoretical contribution, the newly developed theory is disseminated through presentation and publication (53, 167). An article is submitted for possible publication on the design theory for an ADR project in general, and also on the design theory for the class of SOMMs in NPOs. A presentation is made at an international conference on the design theory for a research procedure in general.

Table 8-1 List of contributions

Research problem	Contribution	Reference
AN NPO in the South African education and research sector needs an appropriate OM model to become more sustainable	Perspective of the researcher	§7.2.1
	Location of the researcher	§7.2.2
	Utility of a SOMM in an NPO	§7.2.3
	Effectiveness of a SOMM in an NPO	§7.2.4
NPOs in general need appropriate OM models to become more sustainable	Class of SOMMS in NPOs	§6.5.4, §7.3
	Research procedure	§6.4.2, §7.4
A less technologically orientated ADR approach	ADR project in general	§6.5.2, §7.5
Refinement of theories applied to create a SOMM in an NPO	Sustainable operations management	§8.2.1
	Operations management modelling	§8.2.2
	Sustainability	§8.2.3

REFERENCES

1. World Commission on Environment and Development [WCED]. Our common future (the Brundtland report). Oxford: United Nations; 1987. 374 p. Report No.: A/42/427.
2. Linton JD, Klassen R, Jayaraman V. Sustainable supply chains: an introduction. *J Oper Manag.* 2007; 25(6):1075-82.
3. Wong-Mingji DJ. Globalization. In: Helms MM, editor. *Encyclopedia of management*. 5th ed. Detroit (MI): Thomson Gale; 2006. p. 325-30.
4. Heizer J, Render B, Munson C. *Operations management: sustainability and supply chain management*. 12th ed. Harlow: Pearson Education; 2016.
5. Walker H, Seuring S, Sarkis J, Klassen R. Sustainable operations management: recent trends and future directions. *Int J Oper Prod Manag.* 2014; 34(5).
6. Anheier HK. Civil society challenged: towards an enabling policy environment. *Economics.* 2017; 11(1):2017-29.
7. Salamon LM, Anheier HK. Civil society in comparative perspective. In: Salamon LM, Anheier HK, List R, Toepler S, Sokolowski SW, editors. *Global civil society: dimensions of the nonprofit sector*. Baltimore (MD): Johns Hopkins Center for Civil Society Studies; 1999. p. 3-40.
8. Miller C [Internet]. The four horsemen of the nonprofit financial apocalypse. *Nonprofit Information Networking Association*; [updated 2010 March 21; cited 2020 July 8];17(1). Available from: <https://nonprofitquarterly.org/2010/03/21/the-four-horsemen-of-the-nonprofit-financial-apocalypse/>.
9. Munshi S [Internet]. Covid-19 reminds us to respect, admire, learn from social welfare organisations. *Bizcommunity*; [updated 2020 April 6; cited 2020 July 6]. Available from: <https://www.bizcommunity.com/Article/196/849/202496.html>.
10. Bam A [Internet]. How NPOs can avoid panic, mitigate the impact of Covid-19. *Bizcommunity*; [updated 2020 April 15; cited 2020 July 8]. Available from: <https://www.bizcommunity.com/Article/196/849/202800.html>.
11. Kim SE, Kim YH. Democracy and nonprofit growth: a cross-national panel study. *Nonprof Volunt Sec Q.* 2018; 47(4):702-22.
12. Indiana University Lilly Family School of Philanthropy. *The global philanthropy environment index*. Indianapolis (IN): Indiana University Lilly Family School of Philanthropy; 2018. 81 p.
13. Casey J. Comparing nonprofit sectors around the world. *J Nonprofit Educ Leadersh.* 2016; 6(3):187-223.
14. Kim M, Mason DP. Are you ready: financial management, operating reserves, and the immediate impact of COVID-19 on nonprofits. *Nonprof Volunt Sec Q.* 2020; 49(6):1-19.
15. Ozili P, Arun T. Spillover of COVID-19: impact on the global economy. In: Akkucuk U, editor. *Managing inflation and supply chain disruptions in the global economy*. Hershey (PA): IGI Global; 2022. p. 41-61.
16. Chalise N, Davis DP, Grover M, Kaufmann D, De Nie KL. *Perspectives from Main Street: the impact of COVID-19 on low- to moderate-income communities and the entities serving them*. Washington (DC): Federal Reserve System; 2020 August. 5 p.

REFERENCES

17. Abrahams H. The impact of COVID-19 on non-profit organisations: findings from a snap survey of non-profit organisations undertaken in May–June 2020. Parktown: Tshikululu; 2020. 37 p.
18. United States Agency for International Development [USAID]. 2017 civil society organization sustainability index for sub-Saharan Africa. Washington (DC): United States Agency for International Development; 2018. 288 p.
19. Malhotra A. Three schools of nonprofit thought: evolution of the field and implications for leadership. In: Wiltshire K, Malhotra A, Axelsen M, editors. Transformational leadership and not for profits and social enterprises. Routledge studies in the management of voluntary and non-profit organizations. New York (NY): Routledge; 2018. p. 33-51.
20. Anheier HK. Nonprofit organizations: theory, management, policy. London: Routledge; 2005.
21. Van der Merwe M [Internet]. 'Shuttered and hopeless': help is available to small businesses, but many don't know about it. News24; [updated 2020 April 12; cited 2020 July 6]. Available from: <https://www.news24.com/fin24/shuttered-and-hopeless-help-is-available-to-small-businesses-but-many-dont-know-about-it-20200412>.
22. Cotterill J [Internet]. South Africa's economy suffers worst quarterly slide in decades. Financial Times; [updated 2020 September 8; cited 2021 January 20]. Available from: <https://www.ft.com/content/fe84438b-acf3-4adc-b1f7-73884b89f424>.
23. Statistics South Africa [Internet]. Steep slump in GDP as COVID-19 takes its toll on the economy. Statistics South Africa; [updated 2020 September 8; cited 2021 January 20]. Available from: http://www.statssa.gov.za/?p=13601&gclid=CjwKCAiAxp-ABhALEiwAXm6Iycs-IVN5Nn1XQV96DIMrFwSIRSzqWKtSL80QHDqwdyuFIgDgnYKnChoC8BUQAvD_BwE.
24. Drake DF, Spinler S. OM forum - sustainable operations management: an enduring stream or a passing fancy. *Manuf Serv Oper Manag*. 2013; 15(4):689-700.
25. Slack N, Brandon-Jones A, Johnston R, Singh H, Phihlela K. Operations management: global and Southern African perspectives. 3rd ed. Johannesburg: Pearson Education; 2017.
26. Ruedig J, Baldwin Metzger A. Managing organizational sustainability: the business case for sustainability professionals in the workplace. Washington (DC): United States Green Building Council; 2013. 20 p.
27. Álvarez-González LI, García-Rodríguez N, Rey-García M, Sanzo-Perez MJ. Business-nonprofit partnerships as a driver of internal marketing in nonprofit organizations. Consequences for nonprofit performance and moderators. *Bus Res Q*. 2017; 20(2):112-23.
28. Presoto A, Mantovani Fontana I, Souza R. Organization management in nonprofit organizations. Paper presented at the Production and Operations Management Society 25th Annual Conference; 2014 May 9-12; Atlanta (GA): United States.
29. Medina-Borja A, Triantis K. Modeling social services performance: a four-stage DEA approach to evaluate fundraising efficiency, capacity building, service quality, and effectiveness in the nonprofit sector. *Ann Oper Res*. 2014; 221(1):285-307.
30. Akingbola K. Contingency, fit and flexibility of HRM in nonprofit organizations. *Employee Relat*. 2013; 35(5):479-94.

REFERENCES

31. Lin-Hi N, Hörisch J, Blumberg I. Does CSR matter for nonprofit organizations? Testing the link between CSR performance and trustworthiness in the nonprofit versus for-profit domain. *Voluntas*. 2015; 26(5):1944-74.
32. Wicker P, Breuer C. Understanding the importance of organizational resources to explain organizational problems: evidence from nonprofit sport clubs in Germany. *Voluntas*. 2013; 24(2):461-84.
33. Davis MM, Heineke JN. *Operations management: integrating manufacturing and services*. 5th ed. Boston (MA): McGraw-Hill/Irwin; 2005.
34. Kleindorfer PR, Singhal K, Van Wassenhove LN. Sustainable operations management. *Prod Oper Manag*. 2005; 14(4):482-92.
35. Andersen PH. Sustainable operations management (SOM) strategy and management: an introduction to part I. In: De Boer L, Andersen PH, editors. *Operations management and sustainability: new research perspectives*. Cham: Palgrave Macmillan; 2019. p. 15-25.
36. Atasu A, Corbett CJ, Huang XN, Toktay LB. Sustainable operations management through the perspective of Manufacturing & Service Operations Management. *Manuf Serv Oper Manag*. 2020; 22(1):146-57.
37. Lee HL, Tang CS. Socially and environmentally responsible value chain innovations: new operations management research opportunities. *Manage Sci*. 2018; 64(3):983-96.
38. McDonald RE, Weerawardena J, Madhavaram S, Sullivan Mort G. From “virtuous” to “pragmatic” pursuit of social mission: a sustainability-based typology of nonprofit organizations and corresponding strategies. *Manag Res Rev*. 2015; 38(9):970-91.
39. Omura T, Forster J. Competition for donations and the sustainability of not-for-profit organisations. *Humanomics*. 2014; 30(3):255-74.
40. Feng Q, Shanthikumar JG. Not-for-profit operations management. In: Starr MK, Gupta SK, editors. *The Routledge companion to production and operations management*. 1st ed. New York (NY): Routledge; 2017. p. 510-26.
41. Forsund FR. *Measuring efficiency and effectiveness in the public sector*. Working paper. Oslo: University of Oslo, Economics Do; 2013. 36 p. Report No.: 16/2013.
42. Ulrich W, Reynolds M. Critical systems heuristics. In: Reynolds M, Holwell S, editors. *Systems approaches to managing change: a practical guide*. London: Springer; 2010. p. 243–92.
43. Harwood SA. A question of interpretation: the viable system model (VSM). *Eur J Oper Res*. 2019; 274:1198-201.
44. Frigg R, Hartmann S. Models in Science. In: Zalta EN, editor. *The Stanford encyclopedia of philosophy* [Internet]. Spring 2020. Stanford (CA): Metaphysics Research Lab, Stanford University. 2020 [cited 2020 July 6]. Available from: <https://plato.stanford.edu/archives/spr2020/entries/models-science/>.
45. Berenguer G, Shen Z-JM. Challenges and strategies in managing nonprofit operations: an operations management perspective. *Manuf Serv Oper Manag*. 2020; 22(5):888–905.
46. Weerawardena J, McDonald RE, Sullivan-Mort G. Sustainability of nonprofit organizations: an empirical investigation. *J World Bus*. 2010; 45:346-56.

REFERENCES

47. Weerawardena J, Sullivan-Mort G. Learning, innovation and competitive advantage in not-for-profit aged care marketing: a conceptual model and research propositions. *J Nonprofit Public Sect Mark.* 2001; 9(3):53-73.
48. Wyngaard R, Hendricks P. Governance practices of national non-profit bodies and national networking organisations in South Africa. Cape Town: Inyathelo; 2010. 137 p.
49. Ülkü MA, Bell KM, Gray Wilson S. Modeling the impact of donor behavior on humanitarian aid operations. *Ann Oper Res.* 2015; 230(1):153-68.
50. Barra C, Pressgrove G, Torres E. Trust and commitment in the formation of donor loyalty. *Serv Ind J.* 2018; 38(5-6):360-77.
51. Pomerantz ML. Evolutionary social entrepreneurship. Paper presented at the Annual Conference of the United States Association for Small Business and Entrepreneurship; 2019 January 23-27; St Pete Beach (FL): United States.
52. Petersen CG, Aase GR, Heiser DR. Journal ranking analyses of operations management research. *Int J Oper Prod Manag.* 2011; 31(4):405-22.
53. Sein MK, Henfridsson O, Purao S, Rossi M, Lindgren R. Action design research. *MIS Q.* 2011; 35(1):37-56.
54. Banathy BH. Designing social systems in a changing world. New York (NY): Springer Science + Business Media; 1996.
55. Romme AGL. Action research, emancipation and design thinking. *J Community Appl Soc Psychol.* 2004; 14(6):495–9.
56. Bang AL, Krogh PG, Ludvigsen M, Markussen T. The role of hypothesis in constructive design research. Paper presented at the Art of Research IV; 2012 November 28-29; Helsinki: Finland.
57. Collatto DC, Dresch A, Lacerda DP, Bentz IG. Is action design research indeed necessary? Analysis and synergies between action research and design science research. *Syst Pract Act Res.* 2018; 31(3):239–67.
58. Kemmis S. Action research as a practice-based practice. *Educ Action Res.* 2009; 17(3):463-74.
59. Dresch A, Lacerda DP, Miguel PAC. A distinctive analysis of case study, action research and design science research. *Rev Bus Manag.* 2015; 17(56):1116-33.
60. Gill AQ, Chew E. Configuration information system architecture: insights from applied action design research. *Inf Manage.* 2019; 56(4):507-25.
61. Miller TR. Constructing sustainability: a study of emerging scientific research trajectories [dissertation]. Tempe (AZ): Arizona State University; 2011.
62. Maher R, Maher M, Mann S, McAlpine CA. Integrating design thinking with sustainability science: a research through design approach. *Sustain Sci.* 2018; 13(6):1565–87.
63. Haj-Bolouri A, Purao S, Rossi M, Bernhardsson L. Action design research in practice: lessons and concerns. Paper presented at the European Conference on Information Systems; 2018 June 23-28; Portsmouth: United Kingdom.

REFERENCES

64. Mackrell D, McDonald C. Action design research: a case study of business intelligence in non-profit organizations. In: Phillips-Wren G, Carlsson S, Respício A, Brézillon P, editors. *DSS 20 – supporting decision making with new technologies*. Amsterdam: IOS Press; 2014. p. 291-302.
65. Flyvbjerg B. Five misunderstandings about case-study research. *Qual Inq*. 2006; 12(2):219-45.
66. Bhattacharjya J, Venable JR. Adapting soft systems methodology for strategic information systems planning: an action research study in a non-profit organisation in Australia. Paper presented at the 17th Australasian Conference on Information Systems; 2006 December 6-8; Adelaide: Australia.
67. Kistner W. *Logika: studiegids 1 vir LOG202-6 (wysbegeerte van die geesteswetenskappe)*. Pretoria: University of South Africa; 1993.
68. Bannan B. The integrative learning design framework: an illustrated example from the domain of instructional technology. In: Plomp T, Nieveen N, editors. *Educational design research: an introduction*. A. Enschede: Netherlands Institute for Curriculum Development; 2013. p. 114-33.
69. Menon G. Design research model: establishing a link between design education, practice and theory. Paper presented at the ICoRD'15 – research into design across boundaries: Theory, research methodology, aesthetics, human factors and education; 2017 January 7-9; New Delhi: India.
70. Wild R. Decision-making in operations management. *Manag Decis*. 1983; 21(1):9-21.
71. Schonberger RJ, Knod EM, Jr. *Operations management: serving the customer*. 3rd ed. Plano (TX): Business Publications; 1988.
72. Galloway L, Rowbotham F, Azhashemi M. *Operations management in context*. Oxford: Butterworth-Heinemann; 2012.
73. Stevenson WJ. *Operations management*. 11th ed. New York (NY): McGraw-Hill/Irwin; 2012.
74. Russell RS, Taylor BW, 3rd. *Operations and supply chain management*. 8th ed. Hoboken (NJ): John Wiley & Sons; 2014.
75. Krajewski LJ, Malhotra MK, Ritzman LP. *Operations management: processes and supply chains*. 11th ed. Harlow: Pearson Education; 2016.
76. Jacobs FR, Chase RB. *Operations and supply chain management*. 15th ed. New York (NY): McGraw Hill; 2018.
77. Slack N, Lewis M, Bates H. The two worlds of operations management research and practice: can they meet, should they meet? *Int J Oper Prod Manag*. 2004; 24(4):372-87.
78. Piercy N. The role of history in operations management. *Bus Hist*. 2012; 54(2):154-78.
79. Voss CA. Learning from the first operations management textbook. *J Oper Manag*. 2007; 25(2):239-47.
80. Inman RA. *Operations management*. In: Helms MM, editor. *Encyclopedia of Management*. 5th ed. Detroit (MI): Thomson Gale; 2006. p. 602-3.
81. Singhal K, Singhal J, Starr MK. The domain of production and operations management and the role of Elwood Buffa in its delineation. *J Oper Manag*. 2007; 25(2):310-27.

REFERENCES

82. Deming WE. The new economics for industry, government, education. 3rd ed. Cambridge (MA): MIT Press; 2018.
83. Feigenbaum AV. Total quality control. 3rd ed. New York (NY): McGraw Hill; 1983.
84. Crosby PB. Quality without tears - the art of hassle-free management. New York (NY): McGraw Hill; 1984.
85. Juran JM. The quality trilogy: a universal approach to managing for quality. Paper presented at the American Society for Quality Control (ASQC) 40th Annual Quality Congress; 1986 May 20; Anaheim (CA): United States.
86. Fonseca LM. From quality gurus and TQM to ISO 9001:2015: a review of several quality paths. *Int J Qual Res.* 2015; 9(1):167-80.
87. Deming WE. Out of the crisis: quality, productivity and competitive position. Cambridge: Cambridge University Press; 1986.
88. Bloem J, Van Doorn M, Duivesteyn S, Excoffier D, Maas R, Van Ommeren E. The fourth industrial revolution: things to tighten the link between IT and OT. Groningen: Sogeti; 2014. 39 p.
89. Shrouf F, Ordieres J, Miragliotta G. Smart factories in Industry 4.0: a review of the concept and of energy management approached in production based on the internet of things paradigm. Paper presented at the IEEE International Conference on Industrial Engineering and Engineering Management 2014 December 9-12; Selangor: Malaysia.
90. Erol S, Schumacher A, Sihn W. Strategic guidance towards Industry 4.0 – a three-stage process model. Paper presented at the International Conference on Competitive Manufacturing; 2016 January 27-29; Stellenbosch: South Africa.
91. Barrett R. Liberating the corporate soul: building a visionary organization. Boston (MA): Butterworth-Heinemann; 1998.
92. Sanders CE. Lawrence Kohlberg's stages of moral development. *Encyclopaedia Britannica* [Internet]. Chicago (IL): Britannica Group. 2020 [cited 2020 September 7]. Available from: <https://www.britannica.com/science/Lawrence-Kohlbergs-stages-of-moral-development>.
93. Maslow AH. Motivation and personality. 2nd ed. New York (NY): Harper & Row; 1970.
94. Loevinger J. Recent research on ego development. Bethesda (MD): National Institute of Mental Health; 1973 31 March. 17 p. Report No.: ED 078 066 TM 002 885.
95. Covey SR, Merrill AR, Merrill RR. First things first: to live, to love, to learn, to leave a legacy. London: Simon & Schuster; 1994.
96. Corbett CJ, Klassen RD. Extending the horizons: environmental excellence as key to improving operations. *Manuf Serv Oper Manag.* 2006; 8(1):5–22.
97. Angell LC, Klassen RD. Integrating environmental issues into the mainstream: an agenda for research in operations management. *J Oper Manag.* 1999; 17(5):575–98.
98. Goudzwaard B, Bartholomew CG. Beyond the modern age: an archaeology of contemporary culture. Downers Grove (IL): InterVarsity Press; 2017.
99. Dyllick T, Muff K. Clarifying the meaning of sustainable business: introducing a typology from business-as-usual to true business sustainability. *Organ Environ.* 2016; 29(2):156–74.

REFERENCES

100. Elkington J. Enter the triple bottom line. In: Henriques A, Richardson J, editors. *The triple bottom line: does it all add up?* London: Earthscan; 2004. p. 1-16.
101. Porter ME, Kramer MR. Creating shared value: how to reinvent capitalism - and unleash a wave of innovation and growth. *Harvard Business Review*. 2011 January-February; 89(1/2):62-77.
102. Emerson J. The blended value proposition: integrating social and financial returns. *Calif Manage Rev*. 2003; 45(4):35-51.
103. Sargeant A, Foreman S, Liao M-N. Operationalizing the marketing concept in the nonprofit sector. *J Nonprofit Public Sect Mark*. 2002; 10(2):41-65.
104. Grober U. Deep roots: a conceptual history of 'sustainable development' (Nachhaltigkeit). WZB Discussion Paper. Berlin: Wissenschaftszentrum Berlin für Sozialforschung; 2007. 33 p. Report No.: P 2007-002.
105. Meadows DH, Meadows DL, Randers J, Behrens WW, 3rd. *The limits to growth*. New York (NY): Universe Books; 1972.
106. Seers D. *The meaning of development*. Brighton: Institute of Development Studies; 1969. 26 p. Report No.: 44.
107. Hardin G. The tragedy of the commons. *Science*. 1968; 162(3859):1243-8.
108. Ehrlich PR, Ehrlich AH. The population bomb revisited. *J Sustain Dev*. 2009; 1(3):63-71.
109. Carson R. *Silent spring*. London: Hamish Hamilton; 1963.
110. Daya. Arthur Lewis looks at economic growth. *Econ Wkly*. 1956; 8(35):1041-3.
111. Adams WM. *Green development: environment and sustainability in a developing world*. 3rd ed. London: Routledge; 2009.
112. Wing JT. Keeping Spain afloat: state forestry and imperial defense in the sixteenth century. *Environ Hist*. 2012; 17(1):116-45.
113. Beaudoin MS. *Lawyers and sawyers: Venetian forest law and the conquest of terraferma (1350–1476) [thesis]*. Boise (ID): Boise State University; 2014.
114. Birrell J. Deer and deer farming in medieval England. *Agric Hist Rev*. 1992; 40(II):112-26.
115. Wilson D. Multi-use management of the medieval Anglo-Norman forest. *J Oxf Univ Hist Soc*. 2004; (2).
116. Paletto A, Sereno C, Furuido H. Historical evolution of forest management in Europe and in Japan. *Bull Tokyo Univ For*. 2008; 119:25-44.
117. Caradonna JL. *Sustainability: a history*. Oxford: Oxford University Press; 2014.
118. Wallace-Hadrill A. Pliny the Elder and man's unnatural history. *Greece Rome*. 1990; 37(1):80-96.
119. Suzman J. *Affluence without abundance: the disappearing world of the Bushmen*. London: Bloomsbury; 2017.
120. De Haan LJ. Globalization, localization and sustainable livelihood. *Sociol Ruralis*. 2000; 40(3):339-65.

REFERENCES

121. Coleman JS. Social capital in the creation of human capital. *Am J Sociol.* 1988; 94:S95-S120.
122. Hamelink CJ. Language and the right to communicate. *Media Dev.* 1999; 46(4):14-7.
123. Arvidsson A. The ethical economy: towards a post-capitalist theory of value. *Cap Cl.* 2009; 33(1):13-29.
124. Redclift M. Sustainable development: needs, values, rights. *Environ Values.* 1993; 2(1):3-20.
125. Roberts Enterprise Development Fund. Social return on investment methodology: analyzing the value of social purpose enterprise within a social return on investment framework. San Francisco (CA): Roberts Enterprise Development Fund; 2001. 92 p.
126. Rajapakshe TK, Vakharia AJ, Wang L, Yenipazarli A. Sustainable operations. In: Starr MK, Gupta SK, editors. *The Routledge companion to production and operations management.* New York (NY): Routledge; 2017. p. 712-.
127. Bonini S, Emerson J [Internet]. Maximizing blended value - building beyond the blended value map to sustainable investing, philanthropy and organizations. [updated 2005 February 25; cited 2020 July 6]. Available from: <https://www.blendedvalue.org/blog-posts/maximizing-blended-value>.
128. Department of Social Development [DSD] [Internet]. Register a nonprofit organisation. [updated c2020; cited 2020 July 27]. Available from: https://www.gov.za/services/register-nonprofit-organisation?gclid=EAIaIQobChMIw-268Xt6gIVT-3tCh3h-wj0EAAYAiAAEgLDzPD_BwE.
129. Nonprofit Organisations Act, 71. Sect. 12 1997.
130. Burger R, Jegers M, Seabe D, Owens T, Vanroose A. NPO accountability in a disconnected and divided South Africa. Stellenbosch: Stellenbosch University, Vrije Universiteit Brussels; 2017. 28 p.
131. Ngandu S, Motala S. Typologies of civil society in South Africa: a critical review and analysis of the characteristics of the non-profit sector: final report. Pretoria: Human Sciences Research Council, Development EPa; 2019 October. 119 p.
132. Anheier HK, Themudo NS. The internationalization of the nonprofit sector. In: Herman RD, editor. *The Jossey-Bass handbook of nonprofit leadership and management.* 2nd ed. San Francisco (CA): Jossey-Bass; 2016. p. 102-27.
133. Repucci S. A users' guide to civil society assessments. Oslo: United Nations Development Programme; 2010. 70 p.
134. Berenguer G, Keskinocak P, Shanthikumar JG, Swaminathan J, Van Wassenhove LN. A prologue to the special issue on not-for-profit operations management. *Prod Oper Manag.* 2017; 26(6):973-5.
135. Barricelli BR, Valtolina S, Gadia D, Marzullo M, Piazza C, Garzulino A. Participatory action design research in archaeological context. Paper presented at the Human Work Interaction Design: Work Analysis and Interaction Design Methods for Pervasive and Smart Workplaces; 2015 June 25-26; Cham: Switzerland.
136. Krippendorff K. Content analysis: an introduction to its methodology. 4th ed. Los Angeles (CA): SAGE Publications; 2018.

REFERENCES

137. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005; 15(9):1277-88.
138. Davies J. Mining for meaning: the use of content analysis in OM research. *POMS Chronicle.* 2008; 15(2):22-4.
139. Randolph J. A guide to writing the dissertation literature review. *Pract Assess Res Evaluation.* 2009; 14.
140. Wohlin C. Guidelines for snowballing in systematic literature studies and a replication in software engineering. Paper presented at the 18th International Conference on Evaluation and Assessment in Software Engineering; 2014 May 13-14; London: New York (NY).
141. ATLAS.ti [Internet]. Manuals and documents. [updated c2022; cited 2022 May 18]. Available from: <https://atlasti.com/manuals-and-documents>.
142. Saldana J. *The coding manual for qualitative researchers.* 2nd ed. Los Angeles (CA): SAGE Publications; 2013.
143. Strang KD. Integrating theory and practice to identify contemporary best practice factors in USA not-for-profits. In: West LL, Worthington A, editors. *Handbook of research on emerging business models and managerial strategies in the nonprofit sector.* *Advances in Public Policy and Administration.* Hershey (PA): IGI Global; 2017. p. 31-55.
144. Royal Academy of Engineering. *Industrial systems: capturing value through manufacturing.* London: Royal Academy of Engineering; 2012. 29 p.
145. Thompson CT. The nonprofit organizational model: a new model for nonprofit organizations. *Organ Dev Pract.* 2011; 43(2):34-9.
146. Morris M, Schindehutte M, Allen J. The entrepreneur's business model: toward a unified perspective. *J Bus Res.* 2005; 58(6):726 – 35.
147. Bocken NMP, Short SW, Rana P, Evans S. A literature and practice review to develop sustainable business model archetypes. *J Clean Prod.* 2014; 65:42-56.
148. Davies IA, Chambers L. Integrating hybridity and business model theory in sustainable entrepreneurship. *J Clean Prod.* 2018; 177:378-86.
149. Jablonski A, Jablonski M. Research on business models in their life cycle. *Sustainability.* 2016; 8(5):430-67.
150. Greiner LE. Evolution and revolution as organizations grow. *Harvard Business Review.* 1998 May-June; 76(3).
151. Maletic M, Maletic D, Gomiscek B. The role of contingency factors on the relationship between sustainability practices and organizational performance. *J Clean Prod.* 2018; 171:423-33.
152. Van Bommel K. Managing tensions in sustainable business models: exploring instrumental and integrative strategies. *J Clean Prod.* 2018; 196:829-41.
153. Midgley G. Systems thinking: an introduction and overview. In: Midgley G, editor. *General systems theory, cybernetics and complexity. Systems thinking. 1.* London: SAGE Publications; 2003. p. xvii-liii.
154. Weaver W. Science and complexity. In: Midgley G, editor. *General systems theory, cybernetics and complexity. Systems thinking. 1.* London: SAGE Publications; 2003. p. 377-85.

REFERENCES

155. Stacey RD, Griffin D, Shaw P. Complexity and management: fad or radical challenge to systems thinking? Stacey RD, Griffin D, Shaw P, editors. London: Routledge; 2000.
156. Flood RL, Carson ER. Dealing with complexity: an introduction to the theory and application of systems science. 2nd ed. New York (NY): Springer Science + Business Media; 1993.
157. Hossain NUI, Dayarathna VL, Nagahi M, Jaradat R. Systems thinking: a review and bibliometric analysis. *Systems*. 2020; 8(3):23-49.
158. Ulrich W. Operational research and critical systems thinking – an integrated perspective. Part 1: OR as applied systems thinking. *J Oper Res Soc*. 2012; 63(9):1228-47.
159. Midgley G. Systems thinking for evaluation. In: Williams B, Imam I, editors. *Systems concepts in evaluation: an expert anthology*. Washington (DC): American Evaluation Association; 2006. p. 11-34.
160. Mingers J, Brocklesby J. Multimethodology: towards a framework for mixing methodologies. In: Midgley G, editor. *Critical systems thinking and systemic perspectives on ethics, power and pluralism*. IV. London: SAGE Publications; 2003. p. 227-53.
161. Jackson MC, Sambo LG. Health systems research and critical systems thinking: the case for partnership. *Syst Res Behav Sci*. 2020; 37(1):3–22.
162. Williams B. Systems thinking and capacity development in the international arena. In: Fujita N, editor. *Beyond logframe; using systems concepts in evaluation. Issues and prospects of evaluations for international development*. Tokyo: Foundation for Advanced Studies on International Development; 2010. p. 35-53.
163. Reynolds M. Bells that still can ring: systems thinking in practice. In: Tait A, Richardson K, editors. *Moving forward with complexity: proceedings of the 1st international workshop on complex systems thinking and real world applications*. Litchfield Park (AZ): Emergent Publications; 2011. p. 327-49.
164. Gravemeijer K, Cobb P. Design research from the learning design perspective. In: Plomp T, Nieveen N, editors. *Educational design research: an introduction*. A. Enschede: Netherlands Institute for Curriculum Development; 2013. p. 72-113.
165. Angen MJ. Pearls, pith, and provocation: evaluating interpretive inquiry: reviewing the validity debate and opening the dialogue. *Qual Health Res*. 2000; 10(3):378-95.
166. McKenney S, Nieveen N, Van den Akker J. Design research from a curriculum perspective. In: Van den Akker J, Gravemeijer K, McKenney S, Nieveen N, editors. *Educational design research*. London: Routledge; 2006. p. 110-43.
167. Plomp T. Educational design research: an introduction. In: Plomp T, Nieveen N, editors. *Educational design research: an introduction*. A. Enschede: Netherlands Institute for Curriculum Development; 2013. p. 10-51.
168. March ST, Smith GF. Design and natural science research on information technology. *Decis Support Syst*. 1995; 15(4):251-66.
169. Winter R. Design science research in Europe. *Eur J Inf Syst*. 2008; 17(5):470–5.
170. Kuutti K. Activity theory as a potential framework for human-computer interaction research. In: Nardi BA, editor. *Context and consciousness: activity theory and human-computer interaction*. Cambridge (MA): MIT Press; 1996. p. 17-44.

REFERENCES

171. Seuring S, Gold S. Conducting content-analysis based literature reviews in supply chain management. *Supply Chain Manag.* 2012; 17(5):544 - 55.
172. Fan Y, Chen J, Shirkey G, John R, Wu SR, Park H, et al. Applications of structural equation modeling (SEM) in ecological studies: an updated review. *Ecol Process.* 2016; 5(19):12.
173. Paraschi EP, Georgopoulos A, Kaldis P. Airport business excellence model: a holistic performance management system. *Tourism Manage.* 2019; 72:352-72.
174. De Giovannia P, Vinzi VE. Covariance versus component-based estimations of performance in green supply chain management. *Int J Prod Econ.* 2012; 135(2):907–16.
175. Gazley B, Nicholson-Crotty J. What drives good governance? A structural equation model of nonprofit board performance. *Nonprof Volunt Sec Q.* 2018; 47(2):262-85.
176. Borgatti SP, Mehra A, Brass DJ, Labianca G. Network analysis in the social sciences. *Science.* 2009; 323(5916):892-5.
177. Kim Y, Choi TY, Yan T, Dooley K. Structural investigation of supply networks: a social network analysis approach. *J Oper Manag.* 2011; 29(3):194-211.
178. Marais MA, Vannini S. Network weaving to foster resilience and sustainability in ICT4D. Paper presented at the 1st Virtual Conference on Implications of Information and Digital Technologies for Development; 2021 May 26-28; Oslo: Norway.
179. Espinosa A, Walker J. Complexity management in practice: a viable system model intervention in an Irish eco-community. *Eur J Oper Res.* 2013; 225(1):118-29.
180. Beer S. The viable system model: its provenance, development, methodology and pathology. *J Oper Res Soc.* 1984; 35(1):7-25.
181. Espinosa A, Porter T. Sustainability, complexity and learning: insights from complex systems approaches. *Learn Organ.* 2011; 18(1):54-72.
182. Tavella E, Papadopoulos T. Applying OR to problem situations within community organisations: a case in a Danish non-profit, member-driven food cooperative. *Eur J Oper Res.* 2016; 258(2):726-42.
183. Walker J. The viable system model: a guide for co-operatives and federations. *Strategic Management in the Social Economy*; 1991. 94 p.
184. Forrester JW. System dynamics, systems thinking, and soft OR. *Syst Dynam Rev.* 1994; 10(2/3):245-56.
185. Sterman J, Oliva R, Linderman KW, Bendoly E. System dynamics perspectives and modeling opportunities for research in operations management. *J Oper Manag.* 2015; 39-40(1):1-5.
186. Singh N. A system dynamics perspective of the non-profit organisation's quest for sustainability: a case study [dissertation]. Durban: University of Kwazulu-Natal; 2015.
187. Senge PM. *The fifth discipline: the art and practice of the learning organization.* New York (NY): Doubleday; 1990.
188. Ellram LM, Tate WL, Carter CR. Product-process-supply chain: an integrative approach to three-dimensional concurrent engineering. *Int J Phys Distrib Logist Manag.* 2007; 37(4):305-30.

REFERENCES

189. Chaffee MW, McNeill MM. A model of nursing as a complex adaptive system. *Nurs Outlook*. 2007; 55(5):232-41.
190. Moeller L, Valentinov V. The commercialization of the nonprofit sector: a general systems theory perspective. *Syst Pract Act Res*. 2012; 25(4):365–70.
191. Checkland P, Poulter J. Soft systems methodology. In: Reynolds M, Holwell S, editors. *Systems approaches to managing change: a practical guide*. London: Open University Press; 2010. p. 191-242.
192. Palmer J, Smith T, Willetts J, Mitchell C. Creativity, ethics and transformation: key factors in a transdisciplinary application of systems methodology to resolving wicked problems in sustainability. In: Sheffield J, editor. *Systemic development: local solutions in a global environment*. Goodyear (AZ): ISCE; 2009. p. 69-78.
193. Checkland P. *Systems thinking, systems practice*. Chichester: John Wiley & Sons; 1999.
194. Schoemaker PJH. Scenario planning: a tool for strategic thinking. *MIT Sloan Manage Rev*. 1995; 36(2):25-40.
195. Clemens R. Environmental scanning and scenario planning: a 12 month perspective on applying the viable systems model to developing public sector foresight. *Syst Pract Act Res*. 2009; 22(4):249–74.
196. Allison M, Kaye J. *Strategic planning for nonprofit organizations: a practical guide for dynamic times*. 3rd ed. Hoboken (NJ): John Wiley & Sons; 2015.
197. Weick KE, Sutcliffe KM, Obstfeld D. Organizing and the process of sensemaking. *Organ Sci*. 2005; 16(4):409-21.
198. Su H-C. The impact of mindful organizing on operational performance: an explorative study. *Oper Manage Res*. 2017; 10(3-4):148-57.
199. Van der Heijden A, Cramer JM, Driessen PPJ. Change agent sensemaking for sustainability in a multinational subsidiary. *J Organ Chang Manag*. 2012; 25(4): 535-59.
200. Gilstrap CA, Gilstrap CM, Holderby KN, Valera KM. Sensegiving, leadership, and nonprofit crises: how nonprofit leaders make and give sense to organizational crisis. *Voluntas*. 2016; 27(6):2787-806.
201. Kurtz CF, Snowden DJ. The new dynamics of strategy: sense-making in a complex and complicated world. *IBM Syst J*. 2003; 42(3):462-83.
202. Shalbfafan S, Leigh E, Pollack J, Sankaran S. Decision-making in project portfolio management: using the Cynefin framework to understand the impact of complexity Paper presented at the International Research Network on Organizing by Projects; 2017 June 11-14; Boston (MA): United States.
203. Spofford T. Dialogic organization development: an approach for nonprofits seeking sustainable community change [seminar paper]. Platteville (WI): University of Wisconsin-Platteville; 2017.
204. Guijt I. Exploding the myth of incompatibility between accountability and learning. In: Ubels J, Acquaye-Baddoo N-A, Fowler A, editors. *Capacity development in practice*. London: Earthscan; 2010. p. 277-91.

REFERENCES

205. Parker SG, Byrne SJ. Functional siloing? towards a practical understanding of operational boundaries using critical systems heuristics. Paper presented at the International Conference on Systems Thinking in Management 2000 November 8-10; Geelong: Australia.
206. Buse C. Intersectoral action for health equity as it relates to climate change in Canada: contributions from critical systems heuristics. *J Eval Clin Pract.* 2013; 19(6):1095–100.
207. Brennan VT. Developing a contingent, adaptive strategy model for nonprofit organisations: a systems approach [thesis]. Perth: Murdoch University; 2001.
208. Dostal E, Cloete A, Jaros GG. *Biomatrix: a systems approach to organisational and societal change.* 3rd ed. Cape Town: Elisabeth Dostal; 2005.
209. Buthelezi PM. An analysis of South Africa public entity performance using biomatrix systems thinking theory: a case of South African water boards [dissertation]. Stellenbosch: Stellenbosch University; 2022.
210. Wigger A. *Managing organizational change: application of the biomatrix theory to the transformation of a non-profit organization.* Berlin: Werkstatt für Organisations- und Personalforschung; 2008. 92 p. Report No.: 17.
211. Smith WK, Lewis MW. Toward a theory of paradox: a dynamic equilibrium model of organizing. *Acad Manage Rev.* 2011; 36(2):381-403.
212. Gowrisankaran G, Town RJ. Dynamic equilibrium in the hospital industry. *J Econ Manag Strategy.* 1997; 6(1):45-74.
213. Rabinowitz A. It's about time: historical periodization and linked ancient world data. *ISAW Papers.* 2014; 7.
214. Norman D. *The design of everyday things.* New York (NY): Basic Books; 2013.
215. Morris S. Defining the nonprofit sector: some lessons from history. *Voluntas.* 2000; 11(1):25-43.
216. Wiekking P, Handy F. Explanations for cross-national differences in philanthropy. In: Wiekking P, Handy F, editors. *The Palgrave handbook of global philanthropy.* Basingstoke: Palgrave Macmillan; 2015. p. 9-21.
217. Anheier HK. Measure for measure: a commentary on Heinrich and the state of civil society indicators research. *J Civ Soc.* 2005; 1(3):241-6.
218. International Center for Not-for-Profit Law [ICNL]. Assessment tools for measuring civil society's enabling environment. *Global Trends in NGO Law* 2014; 5(1):20.
219. Taylor SJ, Bogdan R, DeVault ML. *Introduction to qualitative research methods: a guidebook and resource.* 4th ed. Hoboken (NJ): Wiley; 2015.
220. Andersen H, Hepburn B. Scientific method. In: Zalta EN, editor. *The Stanford encyclopedia of philosophy* [Internet]. Summer 2016. Stanford (CA): Metaphysics Research Lab, Stanford University. 2016 [cited 2020 September 20]. Available from: <https://plato.stanford.edu/archives/sum2016/entries/scientific-method/>.
221. Bunge MA. *Epistemology & methodology I: exploring the world.* Dordrecht: D. Reidel; 1983.

REFERENCES

222. Bergman MM. The good, the bad, and the ugly in mixed methods research and design. *J Mix Methods Res.* 2011; 5(4):271-5.
223. Johnson RB, Onwuegbuzie AJ. Mixed methods research: a research paradigm whose time has come. *Educ Res.* 2004; 33(7):14-26.
224. Csorba D. The relationship between epistemology and methods of historical research in pedagogy. *Procedia Soc Behav Sci.* 2013; 76:237-42.
225. DeForge BR. Research design principles. In: Salkind NJ, editor. *Encyclopedia of research design.* Thousand Oaks (CA): SAGE Publications; 2010. p. 1252-9.
226. Voss C, Tsikriktsis N, Frohlich M. Case research in operations management. *Int J Oper Prod Manag.* 2002; 22(2):195-219.
227. Benedict G, Gill AQ. A regulatory control framework for decentrally governed DLT systems: action design research. *Inf Manage.* 2022; 59(7).
228. Childe SJ. Case studies in operations management. *Prod Plan Control.* 2011; 22(2):107.
229. Simon HA. *The sciences of the artificial.* 3rd ed. London: MIT Press; 1996.
230. Holmström J, Hameri A-P, Ketokivi M. Operations management as a problem-solving discipline. Paper presented at the Academy of Management Annual Meeting; 2006 August 11-16; Atlanta (GA): United States.
231. Teixeira JG, Patrício L, Tuunanen T. Advancing service design research with design science research. *J Serv Manag.* 2019; 30(5):577-92.
232. Mazé R, Gregory J, Redström J. Social sustainability: a design research approach to sustainable development. Paper presented at the World Conference on Design Research; 2011 October 31 - November 4; Delft: Netherlands.
233. Meroni A, Sangiorgi D. *Design for services.* Cooper R, editor. London: Routledge; 2016.
234. Iivari J, Venable JR. Action research and design science research - seemingly similar but decisively dissimilar. Paper presented at the European Conference on Information Systems; 2009 June 8-10; Verona: Italy.
235. Holmström J, Ketokivi M, Hameri A-P. Bridging practice and theory: a design science approach. *Decis Sci.* 2009; 40(1):65-87.
236. Ma J, Konrath S. A century of nonprofit studies: scaling the knowledge of the field. *Voluntas.* 2018; 29(6):1139-58.
237. Sloane F. Normal and design sciences in education: why both are necessary. In: Van Den Akker J, Gravemeijer K, McKenney S, Nieveen N, editors. *Educational design research.* London: Routledge; 2006. p. 19-44.
238. MacDonald C. Understanding participatory action research: a qualitative research methodology option. *Can J Action Res.* 2012; 13(2):34-50.
239. Baum F, MacDougall C, Smith D. Participatory action research. *J Epidemiol Community Health.* 2006; 60(10):854-7.
240. Schwabe G, Krcmar H. Piloting a sociotechnical innovation. Paper presented at the European Conference on Information Systems; 2000 July 3-5; Vienna: Austria.

REFERENCES

241. Cole R, Purao S, Rossi M, Sein MK. Being proactive: where action research meets design research. Paper presented at the International Conference on Information Systems; 2005 December 11-14; Las Vegas (NV): United States.
242. Iivari J. Nothing is as clear as unclear. *Scand J Inf Syst.* 2007; 19(2):111-7.
243. Hevner AR. A three cycle view of design science research. *Scand J Inf Syst.* 2007; 19(2):87-92.
244. Hüner KM, Ofner M, Otto B. Towards a maturity model for corporate data quality management. Paper presented at the Association for Computing Machinery Symposium on Applied Computing; 2009 March 8-12; Honolulu (HI): New York (NY).
245. Fendt J, Kaminska-Labbé R. Relevance and creativity through design-driven action research: introducing pragmatic adequacy. *Eur Manag J.* 2011; 29(3):217–33.
246. Keijzer-Broers WJW. Developing a service platform for health and wellbeing in a living lab setting: an action design research approach [thesis]. Delft: Delft University of Technology; 2016.
247. Merkel CB, Clitherow M, Farooq U, Xiao L, Ganoë CH, Carroll JM, et al. Sustaining computer use and learning in community computing contexts: making technology part of who they are and what they do. *J Commun Inform.* 2005; 1(2):158-74.
248. Sternkopf H, Mueller RM. Doing good with data: development of a maturity model for data literacy in non-governmental organizations. Paper presented at the Hawaii International Conference on System Sciences; 2018 January 3-6; Big Island (HI): United States.
249. Zaitsev A, Mankinen S. Designing financial education applications for development: applying action design research in Cambodian countryside. *Eur J Inf Syst.* 2022; 31(1):91-111.
250. DiSessa A, Cobb P. Ontological innovation and the role of theory in design experiments. *J Learn Sci.* 2004; 13(1):77-103.
251. Bedny GZ, Harris SR. The systemic-structural theory of activity: applications to the study of human work. *Mind Cult Act.* 2005; 12(2):128-47.
252. Weeding S, Dawson L. Laptops on trolleys: lessons from a mobile-wireless hospital ward. *J Med Syst.* 2012; 36(6):3933-43.
253. Castro L, Lefebvre E, Lefebvre LA. Adding intelligence to mobile asset management in hospitals: the true value of RFID. *J Med Syst.* 2013; 37(5):9963.
254. Ractham P, Kaewkitipong L, Firpo D. The use of Facebook in an introductory MIS course: social constructivist learning environment. *Decis Sci.* 2012; 10(2):165-88.
255. Zuiderwijk A, Janssen M, Choenni S, Meijer R. Design principles for improving the process of publishing open data. *Transform Gov: People Process Policy.* 2014; 8(2):185-204.
256. Maccani G, Donnellan B, Helfert M. Action design research in practice: the case of smart cities. Paper presented at the International Conference on Design Science Research in Information Systems and Technology; 2014 May 22-24; Miami (FL): United States.
257. De Vries M, Berger S. An action design research approach within enterprise engineering. *Syst Pract Act Res.* 2017; 30(2):187-207.

REFERENCES

258. Henriques T, O'Neill H. Action, design & research – a process meta-model. Paper presented at the Conferência da Associação Portuguesa de Sistemas de Informação; 2020 October 16-17; Porto: Portugal.
259. Wing J, Andrew T, Petkov D. Choosing action design research for the process of development, application and evaluation of a framework. Paper presented at the International Conference on Next Generation Computing Applications; 2017 July 19-21; Mauritius.
260. Pries-Heje J, Venable J, Baskerville R. Soft design science methodology. In: Simonsen J, Svabo C, Strandvad SM, Samson K, Hertzum M, Hansen OE, editors. *Situated design methods*. Cambridge (MA): MIT Press; 2014. p. 77-95.
261. Alles MG, Kogan A, Vasarhelyi MA. Collaborative design research: lessons from continuous auditing. *Int J Account Inf Syst*. 2013; 14(2):104-12.
262. Haj-Bolouri A, Bernhardsson L, Rossi M. PADRE: a method for participatory action design research. Paper presented at the Tackling Society's Grand Challenges with Design Science 11th International Conference, DESRIST 2016 May 23-25; Cham: Switzerland.
263. Briggs RO, Böhm T, Schwabe G, Tuunanen T. Advancing design science research with solution-based probing. Paper presented at the Hawaii International Conference on System Sciences; 2019 January 8-11; Maui (HI): United States.
264. Mullarkey MT, Hevner AR. An elaborated action design research process model. *Eur J Inf Syst*. 2019; 28(1):6-20.
265. Buchanan R. Worlds in the making: design, management, and the reform of organizational culture. *She Ji*. 2015; 1(1):5-21.
266. Collins A. Toward a design science of education. In: Scanlon E, O'Shea T, editors. *New directions in educational technology*. NATO ASI. Berlin: Springer; 1992. p. 15-22.
267. Nieveen N, Folmer E. Formative evaluation in educational design research. In: Plomp T, Nieveen N, editors. *Educational design research: an introduction*. A. Enschede: Netherlands Institute for Curriculum Development; 2013. p. 152-69.
268. Cavalcanti MFR. Guidelines for qualitative research in organization studies: controversy and possibilities. *Admin Ens Pesq*. 2017; 18(3):457-88.
269. Moisander J, Valtonen A. *Qualitative marketing research: a cultural approach*. London: SAGE Publications; 2006.
270. Jones M, Hobbs L, Kenny J, Campbell C, Chittleborough GG, Andrew, Herbert S, et al. Successful university-school partnerships: an interpretive framework to inform partnership practice. *Teach Teach Educ*. 2016; 60:108-20.
271. Collins A, Joseph D, Bielaczyc K. Design research: theoretical and methodological issues. *J Learn Sci*. 2004; 13(1):15-42.
272. Walker D. Toward productive design studies. In: Van den Akker J, Gravemeijer K, McKenney S, Nieveen N, editors. *Educational design research*. London: Routledge; 2006. p. 9-18.
273. Lee AS. A scientific methodology for MIS case studies. *MIS Q*. 1989; 13(1):33-50.
274. Venable JR, Pries-Heje J, Baskerville R. FEDS: a framework for evaluation in design science research. *Eur J Inf Syst*. 2016; 25(1):77-89.

REFERENCES

275. Depp C, Lebowitz BD. Clinical trials: bridging the gap between efficacy and effectiveness. *Int Rev Psychiatry*. 2007; 19(5):531-9.
276. Smith GT. On construct validity: issues of method and measurement. *Psychol Assessment*. 2005; 17(4):396-408.
277. Van den Akker J. Curricular development research as a specimen of educational design research. In: Plomp T, Nieveen N, editors. *Educational design research: an introduction*. A. Enschede: Netherlands Institute for Curriculum Development; 2013. p. 52-71.
278. Dowse C. Learning to write by writing to learn: a postgraduate intervention to develop academic research writing [thesis]. Pretoria: University of Pretoria; 2013.
279. Wolters AM. On the idea of worldview and its relation to philosophy. In: Marshall PA, Griffioen S, Mouw RJ, editors. *Stained glass: worldviews and social science*. Lanham (MD): University Press of America; 1989. p. 14-25.
280. Creswell JW. *Qualitative inquiry & research design: choosing among five approaches*. Second ed. Thousand Oaks (CA): SAGE Publications; 2007.
281. Saunders MNK, Lewis P, Thornhill A. *Research methods for business students*. 8th ed. Harlow: Pearson Education; 2019.
282. Inwood MJ. Weltanschauung. In: Honderich T, editor. *The Oxford companion to philosophy*. Oxford: Oxford University Press; 1995. p. 909.
283. Naugle DK. *Worldview: the history of a concept*. Grand Rapids (MI): William B. Eerdmans; 2002.
284. Koshy E, Koshy V, Waterman H. What is action research? In: Koshy E, Koshy V, Waterman H *Action research in healthcare*. 2nd ed. Los Angeles (CA): SAGE Publications; 2011. p. 1-24.
285. Redstrom J. *Making design theory*. Cambridge (MA): MIT Press; 2017.
286. Giacalone RA, Thompson KR. Business ethics and social responsibility education: shifting the worldview. *Acad Manag Learn Educ*. 2006; 5(3):266-77.
287. Mohrhoff UJ. Evolution of consciousness according to Jean Gebser. *AntiMatters*. 2008; 2(3):51-78.
288. Perry WG, Jr. Cognitive and ethical growth: the making of meaning. In: Arnold KK, I.C., editor. *College student development and academic life: psychological, intellectual, social, and moral issues*. New York (NY): Garland; 1997. p. 48-88.
289. Graves CW. The emergent, cyclical, double-helix model of the adult human biopsychosocial systems [unpublished summary statement]. Boston (MA): Lecture; 1981 May 20.
290. Rennie BS. The view of the invisible world: Ninian Smart's analysis of the dimensions of religion and of religious experience. *CSSR Bul*. 1999; 28(3):63-9.
291. Torbert W, Taylor S. Action inquiry: interweaving multiple qualities of attention for timely action. In: Reason PB, H., editor. *The SAGE handbook of action research*. London: SAGE Publications; 2008. p. 238-51.

REFERENCES

292. Laininen E. Transforming our worldview towards a sustainable future. In: Cook J, editor. Sustainability, human well-being, and the future of education. Cham: Palgrave Macmillan; 2019. p. 161-200.
293. Kibert CJ, Monroe MC, Peterson AL, Plate RR, Thiele LP. Working toward sustainability: ethical decision-making in a technological world. Hoboken (NJ): John Wiley & Sons; 2012.
294. Brennan A, Lo Y-S. Environmental ethics. In: Zalta EN, editor. The Stanford encyclopedia of philosophy [Internet]. Winter 2020. Stanford (CA): Metaphysics Research Lab, Stanford University. 2020 [cited 2020 July 6]. Available from: <https://plato.stanford.edu/archives/win2020/entries/ethics-environmental/>.
295. Du Plessis C, Barndon P. An ecological worldview as basis for a regenerative sustainability paradigm for the built environment. *J Clean Prod.* 2015; 109:53-61.
296. Kuhn TS. The structure of scientific revolutions. In: Neurath O, editor. International encyclopedia of unified science. 2nd ed. Chicago (IL): University of Chicago Press; 1970.
297. Burrell G, Morgan G. Sociological paradigms and organisational analysis. Burlington (VT): Ashgate; 1979.
298. Bird A. Thomas Kuhn. In: Zalta EN, editor. The Stanford encyclopedia of philosophy [Internet]. Winter 2018. Stanford (CA): Metaphysics Research Lab, Stanford University. 2018 [cited 2021 January 9]. Available from: <https://plato.stanford.edu/archives/win2018/entries/thomas-kuhn/>.
299. Cordeiro L, Soares CB, Rittenmeyer L. Unscrambling method and methodology in action research traditions: theoretical conceptualization of praxis and emancipation. *Qual Res.* 2017; 17(4):395-407.
300. Lather P. Research as praxis. *Harv Educ Rev.* 1986; 56(3):257-77.
301. Goldkuhl G. Design research in search for a paradigm: pragmatism is the answer. Paper presented at the European Design Science Symposium: Practical Aspects of Design Science; 2011 October 14; Leixlip: Berlin.
302. Hevner AR, March ST, Park J, Ram S. Design science in information systems research. *MIS Q.* 2004; 28(1):75-105.
303. Laverty SM. Hermeneutic phenomenology and phenomenology: a comparison of historical and methodological considerations. *Int J Qual Methods.* 2003; 2(3):21-35.
304. Bateson G. Steps to an ecology of mind: collected essays in anthropology, psychiatry, evolution, and epistemology. Northvale (NJ): Jason Aronson; 1972.
305. Bricker P. Ontological commitment. In: Zalta EN, editor. The Stanford encyclopedia of philosophy [Internet]. Winter 2016. Stanford (CA): Metaphysics Research Lab, Stanford University. 2016 [cited 2020 September 7]. Available from: <https://plato.stanford.edu/archives/win2016/entries/ontological-commitment/>.
306. Smith DW. Phenomenology. In: Zalta EN, editor. The Stanford encyclopedia of philosophy [Internet]. Summer 2018. Stanford (CA): Metaphysics Research Lab, Stanford University. 2018 [cited 2020 July 6]. Available from: <https://plato.stanford.edu/archives/sum2018/entries/phenomenology/>.

REFERENCES

307. Marsh D, Ercan SA, Furlong P. A skin not a sweater: ontology and epistemology in political science. In: Lowndes V, Marsh D, Stoker G, editors. *Theory and methods in political science*. 4th ed. London: Palgrave MacMillan; 2018. p. 177-98.
308. Fuenmayor R. Truth and openness: an epistemology for interpretive systemology. *Syst Practice*. 1991; 4(5):473-90.
309. Davis B, Sumara D. A genealogical tree of contemporary conceptions of teaching. *Educ Insights*. 2003; 8(2).
310. Lincoln YS. Emerging criteria for quality in qualitative and interpretive research. *Qual Inq*. 1995; 1(3):275-89.
311. Fleetwood S. Ontology in organization and management studies: a critical realist perspective. *Organization*. 2005; 12(2):197-222.
312. Vaishnavi V, Kuechler W. Design science research in information systems [Internet]. Atlanta (GA): Association for Information Systems; 2004 [cited 2022 June 17]. Available from: <http://www.desrist.org/design-research-in-information-systems/>.
313. Gregor S, Jones D. The anatomy of a design theory. *J Assoc Inf Syst*. 2007; 8(5):60-.
314. Coghlan D, Brannick T. *Doing action research in your own organization*. 2nd ed. London: SAGE Publications; 2005.
315. Giddens A. *The constitution of society: outline of the theory of structuration*. Berkeley (CA): University of California Press; 1984.
316. Porter S. *Social theory and nursing practice* Miers M, Porter S, Wilkinson G, editors. Hampshire: Palgrave; 1998.
317. Armstrong R. Elaborating a critical realist approach to soft systems methodology. *Syst Pract Act Res*. 2019; 32:463-80.
318. Roderick R. *Habermas and the foundations of critical theory*. London: Macmillan Publishers; 1986.
319. Fuenmayor R, López-Garay H. The scene for interpretive systemology. *Syst Practice*. 1991; 4(5):401-18.
320. Wegerif R. Dialogic or dialectic? The significance of ontological assumptions in research on educational dialogue. *Br Educ Res J*. 2008; 34(3):347-61.
321. Burnham D, Papandrepoulos G. Existentialism. In: Fieser J, Dowden B, editors. *Internet encyclopedia of philosophy* [Internet]. Martin (TN): University of Tennessee at Martin. 2019 [cited 2020 July 6]. Available from: <https://www.iep.utm.edu/existent/>.
322. Crowell S. Existentialism. In: Zalta EN, editor. *The Stanford encyclopedia of philosophy* [Internet]. Winter 2017. Stanford (CA): Metaphysics Research Lab, Stanford University. 2017 [cited 2020 September 7]. Available from: <https://plato.stanford.edu/archives/win2017/entries/existentism/>.
323. MacMillan S, Yue AR, Mills AJ. Both how and why: considering existentialism as a philosophy of work and management. *Philos Manag*. 2012; 11(3):27-46.
324. Trunk Širca N, Shapiro A. Action research and constructivism: two sides of the same coin? Or, one side? *Int J Manag Educ*. 2007; 1(1/2):100 - 7.

REFERENCES

325. Wensveen S. Constructive design research. Eindhoven: Eindhoven University of Technology; 2018. 36 p.
326. Baldwin T. Editor's introduction. In: Baldwin T, editor. Maurice Merleau-Ponty basic writings. London: Routledge; 2004. p. 1-32.
327. Finlay L. A dance between the reduction and reflexivity: explicating the "phenomenological psychological attitude". *J Phenomenol Psychol.* 2008; 39:1-32.
328. Legg C, Hookway C. Pragmatism. In: Zalta EN, editor. The Stanford encyclopedia of philosophy [Internet]. Summer 2021. Stanford (CA): Metaphysics Research Lab, Stanford University. 2021 [cited 2021 September 7]. Available from: <https://plato.stanford.edu/archives/sum2021/entries/pragmatism/>.
329. Steup M, Neta R. Epistemology. In: Zalta EN, editor. The Stanford encyclopedia of philosophy [Internet]. Fall 2020. Stanford (CA): Metaphysics Research Lab, Stanford University. 2020 [cited 2020 July 6]. Available from: <https://plato.stanford.edu/archives/fall2020/entries/epistemology/>.
330. Goldman A, Blanchard T. Social epistemology. In: Zalta EN, editor. The Stanford encyclopedia of philosophy [Internet]. Summer 201. Stanford (CA): Metaphysics Research Lab, Stanford University. 2018 [cited 2020 July 6]. Available from: <https://plato.stanford.edu/entries/epistemology-social/>.
331. Sen A. Utilitarianism and welfarism. *J Philos.* 1979 September; 76(9):463-89.
332. University of Pretoria. General rules and regulations. Pretoria: University of Pretoria; 2020. 50 p.
333. Stahl BC. A critical view of the ethical nature of interpretive research: Paul Ricoeur and the other. Paper presented at the 13th European Conference on Information Systems, Information Systems in a Rapidly Changing Economy; 2005 May 26-28; Regensburg: Germany.
334. Dervin B. An overview of sense-making research: concepts, methods and results. Paper presented at the Annual Meeting of the International Communication Association; 1983 May; Dallas (TX): United States.
335. Eikeland O. Phrónêsis, Aristotle, and action research. *Int J Action Res.* 2006; 2(1):5-53.
336. McCloskey DN. The rhetoric of economics. *J Econ Lit.* 1983; 21(2):481-517.
337. Bohm D. On dialogue. London: Routledge; 2013.
338. Mifsud ML, Johnson SD. Dialogic, dialectic, and rhetoric: exploring human dialogue across the discipline. *South Commun J.* 2000; 65(2-3):91-104.
339. Luscher LS, Lewis MW. Organizational change and managerial sensemaking: working through paradox *Acad Manage J.* 2008; 51(2):221-40.
340. Eikeland O. The validity of action research – validity in action research. In: Aagaard Nielsen K, Svensson L, editors. Action and interactive research – beyond theory and practice. Maastricht: Shaker; 2006. p. 193-240.
341. Ballard G, Koskela L. Rhetoric and design. Paper presented at the 19th International Conference on Engineering Design; 2013 August 19-22; Seoul: South Korea.

REFERENCES

342. Druschke CG, Mcgreavy B. Why rhetoric matters for ecology. *Front Ecol Environ.* 2016; 14(1):46-52.
343. Bhattacharjee A. *Social science research: principles, methods, and practices.* 2nd ed. Tampa (FL): University of South Florida; 2012.
344. Wademan MR. *Utilizing development research to guide people-capability maturity model adoption considerations [dissertation].* Syracuse (NY): University of Syracuse; 2005.
345. Cosic R, Shanks G, Maynard S. A business analytics capability framework. *Australas J Inf Syst.* 2015; 19:S5-S19.
346. Snowden D. The social ecology of knowledge management. In: Despres CC, D., editor. *Knowledge horizons: the present and the promise of knowledge management.* Boston (MA): Butterworth-Heinemann; 2000. p. 237-65.
347. Bedny GZ, Karwowski W. A systemic-structural activity approach to the design of human-computer interaction tasks. *Int J Hum Comput Interact.* 2003; 16(2):235-60.
348. Mueller PD. The theory of interpretive frameworks: ceteris non paribus. *Q J Austrian Econ.* 2013; 16(3):331-52.
349. Schein EH, Schein P. *Organizational culture and leadership.* 5th ed. Hoboken (NJ): John Wiley & Sons; 2017.
350. Oliver D. Identity work as a strategic practice. In: Golsorkhi D, Rouleau L, Seidl D, Vaara E, editors. *Cambridge handbook of strategy as practice.* 2nd ed. Cambridge: Cambridge University Press; 2015. p. 331-44.
351. Van de Ven AH, Poole MS. Alternative approaches for studying organizational change. *Organ Stud.* 2005; 26(9):1377-404.
352. Rhodes C, Brown AD. Narrative, organizations and research. *Int J Manag Rev.* 2005; 7(3):167-88.
353. Snowden DJ. Narrative patterns - the perils and possibilities of using story in organisations. In: Lesser EL, Prusak L, editors. *Creating value with knowledge: insights from the IBM institute for business value.* Oxford: Oxford University Press; 2004. p. 201-16.
354. South African Revenue Service [SARS] [Internet]. What is a public benefit organisation (PBO)? [updated 2018; cited 2020 July 27](27 July 2020). Available from: [https://www.sars.gov.za/FAQs/Pages/270.aspx#:~:text=Page%20Content-,What%20is%20a%20public%20benefit%20organisation%20\(PBO\)%3F,established%20in%20the%20Republic%3B%20or.](https://www.sars.gov.za/FAQs/Pages/270.aspx#:~:text=Page%20Content-,What%20is%20a%20public%20benefit%20organisation%20(PBO)%3F,established%20in%20the%20Republic%3B%20or.)
355. Parker AJ, Veldsman TH. The validity of world class business criteria across developed and developing countries. *S Afr J Hum Resour Manag.* 2010; 8(1):17.
356. Matschke M. *Youth employment scenarios for South Africa in 2035: an interdisciplinary approach combining anthropology, economics, and systems theory [dissertation].* Mainz: Johannes Gutenberg-Universität; 2020.
357. Spaul N. *South Africa's education crisis: the quality of education in South Africa 1994-2011.* Johannesburg: Centre for Development & Enterprise; 2013. 65 p.
358. National Planning Commission. *National development plan 2030: our future - make it work.* Pretoria: Republic of South Africa, The Presidency; 2012. 484 p.

REFERENCES

359. Department of Basic Education [DBE]. Action plan to 2024: towards the realisation of schooling 2030. Pretoria: Republic of South Africa, DBE, DBE; 2020. 141 p.
360. Voogt J, Roblin NP. 21st century skills. Enschede: Kennisnet; 2010. 56 p.
361. Wright M, Woock C, Lichtenberg J [Internet]. Ready to innovate: are educators and executives aligned on the creative readiness of the US workforce? [updated 2008 October 10; cited 2020 July 28](28 July 2020). Available from: <https://www.conference-board.org/publications/publicationdetail.cfm?publicationid=1557>.
362. Ki-moon B. Global education first initiative: an initiative of the United Nations secretary-general. New York (NY): United Nations; 2012. 33 p.
363. International Business Machines [IBM] [Internet]. IBM 2010 global CEO study: creativity selected as most crucial factor for future success. [updated 2010; cited 2020 July 28](28 July 2020). Available from: <https://www-03.ibm.com/press/us/en/pressrelease/31670.wss>.
364. Eger JM [Internet]. STEM + the arts boosted by US and UK reports. Huffpost; [updated 2013 September 10; cited 2020 July 29]. Available from: https://www.huffpost.com/entry/stem-and-steam-boosted-by_b_3581230.
365. United Nations Educational Scientific and Cultural Organization [UNESCO]. The quality imperative: education for all global monitoring report 2005. Paris: United Nations Educational, Scientific and Cultural Organization; 2004.
366. Schwaninger M, Pérez Ríos J. System dynamics and cybernetics: a synergetic pair. Syst Dynam Rev. 2008; 24(2):145–74.
367. Perrini F, Vurro C, Costanzo LA. A process-based view of social entrepreneurship: from opportunity identification to scaling-up social change in the case of San Patrignano. Entrep Reg Dev. 2010; 22(6):515-34.
368. Soysa IB, Jayamaha NP, Grigg NP. Developing a strategic performance scoring system for healthcare nonprofit organisations. Benchmarking. 2018; 25(9):3654-78.
369. Arvidson M, Lyon F. Social impact measurement and non-profit organisations: compliance, resistance, and promotion. Voluntas. 2014; 25:869-86.
370. Jerez Gómez P, Céspedes Lorente JJ, Valle Cabrera R. Training practices and organisational learning capability. J Eur Ind Train. 2004; 28(2/3/4):234-56.
371. National Small Business Chamber [Internet]. 6 ways to keep selling during tough times. [updated 2020 April 20; cited 2020 July 6]. Available from: <https://www.thesmallsbusinesssite.co.za/6-ways-to-keep-selling-during-tough-times/>.
372. Department of Employment and Labour. Easy-aid guide for employers. Pretoria: Republic of South Africa, DEL; 2020. 9 p.
373. Westvig K. Crisis tips for SMEs. 2020.
374. South African Revenue Service [SARS]. Tax exemption guide for public benefit organisations in South Africa. Pretoria: South African Revenue Service; 2017. 87 p.
375. Hedegaard M. A cultural-historical approach to learning in classrooms. Outlines. 2004; 6(1):21-34.

REFERENCES

376. United Nations General Assembly. Transforming our world: the 2030 agenda for sustainable development. New York (NY): United Nations; 2015. 38 p. Report No.: A/RES/70/1.
377. Bell J, Dubb S [Internet]. It's different this time: handling nonprofit staff cuts under Covid-19. *Nonprofit Quarterly*; [updated 2020 April 17; cited 2020 July 6]. Available from: <https://nonprofitquarterly.org/its-different-this-time-handling-your-nonprofits-staffing-under-Covid-19/>.
378. Kaplan RS. Strategic performance measurement and management in nonprofit organizations. *Nonprofit Manag Lead*. 2001; 11(3):353-70.
379. Siwale M. Information systems planning in the not for profit sector in Western Australia [thesis]. Perth: Curtin University; 2015.
380. Hume C, Hume M. The strategic role of knowledge management in nonprofit organisations. *Int J Nonprofit Volunt Sect Mark*. 2008; 13(2):129-40.
381. Mutekwe E. The impact of technology on social change: a sociological perspective. *J Res Peace Gend Dev*. 2012; 2(11):226-38.
382. Bell W. What do we mean by futures studies? In: Slaughter RA, editor. *New thinking for a new millennium*. London: Routledge; 1996. p. 3-25.
383. Institute of Directors in Southern Africa [IoDSA]. King IV report on corporate governance for South Africa. Sandton: Institute of Directors in Southern Africa; 2016 1 November. 122 p.
384. Volpe AC. Harnessing social media for good: how human service nonprofit organizations use social media to connect to stakeholders and clients [banded dissertation]. Minneapolis (MN): University of St. Thomas; 2019.
385. Richmond B. Systems thinking: critical thinking skills for the 1990s and beyond. *Syst Dynam Rev*. 1993; 9(2):113-33.
386. Bryson JM. A strategic planning process for public and non-profit organizations. *Long Range Plann*. 1988; 21(1):73-81.
387. Fernandes JP. Developing viable, adjustable strategies for planning and management — a methodological approach. *Land Use Policy*. 2019; 82:563-72.
388. Lowe D, Espinosa A, Yearworth M. Constitutive rules for guiding the use of the viable system model: reflections on practice. *Eur J Oper Res*. 2020; 287(3):1014-35.
389. Cloete A. The biomatrix model: the development and formalisation of a general systems model [thesis]. Cape Town: University of Cape Town; 1999.
390. Gregory WJ. Discordant pluralism: a new strategy for critical systems thinking. In: Midgley G, editor. *Critical systems thinking and systemic perspectives on ethics, power and pluralism*. IV. London: SAGE Publications; 2003. p. 123-42.
391. Anheier HK, Carlson L, Heinrich VF, Naidoo K. *The civil society diamond: a primer*. Johannesburg: CIVICUS; 2001. 17 p.
392. International Center for Not-for-Profit Law [ICNL] [Internet]. ICNL announces the civic space initiative. [updated 2012 December 20; cited 2021 June 17]. Available from: <https://www.icnl.org/post/in-the-news/icnl-announces-the-civic-space-initiative>.

REFERENCES

393. Espinosa A, Walker J. A complexity approach to sustainability: theory and application. London: Imperial College Press; 2011.
394. Floyd J. Towards an integral renewal of systems methodology for futures studies. *Futures*. 2008; 40(2):138-49.
395. Breukelman H, Krikke H, Löhr A. Root causes of underperforming urban waste services in developing countries: designing a diagnostic tool, based on literature review and qualitative system dynamics. *Waste Manage Res*. 2022; 40(9):1337-55.
396. Schoenenberger L, Schenker-Wicki A. Can system dynamics learn from social network analysis? Working paper. Zurich: University of Zurich; 2015 January. 26 p. Report No.: 349.
397. Hovmand PS, Pitner R. Combining system dynamics, social networks, and geographic information systems. Paper presented at the 23rd international conference of the system dynamics society; 2005 July 17-21; Boston (MA): United States.
398. Woodside AG. Firm orientations, innovativeness, and business performance: advancing a system dynamics view following a comment on Hult, Hurley, and Knight's 2004 study. *Ind Mark Manag*. 2005; 34:275-9.
399. Crawford P, Bryce P. Project monitoring and evaluation: a method for enhancing the efficiency and effectiveness of aid project implementation. *Int J Proj Manag*. 2003; 21(5):363-73.
400. Dutton E. The philosophy of anthropology. In: Fieser J, Dowden B, editors. *Internet encyclopedia of philosophy* [Internet]. Martin (TN): University of Tennessee at Martin. 2021 [cited 2021 April 14]. Available from: <https://iep.utm.edu/anthropo/>.
401. Browning L, Boudès T. The use of narrative to understand and respond to complexity: a comparative analysis of the Cynefin and Weickian models. *Emerg: Complex Organ*. 2005; 7(3-4):32-9.
402. Sandberg J, Tsoukas H. Making sense of the sensemaking perspective: its constituents, limitations, and opportunities for further development. *J Organ Behav*. 2015; 36(S1):S6–S32.
403. Chan RKH. Risk, reflexivity and sub-politics: environmental politics in Hong Kong. *Asian J Pol Sci*. 2008; 16(3):260-75.
404. Weick KE. *Sensemaking in organizations*. Thousand Oaks (CA): SAGE Publications; 1995.
405. Yiling W. *Practices and interpretation: strategy crafting in nonprofit art and cultural organization by front-line employees* [thesis]. Helsinki: Hanken School of Economics; 2017.
406. Van der Heijden K. *Scenarios: the art of strategic conversation*. Chichester: John Wiley & Sons; 1996.
407. Morgan G. Paradigms, metaphors, and puzzle solving in organization theory. *Adm Sci Q*. 1980; 25(4):605-22.
408. Hirsch PM, Lounsbury M. Putting the organization back into organization theory: action, change, and the “new” institutionalism. *J Manag Inq*. 1997; 6(1):79–88.
409. Amer M, Daim TU, Jetter A. A review of scenario planning. *Futures* 2013; 46:23-40.
410. Maranda P. Structuralism in cultural anthropology. *Annu Rev Anthropol*. 1972; 1(1):329-48.

REFERENCES

411. Jackson MC. *Systems thinking: creative holism for managers*. Chichester: John Wiley & Sons; 2016.
412. Schwartz LH, DiGiacomo D, Gutiérrez KD. Diving into practice with children and undergraduates: a cultural historical approach to initiating making and tinkering activity in a designed learning ecology. Paper presented at the Learning and Becoming in Practice: The International Conference of the Learning Sciences (ICLS); 2014 June 23-27; Boulder (CO): United States.
413. Dunlap JC, Lowenthal PR. Getting graphic about infographics: design lessons learned from popular infographics. *J Vis Lit*. 2016; 35(1):42-59.
414. Prudham S. *The dictionary of human geography*. 5th ed. Chichester: Wiley-Blackwell; 2009. Ecology; p. 175-7.
415. Cobb P, Confrey J, diSessa A, Lehrer R, Schauble L. Design experiments in educational research. *Educ Res*. 2003; 32(1):9-13.
416. Haveman HA, Wetts R. Contemporary organizational theory: the demographic, relational, and cultural perspectives. *Sociol Compass*. 2019; 13(3):e12664.
417. Haveman HA, Wetts R. Organizational theory: from classical sociology to the 1970s. *Sociol Compass*. 2019; 13(3):e12627.
418. Porter ME. *Competitive strategy: techniques for analyzing industries and competitors*. 2nd ed. New York (NY): The Free Press; 1998.
419. Vazquez R, Alvarez LI, Santos ML. Market orientation and social services in private non-profit organisations. *Eur J Mark*. 2002; 36(9/10):1022-46.
420. Rieu A, Leclerc C. Work integration social joint-ventures between incremental and transformative change Overcoming multi-scale tensions via core SSE principles to achieve SDG goals. Paper presented at the Implementing the Sustainable Development Goals: What Role for Social and Solidarity Economy? UNTFSSSE International Conference; 2019 June 25-26; Geneva: Switzerland.
421. Macedo IM, Pinho JC. The relationship between resource dependence and market orientation: the specific case of non-profit organisations. *Eur J Mark*. 2006; 40(5/6):533-53.
422. Brix-Asala C, Hahn R, Seuring S. Reverse logistics and informal valorisation at the base of the pyramid: a case study on sustainability synergies and trade-offs. *Eur Manag J*. 2016; 34(4):414-23.
423. McMullen K, Schellenberg G. *Mapping the non-profit sector*. Ottawa: Canadian Policy Research Networks; 2002. 58 p.
424. Singh KD. Creating your own qualitative research approach: selecting, integrating and operationalizing philosophy, methodology and methods. *Vision*. 2015; 19(2):132-46.
425. Nieuwenhuis FJ. Martini qualitative research: shaken, not stirred. Paper presented at the 13th conference of the Bulgarian Comparative Education Society: Quality, social justice and accountability in education worldwide; 2015 June 10-13; Sofia: Bulgaria.
426. Glegg SMN. Facilitating interviews in qualitative research with visual tools: a typology. *Qual Health Res*. 2019; 29(2):301-10.

REFERENCES

427. Harris LR, Brown GTL. Mixing interview and questionnaire methods: practical problems in aligning data. *Pract Assess Res Evaluation*. 2010; 15(1):1-19.
428. United States Agency for International Development [USAID]. 2019 civil society organization sustainability index for sub-Saharan Africa. Washington (DC): United States Agency for International Development; 2020. 310 p.
429. Chetty R, Friedman JN, Hendren N, Stepner M. Real-time economics: a new platform to track the impacts of COVID-19 on people, businesses, and communities using private sector data. Cambridge (MA): National Bureau of Economic Research; 2020. 17 p. Report No.: 27431.
430. Human Rights Institute of South Africa. A national assessment of the enabling environment for civil society organisations in South Africa. Johannesburg: Human Rights Institute of South Africa; 2015. 78 p.
431. Mentzer JT, Stank TP, Esper TL. Supply chain management and its relationship to logistics, marketing, production, and operations management. *J Bus Logist*. 2008; 29(1):31-46.
432. Rosenhead J. Enabling analysis: across the developmental divide. *Syst Practice*. 1993; 6(2):117-38.
433. Jackson MC, Eden C, Keys P, Tomlinson R. Problem alleviation in nonhierarchical organizations: responses and discussion of the special papers. *Syst Practice*. 1993; 6(2):173-8.
434. Volmink J, Van der Elst L. The evolving role of 21st century education NGOs in South Africa: challenges and opportunities. Centurion: National Education Collaboration Trust; 2017. 27 p.
435. Barrett R. Building a values-driven organization: a whole system approach to cultural transformation. Amsterdam: Elsevier; 2006.
436. Dameri RP. Using the balanced scorecard to evaluate ICT investments in non profit organisations. *Electron J Inf Syst Eval*. 2005; 8(2):107-14.
437. Gallagher BP. Interpreting capability maturity model integration for operational organizations. Pittsburgh (PA): Carnegie Mellon Software Engineering Institute; 2002. 24 p. Report No.: CMU/SEI-2002-TN-006.
438. Greiling D. Balanced scorecard implementation in German non-profit organisations. *Int J Product Perform Manag*. 2010; 59(6):534-54.
439. Valero-Amaro V, Galera-Casquet C, Barroso-Méndez MJ. Market orientation in NGDOs: construction of a scale focused on their stakeholders. *Soc Sci*. 2019; 8(8):237-67.
440. De Zúñiga HG, Barnidge M, Scherman A. Social media social capital, offline social capital, and citizenship: exploring asymmetrical social capital effects. *Polit Commun*. 2017; 34(1):44-68.
441. Barcelos RH, Dantas DC, Sénécal S. Watch your tone: how a brand's tone of voice on social media influences consumer responses. *J Interact Market*. 2018; 41:60-80.
442. Bird RB, Stewart WE, Lightfoot EN. Transport phenomena. 2nd ed. New York (NY): John Wiley & Sons; 2002.
443. Shannon CE. A mathematical theory of communication. *Bell Syst Tech J*. 1948; 27(3, 4):379-423, 623-56.

REFERENCES

444. Koestler A. *The ghost in the machine*. London: Hutchinson & Co.; 1967.
445. The Bertha Centre for Social Innovation and Entrepreneurship. *A guide to legal forms for social enterprises in South Africa*. Cape Town: University of Cape Town, Business GSo; 2016 February. 31 p.
446. Flood RL, Jackson MC. *Creative problem solving: total systems intervention*. Chichester: John Wiley & Sons; 1991.
447. Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ] Monitoring and Evaluation Unit. *GIZ's results-based monitoring system: framework of reference*. Eschborn: GIZ; 2008. 3 p.
448. Kulothungan GD, Oham C, Jirel P. Managing uncertainty in small and micro social enterprises: a Cynefin-Bricolage framework. In: Maher C, editor. *Handbook of research on value creation for small and micro social enterprises*. Hershey (PA): IGI Global; 2019. p. 327-48.
449. Bryant LC. *Funding sources and marketing strategies to sustain small-to-midsized nonprofit businesses [dissertation]*. Minneapolis (MN): Walden University; 2020.
450. Waterhouse P. EasyJet and Greiner's growth model. *Business Review*. 2017 September; 24(1):8-10.
451. Almog-Bar M, Schmid H. Advocacy activities of nonprofit human service organizations. *Nonprof Volunt Sec Q*. 2013; 43(1):11-35.
452. Newig J, Challies E, Jager NW, Kochskaemper E, Adzersen A. The environmental performance of participatory and collaborative governance: a framework of causal mechanisms. *Policy Stud J*. 2018; 46(2):269-97.
453. Firmin A. *Contested and under pressure: a snapshot of the enabling environment of civil society in 22 countries*. Johannesburg: CIVICUS; 2017. 52 p.
454. García JM. *Theory and practical exercises of system dynamics: modeling and simulation with Vensim PLE*. Cambridge (MA): MIT Sloan School of Management; 2020.
455. Eker S, Zimmermann N. Using textual data in system dynamics model conceptualization. *Systems*. 2016; 4(3):14.
456. Kopainsky B, Luna-Reyes LF. Closing the loop: promoting synergies with other theory building approaches to improve system dynamics practice. *Syst Res Behav Sci*. 2008; 25(4):471-86.
457. Coyle G. Qualitative and quantitative modelling in system dynamics: some research questions. *Syst Dynam Rev*. 2000; 16(3):225-44.
458. Richardson GP. Reflections for the future of system dynamics. *J Oper Res Soc*. 1999; 50(4):440-9.
459. Jung T, Scott T, Davies HTO, Bower P, Whalley D, McNally R, et al. Instruments for the exploration of organisational culture: a review of the literature. *Public Admin Rev*. 2009; 69(6):1087-96.
460. Transparency International. *Corruption perceptions index 2020: technical methodology note*. Berlin: Transparency International; 2020. 5 p.

REFERENCES

461. Wolstenholme E. Qualitative vs quantitative modelling: the evolving balance. *J Oper Res Soc.* 1999; 50(4):422-8.
462. Nuthmann C. Using human judgment in system dynamics models of social systems. *Syst Dynam Rev.* 1994; 10(1):1-27.
463. Homer J, Oliva R. Maps and models in system dynamics: a response to Coyle. *Syst Dynam Rev.* 2001; 17(4):347-55.
464. Hirsch PM, Bermiss YS. Institutional "dirty" work: preserving institutions through strategic decoupling. In: Lawrence TB, Suddaby R, Leca B, editors. *Institutional work: actors and agency in institutional studies of organizations.* Cambridge: Cambridge University Press; 2009. p. 262-83.
465. Turco C. Difficult decoupling: employee resistance to the commercialization of personal settings. *AJS.* 2012; 118(2):380-419.
466. Suykens B, De Rynck F, Verschuere B. Nonprofit organizations in between the nonprofit and market spheres: shifting goals, governance and management? *Nonprofit Manag Lead.* 2019; 29(4):623-36.
467. Lane D. Participative modelling and big issues: defining features of system dynamics? *Syst Res Behav Sci.* 2010; 27(4):461-5.
468. Jacobs FA, Marudas NP. The combined effect of donation price and administrative inefficiency on donations to US nonprofit organizations. *Financ Account Manag.* 2009; 25(1):33-53.
469. Sargent RG. Verifying and validating simulation models. Paper presented at the 28th conference on Winter simulation; 1996 December 8-11; Coronado (CA): United States.
470. Forrester JW, Senge PM. Tests for building confidence in system dynamics models. In: Legasto AAJ, Forrester JW, Lyneis JM, editors. *System dynamics. TIMS studies in the management sciences.* Oxford: North-Holland; 1980. p. 209-28.
471. Qudrat-Ullah H, Seong BS. How to do structural validity of a system dynamics type simulation model: the case of an energy policy model. *Energy Policy.* 2010; 38(5):2216-24.
472. Beck DEC, C.C. *Spiral dynamics: mastering values, leadership and change.* Oxford: Blackwell Publishing; 1996.
473. Torbert WR. *Managing the corporate dream: restructuring for long-term success.* Homewood (IL): Dow Jones-Irwin; 1987.
474. Cacioppe R, Edwards M. Seeking the holy grail of organisational development: a synthesis of integral theory, spiral dynamics, corporate transformation and action inquiry. *Leadersh Organ Dev J.* 2005; 26(2):86-105.
475. Snowden DJ. Complex acts of knowing: paradox and descriptive self-awareness. *J Knowl Manag.* 2002; 6(2):100-11.
476. Putnam RD, Leonardi R, Nonetti RY. *Making democracy work: civic traditions in modern Italy.* Princeton (NJ): Princeton University Press; 1993.
477. Miller-Millesen JL. Understanding the behavior of nonprofit boards of directors: a theory-based approach. *Nonprof Volunt Sec Q.* 2003; 32(4):521-47.

REFERENCES

478. Fligstein N, Freeland R. Theoretical and comparative perspectives on corporate organization. *Annu Rev Sociol.* 1995; 21:21-43.
479. Ruiz-Miranda CR, Vilchis LI, Swaisgood RR. Exit strategies for wildlife conservation: why they are rare and why every institution needs one. *Front Ecol Environ.* 2020; 18(4):203-10.
480. Davis GF, Cobb JA. Resource dependence theory: past and future. In: Bird Schoonhoven C, Dobbin F, editors. *Stanford's organization theory renaissance, 1970–2000.* 28. Bingley: Emerald Publishing; 2010. p. 21-42.
481. Woo D. Exit strategies in interorganizational collaboration: setting the stage for re-entry. *Communic Res.* 2021; 48(6):845–73.
482. Nuer ATK. Exit strategies for social venture entrepreneurs [thesis]. Wageningen: Wageningen University; 2015.
483. Valentinov V. Toward a critical systems perspective on the nonprofit sector. *Syst Pract Act Res.* 2012; 25(4):355–64.
484. Smith WK, Lewis MW, Jarzabkowski P, Langley A. Foreword: paradox in organizational theory. In: Smith WK, Lewis MW, Jarzabkowski P, Langley A, editors. *The Oxford handbook of organizational paradox.* Oxford: Oxford University Press; 2017.
485. Miron-Spektor E, Ingram A, Keller J, Smith WK, Lewis MW. Microfoundations of organizational paradox: the problem is how we think about the problem. *Acad Manage J.* 2018; 61(1):26-45.
486. Tomm K. Interventive interviewing: part III. Intending to ask lineal, circular, strategic, or reflexive questions? *Fam Process.* 1988; 27(1):1-15.
487. Tomm K. Circular interviewing: a multifaceted clinical tool. In: Campbell D, Draper R, editors. *Applications of systemic family therapy: the Milan approach. Complementary frameworks of theory and practice.* 3. London: Grune & Stratton; 1985. p. 33-45.
488. Snowden DJ, Boone ME. A leader's framework for decision making. *Harv Educ Rev.* 2007; 85(11):68-75.
489. Mingers J. The contribution of critical realism as an underpinning philosophy for OR/MS and systems. *J Oper Res Soc.* 2000; 51(11):1256-70.
490. Sousa FJ. Metatheories in research: positivism, postmodernism, and critical realism. In: Woodside AG, editor. *Organizational culture, business-to-business relationships, and interfirm networks. Advances in Business Marketing and Purchasing.* Bingley: Emerald Publishing; 2010. p. 455–503.
491. Singh V, Walwyn DR. Influence of personal epistemology on research design: implications for research education. *J Res Pract.* 2017; 13(2):2-15.
492. Mertler CA. *Action research: teachers as researchers in the classroom.* 2nd ed. Thousand Oaks (CA): SAGE Publications; 2009.
493. Harmse MFP. A challenge for operations research: serving the Sasolburg Alliance for Street Children [thesis]. Vanderbijlpark: Potchefstroomse Universiteit vir Christelike Hoër Onderwys; 2000.
494. Harris SR. Systemic-structural activity analysis of HCI video data. Paper presented at the First International Workshop on

REFERENCES

Activity Theory Based

Practical Methods for IT-Design; 2004 September 2-3; Copenhagen: Denmark.

495. Corbin J, Morse JM. The unstructured interactive interview: issues of reciprocity and risks when dealing with sensitive topics. *Qual Inq.* 2003; 9(3):335-54.
496. Ackoff RL. A black ghetto's research on a university. *Oper Res.* 1970; 18(5):761-71.
497. Rittel HWJ, Webber MM. Dilemmas in a general theory of planning. *Policy Sci.* 1973; 4:155-69.
498. Jaradat RM. Complex system governance requires systems thinking - how to find systems thinkers. *Int J Syst Syst Eng.* 2015; 6(1/2):53-70.
499. Arnold RD, Wade JP. A complete set of systems thinking skills. Paper presented at the 27th Annual INCOSE International Symposium; 2017 July 15-20; Adelaide: Australia.
500. Bourner T, Brook C. Comparing and contrasting action research and action learning. In: Mertler CA, editor. *The Wiley handbook of action research in education.* Hoboken (NJ): Wiley-Blackwell; 2019. p. 185-205.
501. Pries-Heje J, Baskerville R. The design theory nexus. *MIS Q.* 2008; 32(4):731-55.
502. Dreyfus HL, Rabinow P. *Michel Foucault: beyond structuralism and hermeneutics.* 2nd ed. Chicago (IL): University of Chicago Press; 1983.
503. Habermas Jr. *Communication and the evolution of society.* Cambridge: Polity Press; 1991.
504. Anheier HK. *Civil society: measurement, evaluation, policy.* London: Earthscan; 2004.
505. National Endowment for Democracy. *Annual report.* Washington (DC): National Endowment for Democracy; 2012. 118 p.
506. Article 19 [Internet]. Article 19 report shows sharp decline in global freedom of expression since 2014. [updated 2018 December 5; cited 2021 June 17]. Available from: <https://www.article19.org/resources/article-19-report-shows-sharp-decline-in-global-freedom-of-expression-since-2014/>.
507. International Center for Not-for-Profit Law [ICNL] [Internet]. Monitoring & assessment. [updated c2021; cited 2021 June 6]; 2021(9 June). Available from: <https://www.icnl.org/our-work/monitoring-assessment#icnltools>.
508. Sparke M. *The dictionary of human geography.* Chichester: Wiley-Blackwell; 2009. Globalization; p. 308-11.
509. Park YJ, Matkin DST. The demise of the overhead myth: administrative capacity and financial sustainability in nonprofit nursing homes. *Public Admin Rev.* 2020:1-15.
510. Taylor A, Harold J, Berger K. *The overhead myth: moving toward an overhead solution.* BBB Wise Giving Alliance, GuideStar USA, Charity Navigator; 2014. 2 p.
511. Berrett JL. *Burying the overhead myth and breaking the nonprofit starvation cycle: identifying more valid measures and determinants of nonprofit efficiency [dissertation].* Raleigh (NC): North Carolina State University; 2020.
512. Chia R. The problem of reflexivity in organisational research: towards a postmodern science of organizations. *Organization.* 1996; 3(1):31-59.

REFERENCES

513. Bushe GR, Marshak RJ. Revisioning organization development: diagnostic and dialogic premises and patterns of practice. *J Appl Behav Sci.* 2009; 45(3):348-68.
514. Mikkelsen MF, Venable JR, Aaltonen K. Researching navigation of project complexity using action design research. *Int J Manag Proj Bus.* 2021; 14(1):108-30.
515. Franssen M, Lokhorst G-J, Van de Poel I. Philosophy of technology. In: Zalta EN, editor. *The Stanford encyclopedia of philosophy* [Internet]. Fall 2018. Stanford (CA): Metaphysics Research Lab, Stanford University. 2018 [cited 2020 November 7]. Available from: <https://plato.stanford.edu/archives/fall2018/entries/technology/>.
516. López-Garay H, Molano DL. Alter design: a clearing where design is revealed as coming full circle to its forgotten origins and dissolved into nondesign. *Des Philos Pap.* 2017; 15(1):63-7.
517. Midgley G. Systemic intervention. In: Bradbury H, editor. *The Sage Handbook of action research.* 3rd ed. London: SAGE Publications; 2015. p. 157-66.
518. Ashby WR. Requisite variety and its implications for the control of complex systems. *Cybernetica.* 1958; 1(2):83-99.
519. Weick KE. Enacted sensemaking in crisis situations. *J Manag Stud.* 1988; 25(4):305-17.
520. Michaels S. Matching knowledge brokering strategies to environmental policy problems and settings. *Environ Sci Policy.* 2009; 12(7):994-1011.
521. Spear R. "Underneath the iceberg" - challenges to the process of operational research (OR) / systems from alternative practice. *Syst Practice.* 1993; 6(2):139-53.
522. Emirbayer M, Mische A. What is agency? *Am J Sociol.* 1998; 103(4):962-1023.
523. Oxford Learner's Dictionaries [Internet]. Oxford: Oxford University Press; c2023 [cited 2023 May 25]. Inform; Available from: <https://www.oxfordlearnersdictionaries.com/definition/english/inform?q=inform>.
524. Carey LJ, Flower L. Foundations for creativity in the writing process: rhetorical representations of ill-defined problems. In: Glover JA, Ronning RR, Reynolds CR, editors. *Handbook of creativity.* New York (NY): Springer Science + Business Media; 1989. p. 283-303.
525. Noble H, Smith J. Issues of validity and reliability in qualitative research. *Evid Based Nurs.* 2015; 18(2):34-5.
526. Manthata GT. Social capital and cooperative enterprise development: a case study in Mpumalanga, South Africa [dissertation]. Pretoria: University of South Africa; 2017.
527. Rifkin J. *The zero marginal cost society: the internet of things, the collaborative commons, and the eclipse of capitalism.* New York (NY): Palgrave Macmillan; 2014.
528. Choi TM, Kumar S, Yue X, Chan HL. Disruptive technologies and operations management in the Industry 4.0 era and beyond. *Prod Oper Manag.* 2022; 31(1):9-31.
529. Brown SW, Grant AM. From GROW to GROUP: theoretical issues and a practical model for group coaching in organisations. *Coaching.* 2010; 3(1):30-45.
530. Cambridge Dictionary [Internet]. Cambridge: Cambridge University Press; c2020 [cited 2020 December 2]. Development; Available from: <https://dictionary.cambridge.org/dictionary/english/development>.

REFERENCES

531. Chari S. *The dictionary of human geography*. 5th ed. Chichester: Wiley-Blackwell; 2009. Development; p. 155-6.
532. Gudynas E. Buen vivir: today's tomorrow. *Development*. 2011; 54(4):441-7.
533. Capra F. *The Tao of physics*. Boulder (CO): Shambhala Publications; 1975.
534. Whitney D, Cooperrider DL. The appreciative inquiry summit: overview and applications. *Employ Relat Today*. 1998; 25(2):17-28.
535. Haines A. Asset-based community development. In: Phillips R, Pittman R, editors. *An introduction to community development*. 2nd ed. London: Routledge; 2014. p. 67-78.
536. Loa CK, Chenb CH, Zhong RY. A review of digital twin in product design and development. *Adv Eng Inform*. 2021; 48(101297).
537. Curnin S, O'Hara D. Nonprofit and public sector interorganizational collaboration in disaster recovery: lessons from the field. *Nonprofit Manag Lead*. 2019; 30(2):277-97.
538. Storper M. Society, community, and economic development. *Stud Comp Int Dev*. 2005; 39(4):30-57.
539. Tsarenko Y, Simpson D. Relationship governance for very different partners: the corporation-nonprofit case. *Ind Mark Manag*. 2017; 63:31-41.
540. Delshab V, Winand M, Sadeghi Boroujerdi S, Hoeber L, Mahmoudian A. The impact of knowledge management on performance in nonprofit sports clubs: the mediating role of attitude toward innovation, open innovation, and innovativeness. *Eur Sport Manag Q*. 2020:1-22.
541. Radnor ZJ, Barnes D. Historical analysis of performance measurement and management in operations management. *Int J Product Perform Manag*. 2007; 56(5/6):384-96.
542. Herman RD, Heimovics D. Executive leadership. In: Herman RD, editor. *The Jossey-Bass handbook of nonprofit leadership and management*. 2nd ed. San Francisco (CA): Jossey-Bass; 2016. p. 153-70.
543. Drucker PF. *Managing the non-profit organization: practices and principles*. London: Taylor & Francis; 1995.
544. Bryson JM. *Strategic planning for public and nonprofit organizations*. 5th ed. Hoboken (NJ): John Wiley & Sons; 2018.
545. Warburton J, Moore M, Oppenheimer M. Challenges to the recruitment and retention of volunteers in traditional nonprofit organizations: a case study of Australian Meals on Wheels. *Int J Public Adm*. 2018; 41(16):1361-73.
546. Pinho JC, Rodrigues AP, Dibb S. The role of corporate culture, market orientation and organisational commitment in organisational performance: the case of non-profit organisations. *J Manag Dev*. 2014; 33(4):374-98.
547. Gao Y. Business leaders' personal values, organisational culture and market orientation. *J Strateg Mark*. 2017; 25(1):49-64.
548. Labour Relations Act, 66. Sect. 189 1995.
549. Trialogue. *The Trialogue business in society handbook*. 23rd ed. Cape Town: Trialogue; 2020.

REFERENCES

550. Education Training and Development Practices Sector Education and Training Authority [ETDP SETA]. NGOs subsector skills plan 2020-2021. Johannesburg: ETDP SETA; 2019. 65 p.
551. Statistics South Africa. Statistics of the non-profit sector for South Africa, 2011. Discussion Document. Pretoria: Statistics South Africa; 2014. 29 p. Report No.: D0407.2.
552. International Center for Not-for-Profit Law [ICNL] [Internet]. South Africa. [updated 2021; cited 2021 June 9];2021(9 June). Available from: <https://www.icnl.org/resources/civic-freedom-monitor/south-africa>.
553. Transparency International [Internet]. Corruption perceptions index. [updated 2021 January 28; cited 2021 June 9];2021(9 June). Available from: <https://www.transparency.org/en/cpi/2020/index/zaf#>.
554. Albert Luthuli Centre for Responsible Leadership. Values as a blueprint for value creation. Pretoria: University of Pretoria; 2016. 71 p.
555. Carter D. Tolerance in South Africa: exploring popular attitudes toward foreigners. Cape Town: Afrobarometer; 2010. 8 p. Report No.: 82.
556. South African News Agency [Internet]. Basic education, sports team up in schools. [updated 2018 May 30; cited 2020 April 21];2020(April 21). Available from: <https://www.sanews.gov.za/south-africa/basic-education-sports-team-schools>.
557. Kemp S [Internet]. Digital 2020: South Africa. [updated 2020 February 18; cited 2020 August 2](2 August 2020). Available from: <https://datareportal.com/reports/digital-2020-south-africa>.
558. Kemp S [Internet]. Digital 2020: July global statshot. [updated 2020 July 21; cited 2020 August 2](2 August 2020). Available from: <https://datareportal.com/reports/digital-2020-july-global-statshot>.
559. GlobalWebIndex. Social: GlobalWebIndex's flagship report on the latest trends in social media. London: GlobalWebIndex; 2020. 29 p.
560. Aubrey C. Sources of inequality in South African early child development services. *S Afr J Child Educ.* 2017; 7(1):a450.
561. Binney D. The knowledge management spectrum – understanding the KM landscape. *J Knowl Manag.* 2001; 5(1):33-42.
562. Pauli G. The blue economy. *Japan Spotlight.* 2011; 175:14-7.
563. United Nations Environment Programme Finance Initiative. The natural capital declaration. Declaration. Rio de Janeiro: United Nations Environment Programme Finance Initiative; 2012. 3 p.
564. Valentinov V. System–environment relations in the theories of open and autopoietic systems: implications for critical systems thinking. *Syst Pract Act Res.* 2012; 25(6):537–42.
565. Allee V. Value network analysis and value conversion of tangible and intangible assets. *J Intellect Cap.* 2008; 9(1):5-24.
566. Day NE. Total rewards programs in nonprofit organizations. In: Herman RD, editor. *The Jossey-Bass handbook of nonprofit leadership and management.* 2nd ed. San Francisco (CA): Jossey-Bass; 2016. p. 660-702.

REFERENCES

567. Watson MR, Abzug R. Finding the ones you want, keeping the ones you find: recruitment and retention in nonprofit organizations. In: Herman RD, editor. *The Jossey-Bass handbook of nonprofit leadership and management*. 2nd ed. San Francisco (CA): Jossey-Bass; 2016. p. 623-59.
568. Mex CL. Stepping up or stepping out? Recruitment and retention of volunteer leaders in grassroots associations. *Third Sect Rev*. 2018; 24(1):71-96.
569. Dury S. Dynamics in motivations and reasons to quit in a care bank: a qualitative study in Belgium. *Eur J Ageing*. 2018; 15:407-16.
570. Zaim S, Bayyurt N, Tarim M, Zaim H, Guc Y. System dynamics modeling of a knowledge management process: a case study in Turkish Airlines. *Procedia - Social and Behavioral Sciences* 2013; 99:545 – 52.
571. Bourdieu P. The forms of capital. In: Richardson JG, editor. *Handbook of theory and research for the sociology of education*. Westport (CT): Greenwood; 1986. p. 241-58.
572. Devalkar SK, Sohoni MG, Arora P. Ex-post funding: how should a resource-constrained non-profit organization allocate its funds? *Prod Oper Manag*. 2017; 26(6):1035-55.
573. Hafsi T, Thomas H. Strategic management and change in high dependency environments: the case of a philanthropic organization. *Voluntas*. 2005; 16(4):329–51.
574. Natarajan KV, Swaminathan JM. Multi-treatment inventory allocation in humanitarian health settings under funding constraints. *Prod Oper Manag*. 2017; 26(6):1015–34.
575. United Nations. *World economic situation and prospects*. New York (NY): United Nations; 2020. 214 p.
576. Venter L. *A systems perspective of basic education in South Africa [dissertation]*. Stellenbosch: Stellenbosch University; 2020.
577. Tinkelman D, Mankaney K. When is administrative efficiency associated with charitable donations? *Nonprof Volunt Sec Q*. 2007; 36(1):41-64.
578. Marudas NP, Petherbridge J. Effects of organizational factors on donation sensitivity to an accounting efficiency measure. *J Finance Account*. 2017; 21.
579. Tinkelman D. Factors affecting the relation between donations to not-for-profit organizations and an efficiency ratio. In: Copley PA, editor. *Research in government and nonprofit accounting*. 10. Stamford (CT): JAI Press; 1999. p. 135-61.
580. Leardini C, Rossi G, Landi S. Organizational factors affecting charitable giving in the environmental nonprofit context. *Sustainability*. 2020; 12(21):8947-57.
581. Kinsbergen S, Tolsma J. Explaining monetary donations to international development organisations: a factorial survey approach. *Soc Sci Res*. 2013; 42(6):1571-86.
582. Zhao L, Shneor R. Donation crowdfunding: principles and donor behaviour. In: Shneor R, Zhao L, Flåten B-T, editors. *Advances in crowdfunding*. Cham: Palgrave Macmillan; 2020. p. 145–60.
583. Meer J. Effects of the price of charitable giving: evidence from an online crowdfunding platform. *J Econ Behav Organ*. 2014; 103:113-24.
584. Scott MA. *Organisational factors that drive fundraising effectiveness in Australian health charities [research project report]*. Brisbane: Queensland University of Technology; 2014.

REFERENCES

585. Burger R, Owens T. Receive grants or perish? The survival prospects of Ugandan non-governmental organisations. *J Dev Stud.* 2013; 49(9):1284-98.

586. System Dynamics Society [Internet]. Useful open source tools. System Dynamics Society; [updated c2023; cited 2023 March 14]. Available from: <https://systemdynamics.org/tools/useful-open-source-tools/>.

587. The Anylogic Company [Internet]. Export a model to AnyLogic cloud - tutorial. The Anylogic Company; [updated c2023; cited 2023 March 5]. Available from: <https://anylogic.help/cloud/export-cloud-tutorial.html>.

ADDENDUM A SUMMATIVE CONTENT ANALYSIS

Code Groups	Code	Comment	Grounded	Density
PRODUCTS & SERVICES	Capability	A capability level consists of related specific and generic practices for a process area that can improve the organization's processes associated with that process area (437)	4	8
PRODUCTS & SERVICES	Marketing	Design and marketing are two important parts of product development. Design indicates what people really need (214). Marketing indicates what people actually buy.	12	13
PRODUCTS & SERVICES	Organisational growth	An integrative approach entails the creation of financial value through other sustainability measures, rather than an instrumental win-win business case approach where financial value is created while addressing other sustainability issues (152).	4	13
PRODUCTS & SERVICES	Organisational processes	Process design, and product and service design, are two interrelated conceptual activities which must be treated together (25).	16	16
PRODUCTS & SERVICES	Organisational structure	Organisational structure can be regarded as a pattern of relations among organisational actors, the distribution of functions of management, control and communication, activities, and other resources for strategy implementation (208, 366-368).	6	5
PRODUCTS & SERVICES	Product and service affordability		1	2
PRODUCTS & SERVICES	Product and service design		9	10
PRODUCTS & SERVICES	Product and service distribution		6	2

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PRODUCTS & SERVICES	Product and service management		5	3
PRODUCTS & SERVICES	Product and service offering		1	2
PRODUCTS & SERVICES	Product life		6	3
PRODUCTS & SERVICES	Products and services		10	6
PRODUCTS & SERVICES	Resource management	Operations transform resources into products and services.	29	15
PRODUCTS & SERVICES	Supply chain management	Merged with closed-loop supply chain	16	13
PRODUCTS & SERVICES	Total cost of operation		2	4
PRODUCTS & SERVICES	Value creation		9	8
PRODUCTS & SERVICES	Value-based management		2	10
PRODUCTS & SERVICES	Waste management		20	13
STAKEHOLDERS	Advocacy	Advocacy by NPOs refers to the representation and protection of disadvantaged, disenfranchised or marginalized groups (451).	3	5
STAKEHOLDERS	Beneficiaries		1	2
STAKEHOLDERS	Business		1	3
STAKEHOLDERS	Collaboration		15	19
STAKEHOLDERS	Communication		11	13
STAKEHOLDERS	Competition		5	5
STAKEHOLDERS	Confidentiality	One of the largest barriers to NPOs using social media is concern regarding confidentiality of clients (384).	1	1
STAKEHOLDERS	Customer		18	8

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STAKEHOLDERS	Customer categorisation		2	1
STAKEHOLDERS	Donors		8	5
STAKEHOLDERS	Government		8	7
STAKEHOLDERS	Interdependence among NPOs		4	5
STAKEHOLDERS	Lobbying	Lobbying by NPOs refers to direct or indirect advocacy efforts that aim to influence specific legislation through appeals to policy-makers or individuals by promoting a specific position (451).	2	3
STAKEHOLDERS	Organisational environment	The outer and inner environment of an organisation is indicated by boundaries where the organisation connects with external and internal stakeholders and resources are transformed (208).	14	17
STAKEHOLDERS	Partnerships		11	15
STAKEHOLDERS	Policy	See lobbying	6	5
STAKEHOLDERS	Professional support	Volunteering (420)	2	3
STAKEHOLDERS	Responsibility	Interorganizational structures, trusting relationships and role clarity are required for collaboration where role clarity facilitates interorganizational structures and trusting relationships (537).	3	3
STAKEHOLDERS	Social media		3	2
STAKEHOLDERS	Society	Community refers to forms of collective life in which people are tied together through tradition, interpersonal contacts, informal relationships, and particularistic affinities, interests or similarities, while society refers to collectives held together through anonymous,	5	4

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		rule-bound, more transparent, formal, and universalistic principles (538).		
STAKEHOLDERS	Stakeholder relations		17	38
STAKEHOLDERS	Trusting	NPOs view trust as critical to the management of legitimacy due to concerns that their legitimacy might be called into question by partnering with a corporation and potential power imbalances that can lead to abuses of the relationship (539).	1	4
GOVERNANCE	Accountability	Accountability includes clear performance expectations, evidence to understand effectiveness, consequences, and holding to account (204). However, the context determines which version of accountability is operating.	11	9
GOVERNANCE	Benchmarking	See performance management	3	3
GOVERNANCE	Causal relationships	Some measurement systems have an unbalanced distribution of financial and non-financial performance measures and lack cause-and-effect linkages as well as compensation links at all levels (438).	1	1
GOVERNANCE	Clarity	Clarity regarding accountability and learning is required to close any gap between expected processes, evidence, analysis, timing and capacities (204).	1	3
GOVERNANCE	Complexity	Resolving tension between accountability and learning involves consideration of non-linearity and non-predictability where	1	1

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		appropriate since not everything is complex, nor is everything completely unpredictable (204).		
GOVERNANCE	External threats	Organisational governance involves strategic performance management which includes regulation and performance evaluation (208). It also involves power relations and conflict resolution.	5	6
GOVERNANCE	Global trends	See external threats	2	2
GOVERNANCE	Impact assessment	See performance management	9	2
GOVERNANCE	Innovation	Knowledge management improves innovation (540)	8	22
GOVERNANCE	Internal threats	See external threats	4	7
GOVERNANCE	Knowledge management	Knowledge management gets the right knowledge to the right people at the right time to improve organisational performance (449).	7	12
GOVERNANCE	Legitimacy	Legitimacy is a key performance outcome for NPOs (539).	3	5
GOVERNANCE	Organisational governance		6	7
GOVERNANCE	Organisational learning	Evaluation and social impact measurement encourage learning and self-reflection within organisations (369).	6	10
GOVERNANCE	Organisational synergies	Creatively merge needs, for example, upward accountability requirements with strategic accountability and organizational learning needs (204).	1	2
GOVERNANCE	Outcomes	The measurement system has shifted the organization's focus from programs and initiatives to the outcomes the programs and initiatives are supposed to accomplish (378).	7	3

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GOVERNANCE	Performance management	Organisational governance involves strategic performance management which includes regulation and performance evaluation (208). It also involves power relations and conflict resolution.	50	34
GOVERNANCE	Power	Organisational governance involves strategic performance management which includes regulation and performance evaluation (208). It also involves power relations and conflict resolution.	2	5
GOVERNANCE	Quality management	Total quality management increased the concern of operations management to improve effectiveness and responsiveness as part of performance management (541).	8	10
GOVERNANCE	Risk management	See external threats	1	2
GOVERNANCE	Social return on investment	See outcomes	4	4
LEADERSHIP	Board effectiveness		4	8
LEADERSHIP	Leadership		18	20
LEADERSHIP	Mission	The responsibilities of boards and chief executives include the definition and refinement of the organization's mission, securing the resources necessary to achieve the mission, and the selection and implementation of strategies appropriate to and effective in mission accomplishment and resource acquisition (542).	24	25
LEADERSHIP	Organisational strategy	See mission	32	24
LEADERSHIP	Personal attributes	Development as a person, executive and leader (543).	7	2

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LEADERSHIP	Vision	Strategic planning include the identification of organizational mandates, clarification of organizational mission and values, assessment of the external and internal environments to identify strengths, weaknesses, opportunities and threats, the identification of the strategic issues facing the organization, formulation of strategies to manage the issues, revision and adoption of the strategic plans, establishment of an effective organizational vision, development of an effective implementation process, and reassessment of strategies and the strategic planning process (544).	2	1
FUNDING	Financial management		14	5
FUNDING	Funding model		6	3
FUNDING	Funding sources		16	15
FUNDING	Fundraising expenditure		1	1
FUNDING	Philanthropic funding		13	12
FUNDING	Profit		1	3
FUNDING	Revenue		10	12
HUMAN RESOURCES	Change management	Empowering volunteers to take ownership over change processes could assist with their cooperation, reduce resistance, and help them to embrace change as a positive initiative especially if they have agency (545).	2	7

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		Organisational development involves organisational change to improve performance.		
HUMAN RESOURCES	Employees		5	8
HUMAN RESOURCES	Human resource management		10	23
HUMAN RESOURCES	Organisational commitment	Organisational commitment refers to employees' emotional attachment, identification with and involvement in the organisation (546).	3	5
HUMAN RESOURCES	Recognition		2	4
HUMAN RESOURCES	Recruitment		9	11
HUMAN RESOURCES	Retention		4	10
HUMAN RESOURCES	Training and development		8	6
HUMAN RESOURCES	Volunteers		11	10
ORGANISATIONAL CULTURE	Contemporary orientation	See market orientation	1	1
ORGANISATIONAL CULTURE	Decoupling	An organization's external discourse can expand into a key feature of the organization's internal culture and may mark decoupled practices as illegitimate and justify resistance (465).	2	2
ORGANISATIONAL CULTURE	Diversity	Cultural competence refers to how skilfully an organization and its staff/volunteers interact with diverse cultures (145).	2	3
ORGANISATIONAL CULTURE	Market orientation	Different organisational cultures have different impacts on market orientation (547).	12	14

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ORGANISATIONAL CULTURE	Organisational culture		14	22
ORGANISATIONAL CULTURE	Organisational identity		3	1
ORGANISATIONAL CULTURE	Organisational values		8	1
ORGANISATIONAL CULTURE	Societal orientation	See market orientation	8	20
TECHNOLOGY	Appropriate technology		14	13
TECHNOLOGY	Clean process technology		2	3
SUSTAINABILITY	Agency	Capitals are used by actors to produce livelihood (120). Structure determines the direction of the outcome, but the agency of actor's livelihood strategies may change the direction. The feedback loops of agency from actor to structure therefore run through the vital capitals.	3	1
SUSTAINABILITY	Capitals	See agency	3	0
SUSTAINABILITY	Corporate social responsibility		3	0
SUSTAINABILITY	Economic prosperity		1	0
SUSTAINABILITY	Energy security		1	0
SUSTAINABILITY	Industrial ecology		3	0
SUSTAINABILITY	Low-carbon economy		1	0

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SUSTAINABILITY	Natural environmental management system		4	5
SUSTAINABILITY	Operations		7	1
SUSTAINABILITY	Operations control		4	0
SUSTAINABILITY	Operations design		4	0
SUSTAINABILITY	Operations improvement		4	1
SUSTAINABILITY	Operations planning		4	0
SUSTAINABILITY	Social capital		5	5
SUSTAINABILITY	Social economy		1	4
SUSTAINABILITY	Social manufacturing		1	0
SUSTAINABILITY	Trade-off	A better understanding is required of the trade-offs and tensions between the different sustainability dimensions (422).	3	1
SUSTAINABILITY	Triple bottom line		6	1

ADDENDUM B RESEARCH AGREEMENT

COLLABORATION AGREEMENT

between

XXX
(Trading as XXX)

With registration number XXX

Herein represented by XXX in his capacity as General Manager, and being duly authorised thereto.

AND

MARTHA FREDRICKA PETRONELLA HARMSE

Registered for studies towards the degree of Doctor of Philosophy in Industrial Systems at the University of Pretoria with student number 20818778

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ABBREVIATIONS AND DEFINITIONS

Agreement	Collaboration agreement between Martha Fredricka Petronella Harmse (University of Pretoria student number 20818778) and XXX trading as XXX (PBO registration number XXX)
XXX	XXX
NPO	A corporate body which is not part of government and with an identity and existence distinct from its members or office-bearers, a constitution that states the mechanisms for its governance, a banking account through which financial transactions are conducted, and with income, property and other assets not distributable to its members or office-bearers.
PBO	Public benefit organisation
Researcher	Martha Fredricka Petronella Harmse (University of Pretoria student number 20818778)
University	University of Pretoria

1. PREAMBLE

In pursuit of sustainable development, the Researcher and XXX enter into this Agreement in order to generate reciprocal and sustainable benefit within a framework of integrity, relationship building, human capacity building, sense of identity and self-esteem, and accountability.

2. PARTIES TO THE AGREEMENT

- 2.1. The Researcher is interested in collaborative research of operations management for sustainability in an NPO.
- 2.2. XXX is interested in collaboration to improve the sustainability of the management of their operations.
- 2.3. Should the trading name “XXX” change, the Agreement will continue between XXX and the Researcher. In such an event, the change of name will be formally incorporated as an addendum to the Agreement and signed by both parties.

3. BACKGROUND

- 3.1. The Researcher is doing research with Dr WL Bean, a senior lecturer in the Department of Industrial Engineering, towards a PhD at the University of Pretoria. The research study is entitled An operations management model for sustainability in an NPO. Like other organisations, NPOs must address the consequences of current social and natural issues including more, complex and often conflicting objectives, complex operations performance assessment, complex types of products and services, an uncertain environment, and multiple stakeholders. Moreover, NPOs must advocate the sustainability of businesses and government and contribute to the sustainability of society. The challenge is that the mentioned social and natural concerns question the legitimacy of NPOs so that their sustainability is at stake.
- 3.2. XXX, which trades as XXX, was established in Pretoria, South Africa in XXX with the aim to bring the educational value of chess to communities where there are major challenges in education and where these challenges reflect in the academic performance of schools. In XXX the Trust registered as an NPO and a PBO. The mission of XXX is to educate future mindsets. Their vision is to ignite confidence and talent. Currently XXX does not have an effective business plan in place which would have enabled them to improve their operations and service quality. Not all staff members have sufficient knowledge and experience to execute an operational business plan, but XXX does not have funds available for staff training and development. Furthermore, XXX needs assistance with project rollout in terms of events management, project management and equipment. XXX also requires more funds and collaborations in order to continue the valuable work they do in society. XXX enter into the Agreement with the Researcher because they have been working with her since XXX.
- 3.3. Should the operations of XXX change, including but not restricted to change of office-bearers, the Agreement will continue as long as XXX is defined as an NPO as stipulated in the Abbreviations and Definitions of the Agreement. In the event that XXX is no longer defined as such, including but not restricted to dissolution, the Agreement will be terminated as set out in §7.

4. PURPOSE

The purpose of the Agreement is to formulate, implement and assess an operations management model for sustainability in XXX. The intention is to contribute positively directly to XXX through the Agreement and indirectly to society, business and government through contributions to the scholarship of operations management, theory development, discovery, integration, application, and teaching.

5. OBJECTIVES

- 5.1. Develop a case study to typify the class of operations management models for sustainability in NPOs.

-
- 5.2. Identify contributing theories regarding relevant concepts, formulation, implementation and assessment of an operations management model for sustainability and an application theory.
 - 5.3. Formalise for dissemination an operations management model for sustainability in XXX and also application and design theories.

6. ROLES AND RESPONSIBILITIES

- 6.1. Action design research will be employed as research methodology. The Researcher will formulate and assess an operations management model for sustainability and an application theory thereof in collaboration with XXX. The research design of the project will involve four phases namely that of problem statement, formulation and assessment, reflection, and formalisation.
- 6.2. During the problem statement phase the Agreement will be signed by both parties based on the need for a model and application theory being jointly articulated and roles and responsibilities will be clarified. The Researcher will, with input from XXX, identify and conceptualise a research problem, formulate initial research objectives, and describe the problem as a case study. It is envisaged that the Researcher will then identify contributing theories, existing models and application theories through a focused literature review and consultation with critical friends including XXX. Focusing on XXX, next it is planned for the Researcher and XXX to develop a better understanding of the case study operations management model for example through business process modelling, cultural-historical analyses, problem structuring methods, systems thinking, and impact assessment.
- 6.3. During the formulation and assessment phase the intention is for the Researcher and XXX to contextualise a model, an application theory and definitions of basic concepts for example through analyses of artefacts of XXX. The Researcher will, with input from XXX, develop a procedure to formulate, implement and assess the model and application theory and establish criteria to decide whether the model and application theory is sufficiently refined or not. Next the aim is for the Researcher and XXX to formulate an initial model and an application theory in terms of their substantive parts with tentative detail for all components and some implementable components for example through business process modelling, cultural-historical analyses, problem structuring methods and systems thinking. The Researcher and XXX will then execute the formulation, implementation and formative assessment of the model and application theory including sampling, data collection, processing and analysis where rich information must be produced from intensive data collection methods and instruments from small purposive samples of respondents and situations. The cycle will be repeated by developing all components of the model and application theory and by including different projects of XXX until the model and application theory is sufficiently refined.
- 6.4. During the reflection phase the Researcher and XXX will reflect on the research process, assess the adherence to the Agreement, analyse results according to stated objectives, and reflect on assumptions and implications thereof.
- 6.5. During the formalisation phase the Researcher will abstract the learning into concepts for a class of operations management models for sustainability and application theories, share the model, application theory and assessment results with XXX, articulate research results as design theories, articulate learning, including recommendations and indications of future research projects, and formalise results for dissemination.
- 6.6. If during the research any questionnaire, interview or focus group protocol is developed it will be submitted for further ethics review and approval by the University Faculty Committee for Research Ethics and Integrity before any data will be collected.

7. DURATION

- 7.1. The Agreement will come into effect from the date of signature by both parties and will remain in force for an initial period of three years and may be renewed by mutual consent.
- 7.2. The Agreement may be terminated by either party provided written notice, including full reasons, is given to the other party three months in advance.
- 7.3. Besides return on investment which might not realise, no other negative consequences are foreseen should XXX decide to terminate the Agreement. In such an event, another NPO could be identified to complete the research study.

8. SCHEDULE

Target date	Action
25 May 2020	Researcher registered for studies towards PhD in Industrial Systems at the University
28 July 2020	Ethics approval
31 August 2020	Agreement between the Researcher and XXX
30 September 2020	Articulate and contextualise in collaboration with other stakeholders and other sources an operations management model for sustainability in NPOs, a theory of how to successfully apply an operations management model for sustainability in NPOs, and definitions of basic concepts
30 November 2020	Identify existing models, application theories and definitions by analysing artefacts of XXX, conducting a focused literature review, consulting critical friends, and analysing promising examples
28 February 2021	Propose a preliminary model, theory of application and definitions
30 September 2022	Execute cycles to refine the problem, model, application theory and definitions of basic concepts
30 September 2022	Submit article for publication in accredited journal
30 November 2022	Propose a final operations management model for sustainability in NPOs, a theory of how to successfully apply an operations management model for sustainability in NPOs, and a design theory
30 November 2022	Completion and submission of first draft of thesis
7 March 2023	Submit second article for publication in accredited journal
15 March 2023	Submit thesis for internal evaluation
31 March 2023	Submit thesis for external examination
1 June 2023 – 10 July 2024	Public defence of thesis
15 July 2024	Submit approved thesis
30 September 2024	Graduation

9. DATA MANAGEMENT PLAN

- 9.1. Data will be managed in accordance with the University research data management policy.
- 9.2. During the problem statement phase (Paragraph 6.1) the Researcher will identify contributing theories, existing models and application theories through a focused literature review and consultation with critical friends. The Researcher and XXX also will develop a better understanding of their current operations management model which will include various data collections, processing, analyses and interpretations.
- 9.3. During the formulation and assessment phase (Paragraph 6.2) the Researcher and XXX will execute the formulation, implementation and formative assessment of an operations management model for sustainability and application theory which again will include cycles of samplings, data collection, processing, analyses and interpretations.

- 9.4. During the formalisation phase (Paragraph 6.4) the Researcher will formalise results for dissemination.
- 9.5. In order to assure data quality, standardised methods will be used for data collection, processing, analyses and interpretations including business process modelling, cultural-historical analyses, problem structuring methods, systems thinking, and impact assessment. Data reliability will be confirmed by the scholarly community and validity will also be confirmed by XXX. Data will be updated through the cycles of formulation, implementation and assessment.
- 9.6. During collection and analyses all hard copies of data which identify XXX, their employees, contractors or volunteers will be stored in a locked room at the Researcher's house. On completion of the project all such hard copies will be destroyed.
- 9.7. During collection and analyses all electronic data which identifies XXX, their employees, contractors or volunteers will be stored in password protected files on the Researcher's computer. File names will be dated and each file will contain a cover page indicating the title of the data set, place and date of collection, and authors with contact details. A preamble will indicate the objectives of the data set, type of data, collection and processing method, reliability, gaps, and possible future uses of the data. Files will be organised according to appropriate entities and attributes with descriptions thereof such as value types, units of measure, accuracy, etc.
- 9.8. On a weekly basis a differential backup will be made of the folder containing data and other research files, onto an external hard disk which will be stored in a secure location separate from the computer containing the original folder.
- 9.9. Intellectual property and dissemination of findings is set out in Section 14. XXX gives permission for identification but data will be anonymised by using pseudonyms for XXX employees, contractors and volunteers.
- 9.10. On completion of the project, processed data and accompanying metadata will be published in PDF format through the University research data repository which runs on Figshare. Processed data and metadata will be preserved for at least ten years through the University Baglt hierarchical file packaging system. Future use of stored data will be subject to further research ethics reviews and approval if applicable.

10. MANAGEMENT

- 10.1. The Researcher will manage the Agreement and all endeavours that derive from the Agreement in collaboration with the authorised signatory of XXX.
- 10.2. The Researcher will be responsible to develop and carry out a realistic joint plan that accommodates the realities of an operating NPO and the goals of the Researcher as set out in Section 8. The Researcher also will submit regular reports on the implementation of the Agreement in collaboration with the designated representatives of XXX and confirm that XXX is satisfied with progress and comfortable with continuing with the Agreement.
- 10.3. Any proposed activity that does not fit into the general terms of the Agreement will be formally incorporated as an addendum to the Agreement, provided that the addendum is agreed to and signed by both parties.
- 10.4. The Researcher recognises the right of XXX to ask questions, request information and provide comments at any stage in the course of the Agreement.
- 10.5. The Researcher also acknowledges that interference that may jeopardise the scientific integrity of the project or the interests of research participants may oblige the University to cancel the cooperation.
- 10.6. For the purpose of facilitating the ongoing implementation of the Agreement, both parties agree to maintain integrity and transparency and have regular communication and correspondence, via the contact person of the XXX. Honouring the limitation of resources such as time, such communication and correspondence will be executed effectively and parties will come well prepared.

11. FINANCES

- 11.1. The terms of, and the necessary resources for joint activities shall be discussed and mutually agreed upon in writing by both parties through the liaison officer specified by XXX prior to the initiation of the particular activity.
- 11.2. XXX must approve any funding for joint activities internally. The parties may also apply for external funding. The final approval of any activity is subject to the approval of both parties and will partially depend on the availability of guaranteed support funds.
- 11.3. Any financial or other benefits arising would be shared proportionately by the parties in consonance with efforts / inputs given.
- 11.4. Likewise any financial or other burdens arising would be shared proportionately by the parties in consonance with responsibility.

12. RIGHTS

- 12.1. The Researcher and XXX voluntarily enter into the Agreement. No party will receive any compensation for their participation.
- 12.2. No physical, psychological or other harm or wrong doing is foreseen to the parties or any other individual, group or organisation as a direct or indirect result of the Agreement.
- 12.3. XXX and their employees, contractors and volunteers have a right to dignity, privacy and confidentiality which will be maintained by the Researcher and others responsible for making sure that research is done properly, including the supervisor and members of the University Faculty Committee for Research Ethics and Integrity.
- 12.4. If focus group discussions are facilitated internally to XXX, confidentiality cannot be guaranteed to employees, contractors and volunteers in such a group setting. This will be explained at the setup of every focus group discussion.
- 12.5. XXX has a right to receive a copy the Code of Ethics for Scholarly Activities of the University and the University Committee for Research Ethics and Integrity Policy and Procedures for Responsible Research. XXX can expect that the Agreement contains the necessary information on ethical issues and will comply with the policy and procedures. Before progressing, this study was submitted for written approval from the University Faculty Committee for Research Ethics and Integrity. A copy of the approval letter is available from the Researcher.
- 12.6. XXX must respect the Code of Ethics for Scholarly Activities of the University and the University Committee for Research Ethics and Integrity Policy and Procedures for Responsible Research and must not expect the Researcher or the University to undertake research or conduct which is in any way contrary to the policy.
- 12.7. The Researcher will not transfer onto XXX the responsibility to obtain separate and informed consent from participants and to protect their rights where they act, directly or indirectly, as gatekeeper and control access to participants, excluding XXX employees, contractors and volunteers.

13. RISKS

- 13.1. The Researcher and XXX fully and voluntarily accept the risks involved in the project which they are currently aware of.
- 13.2. The main risk in the project is the untried nature of the operations management model for sustainability to be formulated, implemented and assessed. Limitations and remaining risks of the final model will be reported.
- 13.3. Although the Researcher and XXX will make provision to the extent feasible for resources to be available to complete the project such as time, funds, facilities, equipment, access, support, cooperation, talent and health, a risk is still posed.
- 13.4. An operations management model for sustainability in XXX can be formulated, implemented and assessed according to the proposed schedule (§8). However, operations management for sustainability refers to the satisfaction of self-defined basic needs and building of resilience over the long term beyond the project. This risk is addressed by selecting a future orientated research methodology.

- 13.5. Assumptions shared and reinforced by the scholarly community, the Researcher's interests and assumptions, and assumptions about XXX by stakeholders and XXX themselves must be opened up for discussion, tested and revised if required as they link to practice in various ways.
- 13.6. The main health and safety risk entails travelling by the Researcher. The Researcher and XXX however are committed to the prevention of accidents and injuries and to compliance with all environmental, health and safety legislation and regulations. Travelling therefore will be minimised through appropriate planning as set out in §10. Since the project will include interactions away from the University grounds, appropriate safety measures will be taken so as to protect as far as possible the Researcher, XXX, all other parties involved and University equipment.
- 13.7. If unexpected adverse events occur or injury or harm that is attributable to the Agreement, the Researcher will inform the University Faculty Committee for Research Ethics and Integrity for immediate investigation and action. Such action may include the referral of a member or members of XXX, the community or third party for example for counselling. XXX may also contact the University Faculty Committee for Research Ethics and Integrity if such adverse events occur.

14. INTELLECTUAL PROPERTY AND DISSEMINATION OF FINDINGS

- 14.1. Findings will be presented truthfully without misrepresentation or ambiguity in order to meet the intended purpose of the research study. Findings, assumptions and implications will be critically assessed, limitations and shortcomings will be pointed out, and unexpected findings will be reported.
- 14.2. Independence of research will be maintained and no conflict of interest is foreseen.
- 14.3. Intellectual property rights of parties will be respected and acknowledged.
- 14.4. Intellectual property developed by joint efforts will be the joint property of XXX and the University.
- 14.5. Copyright of the final thesis submitted to the University in fulfilment of the Doctoral degree is vested with the University. XXX will also receive a copy of the final thesis.
- 14.6. The value of publishing parts of the thesis is recognised in order to receive peer-reviewed feedback on the original research and to build and enhance the standing of the Researcher, the supervisor and XXX. It is therefore agreed that research findings will be published by the Researcher. The Researcher will provide XXX the opportunity to review all draft publications and XXX will receive copies of all such publications subject to copyright restrictions. Should distribution of copies of a publication be prohibited, the Researcher will provide XXX with full details of access.

15. DISPUTES

- 15.1. The parties hereto undertake to work closely and cooperate in the implementation of the Agreement and to endeavour to resolve disputes arising between them in relation to the Agreement amicably.
- 15.2. Should XXX have concerns about the way in which the Agreement is executed, they may contact Dr WL Bean at wilna.bean@up.ac.za or (012)420 6706.
- 15.3. If disputes are not resolved to the satisfaction of both parties, the Agreement may be terminated by mutual consent of the two parties.

16. DOMICILIA CITANDI ET EXECUTANDI

The parties choose as their domicilia citandi et executandi as follows:

- 16.1. The Researcher
Physical address: 7 Vermeer Street, Secunda, 2302
Postal address: PO Box 5044, Secunda, 2302
- 16.2. XXX
Physical address: XXX
Contact person: XXX

17. INFORMED CONSENT

- 17.1. _____ for and on behalf of XXX hereby voluntarily grant my permission for participation in the project as explained to me by Martha Fredricka Petronella Harmse (the Researcher).
- 17.2. The nature, objective, possible safety and health implications have been explained to me and I understand them.
- 17.3. I understand my right to choose whether to participate in the project and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for the purposes of publication.
- 17.4. Upon signature of this form, XXX will be provided with a copy.

Signed: _____ Date: _____

Witness: _____ Date: _____

Researcher: _____ Date: _____

18. SIGNATURES

The collaboration agreement has been accepted by both parties and supersedes any existing agreement.

Thus done and signed at _____ on this ____ day of

_____ 20_____.

For the Researcher:

Name Signature

Witness:

Name Signature

For and on behalf of XXX:

Name Signature

Witness:

Name Signature

ADDENDUM C HISTORY OF THE NON-PROFIT ORGANISATION

The founder of the trust which registered the NPO, experienced the benefits of participating in sport at school and encouraged his¹ children to participate as well. The business of which he is the managing director, also started manufacturing sport equipment about twenty years ago and was invited by a school to become involved in a sport community outreach project six years later. This outreach project was started at five schools the previous year with a donation from another business. The coach at the inviting school also developed a programme in his private capacity to support foundation phase learners through sport (Grade R – 3). The founder of the trust proposed to implement the programme that the coach had developed and also sport development for all learners on a national level. A trust was established with the founder, the programme developer and another coach at the inviting school as trustees in order to receive donations to coordinate, develop and administrate sport as such and as an educational aid, organise and host sport events, and to enhance learning through participation in organised sport. Programme material was developed which was piloted at a school for seven months. A contract was signed between the trust and the inviting school which included remuneration for the founder and the programme developer, and scholarships for a learner who was a national sport participant and another learner. While the original trust deed does not specify a maximum number of trustees, the programme developer proposed three additional trustees all of whom were appointed in the second year of the trust's existence although one of them had to step down later during the same year. The amended trust deed stipulates a maximum number of five trustees.

At the end of the first year of the trust's existence one of the trustees saw a television broadcast of a regional sport tournament which was organised by another NPO on initiative of government. Since a business showed interest in donations for a trust programme in the same region, the trustees arranged a meeting with the other NPO early the next year. During the second year of the trust's existence this other NPO facilitated a meeting between the trust and government who offered to assist with the national launch of the trust programme. The trust arranged a meeting with the relevant national sport federation to discuss how both parties could best benefit from the event. Subsequently, the trust launched their programme at a gala dinner with a government representative as guest speaker and attended by among others the Minister of Basic Education, the Deputy Minister of Sport and Recreation, chief executive officers of various businesses, the vice president of the relevant international sport federation and chairman of sport in schools, the vice president of the African sport federation, and the president of the South African sport federation. All parties endorsed the programme, a government official became the patron of the programme, and the trust became the donor of the annual regional sport tournament organised by the other NPO including gifts for local officials. Good working relationships still are maintained between the trust and the

¹ In order to anonymise participants, the masculine pronoun is used for all participants.

Department of Basic Education (DBE) at national, provincial and district level. However, the relationship with the South African sport federation was strained.

A big international business invited a world champion to visit South Africa. The founder had an opportunity to briefly meet with him and mentioned the state of education in South Africa and the opportunity to make a difference through sport. The world champion was keen to get involved. The programme developer claims to personally have known the world champion but apparently did not. The world champion would visit South Africa again in the third year of the trust's existence which would involve an exhibition game including politicians, celebrities and sport personalities in order to prepare for the launch of an African foundation by the world champion in cooperation with the trust. As soon as the visit was secured, the trust again informed the national sport federation about it and invited them to participate. However, the federation decided not to participate and instructed the trust to cancel the world champion's visit just before to the event. The visit nonetheless went ahead and received national and international media coverage which gave good exposure for sport in South Africa. The world champion also visited schools already participating in the trust programme including the school that invited the founder to get involved. The next year the world champion launched the foundation as a public benefit organisation (PBO) with another exhibition game after which he met with government. Two of the trustees were appointed as directors of the foundation.

In the fourth year of the trust's existence the national sport federation and the trust jointly announced that they have entered into a formal relationship and published a MoU on their websites whereby they would cooperate with each other to promote sport as such and as an educational aid. In order to strengthen the synergy between the parties the national sport federation endorsed the trust programme, cooperated through their regional structures to support the activities of the trust, designated a contact person to liaise between them and the trust, and pursued together with the trust the development of formal accreditation standards for sport development in schools and other educational institutions. The trust provided the sport federation with statistics and progress regarding the trust programme, maintained a database of all participants to be incorporated into the database of active participants of the sport federation, encouraged participants to affiliate with the sport federation, and designated a contact person to liaise between them and the sport federation, while sourcing their own donors to market the trust programme. Neither party would implement a venture that might affect the other party without involvement before any formal commitments.

In the same year the trust was approved as a PBO and remained in good standing since then to entitle donors to deduct donations from income tax. Big domestic businesses became interested in donations to the trust after the developer of the programme won a national competition. In the fifth year of the trust's existence a MoU was signed between a prominent domestic business and the

trust and the business was awarded naming rights to the programme. The next year the business officially announced their involvement in the programme.

Also in the fifth year of the trust's existence the trust registered their programme as an NPO for them to trade as such. The NPO was verified as a level 4 broad-based black economic empowerment (BBBEE) contributor in the seventh year of the trust's existence in order for donors to raise their BBBEE scores. Three years later the NPO was verified as a level 1 BBBEE contributor taking beneficiaries into consideration.

The trustee who was a coach at the inviting school received fulltime employment elsewhere and resigned as trustee in the fifth year of the trust's existence. Another person was proposed by one of the remaining trustees and appointed. The inviting school also was no longer involved and the programme developer resigned as trustee and established his own private company. At that stage the programme grew to such an extent that the position of a general manager was advertised. Out of five applications received, the successful candidate was appointed based on key performance indicators including leadership to implement decisions and preparedness to work in rural areas, and extensive psychometric testing.

Since the establishment of the trust, they bought programme material from the initial programme developer who also was a founding trustee. This amounted to about 80% of the trust's revenue while the programme developer did not pay income tax on the material sold to the NPO. In the seventh year of the trust's existence, they decided to develop their own curriculum and workbooks based on feedback received from schools that the programme was not well aligned with curriculum and assessment policy statements (CAPS). The initial programme developer accused the trust of stealing his intellectual property and that additional material was developed to increase profits. Later during the year, the general manager of the NPO and the initial programme developer each made a presentation at a conference. In his presentation the initial programme developer did not mention the NPO and a final relationship breakdown occurred. The trust scheduled a meeting with the initial programme developer and agreed on a mediation process to settle the differences between them. The next year the trust notified the initial programme developer that they are interested in continuing ordering products from him but no longer as a preferred supplier.

At the end of the seventh year the trust decided to end cooperation with the African foundation established by the world champion. Although the intention was to make contact with high-profile international businesses through association with the foundation and to expand to other African countries, little financial advantage realised for the trust and the cooperation posed a challenge for the support of the DBE due to the world champion's political connections. The trust also proposed that all trustees should resign as directors of the African foundation due to a challenge of keeping

the foundation accountable for their part of the signed agreement. It was difficult to obtain funds from the European Union without a signed letter from the DBE that funds would flow directly to the NPO and not through government.

In the eighth year of the trust's existence the trust registered a private company with limited liability in order to comply with the requirements of the main donor to raise scores for BBBEE through enterprise development. The trust believed that a non-profit company would have been able to show a greater profit component than an NPO but would not enjoy the same tax benefits and hence decided to register a private company which operates as a social enterprise instead of a non-profit company. The general manager of the NPO was appointed as the only director of the private company.

The NPO also had to restructure due to donations that came to an end or were reduced and had to execute a retrenchment process according to Section 189 of the Labour Relations Act (548). Furthermore, the NPO requested employees who were employed by both the NPO and the company of the initial programme developer to resign at either organisation due to conflict of interest. Subsequently, a number of previous employees, supported by the initial programme developer, declared disputes with the NPO which were referred to the Commission for Conciliation, Mediation and Arbitration. They also annoyed donors by contacting them and threatened to disclose NPO information to third parties. Internal damage caused by these actions was addressed through a cultural diversity workshop which was appreciated by employees. These actions costed the trust almost R1M. Currently all employees must sign an integrity declaration according to which they declare that they are not employed anywhere else, do not have any connections with any organisation that is in competition with the NPO, and that management will take disciplinary action against them should they discover that employees are indeed involved in activities in conflict with their duties at the NPO. Alternatively, employees must declare that they are employed elsewhere and provide full details of such employment including the nature of their duties and hours and days per week employed. Trustees also assist to address issues before they escalate from then on.

By the ninth year of the trust's existence challenges occurred due to the late arrival of some trustees at board meetings and absenteeism from these meetings. While trustees assisted to secure donations, one trustee became operationally involved and received the donation instead of allowing the NPO to follow up with the donor while the NPO still had to render services to address the expectations of beneficiaries and the donor. The trust deed was amended to address ambiguities in the original trust deed. The main donor requested representation on the trust and a trustee was appointed as such. Subsequently, one of the other trustees had to step down as trustee. The donation from the main donor was further reduced and the business withdrew their naming rights.

ADDENDUM D INTERVIEW PROTOCOL

1. Project information

1.1 Title of research project

An operations management model for sustainability in a non-profit organisation

1.2 Researcher details

Mrs MFP Harmse, student number 20818778

Department of Industrial and Systems Engineering, University of Pretoria

Mobile: 083 627 3501

Email: u20818778@tuks.co.za

1.3 Research study description

The research study formulates, implements and assesses an operations management model for sustainability in a non-profit organisation (NPO) in South Africa. The objectives of the project are as follows:

- Identify requirements for how to formulate, implement and evaluate an operations management model for sustainability in NPOs.
- Develop and implement an operations management model for sustainability in a specific NPO.
- Publish a generalised operations management model for sustainability in NPOs and how other NPOs may apply it in other contexts.

1.4 Purpose of interview

As General Manager of the NPO participating in this project, you are kindly requested to answer fourteen questions with reference to the sustainability of the NPO in a one-on-one interview with the Researcher which should take about three hours to complete. The NPO signed a collaborative agreement with the Researcher based on a need for an operations management model for sustainability. It was agreed that this need will be further explored through the research study and the interview may significantly contribute towards this. In the process the aim is to increase the ability of the NPO to undertake self-assessments and analyses, and to establish a baseline for the NPO to track and compare progress over time.

1.5 Risks

- As stated in the collaborative agreement between the Researcher and the NPO participating in the project, both parties are committed to compliance with all environmental, health and safety legislation and regulations including those pertaining to COVID-19. These will be adhered to during the interview.
- Any interview holds a risk regarding confidentiality and anonymity. Thorough record keeping and removal of personally identifiable information from data sets will be maintained as

described in the collaborative agreement to minimise risk. These procedures also apply to you as individual.

- The interview involves a probability of causing you distress. In this respect your control will be respected over what is said, how it is said, and if anything is said at all in response to any of the questions.
- A risk involving the time to complete the interview will be minimised by both parties to properly prepare for the interview and by scheduling the interview at a convenient time for you.
- No further physical, psychological or other harm or wrong doing is foreseen for you or any other individual, group or organisation as a direct or indirect result of the interview. Your dignity, privacy and confidentiality will be maintained by the Researcher and others responsible for making sure that research is done properly, including the supervisor and members of the University Faculty Committee for Research Ethics and Integrity.
- If unexpected adverse events occur or injury or harm that is attributable to the interview, the Researcher will inform the University Faculty Committee for Research Ethics and Integrity for immediate investigation and action. Such action may include for example your referral for counselling. You may also contact the University Faculty Committee for Research Ethics and Integrity if such adverse events occur.

2. Informed consent

2.1 _____ hereby voluntarily grant my permission to be interviewed as explained to me by the Researcher namely Martha Fredricka Petronella Harmse.

2.2 The nature of the research study, objectives and possible risks have been explained to me and I understand them.

2.3 I understand my right to choose whether to participate in the interview and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for the purposes of publication.

2.4 Upon signature of this form, the interviewee will be provided with a copy.

Signed: _____ Date: _____

Witness: _____ Date: _____

Researcher: _____ Date: _____

3. Questions

1. Regarding the **legal and regulatory environment** governing NPO XXX, how would you describe each of the following indicators? Could you give specific examples relevant to NPO XXX from the past year to explain your answers?
 - 1.1. Legal procedures to formalise the existence of the NPO
 - 1.2. Enforcement of the law and its effects on the NPO
 - 1.3. Abuses committed against the NPO and their members by state institutions and groups acting on behalf of the state
 - 1.4. Tax policies that affect the NPO
 - 1.5. Legal opportunities for the NPO to mobilise financial resources
 - 1.6. Availability and quality of legal expertise to the NPO
2. Based on the indicators in Question 1, how would you score the **legal and regulatory environment** governing NPO XXX on a sliding scale as given below? Please weigh the impact of the different indicators in terms of their relative scope and duration.

The legislative and regulatory framework makes special provisions for the needs of the NPO, regardless of their affiliation or nature of activities, or gives the NPO special advantages such as significant tax deductions for business or individual contributions, significant tax exemptions, open competition among NPOs to provide government-funded services, etc. Legal reform efforts at this point are primarily the NPO's advocacy effort to reform or fine-tune taxation laws, procurement processes, etc. Local and comparative expertise on the NPO's legal framework exists, and legal services and materials are available.

The legal environment severely restricts the ability of the NPO to register and/or operate, either through the absence of legal provisions, the confusing or restrictive nature of legal provisions (and/or their implementation), or government hostility towards and harassment of the NPO.

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3. Regarding the **internal capacity** of NPO XXX to pursue their goals, how would you describe each of the following indicators? Could you give specific examples relevant to NPO XXX from the past year to explain your answers?
- 3.1. Relationships with individuals or groups affected by or interested in issues on which the NPO works
- 3.2. Organisational goals and priorities of the NPO for a set timeframe
- 3.3. Structures and processes to guide the work of the NPO
- 3.4. Quality and management of human resources of the NPO
- 3.5. Access to and use of technology by the NPO
4. Based on the indicators in Question 3, how would you score the **internal capacity** of NPO XXX to pursue their goals on a sliding scale as given below? Please weigh the impact of the different indicators in terms of their relative scope and duration.

The NPO is transparently governed and capably managed. They have a clearly defined mission statement and utilises strategic planning techniques. A board of directors exists, and there is a clear distinction between the responsibilities of board members and staff. The NPO has permanent well-trained staff, and volunteers are widely utilised. They have relatively modern equipment that allows them to do their work efficiently. They have successfully developed strong local constituencies.

The NPO is essentially a "one-man show," completely dependent upon the personality of one or two major figures. They often split apart due to personality clashes. The NPO lacks a clearly defined sense of mission. At this stage, the NPO reflects little or no understanding of strategic planning or programme formulation. They do not have a board of directors, by-laws, staff, or more than a handful of active members. The NPO has no understanding of the value or need of developing local constituencies for their work.

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5. Regarding the access of NPO XXX to various sources of **financial support**, how would you describe each of the following indicators? Could you give specific examples relevant to NPO XXX from the past year to explain your answers?
- 5.1. Access to multiple sources of funding by the NPO
- 5.2. Domestic sources of funding and resources available to the NPO
- 5.3. Foreign sources of funding and resources available to the NPO
- 5.4. Capacity of the NPO to raise funds
- 5.5. Revenue generated by the NPO from the sale of products or services
- 5.6. Processes, procedures and tools of the NPO to manage financial resources and operations
6. Based on the indicators in Question 5, how would you score the access of NPO XXX to various sources of **financial support** on a sliding scale as given below? Please weigh the impact of the different indicators in terms of their relative scope and duration.

The NPO has a sound financial management system in place, including independent audits and the publication of annual reports with financial statements, to win potential donors' confidence. The NPO raises a significant percentage of their funding from local sources, including government, corporate and individual philanthropy, and earned income. They have multiple sources of funding, which allow them to remain viable in the short term. A growing economy makes growth in domestic giving possible.

The NPO survives from grant to grant and/or depends financially on one foreign sponsor. While the NPO was created in the hope of receiving funding, they are largely inactive after attempts to win foreign donor funding fail. Local sources of funding are virtually non-existent, in part due to a depressed local economy. The NPO has no financial management system and does not understand the need for financial transparency or accountability. Government restricts access to resources – foreign or domestic -- through legislative and other restrictions.

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7. Regarding the ability of NPO XXX to **influence public opinion and policy**, how would you describe each of the following indicators? Could you give specific examples relevant to NPO XXX from the past year to explain your answers?
- 7.1. Access of the NPO to government decision-making processes
- 7.2. Initiatives of the NPO to shape the public agenda, public opinion, or legislation
- 7.3. Engagement of the NPO with lawmakers to directly influence the legislative process
- 7.4. Initiatives of the NPO to promote a more favourable legal and regulatory framework
8. Based on the indicators in Question 7, how would you score the ability of NPO XXX to **influence public opinion and policy** on a sliding scale as given below? Please weigh the impact of the different indicators in terms of their relative scope and duration.

The NPO demonstrates the ability and capacity to respond to changing needs, issues and interests of the community and country. As the NPO secures their institutional and political base, they begin to form coalitions to pursue issues of common interest, including NPO legislation, monitor and lobby political parties, and monitor and lobby legislatures and executive bodies. The NPO demonstrates the ability to mobilise citizens and other organisations to respond to changing needs, issues, and interests. The NPO regularly reviews their strategies, and possesses an ability to adapt and respond to challenges. A prime motivator for cooperation is self-interest: the NPO may form alliances around shared issues confronting them. Formal mechanisms exist and are utilised to allow the NPO to participate in the various levels of government decision-making processes.

The broad umbrella movement, which the NPO belongs to with others concerned with a variety of sectors and united in their opposition to government, falls apart or disappears. The country has not experienced any initial burst of activism. Economic concerns are predominant for most citizens. Passivity, cynicism or fear exists within the general public. The NPO is afraid to engage in dialogue with the government, feels inadequate to offer their views and/or does not believe the government will listen to their recommendations. The NPO does not understand the role that they can play in public policy or does not understand the concept of public policy.

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9. Regarding the ability of NPO XXX to provide **products and services**, how would you describe each of the following indicators? Could you give specific examples relevant to NPO XXX from the past year to explain your answers?
- 9.1. Variety of products and services offered by the NPO
- 9.2. Extent to which products and services of the NPO address local needs
- 9.3. People, organisations and communities who utilise or benefit from the NPO's products and services
- 9.4. Capacity of the NPO to generate revenue through product and service provision
- 9.5. Government appreciation for the NPO's product and service provision
10. Based on the indicators in Question 9, how would you score the ability of NPO XXX to provide **products and services** on a sliding scale as given below? Please weigh the impact of the different indicators in terms of their relative scope and duration.

The NPO provides a wide range of products and services, which reflects community and/or local donor priorities. The NPO delivers products and services beyond basic social services in such sectors as economic development, environmental protection or democratic governance. They have developed a sufficiently strong knowledge of the market demand for their services, the ability of government to contract for the delivery of such services or other sources of funding including private donations, grants and fees, where allowed by law. The NPO finds it possible to cross-subsidise those products and services for which full cost recovery is not viable with income earned from more lucrative products and services, or with funds raised from other sources. Government bodies, primarily at the local level, recognise the abilities of the NPO and provide grants or contracts to enable them to provide various services.

The NPO is capable of providing basic social services – such as health, education, relief or housing – although at a low level of sophistication. If the NPO provides such services they receive few if any government subsidies or contracts. If they produce publications, technical services or research they do so only for their own members or donors. There are rarely attempts to charge fees for products and services.

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11. Regarding **support services** available to NPO XXX, how would you describe each of the following indicators? Could you give specific examples relevant to NPO XXX from the past year to explain your answers?
- 11.1. Organisations and programmes that provide training and other support services to the NPO
- 11.2. Local institutions, organisations or programmes providing financial resources to the NPO
- 11.3. Cooperation within the NPO sector
- 11.4. Training opportunities available to the NPO
- 11.5. Collaboration between the NPO and other sectors
12. Based on the indicators in Question 11, how would you score **support services** available to NPO XXX on a sliding scale as given below? Please weigh the impact of the different indicators in terms of their relative scope and duration.

NPO intermediary support organisations and/or NPO resource centres are active in all areas of the country and provide advanced training, informational services, legal support and advice, and philanthropic development activities. Efforts are underway to establish and endow community foundations, indigenous grant-making institutions, and/or organisations to coordinate local fundraising. A professional team of local experts, consultants and trainers in NPO management exists. The NPO recognises the value of training, although the lack of financial resources may remain a constraint to accessing locally provided training. Topics of available training cover for example legal and tax issues, accounting and bookkeeping, communication skills, volunteer management, media and public relations skills, sponsorship and fundraising. The NPO works together and shares information through networks and coalitions. The NPO is beginning to develop inter-sectoral partnerships with business, government and the media to achieve common objectives.

There are few, if any, active NPO intermediary support organisations or resource centres, networks and umbrella organisations. Those that do operate work primarily in capital cities and provide limited services such as access to computer equipment, faxes, e-mail and meeting space. Local training and NPO development capacity is extremely limited and undeveloped. Primarily programmes of international donors provide training and technical assistance. There is no coordinated effort to develop philanthropic traditions, improve fundraising or establish community foundations. The NPO's efforts to work with other NPOs are limited by a perception of competition for foreign donor support and mistrust of other organisations.

13. Regarding **society's perception** of NPO XXX, how would you describe each of the following indicators? Could you give specific examples relevant to NPO XXX from the past year to explain your answers?

13.1. Presence of the NPO and their activities in the media (print, television, radio and online)

13.2. Reputation of the NPO in the larger community

13.3. Reputation of the NPO with government and the business sector

13.4. Efforts by the NPO to promote their organisational image and activities

13.5. Actions taken by the NPO to increase accountability and transparency

14. Based on the indicators in Question 13, how would you score **society's perception** of NPO XXX on a sliding scale as given below? Please weigh the impact of the different indicators in terms of their relative scope and duration.

There is growing public knowledge of and trust in the NPO, and an increased rate of volunteerism. The NPO unites to mount campaigns to increase public trust. Good working relationships exist between the NPO and national and local government which may result in public-private initiatives or an NPO advisory committee for government. Media covers the work of the NPO, and the NPO approaches media and public relations in a professional manner. The NPO is increasingly accountable, transparent and self-regulated, including a generally accepted code of ethics or a code of conduct.

The public and/or government are uninformed or suspicious of the NPO as institution. Most of the population does not understand the concept of "nongovernmental," "non-profit" or "civil society," including government officials, business leaders and journalists. Media coverage may be hostile, due to suspicion of a free but uninformed media, or due to the hostility of an authoritarian government-controlled media. Charges of treason may be issued against the NPO. Due to a hostile atmosphere caused by an authoritarian government, if individuals or businesses donate to the NPO at all, they do so anonymously.

ADDENDUM E SUSTAINABILITY EVALUATION

Table E-1 Preferred indicators of the CIVICUS indices for the non-profit organisation

Dimension	Preferred organisational indicators	Assessment of participating NPO
Socio-economic or structural	Paid employment relative to sector average	<ul style="list-style-type: none"> • NPO employees: 56 • Education & research NPO sector employees per organisation: estimated 49 (549, 550)
	Ratio of advocacy vs service-providing activities relative to sector ratio	<ul style="list-style-type: none"> • NPO 0% advocacy, 100% service • Education & research 0% advocacy, 100% service (551)
	Donations (time, money, in kind)	<ul style="list-style-type: none"> • NPO donations: 2018/2019 R1M • Education & research donations per organisation: estimated R16M (549)
	Resource dependency re revenue, public sector dependency	<ul style="list-style-type: none"> • NPO 2% revenue, 1% public sector • NPO sector 10% revenue, 7% public sector (549)
Legal, political or constitutional space	Overall fiscal and regulatory environment	No legal barriers to entry, activity, speech and/or advocacy, international contact, or resources, but assembly is restricted (552)
	Corruption perceptions	Score 44/100, rank 69/180 (553)
Normative or values-related	Trust in NPO relative to adult population	<ul style="list-style-type: none"> • NPO espoused values are education integrity, human capacity building, accountability, relationship building, and sense of identity and self-esteem Trust not in top South African values but integrity is there (554)
	Tolerance of diversity in NPO relative to adult population	<ul style="list-style-type: none"> • In NPO racial and gender issues occur, intolerance experienced from legal and regulatory framework • Most South Africans are intolerant of foreigners (555)
	Awareness of code of conduct and ethics	NPO employees sign integrity declaration and trained in all policies and procedures, fundraisers sign agreement, promotes ethics and leadership in programmes, general manager consulted judge Mervyn King re governance, governance acknowledged as challenge
Functional or impact-related	Fulfilled commitment (e.g. stakeholder survey)	Fulfilled commitment monitored and evaluated weekly, monthly, quarterly and annually – excellent quantitative and qualitative feedback from all stakeholders
	Perceived impact	Impact in 7 provinces, 37 early childhood development centres, 145 primary schools, 7 secondary schools, 56 000 learners, 1 500 teachers, many employment opportunities, 7 franchisees, 126 provincial and 2 national junior sport participants. Need for further impact evaluation.
	Media coverage	Maintains a website, active on YouTube, Facebook, Instagram, Twitter, Pinterest, LinkedIn and blog, excellent presence in other media, but still not enough

Table E-2 Enabling environment assessment for the South African NPO (430, 453)

	Enabling	Disabling
Freedom of association: formation	<ul style="list-style-type: none"> • No legal barriers except that founding member must not have criminal record • Registration is voluntary, free and once-off • Reasons for refusal are given with clear appeal process 	<ul style="list-style-type: none"> • Poor information, support and processing time due to lack of registrar capacity
Freedom of association: operation	<ul style="list-style-type: none"> • Annual reporting and audited financial statements • Can be deregistered if annual reports are not submitted but may be appealed 	<ul style="list-style-type: none"> • Arbitrary changes to reporting system without proper communication
Freedom of association: access to resources	<ul style="list-style-type: none"> • No legal restrictions on receipt of funds • Donations are exempted from tax if the NPO has public benefit status 	<ul style="list-style-type: none"> • International donors withdrew after democratisation while not substituted by domestic funding • Unequal competition between smaller domestic NPOs and locally registered international NPOs • Limited capacity to make proposals to donors • Donors determine NPO focus • Government regards NPOs as sub-contractors rather than partners • Few NPOs benefit from distribution of state funds which is opaque, unpredictable and involves favouritism • Regulations on direct marketing hamper donation seeking
Freedom of assembly	<ul style="list-style-type: none"> • Legislation addresses right to peaceful assembly 	<ul style="list-style-type: none"> • Seven days advanced notice • Restrictions near government buildings • Poor access to information • Selective refusals with opaque reasons and additional documentation required • Selective excessive use of police force
Freedom of expression	<ul style="list-style-type: none"> • Open criticism of government policies and practices is tolerated • NPOs are aware of their rights with respect to expression 	<ul style="list-style-type: none"> • Selective harassment by society and government • Inadequate legislation to protect journalists' sources • Uncertain interpretation of hate speech • Proposed Protection of State Information Bill contains broad definition of what constitutes national security

	Enabling	Disabling
Relations with government	<ul style="list-style-type: none"> • Legislation enables engagement 	<ul style="list-style-type: none"> • Mutual distrust • Subservience marginalise NPOs in decision-making and consultations are tokenistic • Hostility towards grassroots advocacy organisations and organisations of middle-class intellectuals
NPO coalition and cooperation (optional)	<ul style="list-style-type: none"> • No legal barriers • DSD 	<ul style="list-style-type: none"> • NPOs do not take cognisance of code of good practice with many dissolved or deregistered (131, 430, 550) • Done little to adopt and promote self-regulation mechanisms • Fragmented sector with very little cooperation and coalition building

ADDENDUM F BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

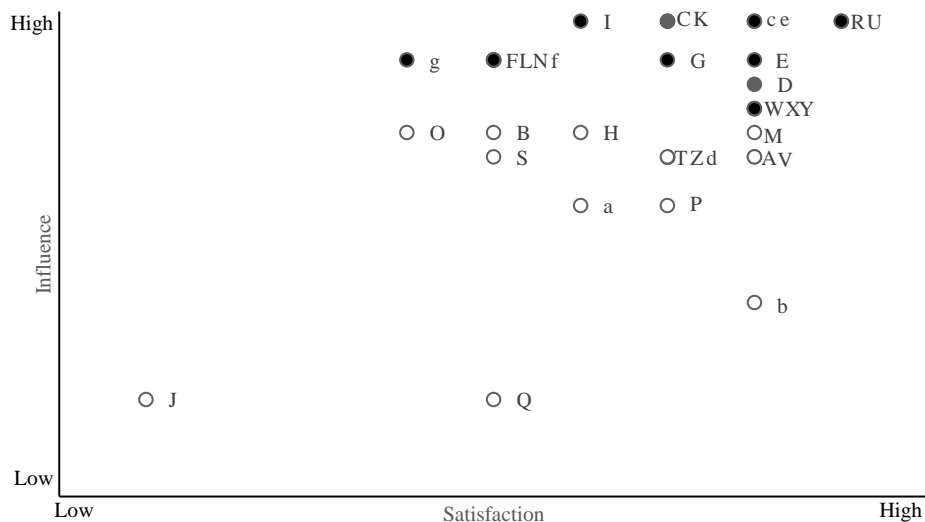
F.1 ENVIRONMENT

The human, natural, physical, financial and social capital of the contextual environment of the NPO is considered in terms of the natural, psycho-social and technological dimensions of the biomatrix approach as summarised in Table F-1 (14, 16). Human capital is considered in terms of the psycho-social dimension as knowledge, skills and attitudes of people (17). Natural capital refers to resources in the natural dimension. Physical capital is considered in terms of the technological dimension (14, 17-19). Financial capital is considered in terms of the psycho-social dimension as providing the resources to enable the economy of products and services and their exchange (14, 17, 20). Social capital also is considered in terms of the psycho-social dimension in relations among people and organisations which facilitate certain actions in social structures (17).

Table F-1 Contextual environment of the non-profit organisation

Capital	Opportunity	Threat
Natural		<ul style="list-style-type: none"> • COVID-19 pandemic
Psycho-social: human	<ul style="list-style-type: none"> • Major challenges in education in South Africa • Memorandum of understanding (MoU) on school sport between Departments of Basic Education and Department of Sport, Arts & Culture (556) • Teachers' existing knowledge and experience 	<ul style="list-style-type: none"> • Lacking computer skills
Psycho-social: financial	<ul style="list-style-type: none"> • Market for sport equipment • Market for education programmes • Public benefit donations deductible from income tax 	<ul style="list-style-type: none"> • Downgrading and poor performance of national economy • Impact of COVID-19 pandemic • Impact of poor sectoral infrastructure • Donations not to cover overheads • Donations not to be invested in reserve funds • Tough competition for donations from local business • Difficult to obtain donations from foreign funding sources
Psycho-social: social	<ul style="list-style-type: none"> • National Development Plan • International 21st century skills • Cooperation with international NPOs • Blended learning • Broad-based black economic empowerment (BBBEE) scoring • Safety 	<ul style="list-style-type: none"> • Diversity intolerance • Cooperation with international NPOs is complex • Corruption • BBBEE criteria • Changing social trends • Perceptions about and politics and financials of sport bodies • Underdeveloped infrastructure of regional NPO sector • Availability and quality of legal services • Relations with government
Technological / physical	<ul style="list-style-type: none"> • Electronic media • Blended reality 	<ul style="list-style-type: none"> • Infrastructure • Maintenance cost

The transactional environment of the NPO is studied in terms of stakeholder influence and satisfaction as summarised in Figure F-1 (14). With reference to the original social enterprise orientation of the trust based on a hybrid conceptualisation of an NPO, they do not utilise the services of volunteers. Although the NPO realises that stakeholder influence and satisfaction are fluid and changes continuously, stakeholders with the highest influence in the transactional environment of the NPO are indicated with dark dots in Figure F-1 while stakeholders with less influence are indicated with light dots.



A Academic institutions	L Life coach	W South African Democratic Teachers Union
B Advisors	M Media	X South African Teachers' Union
C Business, donors	N Network operators	Y School principals & governing bodies
D Community leaders	O Other NPOs (International & local)	Z Secondary school learners
E Education district & circuit offices	P Parents	a Social media connections (LinkedIn)
F Employees	Q Patron	b Social media followers (other)
G Founder	R Preschool children	c Sport coaches
H Fundraisers	S Previous beneficiaries	d Suppliers
I General manager	T Previous donors	e Teachers
J Initial programme developer	U Primary school learners	f Technical support
K Learning centre owners	V South African Council for Educators	g Trustees

Figure F-1 Transactional environment of the non-profit organisation

F.2 ETHOS

The espoused values of the NPO are education integrity, human capacity building, accountability, relationship building, and sense of identity and self-esteem. These values are confirmed in the sustainability evaluation interview including relationships where relationships are continuously built through transparency. The belief that people are the most important asset of the NPO is demonstrated through their human resource development procedures. The NPO also increases accountability and transparency through their monitoring and evaluation process.

The trust who registered the NPO was founded by an entrepreneur who appreciates the benefits of participation in sport. He also is the managing director of an engineering company which started

manufacturing sport equipment. This is regarded as a social enterprise (Ridley-Duff, 2019; Rifkin, 2014). The founder was then invited by a school to get involved in a community outreach project which was started by a sport coach at the inviting school who developed a programme in his private capacity to support foundation phase learners through sport. In order to implement the programme on a national level, the trust was established with remuneration for the founder and the programme developer which strengthens the social enterprise. Later other trustees also became operationally involved in the NPO.

However, three years later the trust was approved as a public benefit organisation (PBO) to entitle donors to deduct donations from income tax (Republic of South Africa, 2020b; South African Revenue Service, 2018). A PBO performs public benefit activities in a non-profit way which are not intended to economically benefit any trustee or employee except for reasonable remuneration. The following year the trust registered their programme as an NPO to receive tax incentives and improve credibility and funding opportunities (Republic of South Africa, 1997; Republic of South Africa, 2020c). The income, property and other assets of an NPO are not distributable to its members or office-bearers. Subsequently, the programme developer resigned as trustee and established his own private company to become a preferred supplier to the NPO.

A general manager was appointed due to the growth of the programme. The appointment was made based on key performance indicators and extensive psychometric testing for the management of an NPO according to a contemporary conceptualisation (Malhotra, 2018). This causes inherent tension and conflict with the original social enterprise orientation of the trust based on a hybrid conceptualisation of an NPO as demonstrated, for example, by not recruiting volunteers.

Later the trust registered a private company with limited liability in order for donors to contribute to enterprise development. The trust believed that a non-profit company would have been able to show a greater profit component than an NPO but would not enjoy the same tax benefits and therefore decided to register a private company which again is in line with the original social enterprise orientation of the trust. However, the general manager of the NPO was appointed as the only director of the private company.

The NPO was verified as a level 1 BBBEE contributor in order for donors to raise their BBBEE scores. When the private company was registered, donors could further raise scores for BBBEE through enterprise development. However, sometimes employees are appointed based on BBBEE requirements and not competency. The BBBEE contributor status of the NPO furthermore restricts the implementation of their programmes. During the study donors became less motivated to increase their BBBEE scores.

The trust was established to coordinate, develop and administrate sport as such and as an educational aid to enhance learning. The initial aim of the NPO therefore was to bring the educational value of sport to communities where there are major challenges in education. However, there is a perception that the NPO only is involved in sport as such and the reputation of sport is tarnished due to politics and financial matters of sport bodies. The NPO nonetheless intends not to abandon their mission even if impact is achieved on a smaller scale.

Since the first year of the trust's existence they attempt to cooperate with stakeholders such as other NPOs, government, sport federations and business. However, expected exposure, expansion opportunities, financial benefits and trust relationships do not always realise. Cooperation with some entities furthermore poses challenges for support from other entities, sometimes causes conflict within the NPO, and even leads to additional costs. Cooperation is further strained due to the COVID-19 pandemic.

F.3 AIMS

The trust who registered the NPO states their objects as follows over time:

- To receive donations to conduct public benefit activities in a non-profit manner with an altruistic intent through the coordination, development and administration of sport as such and as an educational aid, the organisation and hosting of national and international sport events, and the enhancement of learning through participation in organised sport
- To conduct public benefit activities in education and development, human welfare and/or sport through the establishment and administration of a fund

The overall aim of the NPO is to empower learners and teachers to give children a head-start in life. Although trustees should be committed to the aim of the NPO, currently they do not drive the aim and do not render the required support in strategic planning. Over time the aim of the NPO is formulated as follows:

- To bring the educational value of sport to communities where there are major challenges in education and where these challenges reflect in the academic performance of schools
- To bring the educational benefits of sport to children throughout South Africa
- To unlock the full mental and social capability of as many children as possible in order to improve their educational performance by improving their cognitive and analytical abilities through exposure to the mental discipline provided by sport
- To bring the educational benefits of sport to children throughout Africa by providing them with access to a complete sport curriculum and a variety of enrichment programmes
- To educate future mindsets of South African children in terms of employability, global citizenship and sustainability by igniting their confidence and talent through sport

- To use sport as an educational tool through its positive values and outcomes to address the personal development of people

The NPO states their vision as follows over time, which typically involves a sensory rich description of the desired outcome of an organisation (208):

- Improved educational performance of as many children as possible by unlocking their full mental and social capability
- The ignition of confidence and talent

The purpose statement of an organisation relates the aim of the organisation to their ethos (208).

The NPO expresses it as follows:

- To ignite confidence and talent through learning and development

The mission of an organisation elaborates on the purpose statement in terms of what the organisation wants to do for their external and internal stakeholders and for themselves (208). The NPO formulates their mission as follows over time which may indicate mission drift (148):

- To improve the cognitive and analytical abilities of children by exposing them to the mental discipline provided by sport. The programme intentionally links sport principles to life skills, mathematics, science and language and holds education is critical to any kind of development.
- To educate future mindsets to enable and develop individuals to become exemplary citizens, to be equipped for the challenges of the work place, add value and contribute towards the good of their communities in general

The brand promise of the NPO is stated as follows:

- To educate future mindsets

The NPO realises that they should not chase numbers and rather grow more slowly while keeping in line with relevant government priority goals. They also intend to make a real difference over the long term which teachers appreciate. However, business requires a wide footprint with short-term change in order to make donations. The NPO therefore formulates the following goals over time:

- To lead children to discover, establish and improve their problem-solving skills and to empower and train teachers to teach children the correct way and to be enthusiastic about their work
- A national programme which is dominant in all schools by 2030 (more than 60% of all schools), quality education that exceeds expectation, selling enterprise development learning centres, modernising their approach, pioneering 21st century skills in learners, to impact on the largest number of learners where all participants benefit, impact at an extremely low cost, impact at the age where it matters most, establish fundamental mathematics, science and life

skills concepts, learning through play, teacher empowerment through lesson planning and execution strategies, measurement and continuous improvement, and the active involvement of the community, parents, schools and learners in collaboration with the NPO programme

The NPO articulates their objectives as follows:

- To achieve programme goals within the required timeframes, foster effective communication skills, deliver to high work standards, demonstrate applied learning, life skills through activity, job readiness of young people, support the broader schooling curriculum and education system, seek maximum community participation, and allow beneficiaries and communities to see opportunities and hope

F.4 PROCESSES

The need identification, development, and delivery of products and services of the NPO are more aligned with the ethos of a PBO but also exhibit the ethos of a social enterprise through learning centres if operating as social franchises, holiday programmes if run as small business opportunities, adult training and recreational projects if paid for by participants, short courses offered at academic institutions, and blended learning schools. Furthermore, the status of the NPO as a level 1 BBBEE contributor including enterprise development is supported by these processes, although sometimes they are restricted by the status of the NPO. The processes of the NPO are focused on the development of sport as such and of sport as an educational aid to enhance learning, but are hampered by a perception that the NPO only is involved in sport as such and a poor reputation of sport. Cooperation with stakeholders is emphasised in need identification, development, and delivery of products and services of the NPO, yet it proves challenging. The processes of the NPO to identify needs, develop products and services, and to deliver products and services promote values of education integrity, human capacity building, accountability, relationship building, sense of identity and self-esteem, and transparency.

The aims of the NPO are supported by their need identification, development, and delivery of products and services. However, organisational growth before proper documentation of organisational processes poses a challenge for the NPO. The process mapping of the NPO furthermore only documents in-school and extracurricular programmes and not programmes at learning centres, holiday programmes and adult training. Obtaining the buy-in of the relevant community and community leadership also is not indicated in the process mapping and it is not clear how the objective is achieved to seek maximum community participation although holiday programmes aim to actively involve the community.

Continuity in the process field helps to prevent disturbances, waste of resources, and blockages in the organisation (208). It involves coherent aims and regulations with stakeholders, optimisation of

resource flow according to these aims and regulations, external and internal relations, and the desirability of output (348). Focusing on stakeholders with the highest influence in the transactional environment of the NPO, the continuity of the need identification, development, delivery of products and services of the NPO is summarised in Table F-2. While relations of empowerment and of stakeholders having power over the NPO are indicated.

Tapping also affects the continuity of the process field of organisation in terms of the intention and ability of the process to utilise opportunities, mitigate risks and influence its outer and inner environment (208). The intention to tap depends on the alignment of the aims of the contributing process and the tapping process as indicated in Table F-2. The ability to tap depends on regulation and the resource flow as shown in Table F-2 and also the format of resources (208). In South Africa, 60% of people accesses the internet mainly via a smartphone with 1.76 mobile connections per person (557, 558). Although most people watch online videos, play games or stream music, 37% (49% globally) of internet users visits social media with almost a 20% growth rate with the COVID-19 pandemic. The most popular social media is WhatsApp, then YouTube, Facebook, Instagram, Twitter, Pinterest, LinkedIn, Snapchat, Skype, Reddit, and lastly TikTok. Marketing is done mostly through television advertisements, then search engines, social media advertisements, word-of-mouth recommendations, in-store displays or promotions, website advertisements, retail websites, television shows or films, social media recommendations or comments, and lastly brand or product websites. 56% of internet users make online purchases with almost a 25% growth rate with the COVID-19 pandemic although closing sales remains a challenge (557, 559).

The NPO employs two-way tapping through regular meetings, emails and telephonic conversations with potential donors and partners. Feedback also is continuously requested from stakeholders through the monitoring and evaluation process of the NPO. Donors require regular reporting which sometimes entail additional measurements to the monitoring and evaluation process of the NPO. Information for tapping by stakeholders is contributed by the NPO furthermore through their website, social media including YouTube, Facebook, Instagram, Twitter, Pinterest and LinkedIn and previously through a blog, and other media. The NPO utilises Facebook well to communicate swiftly and with commitment to create certainty when the pandemic hit, strengthen a sense of community, and to send out content which adds value for learners, teachers and parents. Proper naming rights were updated on all platforms except for the blog, some links to social media were added on the website, a subscription option was added on YouTube, the Facebook site was cleaned up and the LinkedIn site updated through the study.

Table F-2 Continuity of the processes of the non-profit organisation

Stakeholder	Aims	Regulation	Resource flow	Relation	Output desirability
Business, donors	<ul style="list-style-type: none"> • Mining Charter • Provincial conditions of gambling licence • Current social trends • BBBEE score 	<ul style="list-style-type: none"> • Companies & Intellectual Property Commission • Department of Mineral Resources • Provincial Offices of the Premier • SARS • BBBEE verification agencies 	<ul style="list-style-type: none"> • Funding to NPO • Do not cover overheads • Do not contribute to reserve funds • Corporate social investment 	<ul style="list-style-type: none"> • Power over NPO • Empower NPO • Varies from implementation partner, customer, donor, advisor, political player, to competitor 	<ul style="list-style-type: none"> • Brand exposure • Income tax benefits • SACE accredited training • Community development and creation of safe social structures • Human development including 21st century skills • Continuous reporting and impact evaluation of investment • BBBEE scores including enterprise development • Personal interest
Community leaders	<ul style="list-style-type: none"> • Safe space for community members • Constructive recreation and sport • Job creation 	<ul style="list-style-type: none"> • Local government 	<ul style="list-style-type: none"> • Support NPO programme 	<ul style="list-style-type: none"> • Power over NPO • Empower NPO 	<ul style="list-style-type: none"> • Safe space for learners through extracurricular sport programme, learning centres • Constructive recreation and sport through extracurricular sport programme including tournaments • Job creation through recruitment and training of facilitators, sport coaches

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

Stakeholder	Aims	Regulation	Resource flow	Relation	Output desirability
Education district & circuit offices	<ul style="list-style-type: none"> • Improve access to quality early childhood development • Continuously improve professionalism, teaching skills, subject knowledge and computer literacy of teachers • Ensure that every learner has access to minimum set of required textbooks and workbooks • Ensure that basic annual management processes take place at all schools to contribute towards functional school environment • Improve monitoring and support services provided to schools by district offices 	<ul style="list-style-type: none"> • DBE • Provincial Education Departments 	<ul style="list-style-type: none"> • Approval to NPO 	<ul style="list-style-type: none"> • Power over NPO • Approve, accredit and recommend 	<ul style="list-style-type: none"> • Continuous reporting and impact evaluation of investment • Holistic transformative developmental model • Sound educational principles • Benefit learners at age with biggest impact
Employees	<ul style="list-style-type: none"> • Tutoring to assist learners to learn more effectively • Previously 50% of employees worked for income, but many of these employees resigned and the motivation changed of those remaining 	<ul style="list-style-type: none"> • DBE • DSD • Department of Sport, Arts & Culture • SARS 	<ul style="list-style-type: none"> • Job opportunities • Remuneration • Annual needs assessment and career and skills development • Accredited training • Tablets • Realise aims of NPO through knowledge, skills and conduct 	<ul style="list-style-type: none"> • Empowered by NPO • Most significant resource to differentiate products and services in competitive environment 	<ul style="list-style-type: none"> • BBBEE • Nepotism • Salaries reduced to two days/week • No raise in six years • Retrenchments

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

Stakeholder	Aims	Regulation	Resource flow	Relation	Output desirability
Founder	<ul style="list-style-type: none"> Enhance the learning of all learners through participation in organised sport on a national level 	<ul style="list-style-type: none"> Companies & Intellectual Property Commission DBE DSD Department of Sport, Arts & Culture National sport federation SARS 	<ul style="list-style-type: none"> Founded trust Supply sport equipment Receive remuneration No commission Chair board of trustees Identify donors 	<ul style="list-style-type: none"> Power over NPO Founder Chairs board of trustees 	<ul style="list-style-type: none"> Opportunity to give back to community
General manager	<ul style="list-style-type: none"> Empower learners, teachers to give children head-start in life 	<ul style="list-style-type: none"> DBE DSD Department of Sport, Arts & Culture SARS 	<ul style="list-style-type: none"> Remuneration Skills development No succession planning No mentoring Unsustainable work-life balance 	<ul style="list-style-type: none"> Empowered by NPO Attributed with continued operation of NPO 	<ul style="list-style-type: none"> Salary reduced to two days/week No raise in six years
Learning centre owners	<ul style="list-style-type: none"> Contribute to human development in 21st century 	<ul style="list-style-type: none"> DBE DSD Department of Sport, Arts & Culture SARS 	<ul style="list-style-type: none"> Social franchise / funded by donors Programme material provided Sport equipment provided Curriculum provided Monthly accredited training provided 	<ul style="list-style-type: none"> Empowered by NPO Utilise products and services of NPO 	<ul style="list-style-type: none"> Encouraged to attend training through award structure Continuous support required due to poor marketing
Life coach	<ul style="list-style-type: none"> Contribute to human development in 21st century 	<ul style="list-style-type: none"> Coaches & Mentors of South Africa / International Coaches Register (optional since it is not a regulated profession in South Africa) SARS 	<ul style="list-style-type: none"> Mutual opportunities to realise aims Mutual opportunities to generate revenue 	<ul style="list-style-type: none"> Mutual empowerment Implementation partner 	<ul style="list-style-type: none"> Mutual opportunities to realise aims Mutual opportunities to generate revenue

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

Stakeholder	Aims	Regulation	Resource flow	Relation	Output desirability
Network operators	<ul style="list-style-type: none"> • Generate revenue by providing communication services through licensed infrastructure and supporting services 	<ul style="list-style-type: none"> • Independent Communications Authority of South Africa • SARS 	<ul style="list-style-type: none"> • Communication infrastructure and services for NPO • Corporate social investment 	<ul style="list-style-type: none"> • Power over NPO • Empower NPO • Implementation partner and advisor 	<ul style="list-style-type: none"> • Brand exposure • Income tax benefits • Community development and creation of safe social structures • Human development including 21st century skills • Continuous reporting and impact evaluation of investment • BBBEE scores including enterprise development
NPO sector	<ul style="list-style-type: none"> • Focus on gender-based violence 	<ul style="list-style-type: none"> • DSD 	<ul style="list-style-type: none"> • Training and other support services 	<ul style="list-style-type: none"> • Constrained mutual empowerment 	<ul style="list-style-type: none"> • Knowledge & experience of NPO • Paid-for training & support are growing while free training & support are declining
Preschool children	<ul style="list-style-type: none"> • Parents have a neoliberalist focus on individualism, competition, performance and accountability for learners and teachers (560) – impacted by COVID-19 • See opportunities and hope 	<ul style="list-style-type: none"> • DBE • DSD • Department of Sport, Arts & Culture 	<ul style="list-style-type: none"> • Weekly sport as educational intervention to improve mathematics, science, problem-solving and language development at learning centre • Tutoring classes in mathematics and science, music sessions, and meals at learning centre 	<ul style="list-style-type: none"> • Empowered by NPO • Beneficiaries 	<ul style="list-style-type: none"> • Impact on parent and community involvement • Opportunities to experience success • Developing 21st century skills • Play-based learning which is pleasurable, voluntary, symbolic, process orientated, active and self-motivating

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

Stakeholder	Aims	Regulation	Resource flow	Relation	Output desirability
Primary school learners	<ul style="list-style-type: none"> Parents have a neoliberalist focus on individualism, competition, performance and accountability for learners and teachers (560) – impacted by COVID-19 See opportunities and hope 	<ul style="list-style-type: none"> DBE DSD Department of Sport, Arts & Culture 	<ul style="list-style-type: none"> Foundation: in-class curriculum addressing all national curriculum and assessment policy statements (CAPS) focusing on life skills, mathematics, home language, science, art, dance, drama, introduction to coding Intermediate: in-class curriculum focusing on life skills, topical mathematics, natural sciences & technology, coding, business games Occupational therapy Social worker services Sport as an extracurricular activity Tutoring classes in mathematics and science, music sessions, business game, sport, and meals at learning centre 	<ul style="list-style-type: none"> Empowered by NPO Beneficiaries 	<ul style="list-style-type: none"> Impact on parent and community involvement Opportunities to experience success Developing 21st century skills Play-based learning which is pleasurable, voluntary, symbolic, process orientated, active and self-motivating
School principals & governing bodies	<ul style="list-style-type: none"> Improve academic performance Better trained teachers 	<ul style="list-style-type: none"> DBE 	<ul style="list-style-type: none"> Approval to NPO 	<ul style="list-style-type: none"> Power over NPO Empower NPO Approve implementation of programme 	<ul style="list-style-type: none"> Programme developed in South African classrooms Programme introduced in foundation phase Programme links with national CAPS Practical & user-friendly programme builds on

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

Stakeholder	Aims	Regulation	Resource flow	Relation	Output desirability
					teachers' existing knowledge & experience • Implemented as part of weekly teaching schedule / after school at learning centre • Immediate impact • Impact teacher effectiveness, learners' learning, parent & community involvement
Sport coaches	<ul style="list-style-type: none"> • Sport development for children 	<ul style="list-style-type: none"> • DBE • Department of Sport, Arts & Culture • National sport federation 	<ul style="list-style-type: none"> • SACE accredited training • Interactive e-learning platform used as visual aid • Coaching aids e.g. coaching manuals • Sport equipment 	<ul style="list-style-type: none"> • Empowered by NPO • Deliver products and services of NPO 	<ul style="list-style-type: none"> • Award structure • Equipped to coach children individually for extra income
Teachers	<ul style="list-style-type: none"> • Long-term impact 	<ul style="list-style-type: none"> • DBE • Provincial Education Departments 	<ul style="list-style-type: none"> • SACE accredited training • Interactive e-learning platform used as visual aid • Teaching aids e.g. teacher manuals, comprehensive lesson plans, geometry toolboxes, sport equipment, differentiated workbooks and worksheets for each learner 	<ul style="list-style-type: none"> • Empowered by NPO • Utilise products and services of NPO 	<ul style="list-style-type: none"> • Award structure • Continuing professional teacher development (CPTD) points • Developed in South African classrooms • Support national CAPS • Practical and user-friendly • Build on existing knowledge & experience • Immediate impact on effectiveness and learners' learning

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

Stakeholder	Aims	Regulation	Resource flow	Relation	Output desirability
					<ul style="list-style-type: none"> • Introduction of programmes in foundation phase • Innovative, integrated, interactive, fun and play-based • In-class curriculum part of weekly teaching schedule not requiring extra time on timetable
Teacher unions	<ul style="list-style-type: none"> • Improve academic performance • Better trained teachers 	<ul style="list-style-type: none"> • Department of Labour • Commission for Conciliation, Mediation and Arbitration • National Economic Development and Labour Council 	<ul style="list-style-type: none"> • Approval to NPO 	<ul style="list-style-type: none"> • Power over NPO • Empower NPO • Approve implementation of programme 	<ul style="list-style-type: none"> • Programme developed in South African classrooms • Programme introduced in foundation phase • Programme links with national CAPS • Practical & user-friendly programme builds on teachers' existing knowledge & experience • Implemented as part of weekly teaching schedule / after school at learning centre • Immediate impact • Impact teacher effectiveness, learners' learning, parent & community involvement
Technical support	<ul style="list-style-type: none"> • Generate revenue by designing, building, 	<ul style="list-style-type: none"> • SARS 	<ul style="list-style-type: none"> • Support software of NPO through knowledge and skills 	<ul style="list-style-type: none"> • Power over NPO • Empower NPO 	<ul style="list-style-type: none"> • Mutual opportunities to realise aims

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

Stakeholder	Aims	Regulation	Resource flow	Relation	Output desirability
	installing and maintaining software		<ul style="list-style-type: none"> • Corporate social investment 	<ul style="list-style-type: none"> • Implementation partner and advisor 	<ul style="list-style-type: none"> • Mutual opportunities to generate revenue
Trustees	<ul style="list-style-type: none"> • Suppose to entrench the ethos of the NPO, support the general manager and to govern the NPO • Heart for children • Making money • Build curriculum vitae 	<ul style="list-style-type: none"> • Companies & Intellectual Property Commission • DBE • DSD • Department of Sport, Arts & Culture • National sport federation • SARS 	<ul style="list-style-type: none"> • Receive remuneration • No commission • Direct trust • Identify donors 	<ul style="list-style-type: none"> • Power over NPO • Not all drive aims of NPO • Not all render required support in strategic planning • Value clash among some trustees and NPO • Experience governance challenges 	<ul style="list-style-type: none"> • Politically motivated

Multifunctionality of the process field of organisation is used to create synergies by sharing aims, activities, or by sharing resources and structures (208). The same aim is shared by different activities of the NPO through the following examples:

- Concepts are taught and rephrased in different ways to accommodate learners with diverse learning styles, methods and paces to improve academic success for each learner
- Concepts are consolidated through constant repetition and revision
- A blended learning school includes a virtual school which learners attend from a local blended learning centre
- Learners attend a blended learning school according to a school timetable or on a per subject basis
- Blended learning school activities are offered via a virtual reality platform or in person at clubs
- Communication with stakeholders is implemented through a website, social media including YouTube, Facebook, Instagram, Twitter, Pinterest, LinkedIn and a blog, print media, television and radio, and at events

The same activities are shared to achieve different aims through the following examples:

- Use sport as an educational tool through its positive values and outcomes to address the personal development of people. This however causes a perception that the NPO only is involved in sport as such.
- Address the aims of business to score BBBEE point and satisfy requirements of the Mining Charter and provincial conditions of gambling licences
- Address the aims of the DBE to improve access to quality early childhood development, continuously improve professionalism, teaching skills, subject knowledge and computer literacy of teachers, ensure that every learner has access to workbooks, and to improve monitoring services to schools and district offices
- Address different aims associated with opportunities in the contextual environment of the NPO in terms of human, natural, physical, financial and social capital through all their programmes.

Resources and structures of the NPO are shared through the examples listed below. The NPO also plans to investigate expansions of projects that run well through long-term engagements with stakeholders. On the other hand, attempts to raise funds through cooperation with other NPOs and fundraisers are not effective and further hampered through the COVID-19 pandemic. It also proves difficult to generate revenue through the same products and services without extensive marketing. Politics and financial matters of local and international sport bodies also pose challenges for cooperation. Although it would have been more beneficial financially and otherwise to the trust, a retainer with a legal advisor was terminated by the trust.

- Address all national CAPS while developing 21st century skills

- An innovative, integrated, fun and play-based, interactive and in-class curriculum which does not require extra time on the timetable
- The in-class programme builds on teachers' existing knowledge and experience
- Coaches are trained to support or establish and run sport clubs and coach sport as an extracurricular activity.
- The official NPO calendar is used for planning to share resources and structures wherever possible
- A change in the role of tutor to that of facilitator who offers guidance to and consult with all teachers in a specific grade outside of the classroom to connect and engage with many more schools per week
- Restructuring of management positions to improve implementation efficiency
- Reporting to different stakeholders
- Sport equipment is used as an educational aid to enhance learning and also for sport as such
- Cooperation with other NPOs and business such as to offer tutoring classes, informal music sessions, a business game and life coaching, operate a school kitchen and vegetable garden, and to perform data processing
- Cooperation with academic institutions such as research and development projects regarding pathways of the mind, teaching learners to code, offering of short courses, outreach programmes, entrepreneur supplier development, leadership development, management training, business plan development, employee training, project management, quality management, marketing, quality assurance, monitoring and evaluation, and social and educational impact
- At a learning centre preschool children and primary and secondary school learners develop in sport as such and improve their learning skills through curricula aligned to national CAPS, grade and subject specific tutoring classes, informal music sessions, a business game, and meals are offered from a school kitchen and vegetable garden
- At a school teachers and coaches receive training, learners enhance their learning and develop their sport skills, and adult training and recreational projects are offered
- To offer their products and services online, for example, blended learning schools, the NPO decided to turn the physical environment threat of a lack of infrastructure in underdeveloped areas into an opportunity by partnering with network providers to also benefit local communities

Sustainable operations management (SOM) implies multifunctionality of processes to create synergies by sharing the same activities to achieve different aims associated with human, natural, physical, financial and social capital. To explore this further, a BES perspective is supplemented with a modification of general organisational models for sustainability as summarised in Table F-3

(148, 208). SOM also implies multifunctionality in terms of achieving the same aim through different activities to develop capabilities and competencies for sustainability-related innovation and to embed sustainability into organisational aims and processes. For this purpose a BES perspective is supplemented with technological, social and organisational models for sustainability as summarised in Table F-4 (147). A BES perspective furthermore is supplemented with customised organisational models for sustainability (151) to distinguish between processes to efficiently deploy current sustainability practices, and processes to develop new concepts and capabilities related to sustainability innovation. It is indicated that the NPO should focus on new product and service attributes and functions such as the blended learning schools that they have developed in context of the high levels of competitiveness and uncertainty in the NPO sector, rather than improving material and energy efficiency to lower costs, integrating stakeholders' needs into processes, products and services, or developing sustainability performance measurement systems.

Table F-3 Modification of general organisational models for sustainability

Process	Modifications
Need identification	
Products and services	Promote improved quality of products and services through sustainability by offering unique value in terms of 21 st century skills (362, 365)
Customer segments	Target high-quality focused customers who can bear a higher price through learning centres operated as social franchises, holiday programmes run as small business opportunities, adult training and recreational projects paid for by participants, short courses offered at academic institutions, blended learning schools
Relationships	Engage multiple stakeholders in developing an emotional stake in the NPO
Product and service development	
Activities	Struggle to address tension between different aims and cannot separate appropriate activities to ensure sustainability
Resources	Attempt to overcome resource shortages through multifunctionality by sharing resources and structures as discussed above but lack funding
Channels	Proximity to stakeholders through website, social media and other media can be further improved
Partners	Attempt to improve negotiation power through multifunctionality by sharing resources and structures as discussed above but do not have access to government decision-making processes
Product and service delivery	
Cost structure	Follow a low debt and slow asset-based growth strategy
Revenue streams	Link sustainable impact directly to commercial success through learning centres, holiday programmes, adult training and recreational projects, short courses offered at academic institutions and blended learning schools, but find it difficult to link sustainable impact directly to commercial success for sport

F.5 STRUCTURE

The formal organogram of the NPO was developed through work sessions involving all employees over many years and all employees have a copy thereof. It indicates four main functions namely

fundraising, execution, governance, and public relations and marketing. The core structure is indicated as one out of seven substructures of execution as follows:

- Projects: Donations; Centres (social enterprise development)

Table F-4 Technological, social and organisational models for sustainability

Grouping	Archetype
Technological	Maximise material and energy efficiency through multifunctionality of processes by sharing resources and structures as discussed above
	Do not create value from waste but do not waste resources
	Do not utilise renewable technologies or technologies based on natural processes, but cooperate to provide nutritious meals from a school kitchen and vegetable garden
Social	Do not deliver functionality rather than ownership
	Do not adopt a stewardship role
	Encourage sufficiency regarding materials
Organisational	Repurpose for society through non-profit organisation and equipping coaches to earn extra income
	Develop scale-up solutions through sharing resources and structures as discussed above, enterprise development, learning centre franchises, and crowd funding

The actual organogram of the NPO indicates the core structure as two out of four main functions as listed below.

- Programme coordinator: Facilitators
- Product manager: School representatives (teachers)

The support structure of NPOs emerged over time as mentioned above from entrepreneurial capitalism to contribution to the common good. Since the income, property and other assets of NPOs are not distributable to their members or office-bearers, the main source of funding for many NPOs is donations so that fundraising is a major support function for them (45). The support structure of the NPO is indicated in their formal organogram in all four main functions as listed below. Their reliance on voluntary contributions is a major challenge for the NPO and they emphasise the role of trustees, cooperation with other NPOs and external fundraisers. Currently they struggle to raise funds due to the time intensity, lack of required staff and funding, and challenges due to the COVID-19 pandemic. For the same reasons they do not have the capacity to generate revenue by delivering products and services which they already have developed.

- Fundraising: Fundraisers (Corporates; Small, medium and micro enterprises); Events; Project fees; Social enterprise development
- Execution: Suppliers; Logistics
- Governance: Agreements

- Public relations and marketing: Corporate identity; Materials (Correspondence templates; Brochures; Videos); Donor feedback; Publicity (Media; Social media); Government stakeholders; Corporate stakeholders; Partnerships

The actual organogram of the NPO indicates the support structure as a substructure in one out of four main functions as indicated below. Relevant positions are not indicated. The NPO emphasises the importance of marketing not only for donations but also for generating revenue. They increase accountability and transparency to support their marketing through their monitoring and evaluation process. However, they experience marketing by other organisations often as misleading and pretentious. The NPO maintains a good reputation but requires funding to promote their organisational image and activities. Currently administration is prioritised above marketing.

- (Administration) and marketing

The organisational support structure of the NPO is indicated in the formal organogram of the NPO in two out of four main functions as listed below. Besides the challenges indicated in the organogram, issues raised in the contextualisation involve governance, legal support, strategic planning, monitoring and evaluation, and external training. Furthermore, donors sometimes require measurements in addition to the monitoring and evaluation process of the NPO. Since income, property and other assets are not distributable to members or office-bearers and currently the NPO lacks funding, challenges also are experienced regarding a remuneration system so that salaries are reduced to two working days per week, employees did not receive a salary increase for the past six years, and no commissions are paid. Fortunately a business assists with data processing on a pro bono basis.

- Execution: Administration; Coordinators; Impact measurement; Challenges (Transport; Information technology and communication; Managerial training)
- Governance: Statutory compliance; Finances; Policies

The actual organogram of the NPO indicates the organisational support structure in two out of four main functions as listed below. Relevant positions are not indicated.

- Finance
- Administration (and marketing)

F.6 RESOURCES

According to a BES perspective, organisational resources include material, financial, human, knowledge and technological resources. With reference to the definition of sustainability in this study however, an organisation requires physical, financial, human, social and natural resources to satisfy self-defined needs and to build resilience over the long term. Physical capital is considered in terms of material resources and technological resources. Human capital is considered in terms of human resources and knowledge resources. Knowledge resources usually refer to knowledge types as defined by Binney (561) in a business context, but this study applies a BES perspective to customise knowledge needs in an NPO context (380). Natural capital is considered by adding natural resources with reference to the integration of renewable products and services (51, 562, 563). Social capital is considered in the continuity of the processes of the NPO (120, 121).

Table F-5 Material resource management of the non-profit organisation

Material	Acquisition	Distribution	Development	Maintenance	Discharge
<ul style="list-style-type: none"> • Manuals • Workbooks • Presentation leaflets • Facilitator files 	Printed by supplier A	Coordinators	Product manager maintaining version control	<ul style="list-style-type: none"> • Content: academic institution A • Inventory: data manager 	Write off, donate to under-resourced schools if outdated / slightly damaged
<ul style="list-style-type: none"> • Electronic presentations • Video guides 	USB flash drives from supplier B			<ul style="list-style-type: none"> • Content: product manager • Inventory: administrator 	
Teacher toolboxes	Content from supplier C				
Clay	Supplier D		Supplier D	Data manager	Write off, donate to under-resourced schools if slightly damaged / close to expiry date
Geometry tool sets	Supplier E		Supplier E	Data manager	Write off, donate to under-resourced schools if outdated / slightly damaged and not fit to be sold
Mathematics dictionary	Supplier F		Supplier F		
Manuals & workbooks for accounting tutoring classes	Supplier G		Supplier G		
Science laboratory kits	Academic institution A		Academic institution A		
Coding software & manuals	Academic institution B		Academic institution B		
Sport equipment	Founder		Founder		
<ul style="list-style-type: none"> • Informal music sessions 	No materials acquired	Cooperating partners	Cooperating partners		

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

<ul style="list-style-type: none"> • Business game • Occupational therapy • Social worker services • Life coaching 					
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Table F-6 Technology management of the non-profit organisation

Hardware / software	Acquisition	Distribution	Development	Maintenance	Discharge
<ul style="list-style-type: none"> • Printing and binding of learning material • Printer • Mobile phones • Shredder, desktop, projectors, screens 	<ul style="list-style-type: none"> • Printing and binding learning material outsourced • Printer donated • Mobile phones per contract • Shredder, desktop, projectors, screens bought from supplier I 	Head office distributes to district offices		<ul style="list-style-type: none"> • Learning material stored in rented storeroom • Shredder, desktop, projectors, screens stored in rented storeroom 	<ul style="list-style-type: none"> • Mobile phone contracts terminated
Laptops	Supplier H	Head office distributes to district offices	Replaced every five years per NPO policy	Supplier H	Donate to under-resourced schools
Reporting system	Custom-developed by business A	<ul style="list-style-type: none"> • Main donor donates tablets with system installed to facilitators on their projects • NPO and facilitators share cost equally of tablets with system installed on all other projects 	<ul style="list-style-type: none"> • Once-off • Abandoned since facilitators struggled too much 	Manually	Donate tablets to under-resourced schools
Monitoring and evaluation system	Developed by business B for all corporate social responsibility projects of main donor with their financial support	Data administrator from head office enters all data	<ul style="list-style-type: none"> • Prototype ran but online system not implemented due to scaling down by main donor and impact of COVID-19 • Replaced by spreadsheet system 	Administrator	Not implemented

Table F-7 Natural resource management of the non-profit organisation

Product / service	Acquisition	Distribution	Development	Maintenance	Discharge
Vegetable garden	No materials acquired	Cooperating partners	Cooperating partners	Cooperating partners	Completed for one project
School kitchen					

Table F-8 Financial resource management of the non-profit organisation

Source	Acquisition	Distribution	Development	Maintenance	Discharge
Donations	Identification: <ul style="list-style-type: none"> • Trustees • Fundraisers • Well-connected references • Other NPOs • General manager Contract: <ul style="list-style-type: none"> • General manager 	<ul style="list-style-type: none"> • Human resources (49%) • Training (23%) • Tournaments (9%) • Administration (9%) • Material (5%) • Marketing (4%) • Monitoring and evaluation (1%) 	<ul style="list-style-type: none"> • Donor brand exposure • BBBEE scores including enterprise development • Income tax benefits • SACE accredited training 	Bookkeeping	Any remaining assets to be transferred to another NPO with similar objectives on dissolution
Revenue	<ul style="list-style-type: none"> • Sport equipment • Teacher training 		<ul style="list-style-type: none"> • Teacher training • Short courses at academic institution • Adult training workshops • Blended learning school 		
COVID-19	<ul style="list-style-type: none"> • Crowd funding supported by one faith-based organisation 		<ul style="list-style-type: none"> • Unemployment Insurance Fund • Requests for relief of payments / reduced tariffs / extension on payments • Available security in remaining donations and sport equipment 		

Table F-9 Human resource management of the non-profit organisation

Position	Acquisition	Distribution	Development	Maintenance	Discharge
Trustee	<ul style="list-style-type: none"> • Founder • Proposed by current trustees • Representing donor • Trust deed 	Trust		<ul style="list-style-type: none"> • Remuneration • No commission 	Resignations
General manager	<ul style="list-style-type: none"> • Recruitment as to key performance indicators • Appointment based on extensive psychometric testing 	Head office	<ul style="list-style-type: none"> • Annual needs assessment • Personalised career & skills development plan • Training and development programme • NPO sector training programmes 	<ul style="list-style-type: none"> • Salary reduced to two days/week • No raise in six years • Unsustainable work/life balance 	Attempts to dismiss
National assessor	<ul style="list-style-type: none"> • Promotion 		<ul style="list-style-type: none"> • Annual needs assessment • Personalised career & skills development plan • Training and development programme 	<ul style="list-style-type: none"> • Salary reduced to two days/week • No raise in six years 	<ul style="list-style-type: none"> • Per contract • Resignations • Retrenchments • Dismissals
Programme manager	<ul style="list-style-type: none"> • Fixed-term contract 				
Product manager					
National facilitator					
Data manager	<ul style="list-style-type: none"> • Recruitment 				
Administrator	<ul style="list-style-type: none"> • Instruction by trust 				
Accountant	<ul style="list-style-type: none"> • Fixed-term contract 				
Marketer					
Coordinator	Promotion	According to donor projects			
Facilitator					
Coach	<ul style="list-style-type: none"> • Fixed-term contract 				
Junior facilitator	<ul style="list-style-type: none"> • Instruction by trust • Fixed-term contract 				

Table F-10 Knowledge management of the non-profit organisation

Category	Acquisition	Distribution	Development	Maintenance	Discharge
Environment	<ul style="list-style-type: none"> • Reports on programme impact on learners, teachers and community • Documents on cognitive development evaluation • Journal articles on link between programme and cognitive development • Articles about NPO • Social media • Feedback from fundraisers and well-connected references on potential donors • Training and support by NPO sector • Training and support by academic institutions • Advice from private legal practitioners • Legislation • Publications, newsletter and media releases from DBE • Publications, newsletter and media releases from Department of Sport, Arts & Culture • Newsletters from national sport federation • Reports from companies & Intellectual Property Commission • Reports from DSD • Reports from SARS 	<ul style="list-style-type: none"> • Internal training • External training • On the job coaching and mentoring • Assignments and delegation of tasks and projects • Job swap once a year • Internal job shadowing • Involvement in the planning of new programmes • Cultural diversity workshop • Customer and supplier visits • Reading assignments • Internal briefings and presentations 	<ul style="list-style-type: none"> • Research cooperation with academic institutions • Management analyses all monitoring and evaluation reports • Adapt programmes based on results from monitoring and evaluation process • Annual needs assessments for each employee to establish career and skills development plans 	<ul style="list-style-type: none"> • Manual reporting • Monitoring and evaluation spreadsheet system • Business support on data processing 	<ul style="list-style-type: none"> • Offer SACE accredited short courses on initiative of the NPO in collaboration with academic institutions • Offer leadership training to school principals on invitation • Share knowledge with other NPOs on invitation • No knowledge sharing among sport bodies due to politics
Ethos	<ul style="list-style-type: none"> • Perceptions 				
Aims	<ul style="list-style-type: none"> • Learner competency tests • Learner reaction measurements • Scholastic performance of learners • Sport performance of learners • Teacher questionnaires • Principal questionnaires • Observations of learners and teachers • Project photos and video footage • Parent feedback 				

ADDENDUM F

BIOMATRIX ENTITY SYSTEMS PERSPECTIVE

Process	<ul style="list-style-type: none"> • Internal training and development assessments • Weekly management meetings • Quarterly trust board meetings 	<ul style="list-style-type: none"> • Lunch-and-learn sessions • Formal videos 			
Structure	<ul style="list-style-type: none"> • Weekly management meetings • Quarterly trust board meetings 	<ul style="list-style-type: none"> • E-learning • Social media 			
Resources	<ul style="list-style-type: none"> • Materials inventory and quality reports • Financial statements • Human resource management reports 	<ul style="list-style-type: none"> • Weekly management meetings 			
Governance	<ul style="list-style-type: none"> • Meetings between coordinators and facilitators • Reporting to and response from programme manager • Weekly management meetings • Quarterly trust board meetings 	<ul style="list-style-type: none"> • Quarterly trust board meetings 			

F.7 GOVERNANCE

Table F-11 Driving forces of the strategy of the non-profit organisation

Driving force		Chosen option
Actions	Synergy	<ul style="list-style-type: none"> • Improve human, natural, physical, financial and social capital integratively through all programmes • Experience tension, ambiguity and uncertainty to innovate and embed sustainability into aims and processes due to issues re. ethos and governance • Do not apply value-based management concepts
	Symbiosis	<ul style="list-style-type: none"> • Previously benefited trustees and employees at the cost of donors and beneficiaries • Currently beneficiaries, coaches, learning centre owners who are funded, teachers, DoEs, employees and trustees experience loss of value due to lack of funding
	Symmetry	<ul style="list-style-type: none"> • Develop ability to create value through established policies and procedures, training and development of employees, teachers, coaches and learning centre owners, monitoring and evaluation, and benefits to donors • Ensure long-term value through long-term impact of programmes and continuous research and development
Relationships	Durability	<ul style="list-style-type: none"> • Experience unfulfilled needs re. operations, coordination, management, strategy and governance • Capability to deal with core issues for viability hampered by trustees not driving aims of NPO, not rendering required support, not attending or arriving late at board meetings, lost interest in identifying donors, political orientation, value clash among trustees and NPO, governance challenges • Real-time information on interests of trustees may not be available at quarterly board meetings, information needs of accountants depend on stakeholders' adherence to policies and procedures, and it is not clear if real-time information is available to administrators and marketers • Environmental effectiveness challenged by issues re. communication and cooperation, power delegation from government, and power delegation from business • Conflicting interests are not properly dealt with re. trustee's instructions on employee appointments, operational involvement and receipt of donations • Management support systems include custom-developed real-time reporting system, but facilitators struggled to use it and currently it is done manually, and also monitoring and evaluation online system, but self-defined needs of NPO ignored, spreadsheet system implemented instead, and sometimes donors require additional measurements • Link between local and global governance challenged by issues re. power delegation from government • Sustainable governance challenged by natural, human, financial, social and physical conditions in contextual environment
	Balance	<ul style="list-style-type: none"> • Improve human, natural, physical, financial and social capital integratively through all programmes • Knowledge management includes internal training and development programme
	Stakeholder value	<ul style="list-style-type: none"> • Improve human, natural, physical, financial and social capital integratively through all programmes • Environmental effectiveness challenged by issues re. communication and cooperation, power delegation from government, and power delegation from business

ADDENDUM G VIABLE SYSTEM MODELLING

Table G-1 Defining system in focus

Organisational identity	<p>Purpose statement is to ignite confidence and talent through learning and development</p>
	<p>Stakeholders with the highest influence in the transactional environment:</p> <ul style="list-style-type: none"> • Business, donors • Community leaders • Education district & circuit offices • Employees • Founder • General manager • Learning centre owners • Life coach • Network operators • Preschool children • Primary school learners • School principals & governing bodies • Sport coaches • Teachers • Teacher unions • Technical support • Trustees
	<p>Boundaries determined by tapping</p> <ul style="list-style-type: none"> • Business varies from implementation partner, customer, donor, advisor, political player, to competitor • Community leaders support programmes • Education district & circuit offices approve, accredit and recommend programmes • Employees are most significant resource to differentiate products and services in competitive environment • Founder founded trust and chairs board of trustees • General manager attributed with continued operation of NPO • Learning centre owners and teachers utilise products and services of NPO • Preschool children and primary school learners are beneficiaries • School principals & governing bodies approve implementation of programme

	<ul style="list-style-type: none"> • Sport coaches deliver products and services of NPO • Not all trustees drive aims of NPO, render required support in strategic planning, value clash among some trustees and NPO, experience governance challenges
Recursive organisation	Operational units directly responsible for implementing core products/services <ul style="list-style-type: none"> • Facilitators • Coaches
	Larger system <ul style="list-style-type: none"> • Education & research NPO sector • National NPO sector • International NPO sector

Table G-2 Identifying subsystems in the non-profit organisation

Subsystem	Positions
Operational units (A)	<ul style="list-style-type: none"> • Facilitators • Coaches
Units maintaining stability among operational units (B) by <ul style="list-style-type: none"> • Providing shared values, language, standards and protocols for • Information, communication and processes to follow 	<ul style="list-style-type: none"> • General manager • Administrator • Accountant
Units optimising effectiveness and efficiency of operational units (C) by <ul style="list-style-type: none"> • Supporting them to do the right thing even under difficult circumstances • Identifying synergies among them to improve organisational performance 	<ul style="list-style-type: none"> • Product manager • Programme manager • Data manager
Units monitoring performance of operational units (C)*	<ul style="list-style-type: none"> • Product manager • Programme manager
Units making sense of environmental changes (threats and opportunities) to shape strategy and long-term orientation (D)	General manager
Units creating organisational identity and policies providing consistent framework for operational units (E)	General manager

Table G-3 Identifying interactions in the non-profit organisation

Interaction	Events
Opportunities between (A) and (C) to <ul style="list-style-type: none"> • Agree on expected results • Match resources to expectations 	<ul style="list-style-type: none"> • Daily operational feedback to coordinator • Weekly management meeting
Opportunities between (A), (B) and (C) to <ul style="list-style-type: none"> • Manage operational complexity • Enable effective decision making 	<ul style="list-style-type: none"> • Daily operational feedback to coordinator • Weekly management meeting
Opportunities between (C) and (D) to <ul style="list-style-type: none"> • Combine internal and external perspectives on feasible and desirable future developments • Support organisational strategy development 	<ul style="list-style-type: none"> • Weekly management meeting
Opportunities between (C), (D) and (E) to <ul style="list-style-type: none"> • Balance present and future orientations • Balance internal and external perspectives • Maintain interactions with transactional environment 	<ul style="list-style-type: none"> • Weekly management meeting • Quarterly trust meeting
Opportunities (all units) to <ul style="list-style-type: none"> • Ensure all units operate with appropriate autonomy to do the right thing 	<ul style="list-style-type: none"> • Internal training programme
Opportunities (all units) to <ul style="list-style-type: none"> • Raise awareness of threats and opportunities • Trigger interventions outside normal regulatory channels 	<ul style="list-style-type: none"> • Weekly management meeting • Daily operational feedback to coordinator • Quarterly trust meeting

In the evaluation of subsystems and interactions of the NPO, co-evolution with the environment refers to leadership issues while autonomy and cohesion refers to management issues (208). Furthermore, environmental effectiveness is evaluated according to Newig et al (452). Self-regulation involves the translation of organisational strategy into human, natural, physical, financial and social capital through sensemaking and sensegiving (405). Global governance is defined as rules of international governmental institutions and NPOs for the exercise of power and resolution of conflict as applied in the sustainability evaluation of the NPO (120, 131).

Table G-4 Evaluating subsystems and interactions of the non-profit organisation

		Questions addressed
Co-evolution with environment	Unfulfilled needs	<ul style="list-style-type: none"> • Operational needs: funding • Coordination needs: funding to increase capacity, information from coaches, facilitators, coordinators and trustees • Management needs: funding to increase capacity, competent coaches, facilitators and coordinators, qualitative and quantitative measurements • Strategy needs: effective implementation, address possible mission drift, address perceptions about sport, control organisational growth, succession planning • Governance needs: good governance, trustees must be committed to the aims of NPO, be available, be well connected, collaborate, assist in identifying donors, and must have assigned roles including mentoring, legal portfolio, customised monitoring and evaluation, equitable remuneration system
	Capabilities	<ul style="list-style-type: none"> • Not all trustees drive aims of NPO, render required support, attend or arrive punctual at board meetings, interested in identifying donors, some are politically orientated, value clash among some trustees and NPO, experience governance challenges • General manager reformulates aims of NPO as required, drives policies and procedures, maps processes, afraid of driving away potential donors in desperation to obtain donations • Programme manager contributes to and implement organisational structure, business plan, policies and procedures, ensures that coordinators and facilitators follow correct procedures • Coordinators implement organisational structure, business plan, policies and procedures, ensure that facilitators follow correct procedures • Product manager trains coordinators, facilitators and coaches including policies and procedures but actually also trains teachers • Facilitators schedule formal training, school visits and facilitation sessions, offer guidance and consultation to teachers, conduct monitoring and evaluation. Trainers supposedly conduct formal training for teachers, but actually facilitators do. • Coaches implement sport programme, conduct monitoring and evaluation • Accountants, administrators and marketers implement policies and procedures, properly prepare for a project after planning and before implementation • Teachers and learning centre owners utilise products and services, trained on aims of NPO
	Measurements	<ul style="list-style-type: none"> • Facilitators measure training and facilitation attendance, names of schools, dates, grades, postponements with reasons, challenges and solutions, highlights, learner competency (grade specific mathematical problems, life skills, sport), learner cognitive development (mathematics, language and life skills), learner attitude towards programme, principal feedback (average mathematics percentages per term per grade, programme benefits, impact on learner behaviour and life skills,

		Questions addressed
		<p>teacher benefits), teacher feedback (support from the programme and development of learners socially, emotionally, physically and academically and in terms of communication, teamwork, time management, mathematics and interest in sport), parent feedback, and impact (learners, teachers, school communities and broader community)</p> <ul style="list-style-type: none"> • Coaches measure names of schools, dates, grades, postponements with reasons, challenges and solutions, highlights, teacher feedback, success stories, learner progress regarding sport performance
	Information needs	<ul style="list-style-type: none"> • Trustees require information on good governance, trust deed and amendments, interests of trustees competing with interests of trust, meeting schedule, administrative office, employee matters including remuneration and contracts, legal matters, financials including donations and revenue, marketing, current and potential projects, cooperations with other NPOs, business and academic institutions, supplier development, relations with DBE, and programmes. Real-time information is mostly available at quarterly board meetings. • General manager requires information on good governance, trust deed and amendments, trust meeting schedule, administrative office, employee matters including remuneration and contracts, legal matters, financials including donations and revenue, marketing, current and potential projects, cooperations with other NPOs, business and academic institutions, supplier development, relations with DBE, and programmes. Real-time information is available at weekly management meetings and through reports. • Programme manager requires information on policies and procedures and activities of coordinators and facilitators to support correct procedures and ensure quality. Real-time information is available through daily, weekly and monthly electronic reports, photos and video footage. • Coordinators require information on policies and procedures and activities of facilitators in specific area to support correct procedures and ensure quality. Real-time information is available through daily, weekly and monthly electronic reports, photos and video footage. • Product manager requires information on policies and procedures, detail information on programmes, and competency of coordinators, facilitators and coaches and actually also teachers. Real-time information on programmes is available as co-developer, and on competencies through assessment. • Facilitators require information on policies and procedures, programmes, programme material, project progress and needs, and official NPO calendar. Real-time information on policies and procedures, programmes and programme material are available through training. Real-time information on official NPO calendar is provided by programme manager. Real-time information on project progress and needs is available through monitoring and evaluation process. Real-time information on trainer schedules also is supposed to be provided by programme manager, but actually facilitators conduct training themselves. • Coaches require information on policies and procedures, sport programme, sport equipment, project progress and needs, and schedules. Real-time information on policies and procedures, sport programme and sport equipment are available through

		Questions addressed
		<p>training. Real-time information on schedules is provided through facilitators. Real-time information on project progress and needs is available through monitoring and evaluation process.</p> <ul style="list-style-type: none"> • Accountants require information on policies and procedures and all financial matters including sales, donations, programme costs, training, travel & accommodation, marketing, inventory, renting, insurance, maintenance, commissions, remunerations, accounts, investments, etc. Real-time information is mostly available if all stakeholders adhere to policies and procedures. • Administrators require information on policies and procedures and administrative needs of all stakeholders. It is not clear if real-time information is available. • Marketers require information on policies and procedures and marketing needs of NPO. It is not clear if real-time information is available. • Teachers and learning centre owners require information on programmes, programme material, progress, and schedules. Real-time information on programmes and programme material is available through training. Real-time information on schedules is provided through facilitators. Real-time information on progress is available through monitoring and evaluation process.
	Feedback	<ul style="list-style-type: none"> • Planning is supported by feedback in that the aims of the NPO are reformulated as programmes develop, facilitators and coaches reschedule sessions if needed and adjust plans if challenges occur. After planning, the NPO emphasises preparation before implementation. • Decision-making is supported by feedback in that the programme manager and coordinators receive daily, weekly and monthly facilitator and coach reports and respond as required, management and academic institution analyse facilitator and coach reports to adapt programmes if required • Interpretation and implementation of policies, resource allocation, and maintenance of stability is supported by feedback through monitoring and evaluation process regarding project progress and needs • Monitoring and evaluation entails feedback from coaches, facilitators, learners, teachers, principals, parents and the community
	Responses to change	<ul style="list-style-type: none"> • Aims and policies of the NPO are reviewed on an annual basis • Currently the NPO is in financial trouble and is innovating to meet established goals in set timeframes • Programmes are adapted if required which occurred in the past on average every three years • Programme manager and coordinators respond to facilitator and coach reports to ensure quality of programmes on a daily, weekly and monthly basis • Facilitators and coaches reschedule sessions if needed and adjust plans if challenges occur in real time
	Environmental effectiveness	<ul style="list-style-type: none"> • Breadth of involvement: stakeholders with the highest influence in the transactional environment include business, donors, community leaders, education district & circuit offices, employees, founder, general manager, learning centre owners, life

		Questions addressed
		<p>coach, network operators, preschool children, primary school learners, school governing bodies, school principals, sport coaches, teachers, teacher unions, technical support, and trustees</p> <ul style="list-style-type: none"> • Communication and cooperation: the NPO maintains a website, is active on social media and appears regularly in other media but impacted by lack of funding, regularly meets with, sends email to and telephones potential donors and partners, and requests feedback from stakeholders, the NPO attempts to cooperate with other NPOs, academic institutions, government, sport federations and business but not always successful and sometimes cause conflict, communication and cooperation strained by COVID-19 pandemic, no legal barriers against cooperation, DSD issued code of good practice, increasing number of NPOs provide quality training and support at a fee, government however does not coordinate training and support to NPO sector, fragmented sector with little cooperation and coalition building, NPOs do not take cognisance of code of good practice and do little to adopt and promote self-regulation mechanisms • Power delegation from government: general manager strengthened by legal and regulatory environment, education district & circuit offices approve, accredit and recommend programmes, legal advice however is necessary but very expensive, the NPO has no access to government decision-making processes, perceived corruption by government impedes fundraising, challenging to compete against other organisations better connected with government or against government themselves • Power delegation from business: the NPO relies on voluntary contributions, almost 30 donors have supported and endorsed programmes for almost 15 years, business expects care, professionalism, skill and compliance with standards, laws and regulations, business however wants to arrange donations with a black representative, does not want to work through fundraisers, does not want to cover overheads or contribute to reserve funds, some donors are in arrears with payments, some projects expanded without additional funds, some projects ended in contract break, business insources social investment, business involved in long-term partnerships with other NPOs, priorities shift according to current social trends
	Identity	<ul style="list-style-type: none"> • The organisational structure, business plan, policies, procedures and values are developed at weekly management meetings over many years and then established and implemented through work sessions with all employees
Autonomy and cohesion	Self-regulation	<ul style="list-style-type: none"> • Facilitators and coaches plan, make decisions, interpret and implement policies, allocate resources, and maintain stability by conducting training, rescheduling sessions if needed and adjusting plans if challenges occur which are supported through training on policies and procedures, programmes and programme material, programme manager providing official NPO calendar, and the monitoring and evaluation process providing feedback from learners, teachers, principals, parents and the community. Supposedly programme manager also provides trainer schedules but actually facilitators conduct training.
	Autonomy	<ul style="list-style-type: none"> • Facilitators schedule formal training, school visits and facilitation sessions, offer guidance and consultation to teachers, conduct monitoring and evaluation, ensure beforehand that they have all the necessary documentation including facilitator files, expected to be punctual, and take responsibility for accommodation and travel arrangements with guidance from programme manager. Supposedly trainers conduct formal training for teachers but actually facilitators do.

		Questions addressed
		<ul style="list-style-type: none"> Coaches implement sport programme, ensure beforehand that they have all the necessary documentation and material, expected to be punctual, conduct monitoring and evaluation, and take responsibility for accommodation and travel arrangements with guidance from programme manager
	Conflict resolution	<ul style="list-style-type: none"> Trustees must declare interests competing with interests of trust at every quarterly board meeting. However, trustees instruct the appointment of employees not based on competency, become operationally involved and receive donations All employees must sign an integrity declaration according to which they must declare any additional employment elsewhere Coordinators resolve conflict among facilitators and coaches in their area
	Synergy	<ul style="list-style-type: none"> Aims are shared through the in-class programme and blended learning schools Activities are shared to achieve different aims by using sport as an educational tool to address the personal development of people, addressing different aims of business, and addressing different aims of the DBE Resources and structures are shared through the in-class programme, coaches are trained to support or establish and run sport clubs and coach sport as an extracurricular activity, the official NPO calendar, the role of tutor was changed to that of facilitator, management positions were restructured, reporting to various stakeholders, sport equipment is used as an educational aid to enhance learning and also for sport as such, cooperation with other NPOs and business, cooperation with academic institutions, at learning centres, and at schools
	Management support systems	<ul style="list-style-type: none"> Custom-developed real-time reporting system, but facilitators struggled to use it and reverted back to manual process Monitoring and evaluation online system developed by business to implement monitoring and evaluation process ignored self-defined needs of NPO and eventually did not realise, NPO utilises spreadsheet system, sometimes donors require additional measurements
	Feedback	<ul style="list-style-type: none"> Trustees receive feedback on administrative office, employee matters including remuneration and contracts, legal matters, financials including donations and revenue, marketing, current and potential projects, cooperations with other NPOs, business and academic institutions, supplier development, relations with DBE, and programmes. Receive feedback at quarterly board meetings. General manager receives feedback on administrative office, employee matters including remuneration and contracts, legal matters, financials including donations and revenue, marketing, current projects, supplier development, and programmes. Receive feedback at weekly management meetings and through reports. Programme manager receives feedback on activities of coordinators and facilitators through daily, weekly and monthly electronic reports, photos and video footage Coordinators receive feedback on activities of facilitators in specific area through daily, weekly and monthly electronic reports, photos and video footage

		Questions addressed
		<ul style="list-style-type: none"> • Product manager receives feedback on competency of coordinators, facilitators and coaches and actually also teachers through assessments • Facilitators receive feedback on project progress and needs through the monitoring and evaluation process. Supposedly facilitators also receive feedback on trainer schedules, but actually facilitators conduct training themselves. • Coaches receive feedback on project progress and needs, and schedules through the monitoring and evaluation process and through facilitators • Accountants give feedback on all financial matters including sales, donations, programme costs, training, travel & accommodation, marketing, inventory, renting, insurance, maintenance, commissions, remunerations, accounts, investments, etc. at weekly management meetings and reports • Administrators give feedback on administrative assistance to all stakeholders at weekly management meetings and reports • Marketers give feedback on all marketing activities of the NPO at weekly management meetings and reports • Teachers, principals, learners, learning centre owners and the community give feedback on project progress and needs through the monitoring and evaluation process
Recursive governance	Global governance	<ul style="list-style-type: none"> • Through adherence to and promotion of national legislation and regulations: NPO registration with DSD, trust registration with Department of Justice and Constitutional Development, approved as PBO by SARS, promotion of priorities and policies of DBE • Power delegation from government: general manager strengthened by legal and regulatory environment, education district & circuit offices approve, accredit and recommend programmes, the NPO however has no access to government decision-making processes, perceived corruption by government impedes fundraising, challenging to compete against other organisations better connected with government or against government themselves
	Sustainability	<ul style="list-style-type: none"> • Contextual environment of the NPO (Addendum F)

ADDENDUM H SYSTEM DYNAMICS

H.1 ORGANISATIONAL CAPACITY

Organisational capacity depends on stakeholder relations and organisational aims, processes, structures, human resources and technology (18). With reference to a BES perspective of the NPO, the above are supplemented and articulated with contextual sustainability, stakeholder influence and satisfaction, organisational ethos, material, natural, financial and knowledge resources, and governance (208). According to the definition of sustainability in this study, physical, financial, human, social and natural capital are required to satisfy the self-defined needs of the NPO and to build resilience over the long term. These capitals are included in the conceptual model of the organisational capacity of the NPO as part of the contextual environment of the NPO and also as part of their resources (120, 121). Human capital is expanded upon in the model of human resources, financial capital in the model of financial viability, social capital in the model of stakeholder relations, and the application of all capital of the NPO in the model of product and service provision.

The status quo of the NPO is maintained through anti-clockwise reinforcing feedback loops, which may be prompted at any point along the loops, as supported by Singh (186). Available quality resources are utilised to support the organisational structure, which entrenches existing processes, leading to the attainment of current aims and confirmation of the present ethos of the NPO. Good governance then is maintained through appropriate resources, structure, processes, aims and ethos as explored through VSM. Through governance, the NPO interacts with their transactional environment which entails stakeholder influence and satisfaction as set out in a BES perspective. Positive stakeholder influence and satisfaction then contribute to quality resources. The NPO also addresses confronting issues and improves self-regulation and sustainability through governance (181, 208, 366, 393). Taking a process perspective instead of an entity perspective, sensemaking and sensegiving is not regulated by an entity such as the trustees, but by continuous processes to maintain the status quo and also to effect change including in their transactional environment (208, 351, 512, 564). However, the NPO has less direct impact on and must adapt more to their contextual environment (208, 210).

The above reinforcing feedback loops are affected by delayed impacts (105, 162, 163, 565). An example of gradual stakeholder influence and delayed feedback on stakeholder satisfaction is the feedback received from schools in the seventh year of the trust's existence that the programme was not well aligned with CAPS. An example of gradual stakeholder influence and delayed feedback on positive stakeholder influence is when substitute funding is not obtained before donor contracts expire and projects have to be terminated.

Clockwise balancing feedback loops also operate. Organisational governance involves strategic performance management which includes decision-making, planning, regulation, responsiveness, performance evaluation, organisational learning, and effectiveness improvement (208, 369, 541). Examples include the growth strategy of the NPO, their strategy for research and development, their strategy for quality improvement, and support of self-regulation for employees to differentiate products and services in a competitive environment. Singh (186) identifies a fixed archetype that fails when pressure to improve the quality of product and service provision leads to increased workload and consequently quality deterioration. Such a vicious cycle occurs when an intervention deals with the symptoms of a problem and not the root causes thereof (187). This may happen when performance management through the clockwise balancing feedback loops does not align all fields with one another starting with the environment, or is not cascaded throughout the organisation to ensure that all fields at all levels are coherent with one other (208). The intervention therefore does not deal with reactions in the opposite direction which attempt to maintain the status quo, so that turbulence may prevent a desired transformation (203, 208). Defensive reactions and conflict between the status quo and performance management then promote anxiety and uncertainty rather than working through tensions by applying paradoxical thinking between analyses and syntheses, and acceptance and resolution (152).

H.2 HUMAN RESOURCES

Based on the key focus areas identified through the content analysis of literature (Chapter 2), axial coding is applied (Figure H 1), indicating only the most relevant links for eligibility. A systems diagram is then developed by expanding the systems diagram of organisational capacity. Recruitment is included in acquisition, development, maintenance and discharge of resources. Change management is addressed through clockwise balancing feedback loops as described in §H.1.

With reference to the model developed by Singh (186), the attractiveness of the NPO and retention are not only influenced by remuneration and recursively by human resources themselves, but also by recognition and resource allocation including material, broader financial resources, knowledge and technology as indicated in Figure H-2 (379, 423, 465, 540, 545, 566-569). Knowledge resources are allocated through training as indicated in a BES perspective (570). However, an increase in organisational attractiveness does not always lead to increased organisational commitment due to incompetency despite training, lack in integrity and conflict of interest which entail the ethos of employees. Another adjustment to the model developed by Singh (186) entails that employee commitment and qualified employees not only contribute to quality products and services, but also to strategic performance management through organisational learning, marketing through various media and reporting on impact to stakeholders, and fundraising. It should be noted that there is a delay between marketing and reporting, and achieving the aims of the NPO.

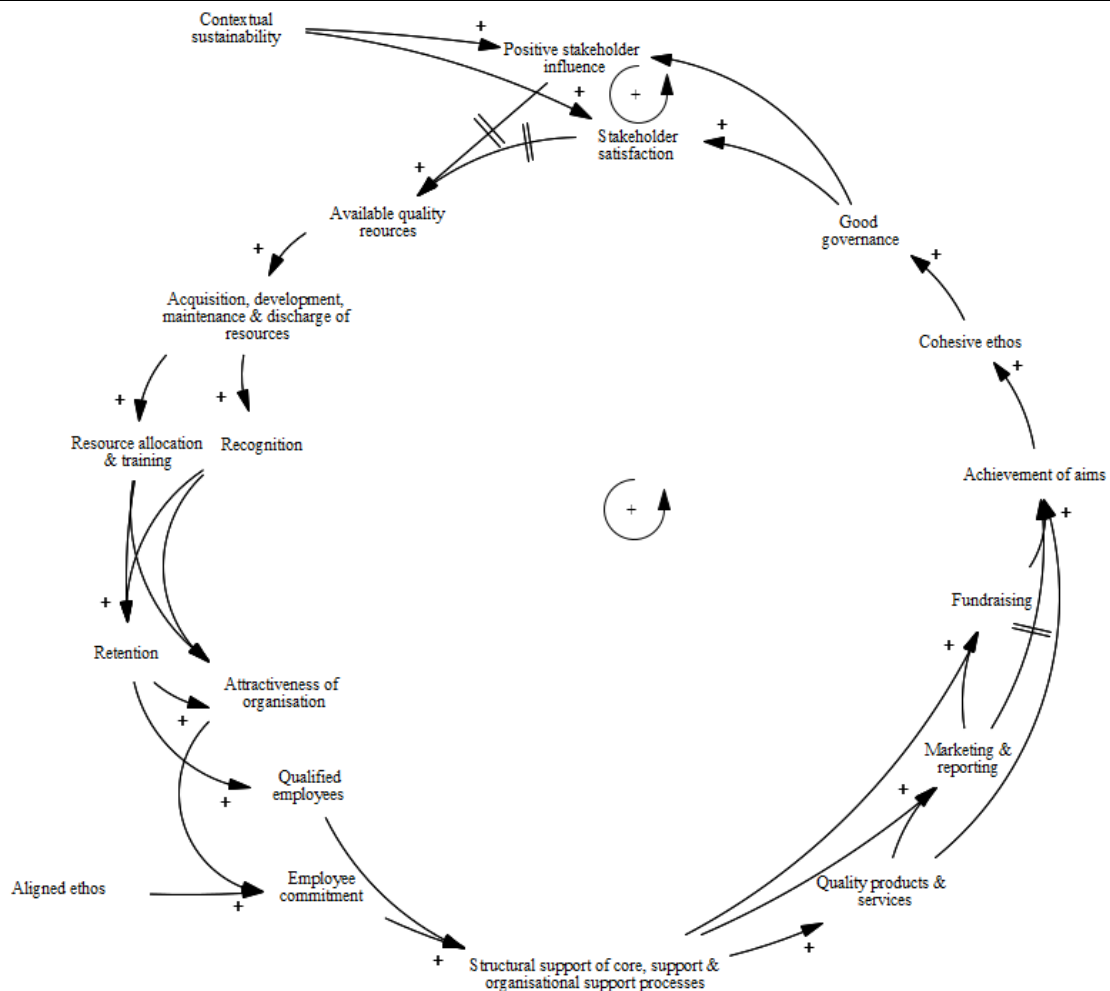


Figure H-2 Conceptual system dynamics model of human resources in the NPO

H.3 FINANCIAL VIABILITY

The sustainability of the NPO furthermore is measured in terms of financial viability which depends on the availability of and access to multiple local and foreign sources of private and public funding and other resources, capacity of the NPO to raise funds, revenue generated by the NPO, and capability of the NPO to manage financial resources and operations (18, 396). Furthermore, the financial viability of the NPO is determined by the freedom of association in terms of access to resources, legal opportunities to mobilise financial resources, and tax policies, which all are determined by legislation and regulations as part of the contextual environment of the NPO (18, 457). Based on the key focus areas identified through the content analysis of literature, axial coding is shown in Figure H 3 again indicating only the most relevant links for eligibility.

A systems diagram is developed in Figure H-4 by expanding the systems diagram of organisational capacity. With reference to axial coding, financial management and a funding model are included in good governance where a funding model entails, for example, who the customers should be, improvement and innovation, a donor constituency, funding levels and funding timing, whether donors contribute in anticipation of results or thereafter, project financing, and fundraising

activities (39, 543, 572-574). Fundraising expenditure is included in acquisition, development, maintenance and discharge of resources.

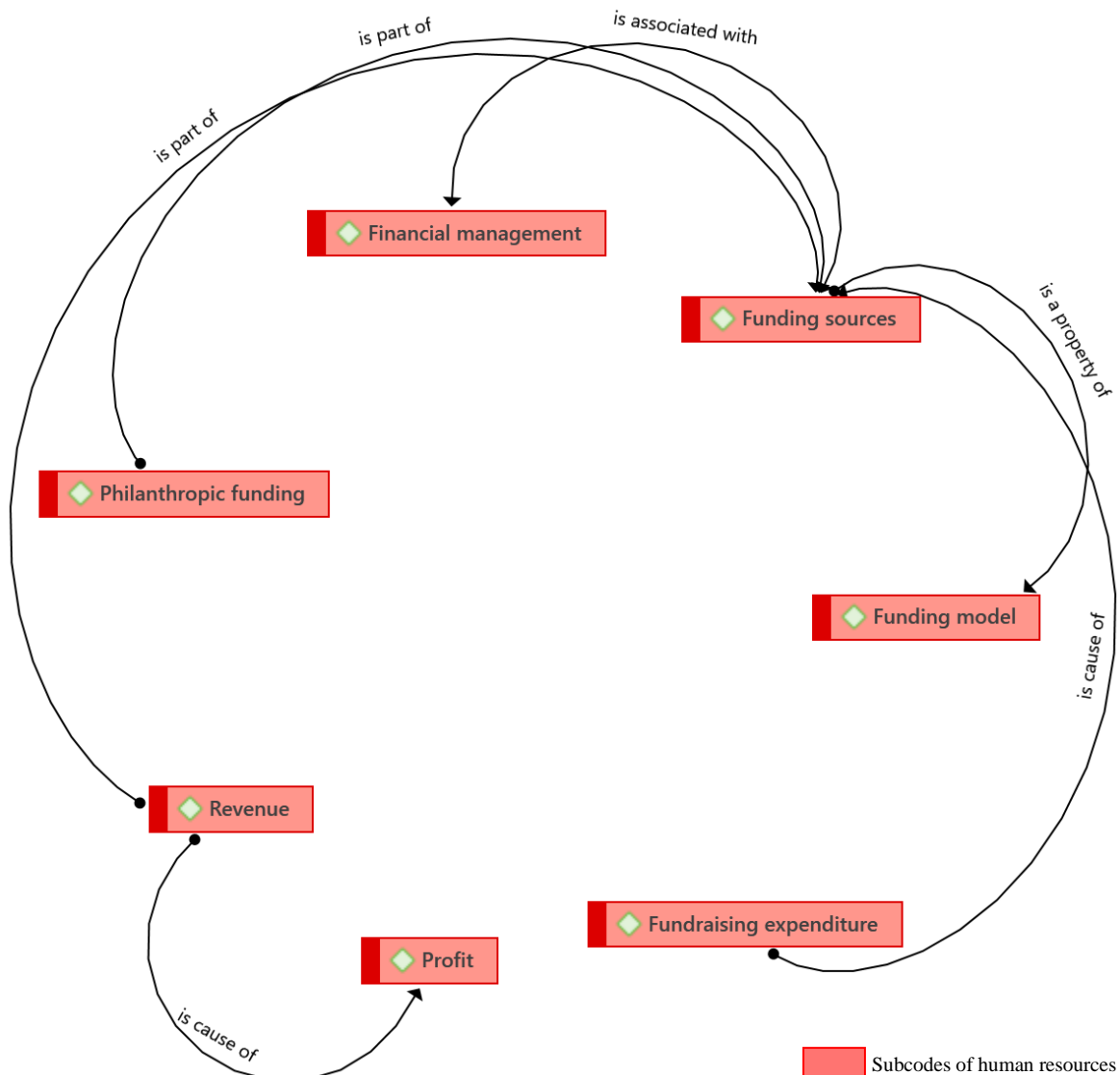


Figure H-3 Axial coding applied to summative content analysis of financial viability

Similar to the model developed by Singh (186), a balancing feedback loop is identified for philanthropic funding (donations) which acts as a limits to growth archetype (186, 187). Since 1994 foreign funding to South Africa decreased significantly due to the country's middle-income status (434). Increasing contextual sustainability leads to the strengthening of this middle-income status and to an increase in the number of NPOs, which increases the competition for donations among NPOs, which negatively impacts stakeholder influence and satisfaction. This balancing feedback loop is regulated by the number of available funding sources which also increases as the contextual sustainability increases. However, Singh (186) refers to the prosperity of the NPO while in this study reference is made to the prosperity of the country. Although the NPO intends to contribute to the prosperity of the country over the long-term, their contribution does not significantly influence

the country's middle-income status. Singh (186) also refers to the competition for donations among NPOs which negatively impacts stakeholder influence and satisfaction. This prompts strategic performance management which eventually enhances stakeholder influence and satisfaction and thereby increases the number of available funding sources.

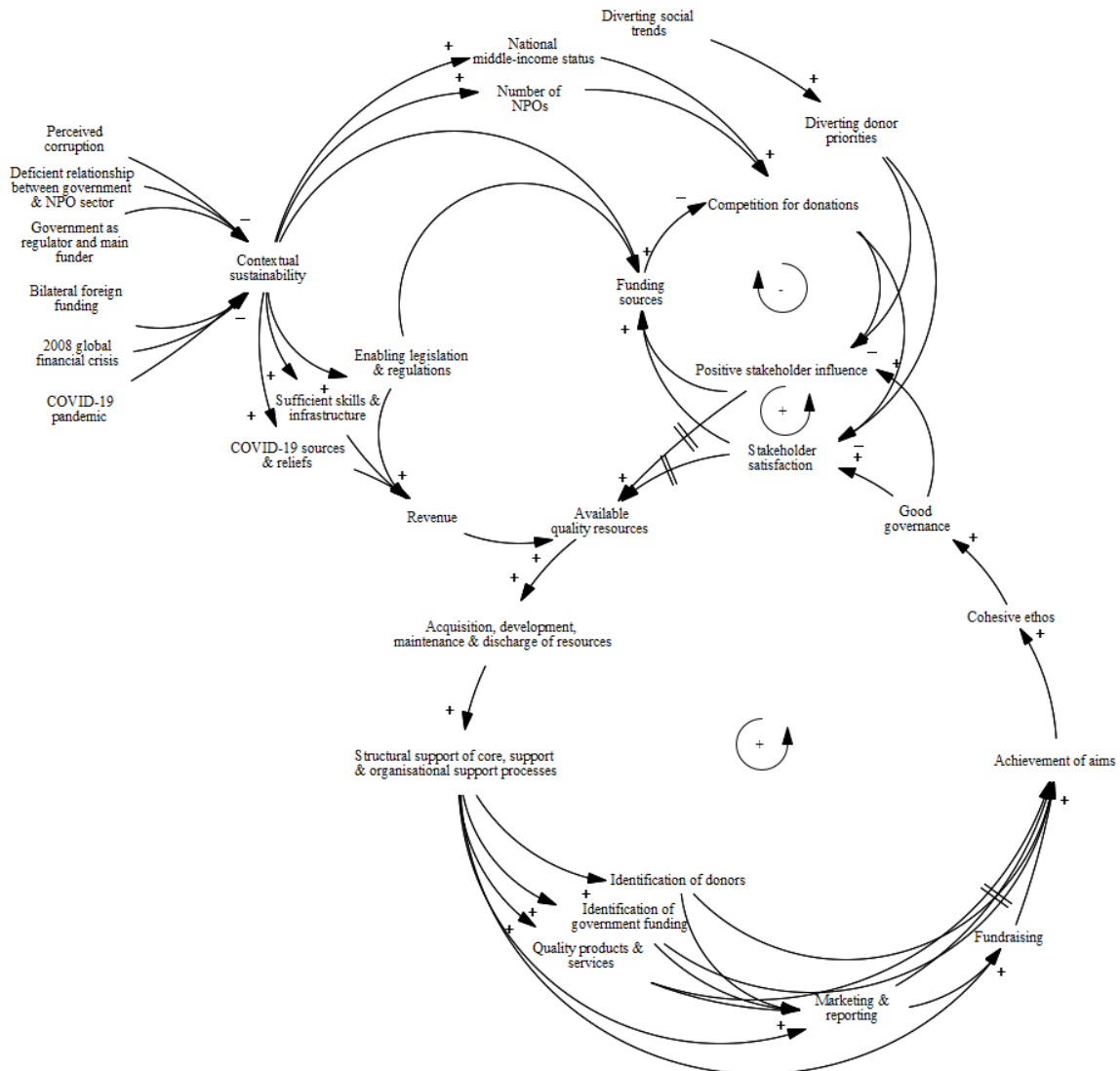


Figure H-4 Conceptual system dynamics model of financial viability of the NPO

The model developed by Singh (186) includes profit (revenue) in balancing feedback loops acting as a shifting the burden archetype (186, 187). However, a hybrid conceptualisation of an NPO does not focus on survival from a financial point of view but on addressing environmental pressures while responding to the needs of society (19). Competition for revenue then is not determined by the income status of the country, the number of NPOs or funding sources, but by the market in which the NPO operates – in this study it entails education.

Donations and revenue are supported by contextual sustainability through enabling legislation and regulations (392), skills and infrastructure in all areas in the country, and relief during crises such

as COVID-19 (17). However, the contextual environment also has a significant impeding influence on the financial viability of the NPO. A shift to bilateral funding arrangements diverted most foreign donations through government for delivery on their mandate. Concerns are raised regarding the role of government as regulator and main funder of the NPO sector (130). Government is the second largest funder of NPOs in the education and research sector after local non-government funding such as South African foundations and trusts, other NPOs, private donations and corporate donations (550). Yet they also experience corruption in the allocation of government funding which defers foreign donations and strains relationships between NPOs and government (130).

Furthermore, since the global financial crisis of 2008 many foreign donors drastically cut their financial contributions to South Africa (434) while the national gross domestic product per capita levelled off (575). Attempts to raise donations or revenue are even further hampered by the COVID-19 pandemic. Social trends diverting from the mission of the NPO also cause donors to redirect their priorities which also negatively impacts donations.

Closing the ant-clockwise reinforcing feedback loop, all other fields impact the financial viability of the NPO. For example, due to a lack of COVID-19 relief, the NPO does not have sufficient time, staff and funding to market their products and services which they already have developed and subsequently generate revenue to achieve their aims and support their espoused values of education integrity, human capacity building, accountability, relationship building, and a sense of identity and self-esteem. However, the trust registered the programme as an NPO not only to improve credibility but also to receive tax incentives and increase funding opportunities. Due to the misalignment of the ethos of trustees, employees, donors, government and cooperating NPOs, the NPO experiences cultural entropy. This hampers relationship building through transparency and accountability as part of good governance.

H.4 STAKEHOLDER RELATIONS

Based on the key focus areas identified through the content analysis of literature, axial coding again indicates only the most relevant links for eligibility (Figure H 5). A systems diagram is developed by expanding the systems diagram of organisational capacity. External stakeholders with the highest influence in the transactional environment of the NPO are identified in a BES perspective as business and donors, education district and circuit offices, teacher unions, community leaders, schools including principals, governing bodies and teachers, implementation partners including coaches, learning centre owners, network operators and technical support, and main beneficiaries including preschool children and primary school learners. Partnerships also include other NPOs, business, academic institutions and sport bodies.

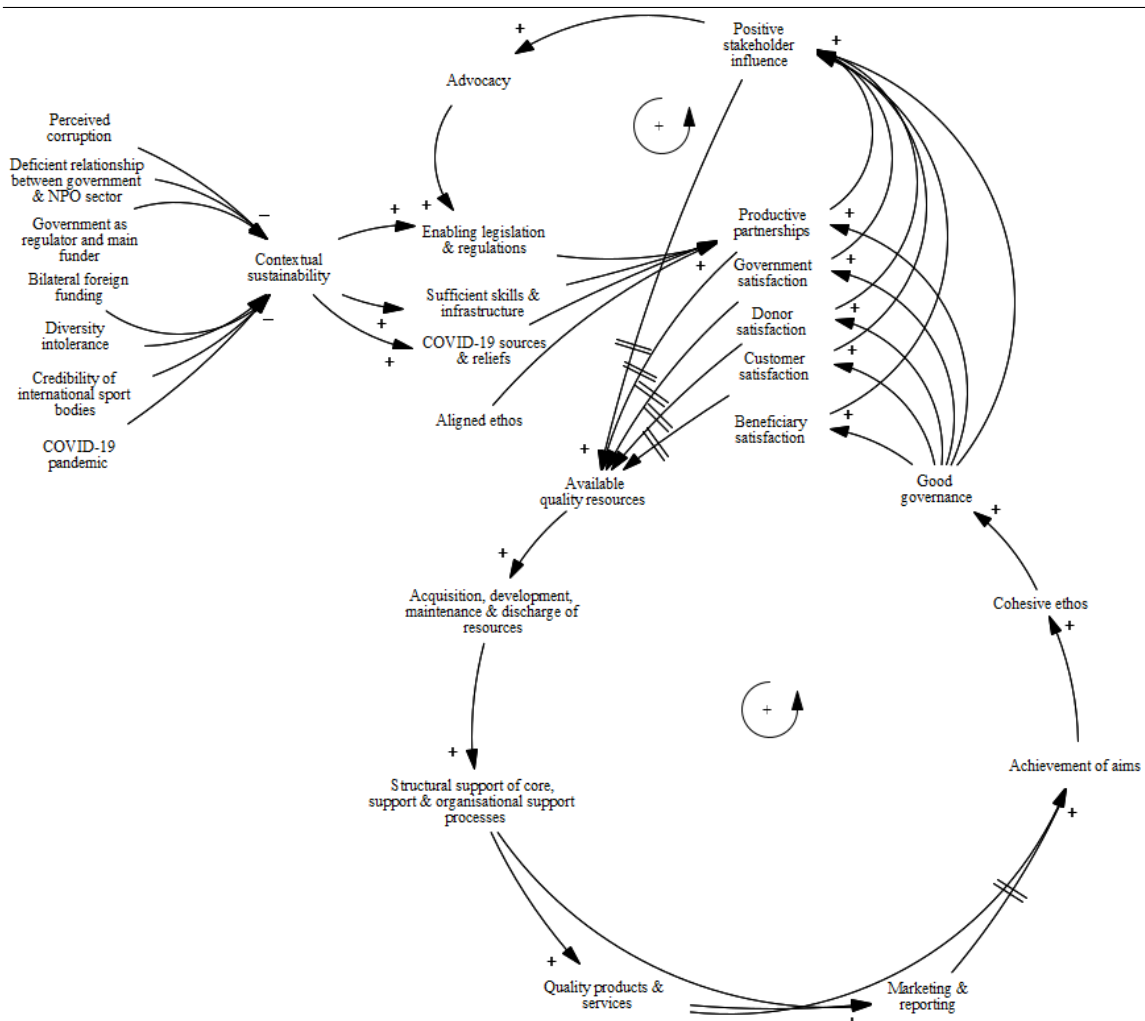


Figure H-6 Conceptual system dynamics model of stakeholder relations of the NPO

Productive partnerships are supported by contextual sustainability through enabling legislation and regulations (392), skills and infrastructure, and relief during crises such as COVID-19 (17). As indicated by Singh (186), a reinforcing feedback loop that acts as a success to the successful archetype occurs when more enabling legislation and regulations strengthen productive partnerships, which strengthens positive stakeholder influence, which strengthens advocacy, which in turn strengthens enabling legislation and regulations (187). Simultaneously, the ethos of the NPO emphasises service-providing activities rather than advocacy through the organisational capacity anticlockwise reinforcing feedback loop explained before (551). Therefore the success to the successful archetype loop benefits other NPOs, business and government departments who already have strong stakeholder influence while the influence of the NPO is further eroded. Advocacy support for the NPO should be available through local institutions, organisations or programmes as part of sectoral infrastructure (18, 452, 453), but the sectoral infrastructure in South Africa and the rest of sub-Saharan Africa is underdeveloped in general as mentioned in the sustainability evaluation of the NPO.

Singh (186) also identifies a limits to growth archetype when NPOs attempt to remain apolitical, but she admits that NPOs always are embedded in a political environment (187). Instead, partnerships impair the NPO's reputation, credibility and funding if the political orientations and therefore the ethos of partners are not aligned.

The NPO also cooperates with government, donors and customers mainly to raise funds to once again form anticlockwise reinforcing feedback loops. Furthermore, they support beneficiaries through their products and services, but an anticlockwise reinforcing feedback loop does not form because beneficiaries do not contribute directly to NPO resources (45). Relations with government, donors, customers and beneficiaries also are supported by contextual sustainability through enabling legislation and regulations, skills and infrastructure, and relief during crises such as COVID-19. Therefore, reinforcing feedback loops that act as a success to the successful archetype operate for each of these relations too. Again the misalignment of the ethos of government, donors, customers and beneficiaries with that of the NPO causes cultural entropy which impedes stakeholder relations.

H.5 PRODUCT AND SERVICE PROVISION

Another measurement of the sustainability of the NPO is product and service provision which depends on the extent to which products and services address local needs and are utilised by stakeholders, government appreciation for the NPO's product and service provision, the variety of products and services offered by the NPO, and the capacity of the NPO to generate revenue through their products and services (18, 396). Based on the key focus areas identified through the content analysis of literature, axial coding indicates only the most relevant links for eligibility (Figure H 7). A systems diagram is developed by expanding the systems diagram of organisational capacity. All processes, including product and service design, products and service variety, product and service improvement, marketing and reporting, supply chain management, and products and service distribution contribute to the achievement of organisational aims.

The extent to which products and services address local needs and are utilised by stakeholders are improved through strategic performance management (96, 97, 148, 208, 369, 541). This involves the establishment of awareness and values of sustainability in the NPO, goal setting, need analysis, product and service development, technology development and deployment, monitoring and evaluation, and organisational learning. The quality of product and service provision therefore is maintained through governance as indicated in Figure H-8 (162, 179, 388). For example, a higher-level SD model indicates that a decrease in family poverty has the greatest impact on the school readiness of children while more high quality teachers and the formally enrolment in higher quality early childhood development programmes also have a significant impact rather than more resources for early childhood development centres (576). Improved home circumstances, more high-quality

teachers, and improved classroom experiences furthermore have a significant impact on the literacy and numeracy achievement of primary school learners. Receiving this input through their monitoring and evaluation, environmental scanning and stakeholder needs analysis as part of their governance, the NPO dedicates their resources to programmes for preschool children and primary school learners which include an in-class programme involving teacher training and support, sport as an extracurricular activity involving coach training and support, learning centres involving tutoring classes, sport, occupational therapy, social worker services, a school kitchen and vegetable garden, and training and support of staff, holiday programmes equipping children with essential life skills, remedial teaching, sport and community support, and adult training and recreational projects equipping people with life skills including accredited teacher training.

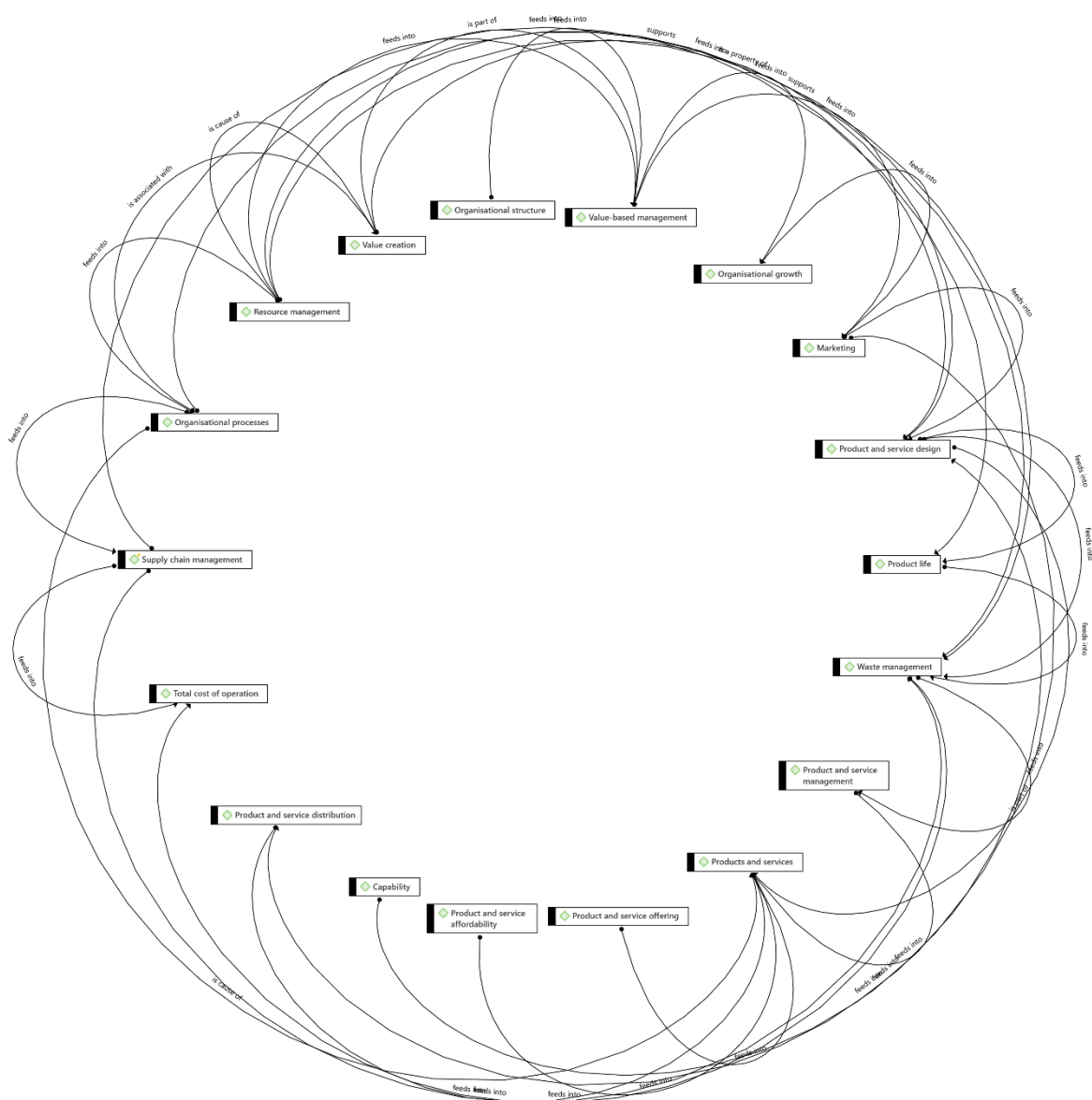


Figure H-7 Axial coding applied to summative content analysis of product & service provision

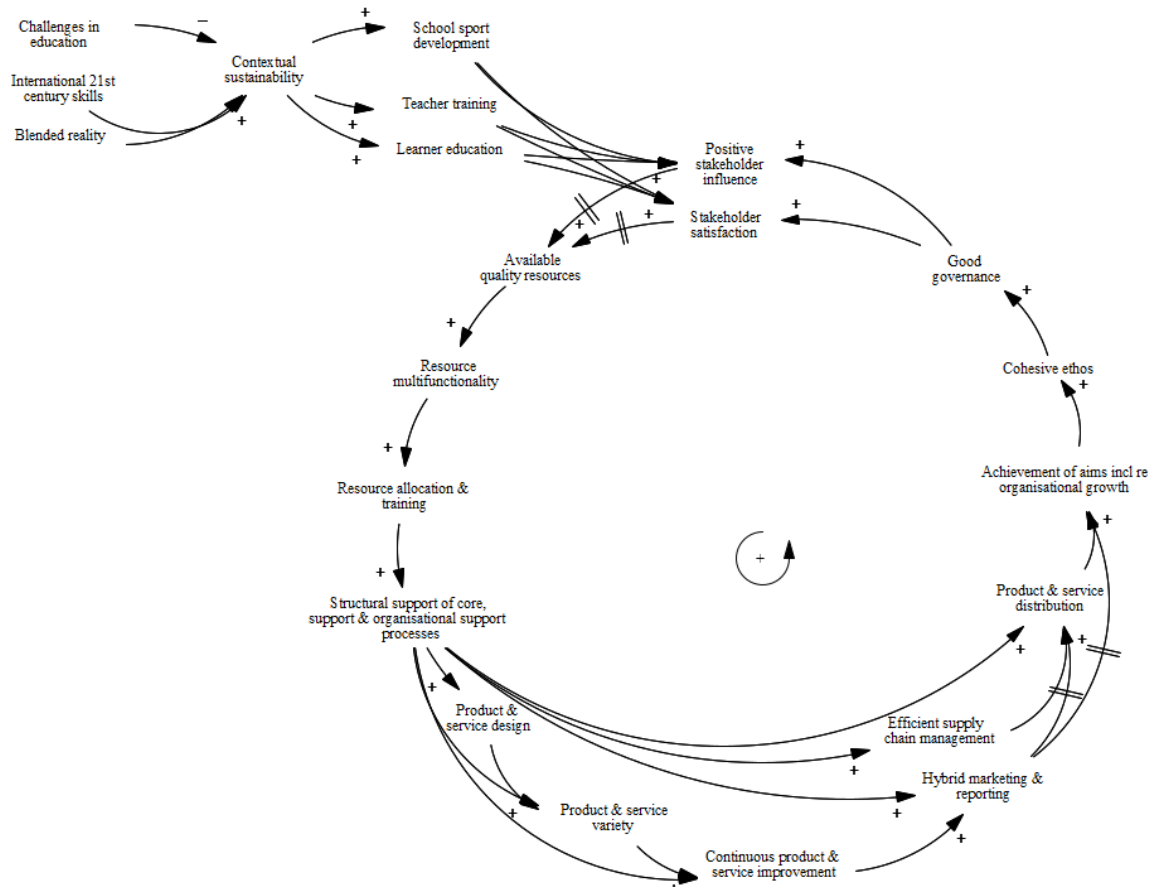


Figure H-8 Conceptual system dynamics model of product and service provision of the NPO

H.5.1 Quantitative simulation model

The following simplification assumptions are made with reference to the conceptual model:

- Credible quantitative estimates for stocks and flows of contextual sustainability are not available and excluded
- Available quality resources only refer to employees and funds
- Training and structural support are assumed and not modelled as stocks or flows
- Efficient supply chain management is modelled through the structure of the model and not as a stock or flow

The most challenging aspect of the simplified systems diagram to quantify, is the flow from achievement of aims, cohesive ethos and good governance, through stakeholder influence and satisfaction, to resources. Quantitative models of resources – mainly represented by donations – as a function of performance measures – mainly represented by an accounting measure of efficiency namely overheads – therefore are considered (577). With reference to organisational factors as summarised in Table H-1, a quantitative simulation model is developed based on the high reliance on donations by the NPO and the number of years in operation. If the NPO would report zero

fundraising or administrative costs and had unaudited financial statements, such reporting would affect donations more than overheads.

Table H-1 Organisational factors of the NPO considered in quantitative models

	Threshold values (578)	Participating NPO
Total assets	> R83M (\$6.8M in 2011)	Less than R0.5M
Total annual income	> R3.7M (\$0.3M in 2011)	Less than R2M
Donations as % of total annual income	> 45%	70%
Years in operation	> 8 years	Almost 15 years
Sector	Education and housing less sensitive	Education

The model developed by Tinkelman (579) does not include administrative costs, the model developed by Tinkelman and Mankaney (577) does not include programme costs, the model developed by Jacobs and Marudas (468) does not include fundraising, the model developed by Marudas and Petherbridge (578) does not include administrative costs and does not provide estimates for all parameters, and the model developed by Leardini, Rossi and Landi (580) includes administrative costs and fundraising inefficiency but therefore introduces perfect negative collinearity. It was decided therefore to use the model as developed by Jacobs and Marudas (468) with reference to the education sector and other organisational factors of the NPO as shown in Equation (H-1).

$$\ln A_t = b_0 + b_1 \ln B_{t-1} + b_2 \ln C_{t-1} + b_3 \ln D_{t-1} + b_4 \ln E_{t-1} + b_5 \ln F_{t-1} + b_6 \ln G_t + b_7 \ln H_t + b_8 \ln I_t + u_{it} \quad (\text{H-1})$$

where all variables ≥ 0 :

A_t = Donations for year t

B_t = Price of giving for year $t = \frac{\sum_t \text{costs}}{\sum_t \text{programme costs}}$

$C_t = \frac{\sum_t \text{administrative costs}}{\sum_t \text{costs}}$

D_t = Fundraising costs for year t

E_t = Government support for year t

F_t = Program service revenue for year t

G_t = Years since first filing a tax return at the beginning of year t

H_t = Wealth at the beginning of year $t =$

$\frac{\sum(\text{fixed assets} + \text{current assets}) - \sum(\text{longterm liabilities} + \text{current liabilities} + \text{restricted assets})}{\sum_{t-1}(\text{costs} - \text{fundraising costs})}$

I_t = Total assets at the beginning of year t

$u_{i,t}$ = Error term

$\widehat{b}_1 = -0.48$

$$\widehat{b}_2 = 0$$

$$\widehat{b}_3 = 0.53 \text{ (Not specifically for education sector)}$$

$$\widehat{b}_4 = -0.01$$

$$\widehat{b}_5 = -0.05$$

$$\widehat{b}_6 = -0.13$$

$$\widehat{b}_7 = 0$$

$$\widehat{b}_8 = 0.33 \text{ (Not specifically for education sector)}$$

The quantitative model of resources, namely donations, as a function of performance measures is shown in Equation (H-2).

$$\ln A_t = b_0 - 0.48 \ln B_{t-1} + 0.53 \ln D_{t-1} - 0.01 \ln E_{t-1} - 0.05 \ln F_{t-1} - 0.13 \ln G_t + 0.33 \ln I_t + u_{it}$$

$$A_t = e^{b_0} \times B_{t-1}^{-0.48} \times D_{t-1}^{0.53} \times E_{t-1}^{-0.01} \times F_{t-1}^{-0.05} \times G_t^{-0.13} \times I_t^{0.33} \times u_{it}$$

$$\begin{aligned} \frac{dA_t}{dt} \approx e^{b_0} & \left(-0.48 B_{t-1}^{-1.48} \times D_{t-1}^{0.53} \times E_{t-1}^{-0.01} \times F_{t-1}^{-0.05} \times G_t^{-0.13} \times I_t^{0.33} \right. \\ & + 0.53 B_{t-1}^{-0.48} \times D_{t-1}^{-0.47} \times E_{t-1}^{-0.01} \times F_{t-1}^{-0.05} \times G_t^{-0.13} \times I_t^{0.33} \\ & - 0.01 B_{t-1}^{-0.48} \times D_{t-1}^{0.53} \times E_{t-1}^{-1.01} \times F_{t-1}^{-0.05} \times G_t^{-0.13} \times I_t^{0.33} \\ & - 0.05 B_{t-1}^{-0.48} \times D_{t-1}^{0.53} \times E_{t-1}^{-0.01} \times F_{t-1}^{-1.05} \times G_t^{-0.13} \times I_t^{0.33} \\ & - 0.13 B_{t-1}^{-0.48} \times D_{t-1}^{0.53} \times E_{t-1}^{-0.01} \times F_{t-1}^{-0.05} \times G_t^{-1.13} \times I_t^{0.33} \\ & \left. + 0.33 B_{t-1}^{-0.48} \times D_{t-1}^{0.53} \times E_{t-1}^{-0.01} \times F_{t-1}^{-0.05} \times G_t^{-0.13} \times I_t^{-0.67} \right) \end{aligned} \quad \text{(H-2)}$$

However, in the case of the NPO the amount donated is fixed based on the project sponsored. A quantitative model is required to determine the probability that a donor will sponsor a project. Most probability models are for specific cases (581) or include external factors included in the financial viability model of the NPO rather than the product and service provision model of the NPO (582-584). Furthermore, Burger and Owens (585) find that previous donations received rather than organisational effectiveness increase the probability that an NPO will receive additional donations. It is difficult for small NPOs who have not previously received donations to become sustainable. In this study, the probability that a donor will sponsor a project is handled as an input parameter based on the experience of the NPO.

The criteria below are used to select software to develop the quantitative simulation model for product and service provision. After considering open-source software as listed by the System Dynamics Society (586), AnyLogic 8 Personal Learning Edition 8.8.1 for students is selected:

- Student licence for the researcher to develop the model

- Full functionality to develop the model
- A user-friendly interface must be developed
- The NPO must be able to run the model without purchasing a licence

The following assumptions are confirmed with the NPO. A user manual also is developed for the NPO to run the model, change default values, run experiments and download output values in the ready-to-use cloud environment (§H.5.2):

- The model runs for three years with weekly time units
- Costs for programme material, coaches and facilitators are excluded
- An average remuneration is paid to all employees, facilitators and coaches on the 25th of every month
- An employee is assigned to only one task at any given time
- Contractors are engaged for only one day at a time
- One fulltime employee is required to do bookkeeping
- Appointments with potential donors and customers are made between the 20th and 27th of every month and takes two weeks for donors and one week for customers to complete
- The number of programmes developed by the NPO, amount of assets, total revenue, total donations received, income received from tax exempted services, government support, overheads, programme expenses, and remunerations paid by the NPO have no effect on the probability that a donor or customer will fund a programme
- Audited financial statements and fundraising expenses have no effect on the probability that a customer will fund a programme
- Financial statements must be audited and fundraising expenses must be spent for a donor to fund a programme
- Programmes are funded for three years
- Customers pay on the 25th of every month in equal instalments
- Donors pay on the 25th of February and July in equal instalments
- If the NPO decides to develop new programmes, programmes are developed every second year on the 5th of January, lasting from 20 weeks to three years and averaging at one year
- The model provides for only one new programme, should the NPO decide to develop such
- All programmes are reviewed on the 5th of January on an annual basis, requiring only employees and lasting one week
- While programmes are reviewed, they are not available for funding
- Deliveries of material for programmes are made on the 15th of January, April and July and lasting two days
- Materials are written off on the 1st of June and December

A screen shot of the stock and flow diagram is shown in Figure H-9. As shown in Table H-2, for default values for input parameters, the NPO runs out of funds after four weeks and ends with a dept of more than R150M after three years. If the NPO does not develop any new programmes and increase their markup on costs to 200%, they still run out of funds after four weeks but ends with a dept of more than R100M after three years with an improvement of 38%. If the NPO half their staff establishment, half salaries and does not appoint any contractors, they still run out of funds after four weeks but ends with a dept of just more than R80M and an improvement of 51%. If the NPO does not develop any new programmes, increase their markup on costs to 200%, half their staff establishment, half salaries and does not appoint any contractors, they still run out of funds after four weeks but ends with a dept of just more than R15M after three years with an improvement of 91%. If the NPO does not develop any new programmes, increase their markup on costs to 200%, half their staff establishment, half salaries, does not appoint any contractors, and have startup funds available to the amount of R18M, they do not run out of funds after three years and ends with a surplus and an improvement of 100%. However, it is unrealistic that the NPO would have R18M available at startup and they indicate that they cannot reduce costs any further.

Table H-2 Results from the quantitative SD simulation model for product and service provision

	Develop new programmes	Markup on costs	Number of employees	Average salary per employee	Appoint contractors	Startup funds
Base case	Yes	18%	10	R _x	Yes	<R2M
Scenario 1	No	200%	10	R _x	Yes	<R2M
Scenario 2	Yes	18%	5	R _x /2	No	<R2M
Scenario 3	No	200%	5	R _x /2	No	<R2M
Scenario 4	No	200%	5	R _x /2	No	R18M
	Run out of funds after 4 weeks		End dept / surplus after three years		Improvement	
Base case	Yes		< -R150M		-	
Scenario 1	Yes		< -R100M		38%	
Scenario 2	Yes		< -R80M		51%	
Scenario 3	Yes		< -R15M		91%	
Scenario 4	No		> R0		100%	

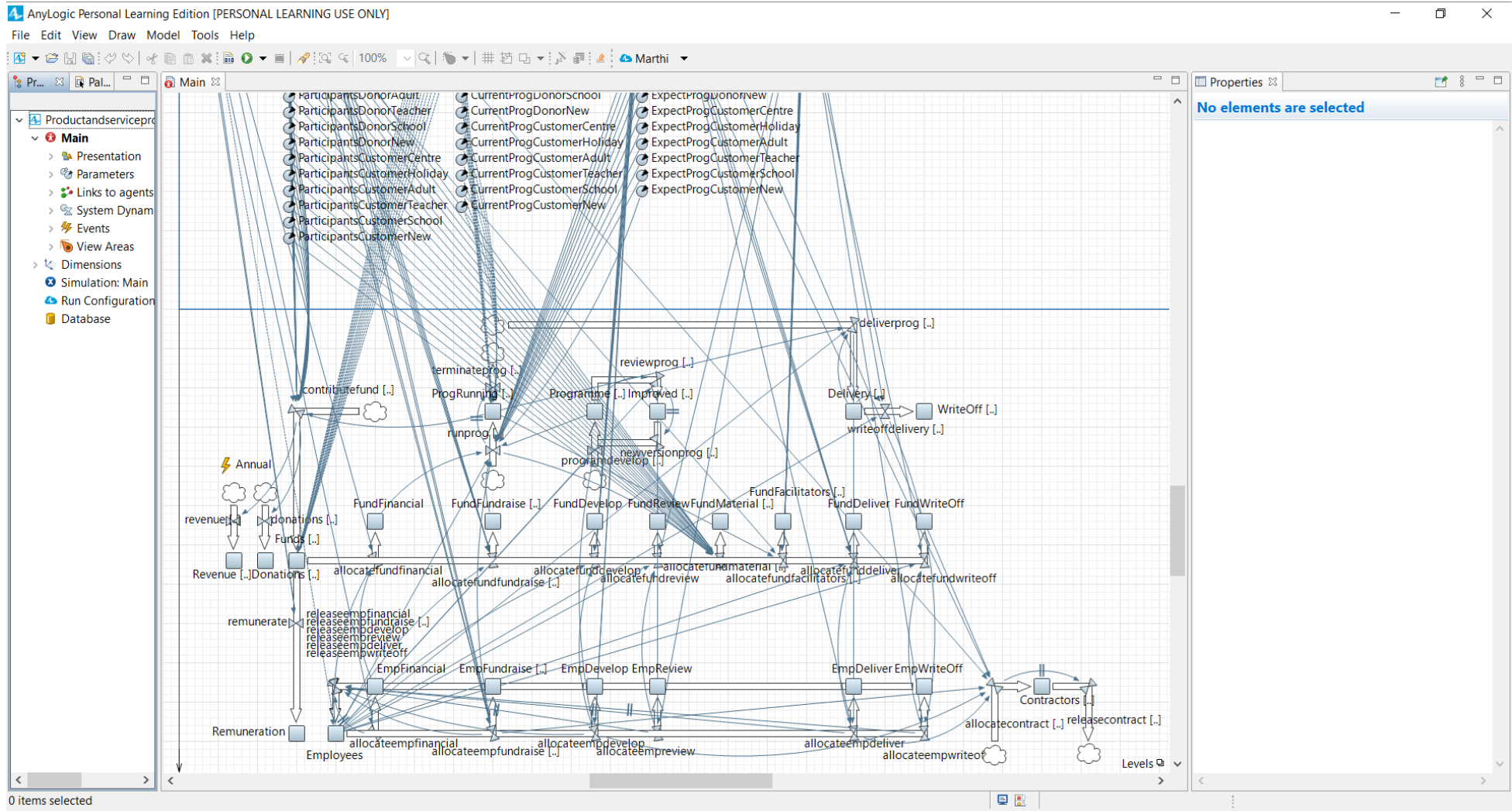


Figure H-9 Screen shot of stock and flow model

H.5.2 User manual

This manual refers to the online help developed by The Anylogic Company (587). For more information please refer to <https://anylogic.help/cloud/export-cloud-tutorial.html>.

For assistance at any point, please contact the Researcher:

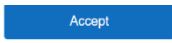
Mrs MFP Harmse, student number 20818778

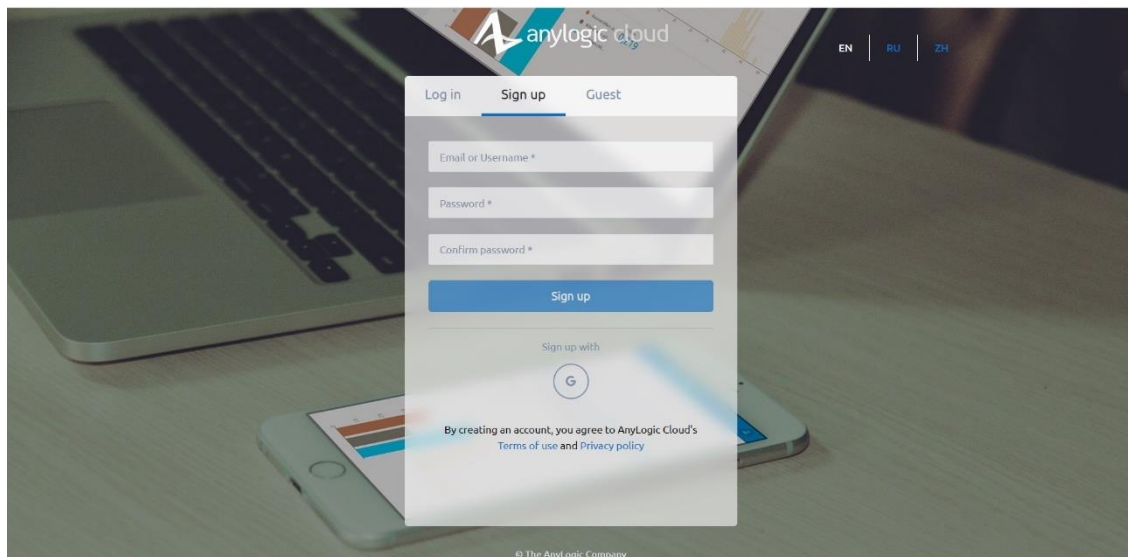
Department of Industrial and Systems Engineering, University of Pretoria

Mobile: 083 627 3501


Email: u20818778@tuks.co.za

4. Invitation acceptance

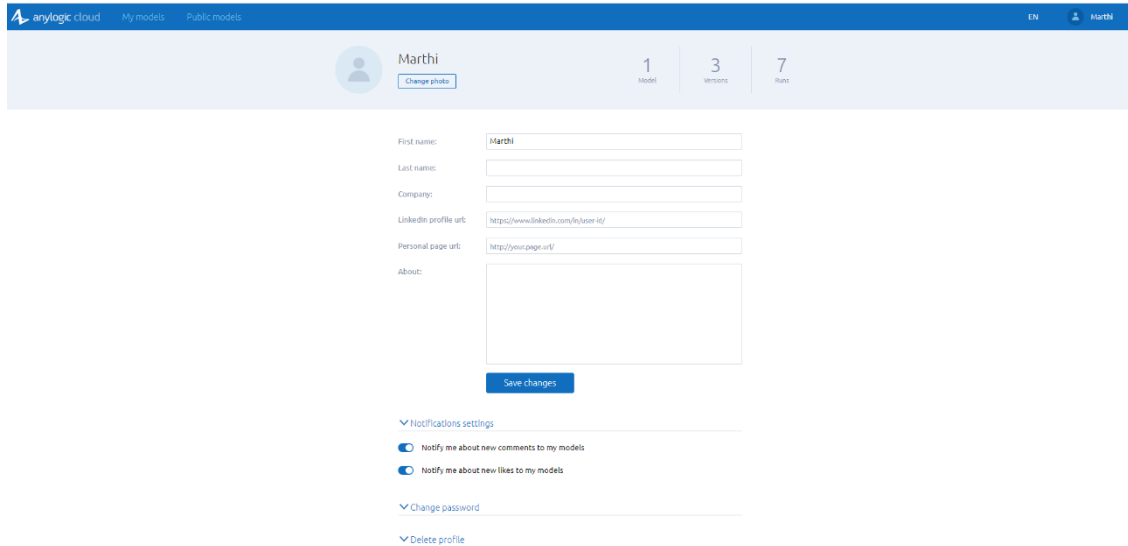
1. You will receive an email from AnyLogic Cloud which invites you to become a user of the Programme management model. Press the button  at the bottom of the email to accept the invitation.
2. The model is only available to registered users. After clicking the button, you will be asked to create an AnyLogic Cloud account.



Click on the “Sign up” tab, type in the email address on which you have received the invitation, create a password which you will remember, confirm the password, and click on the blue “Sign up” button at the bottom.

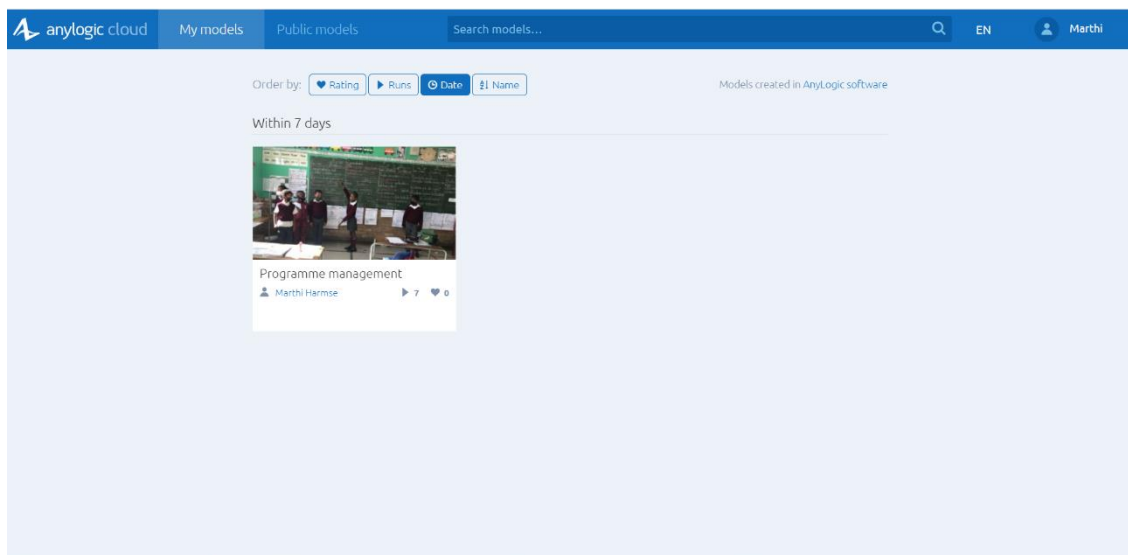
3. You will receive another email from AnyLogic Cloud to indicate that you have successfully created an account. Press the button  at the bottom of the email to confirm your registration. On the “Log in” tab, again type in the email address on which you have received the invitation, type in the password which you have created, and click on the blue “Log in” button at the bottom.

4. If you are logged out due to inactivity or loss of network connection while running the model as described below, log in again as explained in step 3.
5. Create a profile by typing in your name and clicking on the blue “Save changes” button (other information may also be provided but is not required.) Click on “My models” at the top left.

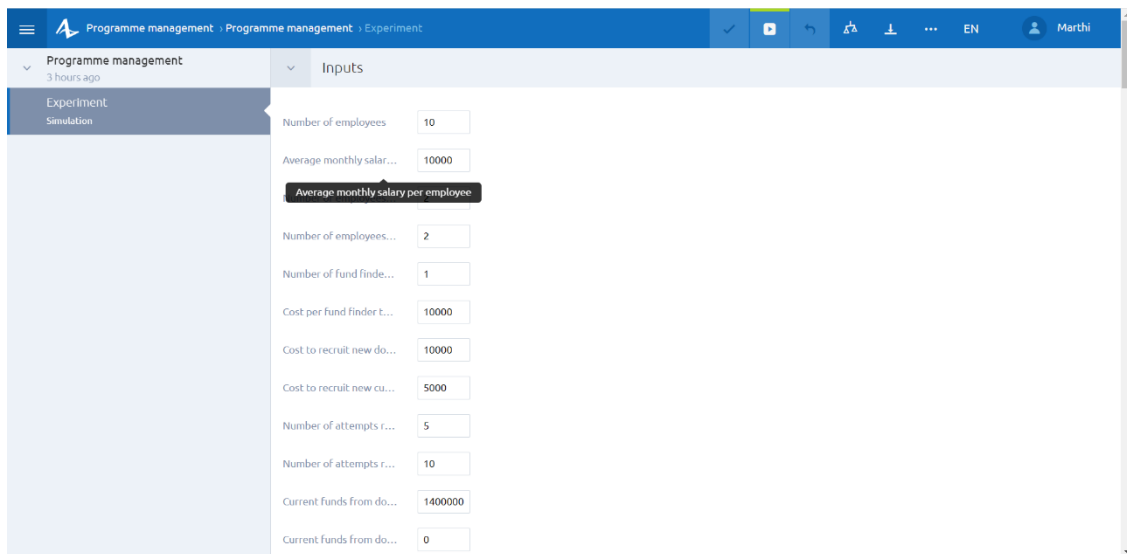


5. Changing input values

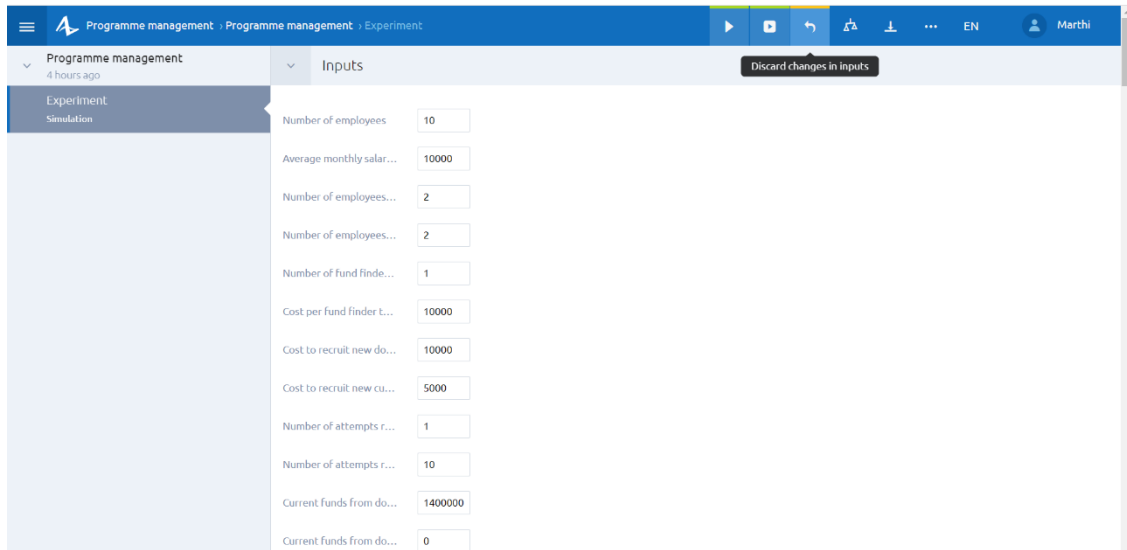
1. Hover over the Programme management model in the middle of the screen. A description of the model will be given on a blue background. Click on the model.



2. The model's name will appear at the top left of the screen. Below the name, an experiment appears which stores the set of input values.

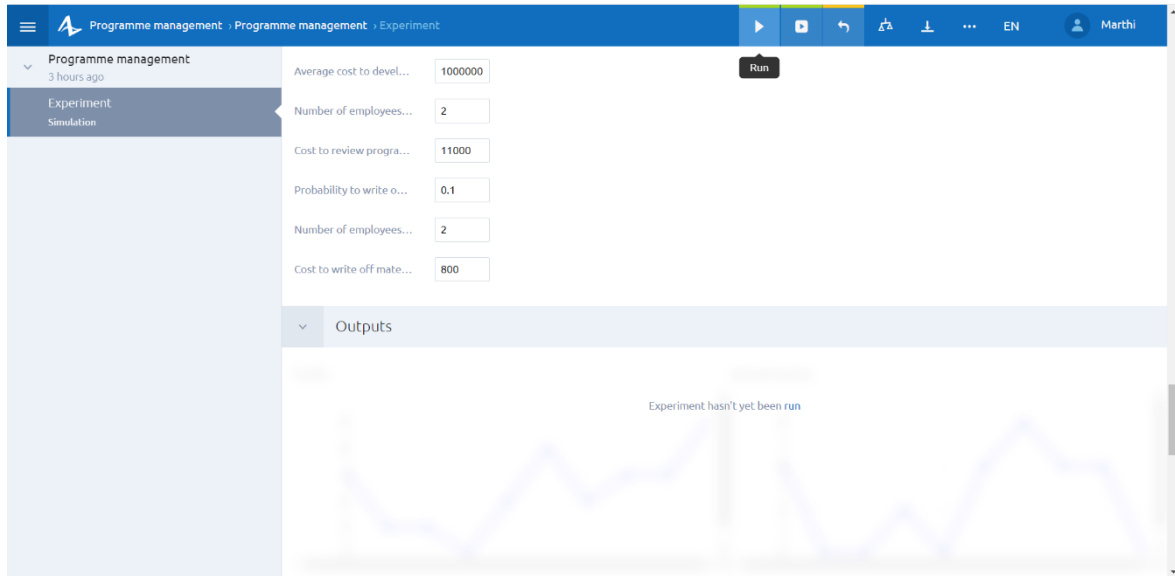


3. Confirm all input values by making changes if required in the right-hand side blocks. A full description of each value appears on a black background if you hover over the name on the left. Outputs will appear blurry since the model was not run yet.
4. If you want to reset all inputs back to their original values, click the back arrow at the top of the screen.

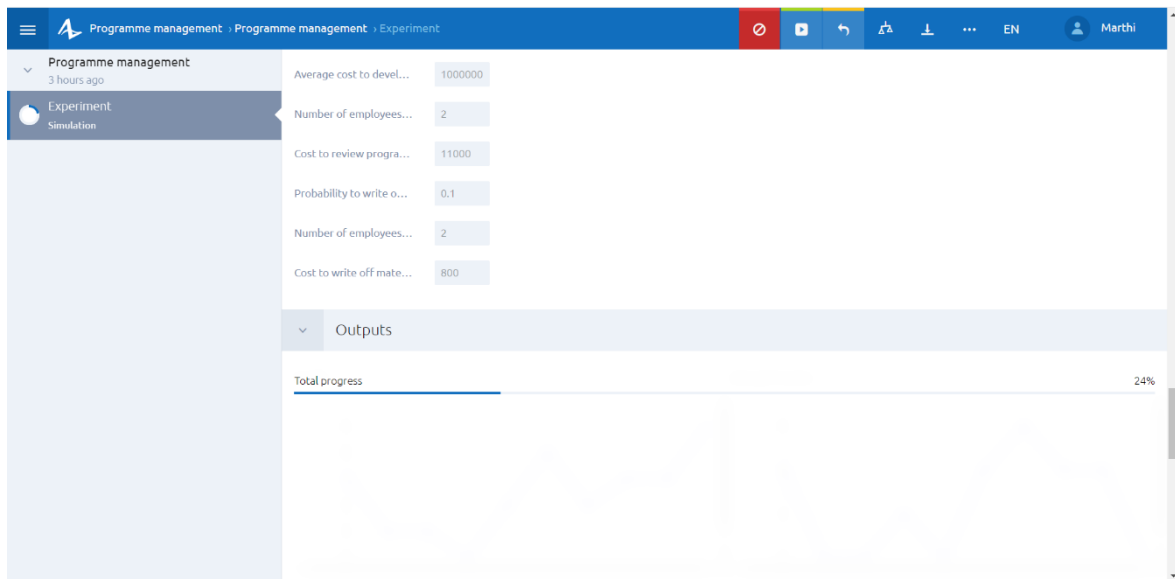


6. Run the model

Run the model by clicking on the white arrow at the top of the screen.

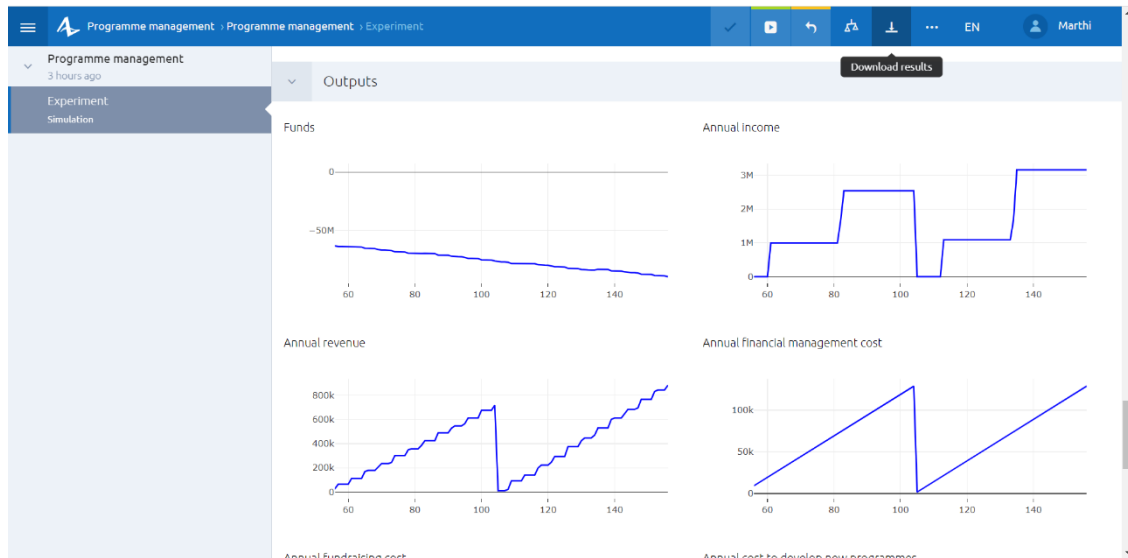


The white arrow will change red and progress will be indicated in the output section.

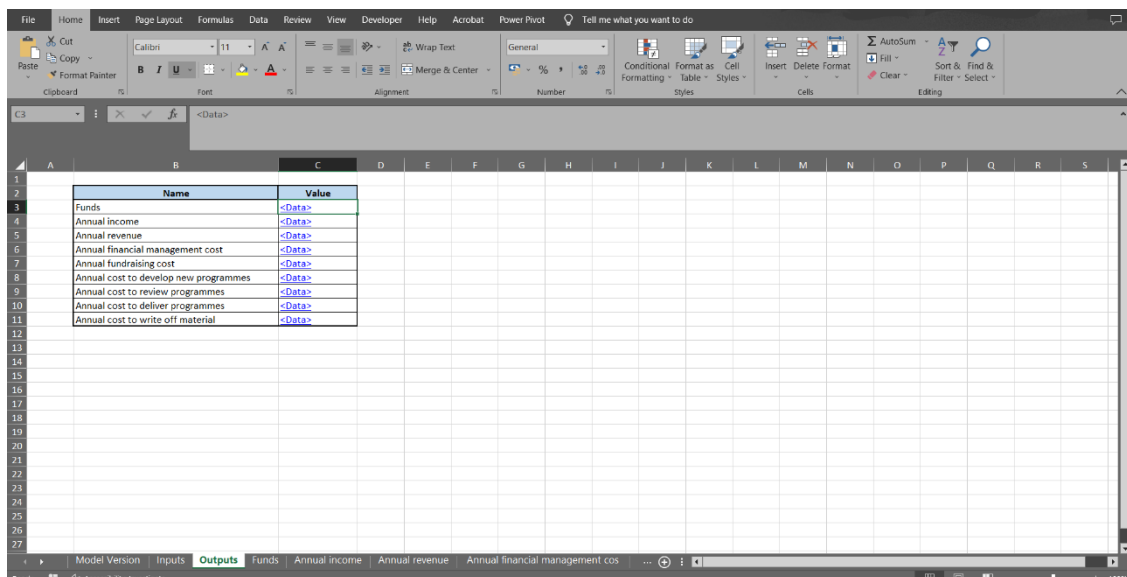


7. Download results

1. Wait until the model run has been completed (the white arrow to run the model will change to a tick mark and the output graphs will appear). Click on the down arrow at the top of the screen to download the results. Choose “XLSX: Experiment” to export the results to an Excel file.



2. The downloaded filename will appear at the bottom left of the screen. Click on it to open.
3. Detail of the model will appear on the first tab (“Model Version”). Input values will appear on the second tab (“Inputs”). Subsequent tabs with output values are listed on the “Outputs” tab. The output values and graphs can be accessed by clicking on the blue <Data> links [<Data>](#).



The screenshot shows an Excel spreadsheet with a table containing the following data:

Name	Value
Funds	<Data>
Annual income	<Data>
Annual revenue	<Data>
Annual financial management cost	<Data>
Annual fundraising cost	<Data>
Annual cost to develop new programmes	<Data>
Annual cost to review programmes	<Data>
Annual cost to deliver programmes	<Data>
Annual cost to write off material	<Data>

8. Run more experiments

More experiments can be run by changing input values, running the model, and downloading the results.

ADDENDUM I SOFT SYSTEMS METHODOLOGY

I.1 WORLDVIEW

To develop an activity model of SOM in the NPO, their worldview must be explored (191). Gebser (287) identifies four major awarenesses in human evolution based on the experience of space and time namely archaic presentiment, magical symbiosis, mythical symbolisation and mental systematisation. A comprehensive understanding of the world and of people themselves occurs when these awarenesses are integrated. Perry (288) proposes nine positions and transitions of cognitive and ethical development namely duality, pre-legitimate multiplicity, subordinate multiplicity, multiplicity, relativism, foreseen commitment, first commitment, balancing of commitments, and wholehearted commitment. Graves (289) develops a spiral dynamics model of adaptive views and capacities of people in response to life conditions involving eight biopsychosocial levels labelled beige, purple, red, blue, orange, green, yellow and turquoise (472). Torbert (473) identifies nine fundamental transformations where a person's worldview changes from a subject controlling the person to an object being controlled by the person, caused by an interaction between the person and the environment. These include stages of impulse, opportunity, diplomacy, expertise, achievement, individualism, strategy, alchemy, and irony. Although some of the above models refer to the intellectual conception of the world and one's place in it from an individual perspective, worldviews permeate organisational culture so that these models are applied to explore the worldview of the NPO (282, 283, 289).

Although some of the above models refer to the intellectual conception of the world and one's place in it from an individual perspective, worldviews permeate organisational culture so that these models are applied to explore the worldview of the NPO (282, 283: 58-59, 289). The worldview of the NPO is described as follows:

- With reference to the four major awarenesses in human evolution (287), a mythical awareness is displayed in the perception of the NPO of time as cyclical and rhythmic. They have a socio-centric organisational identity with role identities and political trustees who have relationships with government. The NPO researches and develops their thinking about education, considers different perspectives, formulates hypothetical possibilities, conducts introspection through their monitoring and evaluation process, and is aware of global tendencies in education.
- With reference to the nine positions and transitions of cognitive and ethical development (288), commitment is shown in the consideration of diverse opinions, values and judgements from credible sources in the research and development of the NPO. Their monitoring and evaluation process include qualitative and contextual data. They demonstrate agency, respect others and are ready to learn.
- With reference to the eight biopsychosocial levels of the spiral dynamics model (289), organisation, hierarchy, reliability, dependability, self-sacrifice and an external focus on the collective is important to the NPO while they are emotionally driven and less accommodating

towards other worldviews. They believe that it is beneficial for everyone to follow the rules and maintain their processes, structures, policies and procedures. The NPO is loyal and true to their cause and believe that it will ultimately be rewarded by advancement in status. They are self-disciplined, want to finish what they have started, keep things orderly and act responsibly within the framework of rules and regulations that govern their status within the hierarchy.

Their projected image is that they are sound and solid as a rock.

- The NPO also is egalitarian, social, caring and friendly. They want to be an accepted member of the community, communicate their feelings, pay attention to the feelings of others and have a spiritual outlook on life. The NPO avoids inequality and conflict and focus on shared values. They seek opportunities for growth and development in their programmes, for their employees and as an organisation. Their projected image also is that they are focused on building lasting and meaningful relationships.
- With reference to the nine fundamental transformations caused by an interaction between an organisation and their environment (473), achievement is shown in the goal-orientation of the NPO to guide research about education and sport, seek feedback about effectiveness and adjust if necessary.

I.2 FINDING OUT

The finding-out phase of the NPO is documented in a rich picture as summarised in Table I-1. The main entities involved with the NPO are listed as children, the trust, sponsors (also referred to as donors), teachers, community leaders, schools including principals, their products and services which are adapted to achieve specific goals, academic institutions who conduct research, didactically edit their curriculum and support their credibility, employees, service providers such as curriculum writers and suppliers, the DBE, and other government institutions such as SARS, Department of Mineral Resources and Energy, and the Gambling Board. Broadly, these correlate with the stakeholders as contextualised in Chapter 4 and indicated in a BES perspective.

Their roll-out process is contextualised in Chapter 4 and indicated in a BES perspective. In brief it entails that the NPO proposes a project after making contact with a potential sponsor and subsequently with the DBE. After community and community leadership buy-in is obtained, the NPO makes contact with principals to invite a school or cluster of schools to participate in the programme and recruit facilitators. Foundation phase teachers are then trained by NPO facilitators to utilise the programme in class through accredited short courses and sessions on teacher mathematics and sport integration. An integrated in-class programme is implemented which benefits learners at an appropriate age and which supports the national CAPS. Another programme involves sport as an extracurricular activity at beginner, intermediate and advanced level and participation in sport tournaments. The NPO monitors, mentors, supports and maintains the programmes in participating schools and also collaborates with academic institutions to analyse,

study and report on social and educational impact. The NPO is sensitive to the varied contexts in which they implement their programmes and adapt their processes as appropriate. Their operations are structured by their products and services, sponsors, and the DBE.

The viewpoint of the NPO is summarised by the espoused values of sustainability, impact, change and empowerment. The viewpoint of the DBE is indicated as to solve problems quickly and for free. The products and services of the NPO are delivered with a viewpoint of a systematic approach to mathematics, making learning hands-on and fun, and empowering teachers. Furthermore, the viewpoint of sponsors varies across income tax benefits, BBBEE, personal interests, a positive impact and co-contributions. The viewpoint of schools involves better overall academic performance and better trained teachers while the viewpoint of teachers involves CPTD points, more effective teaching methods and better mathematics results. The viewpoints associated with the products and services of the NPO, their sponsors and also schools correlate with the contextualisation and indicated in a BES perspective. The viewpoint of community leaders involves a safe space for community members, constructive recreation and sport, and job creation.

Issues that the NPO experiences generally are due to relationships. They continuously must address the distrust of schools and teachers which are caused by numerous other external interventions. They also must ensure that their products and services stay relevant to the needs of beneficiaries and that employment policies and procedures are in place – all of which produced challenges in the past. The NPO addresses these issues through their roll-out process and training as contextualised in Chapter 4 and indicated in a BES perspective. However, some of the biggest issues indicated in the rich picture are the financial viability of the NPO and monitoring and evaluation as contextualised in Chapter 4 and indicated in a BES perspective and SD model. Issues also involve power relationships between the DBE and schools and also community leaders which, for example, cause strikes which are indicated in the SD model.

I.3 ACTIVITY MODEL

The activity model is based on the transforming process, root definitions, evaluation criteria and the modelling guidelines, activities, dependencies, and performance measures, monitoring and control as summarised in Table I-2. The model only includes the worldview of the NPO. Based on a critical realist approach (317), the model serves as a basis for further discussion about the viewpoints of other stakeholders and underlying mechanisms referring to human, natural, physical, financial and social capital also included in Table I-2.

Table I-1 Finding-out phase for the non-profit organisation

Analysis	Questions addressed	
Action	Customer	Children
	Practitioner	NPO
	Owner	NPO, sponsors, teachers, community leaders, schools including principals, employees, DBE
Social	Roles	Trust, sponsors, teachers, community leaders, schools including principals, academic institutions, employees, service providers and suppliers, the DBE, other government institutions
	Norms	<ul style="list-style-type: none"> • Children benefit from an in-class programme, which supports the national CAPS, at an appropriate age and participate in sport as an extracurricular activity and tournaments • Trust embodies the mission, ethos, obligations and good governance • Sponsors donate funds for in-class programmes and sport as an extracurricular activity including tournaments • Teachers attend accredited short courses and sessions on teacher mathematics and sport integration to utilise the programme in class • Community leaders support the in-class programme and sport as an extracurricular activity including tournaments • Community members are involved in the in-class programme and sport as an extracurricular activity by being recruited and trained as facilitators • Schools, through governing bodies and principals, approve the implementation of the in-class programme and sport as an extracurricular activity at their school • Academic institutions analyse, study and report on social and educational impact, conduct research, didactically edit the curriculum of the NPO, and support the credibility of the NPO • Employees monitor, mentor, support and maintain programmes in participating schools, collaborate with academic institutions, and adapt products and services to achieve specific goals • Service providers write curriculums etc. and suppliers provide materials such as workbooks, teacher toolboxes, etc. • DBE approve the implementation of the in-class programme and sport as an extracurricular activity at schools in their jurisdiction • Government institutions regulate the activities of the NPO and their sponsors, including the SARS, Department of Mineral Resources and Energy, and the Gambling Board
	Values	<ul style="list-style-type: none"> • Children: academic marks and reaction, competency & attitude measurements • Trust: trust deed, legislation • Sponsors: contract between sponsor and NPO • Teachers: accredited short course assessments, teacher feedback • Community leaders: community feedback

		<ul style="list-style-type: none"> • Community members: facilitator evaluation included in NPO training and development • Schools: principal feedback, parent feedback, DBE feedback • Academic institutions: contract between institution and NPO • Employees: evaluation included in internal training and development, espoused values of sustainability, impact, change, and empowerment • Service providers and suppliers: contract between service provider / supplier and NPO • DBE: action plan of the DBE (359) • Government institutions: legislation
Political	Commodities of power	<ul style="list-style-type: none"> • Implementation of programme as intended in schools by teachers and employees • Funding from sponsors • Approval to implement programme from DBE and schools • Support for programme from DBE, schools and community leaders
	Processes of commodities	<ul style="list-style-type: none"> • Project proposal to potential sponsor and subsequently to DBE • Buy-in from community and community leadership • Agreement with schools and principals • Accredited training of facilitators and teachers • Programme implementation in class, benefitting learners at an appropriate age and supporting the national CAPS, and sport as an extracurricular activity at all levels, including tournaments • Programme monitoring, mentorship, support and maintenance by NPO and report on social and educational impact in collaboration with academic institutions • Adaption of processes as appropriate to varied contexts of programme

Table I-2 Development of an activity model for the non-profit organisation

Step	Questions addressed	
Transforming process	What	Systematic approach to mathematics, making learning hands-on and fun, and empowering teachers
	How	<ul style="list-style-type: none"> • Integrated in-class programme benefitting learners at an appropriate age and supporting the national CAPS • Sport as an extracurricular activity at beginner, intermediate and advanced level including tournaments
	Why	Empower learners and teachers to give children a head-start in life
Root definitions	Entity to be transformed	Children ill-prepared for life
	Transformed state	Children with a head-start in life
	Transforming process (T)	<ul style="list-style-type: none"> • Integrated in-class programme benefitting learners at an appropriate age and supporting the national CAPS • Sport as an extracurricular activity at beginner, intermediate and advanced level including tournaments

	Worldview (W)	<ul style="list-style-type: none"> • NPO: sustainability, impact, change, and empowerment • DBE: solve problems quickly and for free • Products and services: systematic approach to mathematics, making learning hands-on and fun, and empowering teachers • Sponsors: varied across income tax benefits, BBBEE, personal interests, a positive impact and co-contributions • Schools including principals: better overall academic performance and better trained teachers • Teachers: CPTD points, more effective teaching methods and better mathematics results • Community leaders: a safe space for community members, constructive recreation and sport, and job creation
	Actors (A)	NPO
	Customers (C)	Children
	Environment (E)	<ul style="list-style-type: none"> • COVID-19 pandemic • Downgrading and poor performance of national economy • Lack of computer skills in South Africa • Tough competition for donations from local business • Difficulty to obtain donations from foreign funding sources • Diversity intolerance • Complexity of cooperation with international NPOs • Corruption • BBBEE criteria • Changing social trends • Perceptions about and politics and financials of sport bodies • Poor infrastructure of regional NPO sector • Lack of availability of quality legal services • Challenging relations with government • Lacking technology infrastructure in South Africa • Maintenance cost of technology
	Owners (O)	NPO, DBE, products and services, sponsors, schools, teachers, community leaders
Evaluation criteria	Efficacy criteria	<ul style="list-style-type: none"> • Learners' attitude towards the programme; average mathematics percentages per term for Grade 1, 2 and 3; overall scholastic performance; social, emotional, physical and academic development; communication, teamwork, time management, mathematics, interest and performance in sport; behaviour and life skills; cognitive development of mathematics, language and life skills

		<ul style="list-style-type: none"> • Teachers' support from the programme; benefits • Schools' benefits of the programme as an educational tool in the foundation phase • Observed learning of learners and teachers through the programme
	Efficiency criteria	<ul style="list-style-type: none"> • Official attendance registers for each training and facilitation session • Names of schools trained, training dates, grades and attendance of teachers per school, postponement of sessions with reasons and new dates, challenges with suggested solutions, training session highlights, teacher feedback and comments on a daily, weekly and monthly basis • Monitoring of facilitation sessions to ensure quality
	Effectiveness criteria	<ul style="list-style-type: none"> • Impact on learners, teachers, school communities and the broader community
Modelling	Guidelines	<ul style="list-style-type: none"> • Does every element in the root definitions lead to an activity in the model? • Can every activity in the model be linked back to an element in the root definitions?
	Activities	<ul style="list-style-type: none"> • Contact potential sponsor • Contact DBE • Propose a project • Obtain buy-in from community and community leadership • Contact principals to invite schools to participate in the programme • Recruit and train facilitators • Train foundation phase teachers to utilise the programme in class through accredited short courses and sessions on teacher mathematics and sport integration • Implement integrated in-class programme and sport as an extracurricular activity
	Dependencies	<p>After making contact with a potential sponsor and subsequently with the DBE, the NPO proposes a project. After community and community leadership buy-in is obtained, the NPO makes contact with principals to invite schools to participate in the programme, recruit and train facilitators. Foundation phase teachers are then also trained to utilise the programme in class. The in-class programme and an extracurricular sport programme are then implemented. The NPO monitors, mentors, supports and maintains the programmes in participating schools and also collaborates with academic institutions to analyse, study and report on social and educational impact. The NPO is sensitive to the varied contexts in which they implement their programmes and adapt their processes as appropriate.</p>
	Performance measures	<ul style="list-style-type: none"> • Learners' attitude towards the programme; average mathematics percentages per term for Grade 1, 2 and 3; overall scholastic performance; social, emotional, physical and academic development; communication, teamwork, time management, mathematics, interest and performance in sport; behaviour and life skills; cognitive development of mathematics, language and life skills

		<ul style="list-style-type: none"> • Teachers' support from the programme; benefits • Schools' benefits of the programme as an educational tool in the foundation phase • Observed learning of learners and teachers through the programme • Official attendance registers for each training and facilitation session • Names of schools trained, training dates, grades and attendance of teachers per school, postponement of sessions with reasons and new dates, challenges with suggested solutions, training session highlights, teacher feedback and comments on a daily, weekly and monthly basis • Monitoring of facilitation sessions to ensure quality • Impact on learners, teachers, school communities and the broader community
	Performance monitoring	<ul style="list-style-type: none"> • Monitor, mentor, support and maintain programmes in participating schools through the following: • Pre-intervention tests for Grade 1-3 learners • End-of-year assessments • Teacher questionnaires • Teacher and sport coach records of participating learners' progress submitted to head office for research and analysis purposes • Facilitator reports submitted to programme manager on a daily, weekly and monthly basis • Sport coach reports on a daily, weekly and monthly basis • Official attendance registers for training and facilitation sessions • Monitoring of facilitation sessions • Principal questionnaires • Parent feedback • Observed learning of learners and teachers through the programme • Collaborate with academic institutions to analyse, study and report on social and educational impact through the following: • Evaluation documents • Impact reports • Journal articles on the link between the NPO programme and cognitive development of children in South Africa
	Performance control	<ul style="list-style-type: none"> • Adapt processes as appropriate to varied contexts of programme implementation • Adapt programme based on results from the monitoring and evaluation process
Underlying mechanisms	Natural	<ul style="list-style-type: none"> • Need for food security • COVID-19 pandemic

Human	<ul style="list-style-type: none"> • Products and services address major challenges in education in South Africa • MoU on school sport between Departments of Basic Education and Department of Sport, Arts & Culture • Teachers' existing knowledge and experience • Paid employment • Lacking computer skills • Challenges to innovation and adjustment to new ways of serving beneficiaries
Financial	<p>International: difficult to obtain donations from foreign funding sources</p> <p>National:</p> <ul style="list-style-type: none"> • Market for sport equipment • Market for education programmes • Public benefit donations deductible from income tax • Downgrading and poor performance of national economy • Poor NPO sectoral infrastructure • Tough competition from other NPOs for donations from local business <p>Organisation:</p> <ul style="list-style-type: none"> • Products and services benefit broader public but do not receive taxes so that income must cover costs but do not benefit only narrow group of owners • Require funding from government but do not have access • Pursue a mission which is financially non-viable • Compete against government and business • Value base involves nonmonetary returns • Donations not to cover overheads or invested in reserve funds, struggle to address donor requirements • Experience inherent tension and conflict due to co-existence of social enterprise and PBO ethos • Do not have capacity to generate revenue through product and service provision • Absence of top-up funding, funding for COVID-19 specific interventions, new donors, and recovery plan • Challenges to adjustment to new ways of serving beneficiaries, prioritisation of business plan, operations and budget, and financial accountability
Social	<p>International:</p> <ul style="list-style-type: none"> • Internet of things • International 21st century skills • Blended learning • Evaluation metrics and tools to make sense of NPO sector

		<ul style="list-style-type: none"> • Cooperation with international NPOs is complex • Changing social trends • Perceptions about and politics and financials of sport bodies <p>National:</p> <ul style="list-style-type: none"> • Legal and regulatory environment • National Development Plan • BBBEE scoring • Diversity intolerance • Corruption • BBBEE criteria • Underdeveloped infrastructure of regional NPO sector • Availability and quality of legal services <p>Organisation:</p> <ul style="list-style-type: none"> • Products and services address major challenges in education in South Africa which are neglected by business because they cannot be addressed profitably and by government due to insufficient statutory basis or public support • Require support from government departments • Advocacy • Relation issues with government • Compete against government and business • Experiment and pioneer new approaches in service delivery • Foster and help express diverse values • Pursue a mission which is politically non-viable • Emphasise improvement of operations but struggle to enhance financial performance • Focus on job readiness and employability and less on general human development • Increased demands for accountability • Struggles with sustainability focus that simultaneously pursues financial and social aims through an equitable multiple bottom line • Trust lacks transcendental leadership, moral character, ability to deal with complexity, technology focus and empowerment • NPO lacks transcendental leadership, ability to deal with complexity and entrepreneurial skills • Struggle to revitalise commitment to cause
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		<ul style="list-style-type: none"> • Experience inherent tension and conflict due to co-existence of social enterprise and PBO ethos • Challenges to digital presence, communication with stakeholders including web-based channels, local and global cooperation with other NPOs and academic institutions
	Physical	<p>International:</p> <ul style="list-style-type: none"> • Electronic media • Blended reality <p>National: lacking infrastructure</p> <p>Organisation:</p> <ul style="list-style-type: none"> • Technology involves high maintenance cost • Technologies are not employee appropriate, not particular energy efficient, environmentally friendly, renewable, fostering recycling or upcycling of waste products, but are sparingly used and software is locally produced on small scale

ADDENDUM J CYNEFIN FRAMEWORK

J.1 COMMUNITIES

The trust who registered the NPO is regarded as a voluntary community using private symbolic language and associated stories to learn what to do in ambiguous and uncertain situations. They are responsible to explore issues of social responsibility and to utilise emerging opportunities based on organisational and external knowledge as indicated by their social enterprise orientation, in the self-defined needs of the NPO in Chapter 4 (346, 475). Social responsibility is included in SOM in the NPO as a social enterprise while the NPO takes social responsibility on behalf of business based on a contemporary conceptualisation (2, 19, 36). The governance field of a BES perspective is supplemented in this regard with a sustainable organisational model for mature organisations (149). While social responsibility is addressed as part of stakeholder value and a strategy that focuses on symbiosis and balance is proposed for an NPO, based on a BES perspective a strategy is required to address synergy, symbiosis and durability. However, the trust should guard against falling into chaos or fact-based management by fast-tracking problem resolution or opportunity exploitation instead of allowing time for reflection and encouraging interaction for patterns to emerge (346). This includes urgent information received from the general manager through an algedonic signal regarding organisational communities as indicated in VSM of the NPO.

Coordinators, facilitators, the product manager, programme manager and general manager, coaches and learning centre owners are regarded as professional communities using expert language and associated skill sets to transfer certainty and explicit knowledge – including technology – through training programmes. They have a responsibility to monitor changes and produce organisational responses as indicated in VSM of the NPO (346). However, instead of over-analysis of a situation or overconfidence in the efficacy of past solutions, they should continue to seek feedback from external and internal stakeholders and experiment to stimulate innovation as suggested by organisational models for sustainability. This includes resource bargaining through meetings and reporting to and response from the coordinator, product manager, programme manager, data manager, facilitators and coaches, inter-operational management through meetings and reporting to and response from the general manager, coordinator, product manager, programme manager, data manager, administrator, accountant, facilitators and coaches, and strategy development, ethos and interactions maintenance and recursive governance at meetings involving the general manager, product manager, programme manager and data manager.

Accountants, administrators and marketers are regarded as a bureaucratic community using the language of the dominant culture of the NPO to transfer certainty and explicit knowledge in structured feedback. They have allocated responsibilities based on implicit governance within the

organisational structure as indicated in a BES perspective (346). However, they should guard against complacency, overreliance on best practices if the situation of the NPO changes, and oversimplification of complex issues. They should keep communication channels open and stay connected to the situation of the NPO. This includes resource bargaining in meetings between coordinators and facilitators as indicated in VSM where accountants, administrators and marketers are represented by coordinators.

J.2 BOUNDARIES

The teaching-inclusive domain in Figure J-1 is referred to as a clear domain and concerns simple problems with a limited number of variables. The teaching-exclusive domain is referred to as a complicated domain and concerns disorganised complex problems with a very large number of variables. The boundary between clear and complicated situations is fluid and is often crossed in both directions in diagnostic organisational development which involves a reinforcing cycle of planning that dictates a controllable process of projectable change (203, 204, 318, 319). In the process a technical interest is promoted. For the NPO, a preferred situation is taken for granted in crossing this boundary and mainly involves the views of business and education district and circuit offices who use expert languages and associated skill sets to demand efficiency, best practice and predictable results over a short time horizon (201). The preferred situation in crossing the boundary also involves the views of accountants, administrators and marketers who use the language of the dominant culture of the NPO.

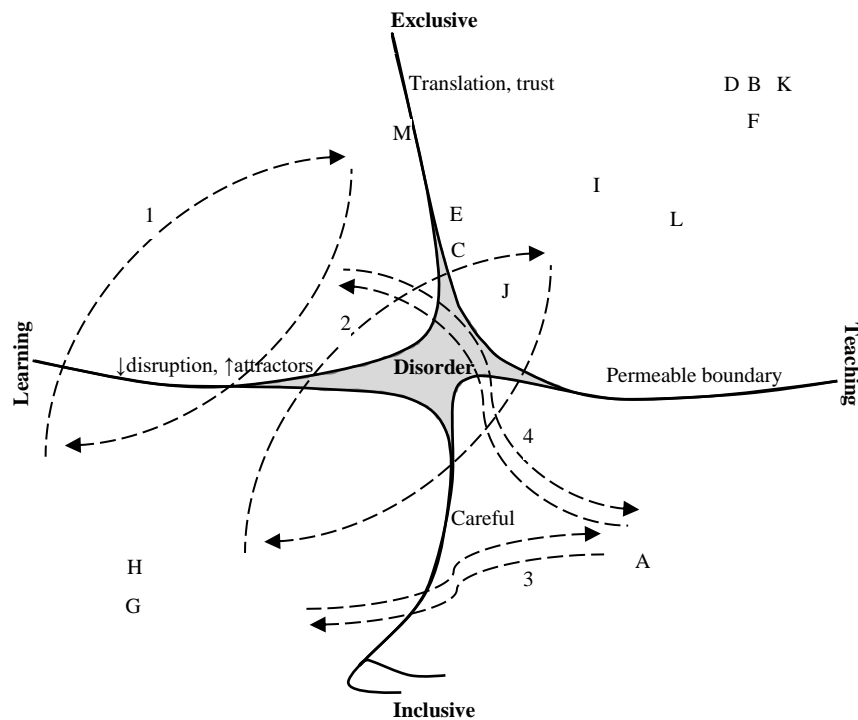


Figure J-1 Boundaries of the non-profit organisation

The learning-exclusive domain in Figure J-1 is referred to as a complex domain and concerns organised complex problems with a significant number of interrelated factors (201, 475). The boundary between complicated and complex situations is not as permeable as the boundary between clear and complicated situations since translations are required between expert languages and associated skill sets on the one hand and private symbolic languages and associated stories on the other. Crossing the boundary however can complement transitions between clear and complicated situations through dialogic organisational development which involves an adaptive process where planning evolves over time (203, 204, 318-320). In the process a technical interest is complemented with a practical interest if communities trust one another (201, 318-320). In the NPO, possible actions and preferred situations are explored and discussed through VSM as summarised in Addendum G among coordinators, facilitators, the product manager, programme manager and general manager, and coaches in terms of value content and assisting those with less power so that these communities regularly cross the boundary between complicated and complex situations. However, value content is not tabled in discussions about possible actions and preferred situations between the trust and the general manager and those with less power are not assisted. The trust also does not offer knowledge to the NPO by crossing the boundary. They also do not discuss value content and those with less power are not assisted in deliberations about possible actions and preferred situations with business and education district and circuit offices so that crossing the boundary remains sterile.

The learning-inclusive domain in Figure J-1 is referred to as a chaos domain and also concerns organised complex problems with a significant number of interrelated factors (201, 475). The boundary between complex and chaotic situations is fluid and difficult to delineate. It may be crossed through dialogic organisational development which involves careful disruption of complex situations to become chaotic in order to instil innovation and adaptability for sustainability (1 in Figure J-1) (163, 203, 204, 318, 319, 389). The boundary is crossed back again by creating multiple attractors to enable patterns to emerge and by repeating the cycle, a rich variety of patterns are created through which to make sense of situations. This process may be utilised to assist the trust to explore issues of social responsibility and to utilise emerging opportunities based on organisational and external knowledge. An emancipatory interest is promoted by considering possible actions and preferred situations in terms of power relations in the environment of the NPO.

The boundary between complicated and chaotic situations also may be crossed through dialogic organisational development involving careful disruption of complicated situations (2 in Figure J-1) (201). Initially situations become disordered, then chaotic, and subsequently follow the same process as above to instil innovation and adaptability for sustainability. Such a process may be

utilised to assist coordinators, facilitators and the product manager, programme manager and general manager to deal with complexity, improve entrepreneurial skills and stakeholder influence and satisfaction, and financial capital.

The boundary between clear and chaotic situations is the strongest and most dangerous and must be treated with respect (201). It too may be crossed through dialogic organisational development involving very careful disruption of clear situations and back again to stimulate reflection without destabilising the whole organisation (3 in Figure J-1). This process may be utilised to assist accountants, administrators and marketers to open communication channels and appreciate the dynamic situation of the NPO. Again, an emancipatory interest is promoted by considering possible actions and preferred situations in terms of power relations in the environment of the NPO.

The boundary between clear and chaotic situations may also be crossed through the imposition of order in chaos (201). This may happen when complex situations or complicated situations are disrupted to become chaotic, but the boundary to complex situations is not crossed through the creation of multiple attractors. This process is utilised by the NPO to address unsustainable situations such as when running out of funds. Stakeholders may accept the imposed order in catastrophic situations, or when the order is well-aligned with needs and brings savings and stability. However, the new order may become rigid and break down to become chaotic again.

The boundary between clear and complex situations may be crossed which involves a process of giving up control (4 in Figure J-1) (201). Initially situations become disordered, then complex, and subsequently complicated. Such a process may be utilised to assist accountants, administrators and marketers to increase cooperation in the NPO and the NPO sector to improve their effectiveness in support of the NPO and to improve the wider NPO sectoral infrastructure.

Examples of boundary crossings in the NPO are summarised in Table J-1.

J.3 TURBULENCE

Similar feedback loops are entailed by CF (201). The status quo is maintained when communities in the complex domain share mutual needs which leads to the emergence of new ideas. Convenience then leads to the stabilisation and ordering of these ideas which causes a crossing to the complicated domain. Tradition subsequently solidifies the ideas into ritual which causes a crossing to the clear domain. However, sometimes lack of maintenance or increasing biases leads to a breakdown which causes a crossing to the chaotic domain. On the other hand, the dispersal of communities or the obsolescence of roles in the clear domain causes knowledge to be forgotten which requires analyses

and a crossing to the complicated domain. Newcomers are filled with curiosity and begin new explorations that question the validity of established patterns which causes a crossing to the complex domain. The energy of newly formed communities breaks the rules and brings radical shifts in power and perspective which causes a crossing to the chaotic domain. Sometimes this may result in the imposition of order and a crossing to the clear domain.

Table J-1 Boundary crossings in the non-profit organisation

Boundary crossing	Example
Learning-inclusive / learning-exclusive (1)	Assist the trust to explore issues of social responsibility and to utilise emerging opportunities based on organisational and external knowledge
Learning-inclusive / teaching-exclusive (2)	Assist coordinators, facilitators and the product manager, programme manager and general manager to deal with complexity, improve entrepreneurial skills and stakeholder influence and satisfaction, and financial capital
Learning-inclusive / teaching-inclusive (3)	Assist accountants, administrators and marketers to open communication channels and appreciate the dynamic situation of the NPO
Teaching-inclusive / learning-exclusive (4)	Assist accountants, administrators and marketers to increase cooperation in the NPO and the NPO sector to improve their effectiveness in support of the NPO and to improve the wider NPO sectoral infrastructure

ADDENDUM K DYNAMIC EQUILIBRIUM MODELLING

Table K-1 Categorisation of organisational tensions

	Identity	Organising	Performing	Learning
Identity	<ul style="list-style-type: none"> • Individuals / organisation • Competing values, roles and memberships 	Individuality / collective action	Individual identities / social and occupational demands	Need for adaptation and change / desire to retain ordered sense of self and purpose
Organising		<ul style="list-style-type: none"> • Collaboration / competition • Empowerment / direction • Control / flexibility 	<ul style="list-style-type: none"> • Means / ends • Employee demands / customer demands • High commitment / high performance 	Stability, clarity, focus and efficiency / dynamicity, flexibility and agility
Performing			Multiple competing goals	Building future capabilities / ensuring current success
Learning				Building upon / destroying the past to create the future

Table K-2 Interventive questions (486)

Intent	Type of questions	Examples	Assumptions	Effect on respondent	Effect on questioner
Investigative	<ul style="list-style-type: none"> • Cause-and-effect • Problem explanation • Problem definition 	Who, what, when, where, why and how of the situation?	<ul style="list-style-type: none"> • Reductionism • Dormitive principles • Causal determinism 	Conservative	Judgemental
Explorative	<ul style="list-style-type: none"> • Cybernetic • Behavioural effect • Difference 	How do others experience the situation?	<ul style="list-style-type: none"> • Cybernetics • Interactional principles • Structure determinism 	Liberating	Accepting
Facilitative	<ul style="list-style-type: none"> • Reflexive • Hypothetical future • Observer perspective 	<ul style="list-style-type: none"> • What are the implications of current perceptions and actions? • What other options are available? 	<ul style="list-style-type: none"> • Cybernetics • Interactional principles • Structure determinism 	Generative	Creative
Corrective	<ul style="list-style-type: none"> • Strategic • Leading • Confronting 	Is the proposal practical?	<ul style="list-style-type: none"> • Reductionism • Dormitive principles • Causal determinism 	Constraining	Oppositional

Table K-3 Enhancement of the reflexive self-regulation of the non-profit organisation

Label	Explicit tensions	Implicit tensions	Tension surfacing	Stakeholder paradox mindsets	Dynamic organisational capabilities	Sensemaking	Separation	Integration
A	<p>Environmental effectiveness and social capital challenged by COVID-19 pandemic, issues re. communication & cooperation, power delegation from government, BBBEE, and power delegation from business. Some stakeholders have instrumental approach to sustainability. Marketing is important but difficult in education & research sector with long-term impact and external presentation of vision, mission and ethos is lacking. Previously trustees & employees benefited at cost of donors & beneficiaries which caused loss of value for everyone. Cultural entropy, telentropy and governance must be addressed to improve stakeholder relations.</p>	<ul style="list-style-type: none"> Performing tensions due to multiple stakeholders Performing tensions due to short-term success and long-term sustainability Performing-organising tensions between means to generate funds, and achieving the aims of the NPO 	<ul style="list-style-type: none"> Environmental change to national democracy, involving unrealistic expectations, impatience to undo before redo, and spiritual conflict Environmental scarcity due to lack of investor trust Donors prioritise need to look good above doing good Donors prioritise latest trends above sustainable impact 	<ul style="list-style-type: none"> Accountants, administrators & marketers have openness to experiences Coordinators, facilitators, product managers & programme managers have tolerance for ambiguity, tolerance for contradictions, openness to experiences, no need for closure General manager has tolerance for ambiguity, tolerance for contradictions, open- 	<ul style="list-style-type: none"> Some misalignments between organisational fields Stakeholders have emotional stake in NPO Increased proximity to stakeholders through website, social & other media Negotiation power improved through multifunctionality Customers who can bear higher price targeted Appropriate activities not separated to ensure sustainability Value not created from waste but do not waste resources Renewable technologies or technologies based on natural processes not utilised Nutritious meals provided in cooperation with other NPOs from school kitchen and vegetable garden Repurposed for society through non-profit organisation 	<ul style="list-style-type: none"> What issue is noticed that warrants closer attention? What is it about? (Weickian model) Who, what, when, where, why and how of the situation? (BES perspective) How do others experience the situation? (VSM and SD) What are the implications of current perceptions and actions? What other options are available? (SSM) Is the proposal practical? (CF) 	<ul style="list-style-type: none"> Continue to adapt processes to varied contexts of programme implementation based on monitoring & evaluation results Clearly distinguish beneficiaries from employees and other stakeholders Focus provision and receipt of real-time information Maintain relationships with influential individuals Internalise societal issues revealed by boundary critique of business & government Implement communication strategy to customise 	<ul style="list-style-type: none"> Implement communication strategy From contraction phase, with experience in scalability, focus on stakeholder relationships, proactive marketing providing for delayed responses, and product & service quality Contract exit strategies with donors Maintain BBBEE verification without restricting programme implementation Appoint employees based on competency and ethos, similar to trustee profile Maintain employment policies and procedures and internal training and development programme Utilise the services of advisors and volunteers, sometimes offered by businesses Continue attempts to contribute to sustainability of businesses by looking for opportunities Identify cooperating partners with compatible aims and ethos to implement good governance required from both parties for a productive partnership through dynamic risk analytics and management Share resources and structures in the NPO sector e.g. legal advice Address distrust of schools and teachers through their existing knowledge & experience Continue to address CPTD points and learner performance for teachers in programme implementation

ADDENDUM K

DYNAMIC EQUILIBRIUM MODELLING

Label	Explicit tensions	Implicit tensions	Tension surfacing	Stakeholder paradox mindsets	Dynamic organisational capabilities	Sensemaking	Separation	Integration
				ness to experiences <ul style="list-style-type: none"> Teachers, coaches & learning centre owners do not have tolerance for ambiguity, integration of complexity, or tolerance for contradictions, but do need closure 	and equipping coaches to earn extra income <ul style="list-style-type: none"> Develop scale-up solutions through multifunctionality, enterprise development, learning centre franchises, and crowd funding Focus on new product & service attributes and functions rather than material & energy efficiency, stakeholder needs integrated into processes, products & services, or sustainability performance measurement system Product & service quality promoted through sustainability re. 21st century skills Sustainable impact directly linked to commercial success Functionality not delivered instead of ownership, and stewardship role not adopted Core structure two out of four main 		communication with separate stakeholders <ul style="list-style-type: none"> Implement marketing to target specific stakeholders Market sport as an educational tool and as a game instead of formal sport Separate NPO aims from business and government aims 	<ul style="list-style-type: none"> Continue to align programme with DBE priority goals Maintain relationships with community leaders and teacher unions Assist employees to deal with complexity, improve entrepreneurial skills and stakeholder influence and satisfaction through a complicated-chaos boundary crossing Assist employees to appreciate the dynamic situation of the NPO through a clear-chaos boundary crossing Assist employees to increase cooperation in the NPO sector through a clear-complex boundary crossing Develop an outside-in organisational perspective
B	Ethos fluctuates between contemporary and hybrid conceptualisation, misaligned among stakeholders, different focuses aligned with different processes, and sometimes ethos restricts processes. Experience cultural entropy.	Identity and performing-organising tensions	Environmental plurality of contextualisation of NPOs	<ul style="list-style-type: none"> Trustees have tolerance for ambiguity, tolerance for contradictions, no need for closure Business varies re. tolerance for ambiguity, integration of complexity, tol- 				<ul style="list-style-type: none"> Strengthen hybrid conceptualisation of NPO together with transcendental leadership Address cultural entropy through a cultural transformation process (435)
C	Struggle to address tensions between different aims, separate appropriate activities to ensure sustainability, and innovate and embed sustainability into aims. Lack of guidance, moving targets, misalignment and lack of clarity increase telentropy.	Performing, performing-learning, organising and organising-learning tensions	Environmental plurality				<ul style="list-style-type: none"> Regularly adapt strategy based on strategic performance management 	<ul style="list-style-type: none"> Formulate goals to indicate what must be achieved, when, where and by whom Continue value-based management focusing on the mission
D	Struggle to innovate and embed sustainability into processes, and to link sustainable impact to commercial success for sport	Performing-learning and performing-organising tensions	Environmental plurality & scarcity					<ul style="list-style-type: none"> Include all objectives and stakeholder engagements in process mapping Assist employees to increase cooperation in the NPO to improve their

ADDENDUM K

DYNAMIC EQUILIBRIUM MODELLING

Label	Explicit tensions	Implicit tensions	Tension surfacing	Stakeholder paradox mindsets	Dynamic organisational capabilities	Sensemaking	Separation	Integration
				erance for contradictions, openness to experiences, need for closure	functions in organogram, support structure one out of four, organisational support structure two out of four			effectiveness through a clear-complex boundary crossing
E	Challenges occur in implicit governance through organisational structure	Organising tensions	Environmental scarcity	<ul style="list-style-type: none"> Education district & circuit offices have tolerance for ambiguity, tolerance for 	<ul style="list-style-type: none"> Maximised material & energy efficiency and resource shortages addressed through multifunctionality Low debt and slow asset-based growth strategy 		<ul style="list-style-type: none"> Clearly assign roles for harmonisation to prevent recurrent conflict among operational units, support of self-regulation to improve performance, and monitoring of performance 	<ul style="list-style-type: none"> A streamlined and integrated organogram is implemented instead of an idealised organogram. From contraction phase, with experience in scalability, focus on structure of value chain and agility
F	Challenges for financial capital involve regulations, sport issues and lack of funding which hamper marketing while marketing is required to raise donations and revenue from products and services. Lack funding to overcome resource shortages. Lack fixed investments to survive. Do not account for total cost of operation.	Organising and performing-organising tensions		<ul style="list-style-type: none"> contradictions, no need for closure Preschool children & primary school learners have tolerance for ambiguity, openness to experiences, no need for closure 	<ul style="list-style-type: none"> Growth phase not yet at organisational perspective from inside-out to outside-in Real-time information from trustees and requirements for real-time information of accountants, administrators and marketers not always available Facilitators struggle to use custom-developed real-time reporting system so that it is done manually Monitoring & evaluation online system ignores self- 		<ul style="list-style-type: none"> Attempted to generate revenue from products and services to cover costs Attempted to focus on new product and service attributes and functions, but material and energy efficiency rather had to be improved to lower costs 	<ul style="list-style-type: none"> Maintain a low debt and slow asset-based growth strategy, aligned with DBE priority goals, and long-term impact From contraction phase, with experience in scalability, emphasise marketing Contract with donors and paid-for projects to cover total cost of operation Communicate overheads of impact to stakeholders Assist employees to deal with complexity, improve entrepreneurial skills, and financial capital through a complicated-chaos boundary crossing
G	Trustees have power over NPO, some lack social capital to identify donors, be well-connected and collaborate,	Identity tensions	Environmental scarcity of financial resources				<ul style="list-style-type: none"> Address leadership crisis to move from the 	<ul style="list-style-type: none"> Reduce spatial and temporal separation between trust and NPO

ADDENDUM K

DYNAMIC EQUILIBRIUM MODELLING

Label	Explicit tensions	Implicit tensions	Tension surfacing	Stakeholder paradox mindsets	Dynamic organisational capabilities	Sensemaking	Separation	Integration
	some do not drive aims of NPO, render required support, attend meetings, or have clear role assignments while some have political and financial motivations, cause conflict and experience value clashes.				<p>defined needs of NPO so that spreadsheet system is implemented</p> <ul style="list-style-type: none"> Monitoring & evaluation process increases accountability & transparency to support marketing Knowledge management includes internal training & development programme Policies & procedures, training & development, monitoring & evaluation, and benefits to donors support value creation Long-term impact of programmes and continuous research & development ensure long-term value Versatile managers Accountants, administrators & marketers maintain status quo 		<p>current contraction phase to a direction phase</p> <ul style="list-style-type: none"> Utilise human capital of trustees 	<ul style="list-style-type: none"> Instead of reporting trustees to the Master of the High Court, go through SOMM with trustees Appoint and incentivise trustees according to developed profile Assist the trust to explore issues of social responsibility and to utilise emerging opportunities based on organisational and external knowledge through a chaos-complex boundary crossing
H	<p>Sustainable governance challenged by natural, human, financial, social and physical conditions in contextual environment. Link between local and global governance challenged by issues re. power delegation from government. Programmes are designed for long-term sustainable impact, but some donors require short-term return on investment and additional performance measurements.</p> <p>Challenges occur in explicit governance through strategic performance management regarding strategy, organisational growth, succession planning, legal portfolio, monitoring and evaluation, and equitable remuneration system.</p>	Identity, organising, identity-organising, performing, organising and performing-learning tensions	Environmental plurality. Founder, general manager, accountants, administrators and marketers recognise contradictory demands				<p>Spatial separation of alternatives, temporal separation (synchronisation)</p>	<ul style="list-style-type: none"> Determine who requires accountability, from whom, in which forums, for which geographical area, for which actions, against which norms, and how the powerful are being held accountable (204) Synchronise rhythms and needs of accountability and learning Contract with donors that the NPO will be accountable and transparent and regularly report proven measurements Starting out from contraction phase, trustees must also have high competencies in terms of stakeholder value creation through their monitoring and evaluation process while continuously improving the quality of their programme for long-term sustainable impact. The donor must provide regular feedback Make contact with previous participants through communication strategy Assist employees to open communication channels through a clear-chaos boundary crossing

ADDENDUM L EFFECTIVENESS EVALUATION

Table L-1 Summative effectiveness evaluation

Self-defined need	Contributions of building, intervention and evaluation cycles
Trustee roles & responsibilities ²	<ul style="list-style-type: none"> • Sustainability evaluation: accountable but not responsible for operations • BES perspective: drive aims of NPO; social capital to build relationships with stakeholders incl. government, potential cooperating NPOs, potential donors • VSM: create organisational identity & policies to provide consistent framework for operational units; make sense of environmental changes to shape strategy, long-term orientation; balance present & future orientations and internal & external perspectives; maintain interactions with transactional environment; raise awareness of environmental changes; mentor general manager; initiate special interventions of required • SD: do not regulate situation of NPO but leverage feedback loops to maintain status quo and to effect change considering delays; build relationships through transparency and accountability • SSM: embody mission, ethos, obligations and good governance of NPO; transcendental leadership; consider different worldviews and impact thereof; consider different underlying mechanisms and impact thereof • CF: address power relations in transactional environment; address internal intrinsic power relations through organisational culture • DEM: monitor paradox surfaced by plurality, change or scarcity in the environment; monitor paradox surfaced by stakeholders regarding contradictory demands; develop paradox mindset among stakeholders; develop dynamic organisational capabilities of NPO
Fundraising	<ul style="list-style-type: none"> • Sustainability evaluation: sound financial management to raise confidence of potential donors; local funding sources incl. government and earned income; multiple funding sources • BES perspective: coherent ethos and good governance to avoid waste; stakeholder cooperation; hybrid conceptualisation to compete on markets through effective planning and management; marketing incl. conceptualisation of sport • VSM: self-regulation to translate funding strategy into operations • SD: donations involve a limits to growth structure, regulated by number of funding sources; all organisational aspects impact financial viability; hybrid conceptualisation focuses on addressing environmental pressures while responding to social needs in competitive market • Quantitative SD model: 91% improvement if no new programmes are developed, markup on costs increased to 200%, staff establishment halved, salaries halved, no contractors appointed • SSM: address funds as commodity of power; cover total cost of operation incl. overheads and reserve funds; operate from declined growth phase • CF: include total cost of operation and exit strategies in donor contracts; crisis management to address funding shortages leads to inflexible situations often causing further funding shortages; cooperation requires alignment of ethos and aims; innovate new ways to raise funds • DEM: address performing-organising tensions between fundraising and achieving aims
Remuneration	<ul style="list-style-type: none"> • Sustainability evaluation: aligned with NPO sector

² NPO requests continued involvement of researcher beyond research project

	<ul style="list-style-type: none"> • BES perspective: no trustee or employee to benefit financially except for reasonable remuneration • SD: retention not only influenced by remuneration but also by human resources themselves, recognition, allocation of resources incl. material, broader financial resources, knowledge and technology • DEM: utilise services of advisors and volunteers, sometimes offered by businesses
Donor motivation ¹	<ul style="list-style-type: none"> • BES perspective: brand exposure, income tax benefits, South African Council for Educators (SACE) accredited training, community development, creation of safe social structures, human development incl. 21st century skills, continuous reporting and impact evaluation, broad-base black economic empowerment (BBBEE) scores incl. enterprise development; target individuals with personal interest; implement communication & marketing strategy; demonstrate mission focus • Quantitative SD model: $\frac{\text{administrative costs}}{\text{total costs}} \approx 40\%$ promotes organisational sustainability • SSM: brand exposure; issuing of tax certificates; issuing of BBBEE certificates; need of donors for positive impact and co-contributions supported by recruitment and training of facilitators, accredited teacher training, sport tournaments and performance monitoring • CF: donor contracts • DEM: contract with donors that the NPO will be accountable and transparent and regularly report proven measurements; donors must provide regular feedback
Legal portfolio	<ul style="list-style-type: none"> • Sustainability evaluation: services available through NPO infrastructure • BES perspective: pro bono advice from private legal practitioners • SD: acknowledge embeddedness in political environment • CF: improve effectiveness of support by the NPO sector and the wider NPO sectoral infrastructure by facilitating the crossing of the boundary between clear and complex domains • DEM: utilise services of advisors and volunteers, sometimes offered by businesses
Governance	<ul style="list-style-type: none"> • Sustainability evaluation: transparency; clearly defined mission; strategic planning • BES perspective: implicit governance through the organisational structure, power relations and conflict resolution; explicit governance through strategic performance management; align hybrid conceptualisation of NPO; avoid mimicry of NPO; coherent ethos • Sustainable organisational model for mature organisations: consider environment, structure, resources and growth phase • VSM: co-evolution with environment; autonomy & cohesion; environmental effectiveness; self-regulation; global governance • SD: address indications of decoupling where good governance to positively influence stakeholders becomes loosely linked to actual activities; address indications of mimicry of NPOs • SSM: performance measures; performance monitoring; performance control • CF: consider different communities and their impact; consider power relations and address them; consider how situation of NPO is framed, take appropriate action, stay aware of risk signals, respond effectively incl. BBBEE, sport as such / educational aid, end-of-life of resources, tenure of trustees, exit strategies • DEM: purposefully iterate between spatial and temporal separation of alternatives and integration of strategy alternatives and develop supportive capabilities for the NPO to become fluid, reflexive and sustainable

Monitoring & evaluation ¹	<ul style="list-style-type: none"> • BES perspective: strategic performance management includes performance evaluation, regulation, decision-making, and planning • Sustainable organisational model for mature organisations: adjust strategies to ensure survival, address uncertainties, realise objectives, and become more sustainable • VSM: accountability and learning • SD: employee competency and commitment contribute to quality products and services, strategic performance management, marketing and reporting, and eventual achievement of aims • SSM: performance measures; performance monitoring; performance control • CF: focus on internal accountability to mission instead of external accountability to stakeholders; responsibility, learning and better performance through sensemaking to clarify diversity of context, negotiate differences, address power dynamics, frame situations • DEM: enhance reflexive self-regulation as part of strategic performance management
Strategy implementation ³	<ul style="list-style-type: none"> • BES perspective: organisational structure aligns employees, management, control and communication, activities and other resources for strategy implementation • VSM supplemented with sustainable organisational model for mature organisations: implement value-based management concept focusing all organisational aspects on mission • SD: strategic performance management (decision-making, planning, regulation, responsiveness, performance evaluation, organisational learning, and effectiveness improvement) involves balancing feedback loops which become vicious cycles if all fields are not aligned with one another starting with the environment, or is not cascaded throughout the organisation to ensure that all fields at all levels are coherent with one other • SSM: consider viewpoints of stakeholders and the implications thereof • CF: guard against falling into chaos or fact-based management by allowing time for reflection and encouraging interaction for patterns to emerge and not fast-tracking problem resolution or opportunity exploitation; seek feedback from external and internal stakeholders and experiment to stimulate innovation without over-analysis of situations or overconfidence in the efficacy of past solutions • DEM: maintain low debt and slow asset-based growth strategy, aligned with Department of Basic Education (DBE) priority goals, and long-term impact
Mission drift	<ul style="list-style-type: none"> • BES perspective: mission describes why NPO exists in terms of what they want to do for external stakeholders, internal stakeholders, and for NPO itself; stakeholders become involved because of mission statement of NPO • VSM supplemented with sustainable organisational model for mature organisations: implement value-based management concept focusing all organisational aspects on mission • Modification of general organisational models for sustainability: tensions among different types of value in hybrid conceptualisation may prioritise financial value over human, natural, physical and social value in the mission statement • SSM: mission addresses needs neglected by business because they cannot be addressed profitably and by government due to insufficient statutory basis or public support

³ Request for continued involvement of researcher beyond research project

ADDENDUM L

EFFECTIVENESS EVALUATION

	<ul style="list-style-type: none"> • CF: carefully disrupt complex situations to become chaotic in order to instil innovation and adaptability for sustainability, then cross the boundary back again by creating a mission attractor to enable a rich variety of patterns to emerge in order to make sense of situations • DEM: regularly adapt strategy based on strategic performance management
Organisational growth	<ul style="list-style-type: none"> • Modification of general organisational models for sustainability: low debt and slow asset-based growth strategy • VSM supplemented with sustainable organisational model for mature organisations: NPO has moved through creativity phase, direction phase, delegation phase, coordination phase, evolved through collaboration phase; leadership crisis persists since creativity phase which prematurely causes growth crisis; NPO does not find outside partners or opportunity to sell itself to bigger organisation but declines • SD: growth strategy must align all fields with one another starting with the environment through productive partnerships and positive stakeholder influence, and cascade throughout the organisation to ensure that all fields at all levels are coherent with one other • SSM: worldviews and growth phases reciprocally shape each other; creativity growth phase of NPO associated with worldview of magical awareness, securing survival of family, and diplomacy • CF: appreciate compatible aims of communities and degree of dissonance necessary for growth • DEM: maintain low debt and slow asset-based growth strategy, aligned with DBE priority goals, and long-term impact
<i>Third sector</i> operation	<ul style="list-style-type: none"> • VSM supplemented with sustainable organisational model for mature organisations: develop capital from an outside-in organisational perspective to contribute to the common good • SSM: consider viewpoints of business and government and the implications thereof • CF: internalise societal issues revealed by boundary critique of business and government • DEM: separate NPO aims from business and government aims
Mentoring of general manager	<ul style="list-style-type: none"> • BES perspective: utilise internal training and development programme of NPO in cooperation with business / NPO sector • VSM: mentoring by trustees • CF: carefully disrupt complicated situations to become chaotic to instil innovation and adaptability for sustainability, then create multiple attractors for the situation to become complex and a rich variety of patterns to emerge in order to make sense of situations and for the general manager to deal with complexity, improve entrepreneurial skills and stakeholder influence and satisfaction, and financial capital
Perceptions about sport	<ul style="list-style-type: none"> • SSM: consider viewpoints of stakeholders and the implications thereof • DEM: sport as game and not as formal sport

ADDENDUM M DESIGN ECOLOGY

Table M-1 Evolved design ecology

Perspective	Entities
Sustainability evaluation	<ul style="list-style-type: none"> • Legal environment: highest level of sustainability • Organisational capacity: highest level of sustainability • Financial viability: evolving level of sustainability • Advocacy: lowest level of sustainability • Product and service provision: highest level of sustainability • Sectoral infrastructure: evolving level of sustainability • Public image: highest level of sustainability
BES perspective	<ul style="list-style-type: none"> • Contextual environment: human, natural, physical, financial and social capital involving number of opportunities and threats • Transactional environment: many stakeholders of whom most have high influence and high satisfaction • Ethos: cultural entropy due to fluctuation between hybrid / contemporary conceptualisation of NPO, mimicry of NPO, misalignment on incentives for being involved, misalignment on fund allocation, interpretation of BBBEE • Aims: telentropy due to lack of guidance, moving targets, misalignments, lack of clarity • Processes: website and social media need updates and monitoring; marketing is lacking to address public perceptions; tension, ambiguity and uncertainty to make sense of the complexity of sustainability due to ethos issues; challenges in strategic performance management; challenges in organisational structure, power relations and conflict; dependence on donations challenges long-term financial viability; social capital under stress due to challenges in ethos, governance, access to government decision-making processes, and cooperation with other parties • Processes sharing activities to achieve different aims supplemented with modification of general organisational models for sustainability: product & service development challenged by tension between different aims, separation of appropriate activities to ensure sustainability, lack of funding to overcome resource shortages, proximity to stakeholders to be further improved, no access to government decision-making processes • Processes achieving similar aims through different activities supplemented with technological, social and organisational models for sustainability: mainly implements archetypes of organisational model for sustainability and to an extent archetypes of technological and social models • Processes supplemented with customised organisational models for sustainability: indicated that NPO should focus on new product & service attributes and functions, but material and energy efficiency rather have to be improved to lower costs • Structure: actual organogram differs from formal organogram; no clear distinctions between core organisational structure, support structure and organisational support structure • Resources: physical capital as material and technological resources, human capital as human and knowledge resources, and natural resources as integration of renewable products and services (social capital considered in continuity of processes); challenge regarding discharge of resources • Governance supplemented with sustainable organisational model for mature organisations: NPO has moved through creativity phase, direction phase, delegation phase, coordination phase and evolves through collaboration phase, but due to leadership crisis prematurely goes through growth crisis and declines back to creativity phase

Perspective	Entities
VSM	<ul style="list-style-type: none"> • Individuals fulfil more than one role while trustees do not have any assigned role • Incoherence in maintenance of harmony among operational units, support of self-regulation, and monitoring of performance • Operational units: require funding to operate properly, expanded responsibilities, trustees become operationally involved • Unit maintaining harmony among operational units: properly prepare for a project after planning and before implementation • Unit supporting self-regulation: require funding to operate properly • Unit monitoring performance: require funding to operate properly, utilise spreadsheet system, donors require additional measurements • Unit scanning the environment for opportunities and threats combined with unit developing the NPO identity, representing the NPO in the wider environment and formulating policies: responsible for continued operation of NPO, reformulate aims of NPO as required, require effective strategy implementation, must address public perceptions, must control organisational growth, require succession planning, obtain funding, strengthened by legal and regulatory environment
SD	<ul style="list-style-type: none"> • Reinforcing feedback loops maintain daily operations while feedback loops in the opposite direction effect quality improvement through strategic performance management • Feedback loop for human resources: attractiveness & retention influenced by remuneration, human resources themselves, recognition and allocation of resources; employees contribute to quality products & services, strategic performance management, marketing and achieving aims; increase in organisational attractiveness does not always lead to increased organisational commitment which indicate decoupling or mimicry of an NPO • Feedback loop for financial viability: assumes contemporary conceptualisation of an NPO; limits to growth archetype for donations regulated by number of available funding sources • Feedback loop for stakeholder relations: success to the successful archetype benefits other NPOs, business and government while influence of the NPO is further eroded; instead of a limits to growth archetype when NPOs attempt to remain apolitical, misaligned political orientations of partners harm reputation of NPOs • Systems diagram converted into stock and flow diagram to develop quantitative simulation model only for product & service provision based on credible quantitative estimates • Feedback loop for product & service provision: high-level view of only product & service provision becomes complicated; quantitative models of donations as a function of overheads assume that higher non-programme costs indicate inefficiency although administrative costs of $\pm 40\%$ of total organisational costs promote organisational sustainability (509); model of Jacobs and Marudas (468) applied based on education sector, high reliance on donations, number of years in operation; quantitative model required of probability that a donor will sponsor a project
SSM	<ul style="list-style-type: none"> • Transforming process: systematic approach to mathematics, making learning hands-on and fun, and empowering teachers • Worldview: worldview of the NPO entails mythical awareness, commitment, organisation, hierarchy, reliability, dependability, self-sacrifice, external focus on the collective, egalitarianism, social awareness, care, friendliness and achievement; summarised by viewpoint of sustainability, impact, change, and empowerment • Actors: NPO • Customers: children

Perspective	Entities
	<ul style="list-style-type: none"> • Environmental constraints: Coronavirus disease of 2019 (COVID-19) pandemic, downgrading and poor performance of national economy, national lack of computer skills, tough competition for donations from local business, difficulty to obtain donations from foreign funding sources, diversity intolerance, complexity of cooperation with international NPOs, corruption, BBBEE criteria, changing social trends, public perceptions, poor infrastructure of regional NPO sector, lack of availability of quality legal services, challenging relations with government, lacking national technology infrastructure, maintenance cost of technology • Owners: NPO, Department of Basic Education (DBE), products and services, sponsors, schools, teachers, community leaders • Activities: programme roll-out process indicating value-based management • Underlying mechanisms: international, national and organisational human, natural, physical, financial and social capital
CF	<ul style="list-style-type: none"> • Historical, cultural and situational context of the NPO: cultural entropy due to misalignment on hybrid / contemporary conceptualisation of NPO, mimicry of NPO, misalignment on incentives for being involved, misalignment on fund allocation • Communities of the NPO: many different communities of whom most operate in the teaching-exclusive domain • Interactions among communities of the NPO: most interactions among communities involve empowerment by the NPO and empowering of the NPO; many communities also have power over the NPO; interactions of intrinsic power also occur • Boundary issues: NPO struggles to manage boundaries e.g. between hybrid and contemporary conceptualisations, mimicry of an NPO, implementation of BBBEE, cooperation with different stakeholders, end-of-life of resources; exit strategies re. trustees, donors • Turbulence: reinforcing feedback loops maintaining daily operations cause feedback loops in the opposite direction implementing quality improvement through strategic performance management; stakeholders experiencing benefits cause others to experience uncontrolled loss of value; tensions among human, natural, physical, financial and social capital; tension between current and future orientations and internal and external perspectives; maintaining the ethos of the NPO and interactions with their transactional environment cause unintended consequences which reconstitute the ethos and interactions; internal accountability to the mission of the NPO causes external accountability to stakeholders
DEM	<p>Implicit tensions:</p> <ul style="list-style-type: none"> • Organising: lack of guidance and clarity; government regulations; lack of funding hampers marketing required to raise donations and revenue; funding required to overcome resource shortages; lack of fixed investments to survive; organisational structure; challenges in contextual environment • Identity: contemporary and hybrid conceptualisations; misalignment among stakeholders; trustees lack social capital to identify donors, be well-connected and collaborate; trustees do not drive aims, render required support, attend meetings, or have clear role assignments; trustees are politically and financially motivated; legal portfolio • Performing-organising: means to generate funds and achieving the aims of the NPO; different focuses aligned with different processes and restricting processes; linking sustainable impact to commercial success; public perceptions; do not account for total cost of operation; strategic performance management regarding strategy, organisational growth and monitoring & evaluation • Performing: multiple stakeholders; short-term success and long-term sustainability; different aims; separate activities to ensure sustainability • Performing-learning: innovation to embed sustainability into aims; succession planning • Identity-organising: equitable remuneration system • Organising-learning: moving targets

Perspective	Entities
	<ul style="list-style-type: none"> • Explicit tensions broadly categorised according to BES perspective and mainly involve governance (including leadership) and environment and stakeholders, and also ethos, aims, processes, structure and resources especially financial resources • Enhance paradox mindsets through study • Organisational dynamic capabilities include achievement of different sustainability aims through an integrative approach, improvement of natural capital by not wasting resources, implementation of value-based management focusing on the mission, agility to adapt strategies and objectives • Addressing paradox through study