

Programme risk management: challenges and proposed solutions

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Graduation ceremony: December 2020


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DECLARATION

I, Emmanuel Mulambya, hereby declare that 'Programme risk management: challenges and proposed solutions' is my own work and that the views and opinions expressed in this thesis are my own and those of the authors as indicated in the text and in the reference list.

I further declare that this thesis has not been submitted to any other academic institution for degree or qualification purposes.

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Signed.....

11 August, 2020

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Dear Sir,

Confirmation of Language Edit completed on the PhD thesis of E Mulambya

This letter serves as formal confirmation that a language and grammar edit was completed by Dr Graham Baker of Kerlick Academic Services on the main text of the PhD degree thesis entitled "Programme risk management: challenges and proposed solutions" by E. Mulambya.

Yours sincerely



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PREFACE

The reader is reminded of the following when reading this thesis:

- The editorial style in all the chapters of this thesis follows the format prescribed by the *Manual for Master's and Doctoral Studies*, which was approved by the Senate of the North-West University for use by postgraduate students of the University.
- The references in this thesis follow the format prescribed by the *Publication Manual* (7th edition) of the American Psychological Association (APA).
- This thesis is submitted in the form of three research articles, to be read as an integrated narrative of this research project. The articles may be reworked as independent articles for publication.

At the time of submitting this thesis for examination, the manuscript of Article 1 (Chapter 2) was under peer review by the *African Journal of Science, Technology, Innovation and Development* (AJSTID) and a decision had not been made to publish, nor not to publish, this article in the *Journal*. Article 2 (Chapter 3) (Southern African programme risk management challenge priorities and suggested improvements: An empirical descriptive study) and Article 3 (Chapter 4) (Addressing southern Africa's programme risk management skills challenges) had not been submitted to any journal. As none of the three articles had been published, this thesis follows the editorial style prescribed by the *Manual for Master's and Doctoral Studies* of the North-West University.

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ABSTRACT

Title: Programme risk management: challenges and proposed solutions

Programme management is increasingly being used by organisations to deliver strategic change. Consequently, the importance of programme risk management to support programme management in the delivery of capital infrastructure initiatives in the public and private sectors is now widely acknowledged. However, implementing the principles of *programme* risk management presents challenges that differ from those of the more researched area of *project* risk management. The aim of the present research was to explore the literature on programme risk management challenges and report those experienced in southern Africa, with the ultimate aim of proposing possible solutions. To reach this objective, three research studies were conducted.

The first study (Article 1) was a qualitative exploratory investigation on programme risk management challenges based on a review of the literature, followed by semi-structured interviews with programme management practitioners on their perceptions of these challenges. Inductive thematic analysis of the study data led to the creation of a literature- and practitioner-informed risk culture-based model of these challenges in southern Africa. This model provides a novel diagrammatic view of the relationship between programme risk culture, programme risk management execution, and programme risk management maturity. The model further facilitates a holistic understanding of programme risk management demands, the satisfaction of which is expected to assist with the successful delivery of programmes. The model and its accompanying codebook provide a framework and a tool for (1) academics to position and structure programme risk research and for (2) programme risk practitioners to evaluate their management practice.

This led to the second study (Article 2), which followed a quantitative, descriptive approach. The purpose was to identify priority areas for improvement of southern African programme risk management challenges, based on the ranking of these challenges as identified from the first study's model. A professional association serving project managers in southern Africa provided access to its members, who represented different economic sectors. A total of 42 survey responses were analysed and provided a new, data-informed ranking of programme risk management challenges. Programme risk management skills demanding improvement were identified as the principal needs to be addressed in order for programme risk management to be able to be enhanced in the region.

The third study (Article 3) was a qualitative exercise aimed at exploring ways to address challenges related to programme risk management skills in southern Africa. It was based on a review and analysis of the skills-related literature, followed by semi-structured interviews to examine specific skills required to improve programme risk management in organisations. Purposeful sampling was used to select 15 interviewees with programme management experience across different southern African economic sectors. Inductive reflexive thematic analysis of the study data led to recommendations for areas of the skills improvement sought, and the creation of a programme risk management specification framework. Addressing these skills challenges in the subcontinent requires both training and non-training interventions. The programme risk management specification framework developed in this study allows for the proper definition of programme risk management within individual organisations, and measures to improve these management skills across a range of sectors. Recommendations are made for programme risk management research and practice in future.

Keywords: Programme risk management in southern Africa, Programme risk management challenges, Programme risk culture, Programme risk management, Programme risk management skills in southern Africa, Programme risk management skills challenges in southern Africa, Programme risk management specification

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

This thesis focuses on exploring programme risk management challenges described in the literature and experienced in practice in southern Africa; and subsequently proposes ways to address these challenges.

The aim of this chapter is to briefly provide an overview of the study, which is discussed in detail in the three articles contained in Chapters 2, 3 and 4. The three articles are presented as an integrated narrative of this study, which could be reworked as independent articles for publication. This chapter also provides an overview of the research methods, data collection methods, data analysis strategies, and ethical considerations that were employed in this study. Furthermore, this chapter concludes with an outline of the division of the chapters comprising this thesis.

1.1 The rationale of the study

In this study, programme management is defined as the centralised coordinated management of a programme to achieve its strategic objectives and benefits (PMI, 2017). Programme management is increasingly being used in organisations to deliver strategic change due to the dynamic nature, societal requirements and cost implications of project-based programmes (Lycett et al., 2004; Pellegrinelli et al., 2007; Shehu & Akintoye, 2009). Consequently, the importance of programme risk management – as a supporting process of programme management in the delivery of capital infrastructure programmes in the public and private sectors – is now widely acknowledged. However, implementing programme risk management principles in practice presents challenges that differ from those of the more researched area of project risk management (Smith et al., 2008). This is an academic area that has not been studied in detail, especially compared with the wealth of project risk management literature available to project management practitioners, as described in Article 1. The aim of this study therefore was to explore programme risk management challenges described in the literature, and experienced in practice in southern Africa, with the ultimate aim of proposing possible solutions for addressing these challenges.

1.2 Problem statement

Implementing programme risk management principles in practice presents unique challenges not experienced in project risk management (Aritua et al., 2010; Hillson, 2008; Smith et al., 2008). Furthermore, compared to *project* risk management, *programme* risk management is

relatively underdeveloped and underrepresented in the academic literature (Rasheed et al., 2015; Sanchez et al., 2009). Published programme risk management research or literature originating in developing countries is scarce; I could not find any published programme risk management research literature specific to southern Africa. Southern African literature has been published on other types of risk management – such as project risk management, drought risk management, enterprise risk management, and financial risk management – but none on programme risk management in this region. In this study, I focused on exploring the challenges experienced in implementing programme risk management in the subcontinent, as this provides a logical starting point for strengthening the implementation of programme risk management in the region.

Accordingly, the following research questions were formulated for this study:

- Which programme risk management challenges are described in the literature? (Article 1)
- Which programme risk management challenges are experienced in practice in southern Africa? (Article 1)
- How do these challenges relate to each other? (Article 1)
- Which programme risk management challenges need to be addressed first to improve programme risk management in southern Africa? (Article 2)
- How could programme risk management skills challenges be addressed in southern Africa? (Article 3)

1.3 Research objectives and outcomes

Based on these research questions, I explored programme risk management challenges as described in the literature, and experienced in practice in southern Africa, and propose solutions for addressing these challenges. This study consisted of three separate research investigations within the larger overarching enquiry. These studies are described in the three articles provided in Chapters 2, 3 and 4 of this thesis. A summarised overview of each article is provided below.

The specific objectives of each study were:

Article 1 (Chapter 2): A literature- and practitioner-informed model of programme risk management challenges as experienced in southern Africa

The aims of Article 1 were to qualitatively explore:

- Programme risk management challenges described in the literature.

- Programme risk management challenges as experienced in practice in southern Africa.

This study produced a southern African programme risk management challenges model that corresponded to the challenges reported in the international literature. The model provides a novel practitioner-informed diagrammatic view of the relationship between programme risk culture-related challenges, programme risk management execution and programme risk management maturity.

Article 2 (Chapter 3): Southern African programme risk management challenge priorities and suggested improvements: An empirical descriptive study

The study findings described in Article 1 allowed for an empirical survey-based investigation to further investigate the relative priorities of the southern Africa-specific challenges identified in the initial investigation. This study therefore aimed to identify and describe priority areas of programme risk management improvement based on a ranking of the challenges contained in the model, combined with consideration of the nature of these challenges.

The main study outcome was that programme risk management skills emerged as the challenge that needs to improve first, to allow for enhancement of programme risk management in the subcontinent.

Article 3 (Chapter 4): Addressing southern Africa's programme risk management skills challenges

Article 2 was followed by a review of the literature on addressing skills challenges in general, and an interview-based qualitative study, with the objective to explore ways to address skills challenges, based on the academic literature and other documents, and proposes suggestions for programme risk management future research and practice.

Key outcomes of the study were recommendations for addressing programme risk management skills challenges in southern Africa and a corresponding specification framework.

This study revealed foundational requirements to addressing programme risk management skills challenges and provides a basis for future research on the subject.

1.4 Literature reviews for Articles 1, 2 and 3

This study entailed three separate investigations as described in Article 1 (Chapter 2), Article 2 (Chapter 3) and Article 3 (Chapter 4). In preparation for this study, an initial literature review was undertaken to gain insight into the state of current knowledge concerning challenges to

programme risk management. This was followed by the in-depth review described in Article 1, which provided the basis for the rest of the study. A further review, described in Article 3, was carried out to address skills challenges in general, and programme risk management skills challenges in particular.

1.5 Research design

According to Creswell (2013, p. 5), research design refers to the entire process of research from conceptualising a problem to writing research questions, data collection, analysis, interpretation, and report writing. Yin (2009, p. 29) comments that research design is the logical sequence that connects the empirical data to a study’s initial research questions and, ultimately, to its conclusions. Thus, simply stated, research design is the plan for conducting the study described in this thesis.

This study was sequentially organised in three separate studies, which are illustrated schematically in Figure 1.

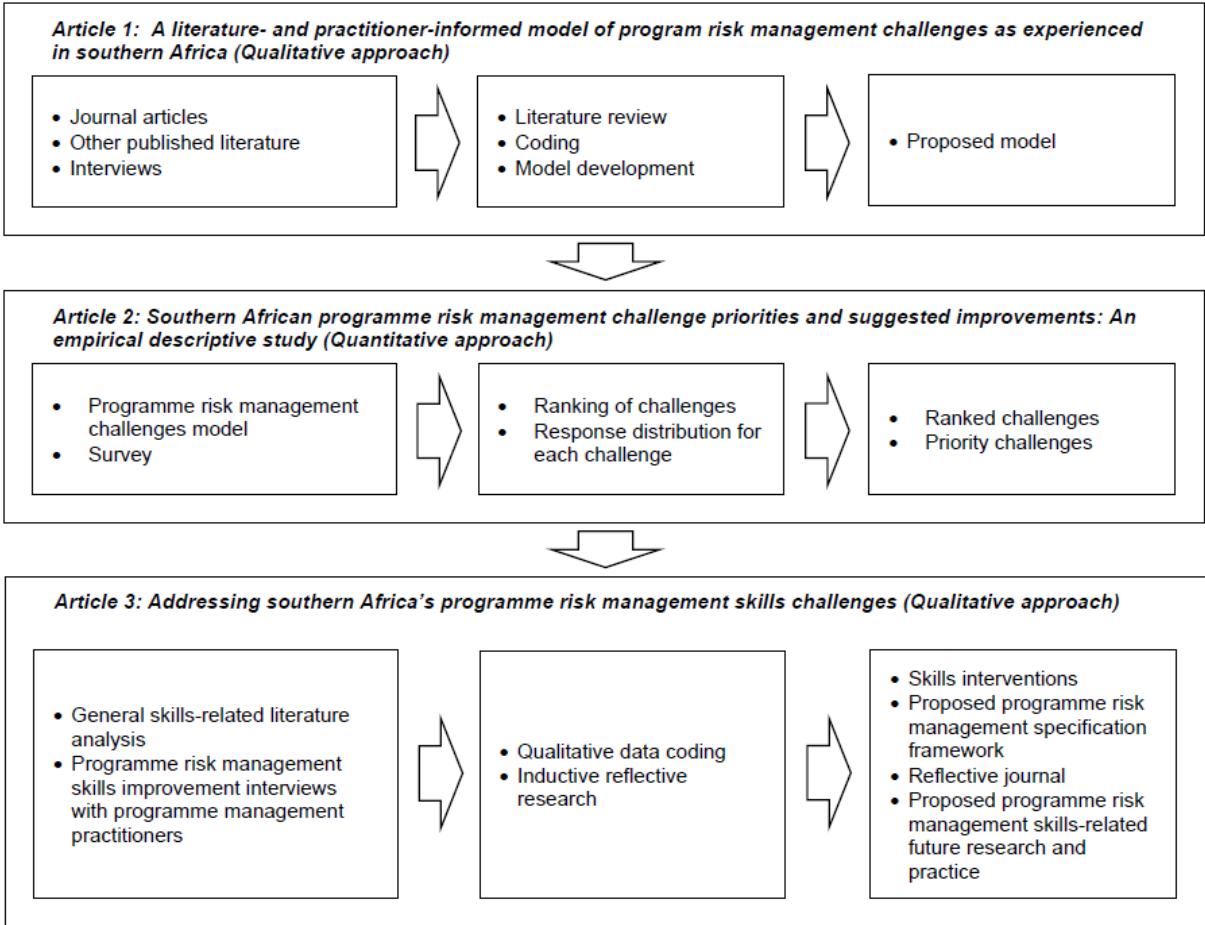


Figure 1. A visual summary of the approaches and methods of this study.

The research methods of the three separate investigations are presented next, beginning with a summary of the research approach for each study.

1.6 Research approach

Article 1 (Chapter 2)

This involved a qualitative approach based on a literature review, semi-structured interviews, and qualitative data coding. This study followed an inductive thematic analysis approach, which is a process of coding the data without trying to fit the data into a pre-existing coding framework (Braun & Clarke, 2006). This means that the themes identified were strongly linked to themes in the interview data, which led to the creation of a risk culture-based model of programme risk management challenges.

Article 2 (Chapter 3)

This was a quantitative descriptive research study, which is a type of research that aims to observe or examine a situation by describing important factors associated with it (Kelley et al., 2003; Saunders et al., 2009, p. 444). In this study, a survey was created: (1) to identify the priority programme risk management challenges in southern Africa based on a ranking of these challenges, and (2) to investigate how programme risk management in southern Africa could be improved, based on the opinions of a relatively large group of participants in the region on the literature- and interview-based information from Article 1 (Chapter 2).

Article 3 (Chapter 4)

This study followed a qualitative approach based on a literature review that addressed skills challenges in general, and on open-ended interviews with programme management practitioners in southern Africa. This approach was adopted to investigate how these skills challenge could be addressed in the region.

1.7 Participants

Article 1 (Chapter 2)

Permission to conduct the first study of this research project was obtained from the Economic and Management Sciences Research Ethics Committee (EMSREC) of the North-West University (ECONIT-2017-032). Purposeful sampling was employed to achieve the aim of the study. Participants were specifically selected because they could inform an understanding of this study's research problem (Creswell, 2013, p. 156; Suri, 2011). Table 1 provides the demographic profile of the 10 participants drawn from different organisational sectors in southern Africa.

Table 1*Demographic profile of participants featured in Article 1 (n = 10)*

Demographic characteristic		Total	Frequency (%)
Age in years	30–39	2	20
	40–49	6	60
	50–59	1	10
	>60	1	10
Highest qualification	Bachelor's degree	2	20
	Postgraduate degree	7	70
	Other [specify]	1	10
Level of experience in, or exposure to, programme management, in years	<5	1	10
	5–10	3	30
	>10	6	60
Role or position	Executive	4	40
	Senior management	6	60

Article 2 (Chapter 3)

The survey for the second study was delivered to the members of a project management professional association, to allow for a broad view of the status of programme risk management. The professional association used in this study has an active membership of about 1300. As programme risk management is a new area of interest in the project management community, the survey attracted a low number of 42 responses, attributed to the small number of persons with experience of programme management in the subcontinent. Table 2 shows the demographic profile of the Article 2 participants.

Table 2*Demographic profile of participants featured in Article 2 (n = 42)*

Demographic characteristic	Demographic variable	Frequency	Percentage
<i>Participant employment sector</i>	Oil and gas (petrochemical)	5	12
	Mining and quarrying	0	0
	Government and public services	8	19
	Capital projects and infrastructure	17	40
	Other	12	29
Total		42	100

Demographic characteristic	Demographic variable	Frequency	Percentage
<i>Participant programme- management- related years of experience</i>	Less than or equal to 1 year	2	5
	More than 1 and less than or equal to 5 years	8	19
	More than 5 and less than or equal to 10 years	13	31
	More than 10 years	19	45
Total		42	100

Article 3 (Chapter 4)

In Article 3, I employed purposeful sampling. Potential participants were therefore selected based on my expectation that they could contribute to the study given their programme-related work experience (Creswell, 2013, p. 156; Suri, 2011). Table 3 provides the profile of the 15 participants, drawn from different organisational sectors in southern Africa, all of whom had more than 10 years' experience of programme risk management.

Table 3

Demographic profile of participants surveyed in Article 3 (n = 15)

Demographic characteristics	Demographic variable	Frequency	Percentage
<i>Participant's employment sector</i>	Oil and gas (petrochemical)	3	20
	Government and public services	3	20
	Capital projects and infrastructure	7	47
	Other	2	13
Total		15	100

1.8 Data collection methods

Article 1 (Chapter 2)

Data for Article 1 were collected from selected literature and 10 semi-structured interviews with programme management practitioners in southern Africa. Permission to conduct the study was obtained from the Economic and Management Sciences Research Ethics Committee (EMSREC) of the North-West University (ECONIT-2017-032).

Article 2 (Chapter 3)

Data collection was executed through an online survey administered by a project management association. Permission to conduct the research was obtained from the Economic and Management Sciences Research Ethics Committee (EMSREC) of the North-West University (NWU-00759-19-A4).

Article 3 (Chapter 4)

Data for Article 3 were collected through 15 open-ended interviews with programme management practitioners in southern Africa. The permission to conduct this interview-based study (ECONIT-2017-032), obtained earlier, also covered this aspect of the research.

1.9 Data analysis methods

Article 1 (Chapter 2) and Article 3 (Chapter 4)

The literature and interview data for these two studies were analysed and interpreted using a qualitative coding process. Each code represents a study-relevant characteristic from the literature and the interview data (Collis & Hussey, 2014, p. 162). A constant comparative method of qualitative analysis was used in the coding process by coding the interview data per interview question (Glaser, 1965). Thus, any newly collected data were compared with previously collected data from earlier interviews. This process was continued until no new codes could be found in the data. This implied that adequate data saturation had been reached from the interviews (Saunders et al., 2009, p. 590).

Article 2 (Chapter 3)

Descriptive statistical analyses were performed using Microsoft Excel 2016. Programme risk management challenges were ranked based on the number of responses from participants “on which programme risk management challenge needs to improve first”. The ranking was conducted independently of the descriptive statistics, which included the mean, the standard deviation (SD), relative standard deviation (RSD), minimum (Min), maximum (Max), median, mode and skewness values of the scores.

1.10 Ethical considerations

Saunders et al. (2009, p. 600) define ethics as the appropriateness of the researcher’s behaviour in relation to the rights of those who will be part of the research process and who will be affected by it. There is therefore a responsibility on the part of the researcher towards participants and the institution under whose auspices this research was carried out.

Responsibility towards participants

The researcher ensured that participants were treated with respect and dignity. The researcher further guaranteed that participants understood what was expected of them, that their participation was voluntary and that they had the prerogative to withdraw from the study at any time. All the participants signed a consent form as required by the North-West University Economic and Management Sciences Research Ethics Committee (EMSREC).

The research approach and methods employed in this research project took into consideration ethical concerns of the persons and organisations participating in the component studies, so that their individual and corporate interests would be protected to the greatest degree possible. This meant that the research was carried out in a manner that was morally defensible to everybody who participated in this research. These considerations were actively taken into account throughout the research project.

Anonymity and confidentiality

Possible issues of anonymity and confidentiality – which were guaranteed to participants in the research – were addressed during data collection. Anonymity is the assurance, given to participants and organisations, that they will not be named in the research (Collis & Hussey, 2014, p. 33). Confidentiality is the assurance, also given to participants and organisations, that the information provided will not be traceable to the individual or organisation providing the information (Collis & Hussey, 2014, p. 33).

In the quantitative study (Article 2), the survey was set up for anonymous data collection. This meant that the participants' identities were not known to the researcher. In addition, anonymity and confidentiality were further guaranteed by reporting the results in aggregated format, and modifying any further possible personally identifying information provided by participants, such as employment sector combined with years of experience in programme management.

In the qualitative studies (Article 1 and Article 3) where participants are known, the results were also aggregated and anonymously reported. Care was taken to ensure that no individual participant or organisation could be identified. Addressing the privacy of participants can encourage open and honest participation in a study.

Responsibility towards the University: Faculty ethical clearance

The ethical considerations stated above were extended to all references, citations, quotations and acknowledgement of those who contributed to this research. The ethical clearance numbers, reported earlier, were obtained from the North-West University under whose authority this research was undertaken. This study was executed with the approval of the North-West University Economic and Management Sciences Research Ethics Committee (EMSREC).

1.11 Division of chapters

Chapter 1: Introduction and background to the study

Chapter 2: Research Article 1 – A literature- and practitioner-informed model of programme risk management challenges.

Chapter 3: Research Article 2 – Southern African programme risk management challenge priorities and suggested improvements: An empirical descriptive study.

Chapter 4: Research Article 3 – Addressing southern Africa’s programme risk management skills challenges.

Chapter 5: Conclusions, contributions, limitations, recommendations and reflexive journal.

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CHAPTER 2

RESEARCH ARTICLE 1

**A literature- and practitioner-informed model of programme risk management
challenges as experienced in southern Africa**

Abstract

Executing capital infrastructure programmes is risky due to the difficulties and complexity inherent in implementing and managing large project-based enterprises. This requires programme risk management skills, whose exercise is under-researched and underdeveloped in practice. The purpose of this qualitative study was to explore the demands of programme risk management described in the literature and practically experienced in southern Africa. The study was based on a literature review on programme risk management, followed by semi-structured interviews with southern African programme management practitioners on their challenges. Inductive thematic analysis of the study data led to the creation of a literature- and practitioner-informed risk-culture-based model of these challenges. The model provides a novel diagrammatic view of the relationship between programme risk culture, programme risk management execution, and maturity. The model facilitates also a holistic understanding of programme risk management demands, expected to assist with the successful delivery of these programmes. The codebook, developed in this study, and the model together provide a framework and a tool for (1) academics to position and structure their research and (2) practitioners at work to analyse and evaluate their programme risk management practice.

Keywords: Programme risk management in southern Africa, Programme risk management challenges, Programme risk culture

1. Introduction

Programme management is increasingly being used internationally as an organisational tool to deliver strategic change. Consequently, the importance of programme risk management to support programme management is now widely acknowledged. However, despite significant risks associated with large project-based programmes, the field of programme risk management remains underdeveloped in practice and academically (Aritua et al., 2010; Hillson, 2008; Rasheed, Wang, & Yaqub, 2015; Sanchez et al., 2009). Implementing *programme* risk management principles presents challenges that are different from those of *project* management (Smith et al., 2008). Such demands complicate the development and implementation of a generally accepted framework for programme risk management, and more academic work in this field is needed.

The objective of the qualitative study described here was therefore to explore programme risk management challenges as described in the literature and as experienced in practice in southern Africa. The research questions of this study were: (1) which programme risk management challenges are described in the literature, (2) which programme risk management challenges are experienced in practice in southern Africa, and (3) how do these challenges relate to each other? This study started with a literature review to provide a qualitative basis for developing a model of programme risk management demands. Subsequently, semi-structured open-ended interviews were conducted with project and programme management practitioners drawn from different organisational sectors in southern Africa, to obtain independent information on their corresponding experiences. The findings from the interviews were then compared with those from the literature to develop a consolidated model of programme risk management challenges, to provide theoretical and practical insights into this increasingly important topic.

This article is structured as follows. Definitions used and the link between project, programme and portfolio risk management are provided in Section 2. The study's research methodology is described in Section 3. The findings from the literature and the interviews are presented in Section 4; and conclusions on the contribution of the study to the academic literature and programme risk management practice are drawn in Section 5.

2 Research background

2.1 Definitions used in this study

The terms programme and programme management have multiple definitions (Shehu & Akintoye, 2010; Thiry, 2002). However, for the purpose of this study, the definitions provided by the Project Management Institute (PMI) (Table 1) were adopted because of their dominance

in the field. These definitions highlight the link between programme management and the attainment of strategic objectives and benefits in contrast with the typical on-time, on-budget and on-specification criteria for success associated with project management.

Table 1
Definitions employed in this study

Terminology	Definition	Source
Project	A project is a temporary endeavour undertaken to create a unique product, service or result.	PMI (2017a)
Programme	A programme is defined as related projects, subsidiary programmes, and programme activities managed in a coordinated manner to obtain benefits not available from managing them individually.	PMI (2017b)
Portfolio	A portfolio is defined as projects, programmes, subsidiary portfolios, and operations managed as a group to achieve strategic objectives..	PMI (2017a)
Project management	The application of knowledge, skills, tools and techniques to project activities to meet project requirements.	PMI (2017a)
Programme management	The centralised coordinated management of a programme to achieve its strategic objectives and benefits.	PMI (2017b)
Portfolio management	The centralised management of one or more portfolios to achieve strategic objectives.	PMI (2017a)

2.2 A theoretical link between project and portfolio risk management

The definitions of programme and programme management in Table 1 indicate that programme management (1) integrates individual projects in a programme to realise its strategic objectives and benefits; (2) is strategic in nature, whereas project management is tactical in character, and (3) focuses on multiple projects and their interdependencies, whereas project management emphasises implementing single projects. The requirements for programme management are therefore different from project management implying that one should not be regarded as an extension or subsidiary of the other (Artto et al., 2009; Hillson, 2008; Pellegrinelli, 2010; Shehu & Akintoye, 2009; Smith et al., 2008).

Standard *project* management approaches are therefore inadequate for the delivery of *programmes* consisting of multiple projects in complex and changing environments (Aritua et al., 2010; Pellegrinelli & Partington, 2006; Sanchez et al., 2009). Project-based programmes form an essential component of the strategic delivery of project portfolios, as programme

management provides a bridge between project delivery and achieving an organisation's portfolio strategy (Lycett et al., 2004; Nieto-Morote & Ruz-Vila, 2011; Olsson, 2008; Pellegrinelli & Bowman, 1994; Pellegrinelli & Partington, 2006; Pellegrinelli et al., 2007; Rauner et al., 2013; Shehu & Akintoye, 2009; Ward & Chapman, 2003).

The main aim for managing programme risks in organisations is to enable programmes to meet their objectives. Programme risk management therefore forms a crucial part of programme management. Given the differences between programme and project management outlined above, project risk management techniques are inadequate for programme risks (Aritua et al., 2010; Hillson, 2008; Smith et al., 2008). Customised programme risk management processes and procedures are therefore required. Programmes are risky undertakings, however, and yet their risk management is relatively underdeveloped (Aritua et al., 2010; Hillson, 2008; Rasheed, Wang, & Yaqub, 2015; Sanchez et al., 2009). To add to the academic body of knowledge on programme risk management, this study investigated and elaborates on the challenges of programme risk management described in the literature and experienced in practice.

3 Research methods

3.1 Research approach

Figure 1 summarises the approach followed in this study based on a literature review, semi-structured interviews, and qualitative data coding. Coding refers to the process of aggregating data into categories or themes of information that share a common characteristic (Collis & Hussey, 2014, p. 162; Creswell, 2013, p. 184). I followed an inductive thematic analysis approach, in which data coding themes were identified from the literature and interview data without relying on a pre-existing coding framework (Braun & Clarke, 2006). These themes led to the creation of a model of programme risk management challenges.

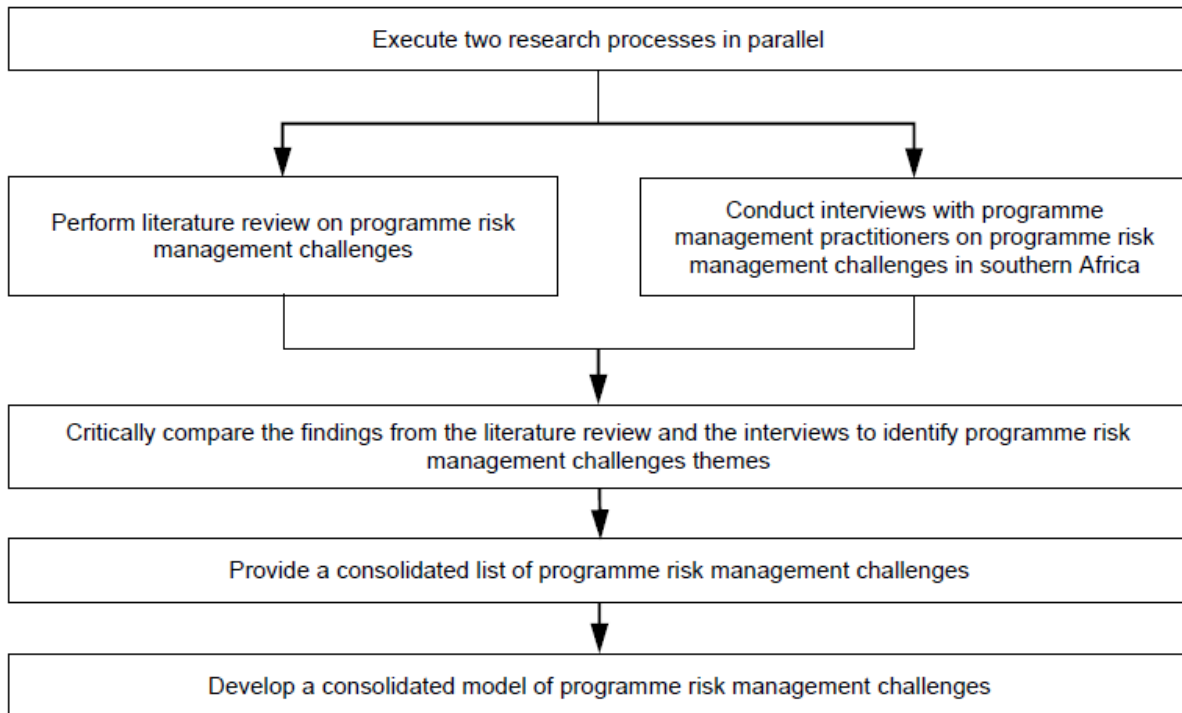


Figure 1: The research approach employed in this study.

3.2 Literature review

I first identified programme risk management literature published by international organisations and journals specialising in project, programme and portfolio management. Using inductive thematic analysis, an initial list of programme risk management challenges was created from the academic literature. These international challenges were used as baseline to compare the challenges reported by programme risk management practitioners in southern Africa. Table 2 provides an overview of the articles that formed part of the literature review.

Table 2

An overview of the articles included in the literature review

No	Article	Title	Journal	Indexed by
1	Aritua et al. (2010)	What risks are common to or amplified in programmes: Evidence from UK public sector infrastructure schemes	International Journal of Project Management	ISI, Scopus
2	Artto et al., (2009).	Foundations of program management: A bibliometric view.	International Journal of Project Management	ISI, Scopus
3	Bowen (2009).	Document Analysis as a Qualitative Research Method	Qualitative Research Journal	Scopus
4	Braun and Clarke (2006)	Using thematic analysis in psychology.	Qualitative research in psychology	ISI, Scopus

No	Article	Title	Journal	Indexed by
5	Hillson (2008)	Towards programme risk management	2008 PMI Global Congress Proceedings, Denver, Colorado, USA	
6	Lycett et al. (2004).	Programme management: a critical review	International Journal of Project Management	ISI, Scopus
7	Olsson (2008)	Risk management in a multi-project environment	International Journal of Quality & Reliability Management	Scopus
8	Papadak et al. (2014)	Essential Factors that Increase the Effectiveness of Project/Programme Risk Management	Procedia - Social and Behavioral Sciences	
9	Pellegrinelli (1997)	Programme management: organising project-based change	International Journal of Project Management	ISI, Scopus
10	Pellegrinelli (2010)	What's in a name: Project or programme?	International Journal of Project Management	ISI, Scopus
11	Pellegrinelli and Bowman (1994)	Implementing strategy through projects	Long Range Planning	ISI, Scopus
12	Pellegrinelli and Partington (2006)	Pitfalls in taking a project-based view of programmes	Proceedings of PMI Global Congress EMEA	
13	Pellegrinelli et al. (2007)	The importance of context in programme management: An empirical review of programme practices	International Journal of Project Management	ISI, Scopus
16	Rasheed et al. (2015)	Risk Leveling in Program Environments—A Structured Approach for Program Risk Management	Sustainability	
17	Rasheed et al. (2014)	Risk Balancing in the Programmes – An Application in the Telecom Domain.	International Journal of u- and e-Service, Science and Technology	
18	Rasheed et al. (2015)	Towards Program Risk Management and Perceived Risk Management Barriers	International Journal of Hybrid Information	
19	Rauner et al. (2013)	Portfolio and Programme Management Denystified: Managing multiple projects successfully (Second edition)	Taylor & Francis Group	
20	Sanchez et al. (2009)	Risk management applied to projects, programs, and portfolios	International Journal of Managing Projects in Business	ISI, Scopus
21	Sanchez et al. (2008)	A project portfolio risk-opportunity identification framework	Project Management Journal	ISI, Scopus
23	Shehu and Akintoye (2009)	Construction programme management theory and practice: Contextual and pragmatic approach	International Journal of Project Management	ISI, Scopus
24	Shehu and Akintoye (2010)	Major challenges to the successful implementation and practice of programme management in the construction environment: A critical analysis	International Journal of Project Management	ISI, Scopus
25	Shi et al. (2014)	Delivery risk analysis within the context of program management using fuzzy logic and DEA: A China case study	International Journal of Project Management	ISI, Scopus
26	Smith et al. (2008)	A Complexity Science Based Approach to Programme Risk Management	White Rose Online Research	
26	Teller (2013)	Portfolio Risk Management and Its Contribution to Project Portfolio Success: An Investigation of Organization, Process, and Culture	Project Management Journal	ISI, Scopus

No	Article	Title	Journal	Indexed by
27	Thiry (2002)	Combining value and project management into an effective programme management model	International Journal of Project Management	ISI, Scopus
28	Ward and Chapman (2003)	Transforming project risk management into project uncertainty management	International Journal of Project Management	ISI, Scopus

3.3 Interviews

In parallel to the literature study, open-ended programme risk management challenge questions were formulated aimed at identifying actual challenges experienced by project and programme managers working in southern Africa. The aim of these questions was to obtain independent, practitioner-based information to see whether the internationally reported challenges also hold in the subcontinent. This was done using open-ended interviews, without including the findings of the literature review to avoid influencing the participant responses.

The interviews were voice recorded and later transcribed for the purpose of data analysis. The interview data were then coded and interpreted, using the constant comparative method of qualitative analysis (Glaser, 1965). Thus, any newly collected data were compared with those previously collected from earlier interviews. This process continued until there were few new thematic codes found in the data. This point was reached after the eighth interview, beyond which only two new codes were generated. Ten interviews proved to be sufficient for this study as little new information emerged after the eighth interview, implying that adequate levels of data saturation had been achieved to satisfy the aims of this study.

3.4 Interview questions

Table 3 provides the five questions that formed the basis of the interviews. Question 1 was used to evaluate whether a common definition and a common understanding of programme risk management is used in practice. Question 2 sought to assess the experience in programme risk management of the participants in contrast to project risk management. Question 3 identified programme risk management challenges, including what works well in the process. This question sought to identify current areas of excellence that could inform solutions to programme risk management challenges. Question 4 elicited additional information that supplemented the first three questions with particular emphasis on improving the application of programme risk management. Question 5 was used to allow the participants to expand on their views on programme risk management.

Table 3*Interview questions*

No.	Question
1	How is the term programme risk management defined in your organisation?
2	How are you involved in programme risk management?
3	Tell me about your experience with programme risk management. In your opinion: a) What works well? b) What does not work well with programme risk management? c) What are the causes of programme risk management not working well?
4	According to the Project Management Institute (PMI, 2017b), programme risk management is a supporting process of programme management. With reference to your organisation, what do you think could assist with the improvement of the implementation and use of programme risk management?
5	Anything else or any other opinions on programme risk management?

3.5 Notation used in the analysis of the interview data

Table 4 lists the notation used in the analysis of the interview data of this study. For example, I1-Q1 refers to interviewee number 1 and question number 1; I10-Q5 refers to interviewee number 10 and question number 5.

Table 4*Notation used in the representation of the interview data*

Notation	Description or meaning
I	Interviewee
Q	Question
n	Interviewee number (from 1 to 10) or Question number (from 1 to 5)

3.6 Interviewee profiles

As indicated in Table 4, each interviewee was assigned a number from 1 to 10. Purposeful sampling was employed to achieve the aim of the study. Participants were specifically selected because they could inform an understanding of this study's research problem (Creswell, 2013, p. 156; Suri, 2011). Table 5 provides the demographic profile of the 10 interviewees drawn from different organisational sectors in southern Africa. The interviewees were either in executive or in senior management positions. The group therefore had sufficient experiences to inform this study. The findings of the literature review and the interviews are presented in the next section.

Table 5*Interviewee profiles*

Demographic characteristics		Total	Frequency
Age in years	30–39	2	20%
	40–49	6	60%
	50–59	1	10%
	>60	1	10%
Highest qualification	Bachelor's degree	2	20%
	Postgraduate degree	7	70%
	Other [specify]	1	10%
Level of experience in, or exposure to, programme management in years	<5	1	10%
	5–10	3	30%
	>10	6	60%
Role or position	Executive	4	40%
	Senior management	6	60%

Subsequently, the interview-based thematic codes were compared to, and consolidated with, the literature-based thematic codes, thereby allowing for a comprehensive interpretation of programme risk management challenges in southern Africa.

3.7 Enhancing the credibility of the study

An important characteristic of qualitative research is that the researcher can influence the outcomes of the research. One should therefore recognise the possibility of introducing researcher bias in the findings and their interpretation. A peer-review process, in which the study supervisor continually asked questions on the method and interpretations of the study results, was therefore used as an external check on the research process to mitigate against such biases.

The credibility of the study was further enhanced by employing member checking, also called participant validation (Harper & Cole, 2012), in which the researcher solicits participants' views on the credibility of the findings and interpretations (Creswell 2013, p. 252). The findings of this study were made available via email to two of the ten interviewees for comment and their views

were incorporated in the study findings and conclusions. The other eight participants were not available for participant validation.

Thus, this study's rigour and credibility were improved by using literature review and interviews as independent research processes, supervisor reviews during the project, and participant validation.

4 Findings

4.1 Literature review findings

The literature related to programme risk management reveals the underdeveloped nature of the field. For example, the terms programme and programme management were found to be inadequately standardised, with different context-based interpretations (Hillson, 2008; Lycett et al., 2004; Pellegrinelli, 1997, 2010; Pellegrinelli & Bowman, 1994; Shehu & Akintoye, 2010). Also, processes and practices specifically developed for programme risk management are difficult to find (Rasheed, Wang, & Yaqub, 2015; Sanchez et al., 2009; Teller, 2013). These activities have either been developed for project risk management or are generic and require adapting to it (Sanchez et al., 2009; Smith et al., 2008). Furthermore, just as programme management has not yet reached the level of maturity attained by project management (Hillson, 2008; Pellegrinelli, 2010), programme risk management has not yet matured as much as project risk management (Sanchez et al., 2009). Based on this review, the nine programme risk management challenges shown in Table 6, were identified.

Table 6

Literature-based summary of programme risk management challenges

No.	Challenge	Description	References
1	Inadequate programme risk management strategy	Inadequate commitment and planning for institutionalising programme risk management in an organisation.	Papadaki et al. (2014); Rasheed, Wang and Yaqub (2015); Shehu and Akintoye (2010)
2	Inadequate programme management standardisation	The terms programme and programme management are used in different ways, leading to confusion about what programme management is. Consequently, lower level programme management processes, such as programme risk management, are inadequately defined.	Hillson (2008); Pellegrinelli (2010); Rasheed, Wang and Lucena (2015); Rasheed, Wang and Yaqub (2015); Shehu and Akintoye (2009); Shi et al. (2014)
3	Programme complexity (interdependencies between programme management, organisational strategic management and individual projects)	Programme management interacts extensively with organisational strategic management and individual projects. Hence, programme risk does not simply equal the sum of individual project risks.	Hillson (2008); Rasheed, Wang and Yaqub (2015); Smith et al. (2008)

No.	Challenge	Description	References
4	Inadequate programme risk management awareness	Low familiarity with programme risk management such as incorrectly equating project and programme risk management, or simply applying project risk management processes to project programmes.	Artto et al. (2009); Hillson (2008); Pellegrinelli (2010); Shehu and Akintoye (2009); Smith et al. (2008)
5	Inadequate programme risk management skills	A shortage of experienced programme risk management resources to carry out programme risk management tasks or activities.	Papadaki et al. (2014); Rasheed, Wang and Yaqub (2015)
6	Inadequate programme risk management knowledge	Frameworks, processes, procedures and guidelines specifically developed for programme risk management are difficult to find.	Papadaki et al. (2014); Rasheed, Wang and Lucena (2015); Rasheed, Wang and Yaqub (2015); Sanchez et al. (2009); Shi et al. (2014); Smith et al. (2008); Teller (2013)
7	Inadequate programme risk management communication	Lack of accuracy, completeness or timeliness for programme risk reporting.	Rasheed et al. (2014); Rasheed, Wang and Yaqub (2015); Shi et al. (2014)
8	Non-supportive programme risk culture	The programme-risk-related values, attitudes, beliefs, and understanding shared by employees of an organisation that create a non-supportive programme risk management environment.	Papadaki et al. (2014); Rasheed, Wang and Yaqub (2015)
9	Low programme risk management maturity	Programme risk management has not yet achieved the level of maturity attained by project risk management.	Aritua et al. (2010); Hillson (2008); Sanchez et al. (2008)

4.2 Findings from the interviews: codebook for the analysis of interview data

The interview data were coded independently of the themes, to allow us to evaluate the organisation-based interview information against those from the literature and to identify possible additional themes of programme risk management challenges not found in the literature analysis. Table 7 provides the initial granular codebook created during the analysis of interview data. It consists of 28 codes, their description and related interview quotes. The positively stated responses to the interview questions 3(a) (Q3) and 4 (Q4) produced discussions leading to additional valuable information on challenges experienced in programme risk management and were therefore included as examples of quotes in Table 7.

Table 7

The initial 28 codes generated from the interview data on organisational programme risk management challenges

No.	Code	Description	Examples of interview quotes	Code sources
1	Programme risk management focus on benefits, not just cost, time and quality	Programme risk management focuses on the realisation of business benefits rather than just looking at project cost, time and quality.	1) 'Initially when you look at programmes, because now you are not worried about delivering pieces of artefacts, but you are actually worried about the benefits.' 2) 'A programme is required to deliver projects; long-term benefits and other strategic objectives.'	I1-Q3, I3-Q5, I6-Q2, I6-Q3, I7-Q1, I8-Q1, I10-Q1, I10-Q2, I10-Q3
2	Inadequate programme risk management business case	Inadequate justification or rationale for businesses to consider programme risk management.	1) 'My biggest light bulb moment is the fact that if you are busy with such a large change programme, all the parts are changing at the same time, risk management is the one thing that can pull those things together.' 2) 'And also defining the benefits of implementing programme risk management, as well as the downside if you do not implement it.'	I1-Q3, I1-Q4, I2-Q3, I2-Q4, I3-Q3, I3-Q5, I4-Q3, I4-Q4, I6-Q3, I6-Q4, I6-Q5, I7-Q4, I8-Q4, I10-Q4
3	Inflexible programme risk management governance	The rigidity of policies, procedures, practices and processes by which programme risk management is directed and controlled.	1) 'The other aspect is that there are, for example, within the organisation some people that bypass the current processes.' 2) 'There is too much governance.'	I2-Q2, I2-Q3, I3-Q5, I4-Q1, I4-Q3, I6-Q2, I6-Q3, I7-Q1, I7-Q2, I7-Q3, I8-Q2
4	Inadequate programme risk management strategy	Inadequate commitment and planning for institutionalising programme risk management in an organisation.	1) 'If you think about causes, there is no clear risk management strategy with regard to projects and no clear roles and responsibilities.'	I7-Q3
5	No centralised programme office	The absence of a central office where the programme is run. This office could take different names.	1) 'That is the office that pulled all the projects together. That would be the place where the programme would run. So I think the thing that worked very well was the very close coordination of the programme and its sub-projects.' (The lack of a central office could lead to bad programme coordination.)	I3-Q2, I3-Q3, I3-Q5
6	Not understanding the business	Inadequate knowledge of, or familiarity with, the business. Risk management should be an integral part of the everyday running of the business and risk managers should understand the business.	1) 'Because there was a programme running on top of this business, if you understand the underlying business, you could understand the integration.' 2) 'But the fact that at that point I understood most of the other business units, it made it easy to integrate into the programme.' (If understanding the business works well, the converse may not work well.)	I3-Q3, I3-Q5
7	Programme risk management definition related issues	Issues related to the definition of programme risk management, or instances where the term programme risk management is not formally defined in the organisation.	1) 'I am asking you to give me the definition of your understanding of programme management so that I can answer you in accordance with that.' 2) 'I do not think that the organisation formally said that they were running a programme. Even though it was a big programme made up of quite a large number of sub-projects, they never called it a programme.'	I1-Q5, I1-Q1, I2-Q1, I2-Q5, I3-Q1, I3-Q5, I4-Q1, I5-Q1, I6-Q1, I7-Q1, I8-Q1, I9-Q1, I10-Q1

No.	Code	Description	Examples of interview quotes	Code sources
8	Inadequate programme management standardisation	The terms programme and programme management are used in different ways, leading to confusion about what programme management is.	<ol style="list-style-type: none"> 1) 'The standard practice of using a generic work breakdown structure for a programme, instead of a work breakdown structure specifically tailored for programme management.' 2) 'That the procedure is not rolled out and standardised across the whole company.' 	I2-Q4, I6-Q3, I1-Q3, I1-Q5, I2-Q5, I3-Q5, I4-Q3, I5-Q1, I5-Q4, I6-Q2, I10-Q1, I10-Q3
9	Programme risk management process complexity	A programme risk management process that is not easy to understand, explain or use.	<ol style="list-style-type: none"> 1) 'And it was enormously complicated with an enormous amount of detail.' 	I3-Q3, I3-Q5
10	Interdependencies between programme management, organisational strategic management and individual projects	Programme management interacts extensively with organisational strategic management and individual projects. Hence, programme risk does not simply equal the sum of individual project risks.	<ol style="list-style-type: none"> 1) 'Which includes then also the management of business risks identification, and interdependencies between risks. So a delay in one project could actually lead to delays all over.' 2) 'I think it came as a result of understanding that there are interdependencies between a number of related projects which are delivering certain collective benefits. And what that sometimes entails is the crossing of business operational people and your programme delivery people.' 	I3-Q3, I3-Q4, I3-Q5, I4-Q1, I4-Q3, I5-Q5, I6-Q3, I6-Q5, I8-Q1, I10-Q2, I10-Q3
11	Varying sizes of programmes	Programmes by nature are big. Hence, programme risk management could be big.	<ol style="list-style-type: none"> 1) 'They were almost anxious by the enormity of the change.' 2) 'Sometimes a project is so big and it's got huge coverage. It could be at one site but with huge coverage, and could become a programme on its own purely because of its size.' 	I3-Q3, I3-Q5, I4-Q3, I6-Q3
12	Running many programmes simultaneously	The activity of running many programmes at the same time	<ol style="list-style-type: none"> 1) 'Because if you are going to say let us do system change, together with a process change, together with a structure change, you are very much disrupting everything, and I think there is a need to plan properly.' 	I3-Q4
13	Confusion between project and programme risk management	The inability to differentiate between project and programme risk management, or simply applying the project risk management process at a higher level, or simply aggregating project risks.	<ol style="list-style-type: none"> 1) 'And what I have picked up is that there is a lot of confusion in terms of the difference between project risk and programme risk. In their minds, it is one and the same thing. So people tend to look at risk from a project perspective.' 2) 'And what we find is that they have got infrequent risk management meetings and there is a bigger emphasis on project risk management than programme risk management.' 	I1-Q1, I2-Q1, I2-Q2, I2-Q3, I2-Q4, I2-Q5, I3-Q5, I4-Q2, I4-Q3, I5-Q2, I6-Q3, I7-Q1, I7-Q4, I10-Q1
14	Low programme risk management awareness	Low familiarity with programme risk management	<ol style="list-style-type: none"> 1) 'So they were not aware of the process.' 2) 'And I think there is also an awareness that is lacking in terms of elevating programme risk management to being a core function so that it is resourced appropriately and given the right level of importance in the organisation to ensure that we have a more sustainable delivery of programmes.' 	I2-Q3, I3-Q1, I4-Q4, I5-Q2, I6-Q3, I7-Q1
15	Managing a programme in isolation	Treating a programme as though it was a single project.	<ol style="list-style-type: none"> 1) 'And what he or she tends to do is to try and manage a programme as if it is a project. So everything is managed in isolation.' 	I10-Q1

No.	Code	Description	Examples of interview quotes	Code sources
16	Inadequate programme risk management skills	A shortage of experienced programme risk management resources to carry out programme risk management tasks or activities.	<ol style="list-style-type: none"> 1) 'The competency of people who have been put in programme management roles plays a huge role. A very good project manager is not necessarily a good programme manager.' 2) 'It is not the methodology that is the challenge. You need to have the right people.' 	I1-Q4, I2-Q2, I2-Q3, I3-Q3, I3-Q4, I4-Q3, I4-Q4, I5-Q3, I6-Q3, I6-Q4, I8-Q3, I8-Q4, I9-Q4, I10-Q1, I10-Q3
17	Inadequate programme risk management standards, processes and methodologies	Inadequate guidelines, practices, procedures, rules, frameworks, metrics and tools employed in programme risk management.	<ol style="list-style-type: none"> 1) 'Lack of a clear programme risk management framework, processes and guidelines.' 2) 'It is the lack of clearly defined processes and procedures.' 	I1-Q1, I1-Q5, I2-Q3, I3-Q2, I3-Q3, I3-Q3, I3-Q5, I4-Q2, I4-Q4, I5-Q2, I5-Q3, I5-Q4, I6-Q2, I6-Q3, I6-Q5, I7-Q3, I7-Q4, I8-Q1, I8-Q3
18	Scarcity of literature specifically for programme risk management	Programme risk management guidelines, practices, procedures, rules, frameworks, tools and literature are difficult to find	<ol style="list-style-type: none"> 1) 'Our organisation follows part of the PMI process. However, we have changed a little bit to match the needs of our organisation.' 2) 'I do not view the frameworks as being very industry specific which I think is a weakness in itself. I understand the methodologies are generic but the nature of our industry itself, I mean the entity touches a number of industries where internationally it will probably be three or four separate entities.' 	I2-Q4, I6-Q4
19	Inadequate programme risk management knowledge sharing	Inadequate processes of transferring or disseminating programme risk management experiences, lessons learnt or information from one person or group to another person or group.	<ol style="list-style-type: none"> 1) 'So that is, there is obviously the closure and within the closure there is the learning as well which is an ongoing thing to then say, whatever we have picked up in how we have executed it, how does it continuously feed back into other programmes.' 2) 'Importantly, I would like to see the lessons learnt cascade quicker. You get a lesson being learnt, then there is someone asking for it again in the next programme, some of these people are within the same office or the same geographical location.' 	I3-Q3, I3-Q5, I4-Q4, I6-Q2, I6-Q3, I8-Q4, I9-Q3
20	Inadequate programme risk management communication	Inadequate reporting and receipt of programme risk management information for decision-making.	<ol style="list-style-type: none"> 1) 'It became clear to me that risk management was now part of the programme dashboard. And I would them put in there. These are the risks to the project, different projects roll up risks to the programme.' 2) 'And then obviously there is the normal management of the risks themselves which is the ongoing reporting, monitoring and all of that.' (These statements on reporting indicate what works well. Thus, the absence of reporting may not work well.) 	I1-Q1, I1-Q2, I3-Q2, I3-Q3, I3-Q5, I4-Q3, I4-Q4, I6-Q2, I7-Q1, I7-Q3, I8-Q3, I8-Q4, I9-Q3
21	Non-supportive programme risk management tone from the top	Programme risk management tone from the top refers to how an organisation's leadership leads by example, thereby creating an atmosphere in the workplace where the programme risk management tone trickles down to the employees of that organisation	<ol style="list-style-type: none"> 1) 'It comes from the top of the tree. The captain of the ship affects how his ship operates.' 2) 'What works well is what suits the programme managers and suits the client. It is very difficult to get programme managers to do something that the client is not prepared to pay for. The client is not always prepared to pay for risk management.' 	I1-Q4, I2-Q4, I5-Q3, I6-Q3, I9-Q3, I9-Q4

No.	Code	Description	Examples of interview quotes	Code sources
22	Non-supportive programme risk culture	Inadequate values, attitudes, beliefs, and understanding regarding programme risk among employees of an organisation that creates a non-supportive programme risk management environment.	<ol style="list-style-type: none"> 1) 'What we found is that if your risk culture in the company is wanting, then programme risk management won't work.' 2) 'Setting risk culture to be pro-active in the identification and management of programme risks.' (Programme risk management values, beliefs, knowledge and understanding that support programme risk management create a supportive environment.) 	I3-Q3, I4-Q4, I8-Q2, I8-Q4, I9-Q3
23	Low programme risk management maturity	Programme risk management has not yet attained level of maturity attained by project risk management.	<ol style="list-style-type: none"> 1) 'I think programme risk management is gaining maturity.' (The interviewee indicated implied low programme risk management maturity currently.) 2) 'It is not really a mature space where you are able to go within the country to get a group of people saying that let us talk about programme risk. We are very good at project risk. You cannot say so for programme risk.' 	I3-Q5, I4-Q4, I6-Q3
24	Late involvement of programme risk management in programme execution	Programme risk management resources are not part of programme execution from the inception of the programme'	<ol style="list-style-type: none"> 1) 'I think if I look at when they came to me, by that time, they were already six months to a year into the programme.' (The interviewee served as risk manager on an organisational strategic change.) 2) 'But it means that upfront at the business case, we actually need to do proper risk management. Now that is where risk management starts. It basically starts in the option selection phase.' (Programme risk managers should get involved at the beginning of programme execution.) 	I2-Q2, I3-Q3, I4-Q3, I6-Q3, I7-Q3, I8-Q4
25	Inadequate programme risk ownership	Programme risks are not appropriately assigned to persons or entities that will be accountable to ensure that the risk is managed.	<ol style="list-style-type: none"> 1) 'The first one is ownership. Risks need to be owned and managed by either project directors or programme directors and the programme management office.' 2) 'So basically to check all the risks, to have a risk register that has all the risks defined and the risk owners and the dates by which they should be closed.' (Risk ownership is important for good programme risk management practice.) 	I4-Q3, I5-Q1, I5-Q3, I6-Q2, I7-Q3, I8-Q3, I8-Q4
26	Inadequate programme risk management process ownership	Inadequate persons or entities that have the accountability for the programme risk management process performance.	<ol style="list-style-type: none"> 1) 'So if you do not have people that are the guardians of the procedure and the guardians of the process, to make sure that it is done and that it is not done as compliance.' 2) 'My involvement purely is to have line of sight of the risks, and then I also have to oversee the risks that they are being managed.' (This person owns, and monitors, the process.) 	I2-Q5, I4-Q3, I5-Q3, I5-Q4, I7-Q2, I8-Q4
27	Inadequate programme risk life-cycle tracking	Inadequate tracking of the management of risks in a programme life cycle from the inception to the closure of a programme.	<ol style="list-style-type: none"> 1) 'There is time horizon that you put on them as well because there is a cost of decision associated with each one of those risks or opportunities that we track.' 2) 'Not reporting only, but monitoring and evaluating the risk performance until the end of the programme.' (Risk tracking and monitoring is important. Merely reporting alone is not enough.) 	I6-Q2, I8-Q3, I8-Q4

No.	Code	Description	Examples of interview quotes	Code sources
28	Programme risk management not aligned with other programme management processes	Inadequate alignment between programme risk management process and other programme management processes.	1) 'So I made sure that my process level involvement was aligned with their processes each and every way, at programme level and at project level.'	I3-Q2

Table 8 shows that the interview-based codes in Table 7 mapped to the literature-based codes in Table 6 with one new, practice-specific thematic code emerging from the interviews: 'Inadequate programme risk management execution'. A congruence of information from different sources leads to greater confidence in the trustworthiness (credibility) of the findings (Bowen, 2009). Therefore, the convergence of the codes from the literature and the interviews enhanced the credibility of the conclusions of this study

Table 8

Mapping of interview-based codes to literature-based codes

No.	Literature-based codes (Table 6)	Interview-based codes (Table 7)
1	Inadequate programme risk management strategy	<ol style="list-style-type: none"> 1. Programme risk management focus on benefits, not just cost, time and quality 2. Inadequate programme risk management business case 3. Inflexible programme risk management governance 4. Inadequate programme risk management strategy 5. No centralised programme office 6. Not understanding the business
2	Inadequate programme management standardisation	<ol style="list-style-type: none"> 7. Programme risk management definition-related issues 8. Inadequate programme management standardisation
3	Programme complexity	<ol style="list-style-type: none"> 9. Programme risk management process complexity 10. Interdependence of programme management, organisational strategic management and individual projects 11. Varying sizes of programmes 12. Running many programmes simultaneously
4	Inadequate programme risk management awareness	<ol style="list-style-type: none"> 13. Confusion between project and programme risk management 14. Low programme risk management awareness 15. Managing a programme in isolation
5	Inadequate programme risk management skills	<ol style="list-style-type: none"> 16. Inadequate programme risk management skills
6	Inadequate programme risk management knowledge	<ol style="list-style-type: none"> 17. Inadequate programme risk management standards, processes and methodologies 18. Scarcity of literature specifically for programme risk management 19. Inadequate programme risk management knowledge sharing
7	Inadequate programme risk management communication	<ol style="list-style-type: none"> 20. Inadequate programme risk management communication
8	Non-supportive programme risk culture	<ol style="list-style-type: none"> 21. Non-supportive programme risk management tone from the top 22. Non-supportive programme risk culture
9	Low programme risk management maturity	<ol style="list-style-type: none"> 23. Low programme risk management maturity
10	Inadequate programme risk management execution (new)	<ol style="list-style-type: none"> 24. Late involvement of programme risk management in programme execution 25. Inadequate programme risk ownership 26. Inadequate programme risk management process ownership 27. Inadequate programme risk life-cycle tracking 28. Programme risk management not aligned with other programme management processes

From the literature and interview data, I expanded the descriptions of these codes and created themes. Table 9 provides the resultant programme risk management theme codebook, and the corresponding numbers in the programme risk management challenges model (Figure 2). This codebook can be used to guide further study on these quests, as well as for analysis of programme risk management challenges in organisations.

Table 9

Theme codebook of programme risk management challenges

No.	Theme	Description	Corresponding number in model
1	Inadequate programme risk management strategy	Inadequate commitment and planning for institutionalising programme risk management in an organisation, e.g.: <ul style="list-style-type: none"> • programme risk management focus on benefits, not just cost, time and quality; • inadequate programme risk management business case; • inflexible programme risk management governance; • no centralised programme office; • not understanding the business. 	2.1.1
2	Inadequate programme management standardisation	The terms programme and programme management are not standardised in the literature or in practice, leading to confusion about what programme management is. This is exemplified by: <ul style="list-style-type: none"> • programme management definition-related issues; • inadequate consensus on the basics of programme management. • Consequently, lower level programme management processes, such as programme risk management, are inadequately defined. 	2.1.2
3	Programme complexity	Programmes by their nature are expected to be complex, e.g.: <ul style="list-style-type: none"> • varying sizes of programmes; • many programmes run simultaneously; • interdependence of programme management, organisational strategic management and individual projects. • Such issues complicate risk management in programmes. 	2.1.3
4	Inadequate programme risk management awareness	Low familiarity with programme risk management, e.g.: <ul style="list-style-type: none"> • low programme risk management awareness; • confusion between project and programme risk management, or treating project and programme risk management as being the same, or simply applying the project risk management process at a programme risk management level; • managing a programme in isolation, as one would do a project, thereby ignoring the strategic nature of project-based programmes. 	2.2.1
5	Inadequate programme risk management skills	A shortage of experienced programme risk management resources to carry out relevant tasks or activities.	2.2.2
6	Inadequate programme risk management knowledge	Frameworks, processes, procedures and guidelines specifically developed for programme risk management are difficult to find, e.g.: <ul style="list-style-type: none"> • scarcity of literature specifically for programme risk management; • inadequate programme risk management knowledge sharing; • inadequate programme risk management standards, processes and methodologies. 	2.2.3
7	Inadequate programme risk management communication	Lack of accuracy, completeness or timeliness for programme risk reporting, e.g.: <ul style="list-style-type: none"> • inadequate risk data aggregation methods or processes; • incomplete programme risk data; • lack of communication of programme risks. 	2.2.4

No.	Theme	Description	Corresponding number in model
8	Non-supportive programme risk culture	The values, attitudes, beliefs and understanding about programme risk shared by employees of an organisation that create a non-supportive programme risk management environment, e.g. <ul style="list-style-type: none"> • non-supportive programme risk management tone from the top. 	2
9	Low programme risk management maturity	Programme risk management has not yet attained the level of maturity achieved by project risk management.	1
10	Inadequate programme risk management execution	Programme risk management is poorly implemented and practised, e.g.: <ul style="list-style-type: none"> • late involvement of programme risk management in programme execution; • inadequate programme risk ownership; • inadequate programme risk management process ownership; • inadequate programme risk life-cycle tracking; • programme risk management not aligned with other programme management processes. 	3

4.3 A consolidated risk culture-based model of programme risk management challenges

The consolidated list of challenges in Table 8 was used to construct the risk culture-based model of programme risk management challenges shown in Figure 2. The model comprises challenges that are interdependent, and is non-linear because complex, long-term programmes display the features of complex adaptive systems such as adaptability, self-organisation, emergent behaviour and non-linearity (Pellegrinelli & Partington, 2006; Smith et al., 2008). The interdependencies between the challenges shown in the model are conceptual at this stage of development of the model. Investigating the nature of such interdependencies provides an opportunity for further research.

Risk culture is a term that describes the values, beliefs, knowledge and understanding about risk shared by a group of people with a common purpose (IRM, 2012). Such attributes of risk that make up culture are evident in organisational behaviours and the structures intended to facilitate them, as explained by Hofstede, Hofstede and Minkov (2010, 8) and Schein and Schein (2017, 17). Challenges 1–7 in Table 8 could be regarded as components of programme risk culture, and were mapped to two categories, namely structural challenges (2.1.1 Inadequate programme risk management strategy; 2.1.2 Inadequate programme management standardisation; and 2.1.3 Programme complexity), and behavioural challenges (2.2.1 Inadequate programme risk management awareness; 2.2.2 Inadequate programme risk management skills; 2.2.3 Inadequate programme risk management knowledge; and 2.2.4 Inadequate programme risk management communication).

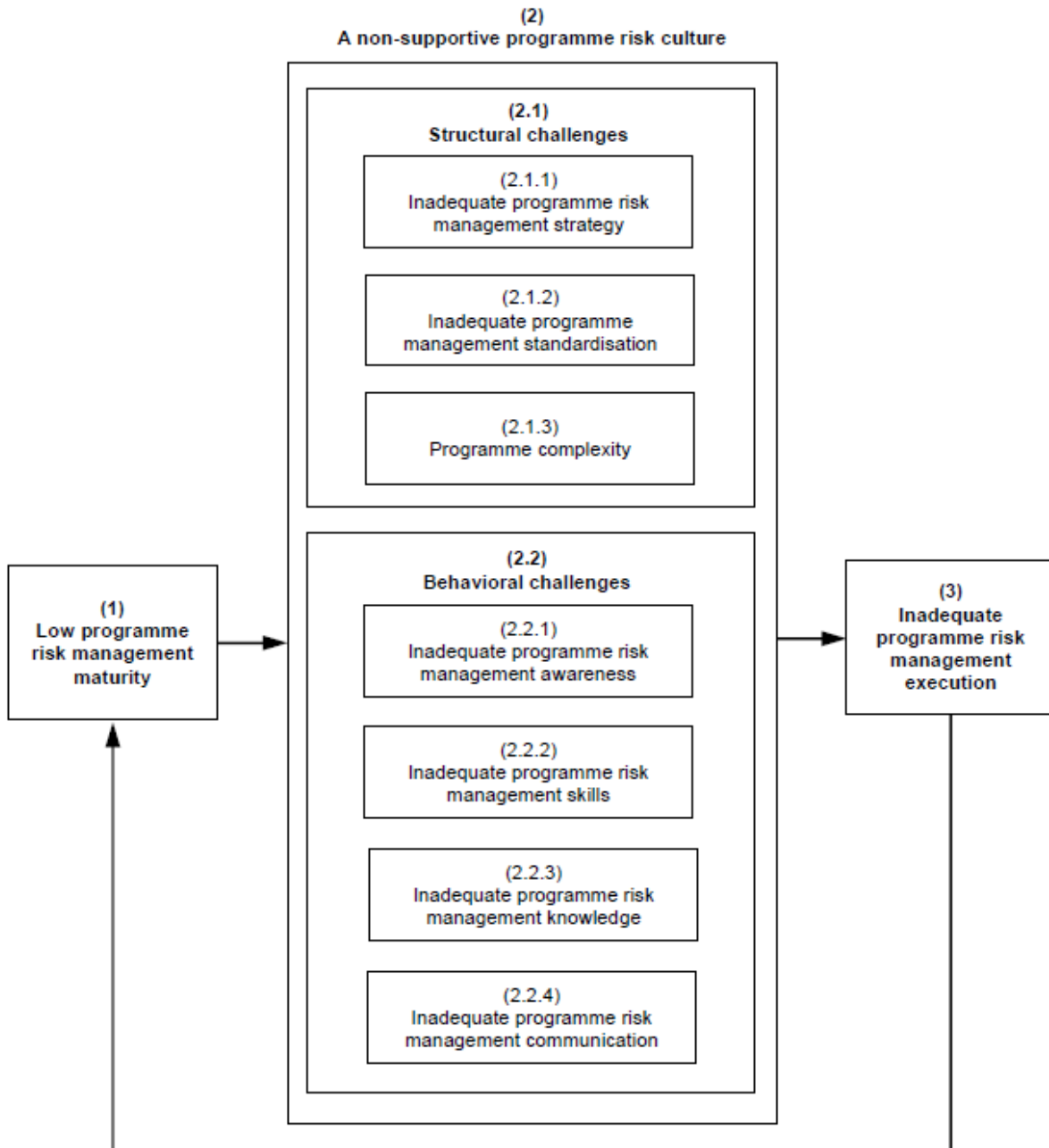


Figure 2: A risk culture-based model of programme risk management challenges derived from the literature review and interview data.

5 Conclusions

This paper explored programme risk management challenges described in the literature and as experienced in practice in southern Africa. The key outcomes of the study were a codebook, and a risk culture-based model, of programme risk management demands.

5.1 A risk culture-based model of programme risk management challenges

The model of programme risk management challenges produced in this study provides a diagrammatic, interdependent view of the landscape of these challenges not previously presented. By this means, the model aims to facilitate a holistic understanding of issues involved, and thereby assists with the successful delivery of programmes in practice. The model and the codebook together provide a framework and a tool for (1) academics to position and structure their research, and (2) practitioners in organisations to analyse and evaluate their programme risk management practice.

5.2 The way forward

This study has enhanced our knowledge of programme risk management challenges through the use of an exploratory qualitative study. I believe that the model and the codebook provide a basis from which an analytical study can be designed to understand better the underlying characteristics and dependencies of these demands in the workplace.

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CHAPTER 3

RESEARCH ARTICLE 2

Southern African programme risk management challenge priorities and suggested improvements: An empirical descriptive study

Abstract

The previous study of this thesis explains how a qualitative literature-based and interview-based study yielded programme risk management challenges described in the literature and as experienced in practice in southern Africa. The purpose of the study described in this article was to identify which of these challenges should be addressed first to improve the practice of programme risk management in southern Africa. A quantitative, descriptive approach was followed for this second phase of the programme risk management challenges research project. An online survey, based on the first article's literature-based and interview-based programme risk management challenges theme codebook, was developed to provide information on challenges to prioritise. A project management professional association in southern Africa provided access to its members with programme management experience across different economic sectors in the subcontinent. A total of 42 survey responses were received and used in the descriptive analysis. This sample provided a ranking of programme risk management challenges, allowing for priorities to be identified. This study contributes a novel, data-informed view of southern African programme risk management challenges, and adds valuable insights to its literature, by providing details of proposed priorities for improvement in this part of the world.

Keywords: Programme risk management, Programme risk management in southern Africa, Programme risk management challenges

1. Introduction

Article 1 (Chapter 2) of this thesis explains how a qualitative literature-based and interview-based study on programme risk management challenges in southern Africa yielded the risk culture-based holistic view of programme risk management challenges shown in Figure 1.

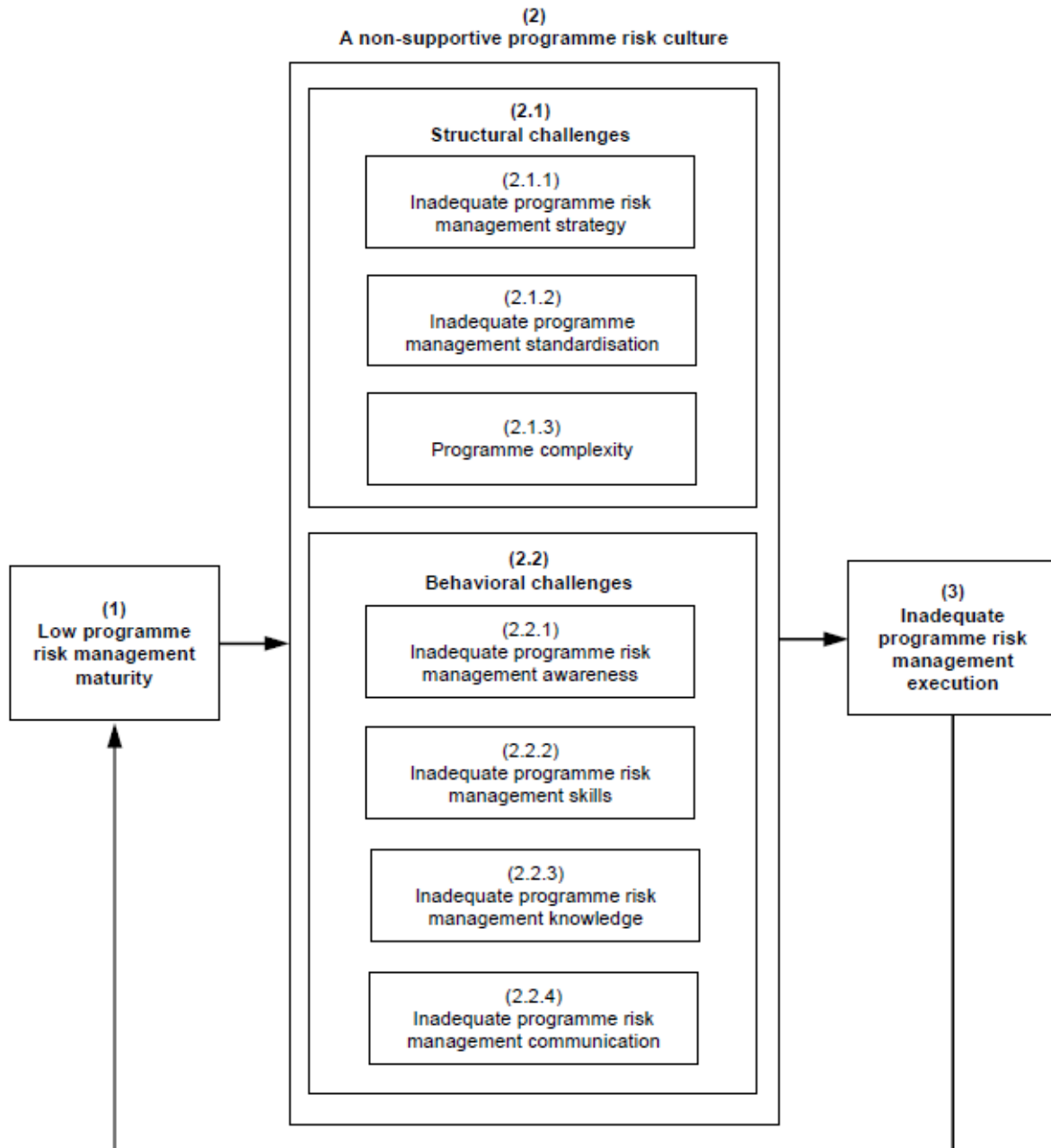


Figure 1: A risk culture-based model of programme risk management challenges sourced from Figure 2, Article 1.

The model shows that low programme risk management maturity leads to a non-supportive programme risk culture, resulting in inadequate programme risk management execution,

thereby further weakening programme risk management maturity. The non-supportive programme risk culture challenges shown in segment 2 of the model include three structural challenges and four behavioural challenges identified in the initial qualitative study. This article focuses on prioritisation of these challenges to allow organisations to improve the maturity of programme risk management in their businesses.

The initial exploratory study that led to the creation of the model of programme risk management challenges included inputs from 10 senior and executive managers with appropriate management experience. The aim of the extended study described here was to obtain information from a broader sample of programme management practitioners than those who informed the development of the model in Article 1, to identify challenges that need to improve first to improve programme risk management execution and maturity in southern Africa. This study therefore aimed to identify and describe priority areas of programme risk management improvement based on a ranking of the challenges contained in the model, combined with consideration of their nature. The research question for this study was: which programme risk management challenges need to be addressed first to improve programme risk management in southern Africa?

In the next section, I describe the research methods I adopted, the target population and the study sample. This is followed by a discussion of the results of the descriptive data analyses employed in this study in the context of the research aim and question. I conclude with reflections on the usefulness of the study findings, their limitations and proposed future research directions for programme risk management.

2. Research methods

2.1 Research approach

A descriptive quantitative approach was followed to address the research question by collecting data to prioritise challenges to improve programme risk management in southern Africa. In descriptive research, the researcher aims to observe and examine a situation by describing important factors associated with it (Kelley et al., 2003; Saunders et al., 2009, p. 444), what has occurred, rather than how or why (Lefaiver, 2012; Lobo, 2005; Nassaji, 2015). Survey tools are frequently used to collect data in such research (Gall et al., 1996). This study employed an online, customised survey to collect the data as shown in Figure 2. The priority challenges were evaluated in the context of the programme risk management challenges model leading to suggestions for priority programme risk management challenges improvement areas.

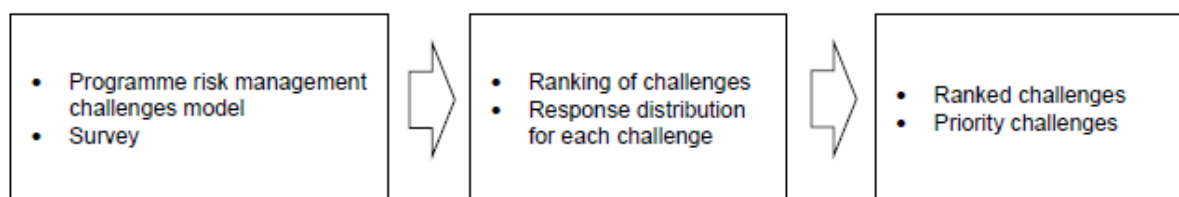


Figure 2: A visual summary of the research approach of this study.

2.2 Data collection

A customised survey instrument was designed for this study, based on the programme risk management challenges theme codebook provided in Table 8 of Article 1. Table 1 provides the measurement items (numbered 1, 2 and 3) used in this study mapped to these challenges themes. The bold numbers in Table 1 correspond to those of these challenges in the model and their associated acronyms for ease of reference.

Table 1

Measurement items for each programme risk management challenge used in this study

No.	Acronym	Description
2.1		Structural challenges
2.1.1	STY	Programme risk management strategy
1	STY1	Organisations in my sector actively include programme risk management in strategic planning
2	STY2	Organisations in my sector actively consider the benefits of programme risk management during strategic planning
3	STY3	Organisations in my sector actively include programme risk management when strategies are executed
2.1.2	STD	Programme management standardisation
1	STD1	Policies, written specifically for programme management, are available for use by organisations belonging to my sector.
2	STD2	Standards, written specifically for programme management, are available for use by organisations belonging to my sector.
3	STD3	Frameworks, written specifically for programme management, are available for use by organisations belonging to my sector.
2.1.3	CXY	Programme complexity
1	CXY1	Rate the business complexity (e.g. size and impact of change) of typical programmes in your sector.
2	CXY2	Rate the technical complexity (e.g. processes involved) of typical programmes in your sector.
3	CXY3	Rate the programme execution complexity (time, cost and other resource requirements) of typical programmes in your sector.
2.2		Behavioural challenges
2.2.1	AWA	Programme risk management awareness
1	AWA1	Senior managers in my sector are familiar with the concept of programme risk management
2	AWA2	Senior managers in my sector understand programme risk management
3	AWA3	In my sector, organisations distinguish between project- and programme- risk management during programme execution

No.	Acronym	Description
2.2.2	SKL	Programme risk management skills
1	SKL1	Suitably experienced programme risk management resources are available in organisations in my sector to carry out programme risk management tasks
2	SKL2	Suitably experienced programme risk management resources are available in the southern African employee market
3	SKL3	Senior managers in my sector are specifically trained in programme risk management
2.2.3	KNW	Programme risk management knowledge
1	KNW1	Organisational programme risk management frameworks in my sector allow us to actually manage programme risks, rather than only report on programme risks
2	KNW2	Organisations in my sector actively learn from programme risk events to improve the management of related risks
3	KNW3	Programme risk management is included in programme management frameworks used in organisations in my sector.
2.2.4	COM	Programme risk management communication
1	COM1	Programme risk management reports are understood by programme management stakeholders in my sector
2	COM2	Organisations in my sector produce enough programme risk management reports to meet the needs of programme management stakeholders
3	COM3	Senior managers in my sector welcome discussions about programme risk
3	EXE	Programme risk management execution
1	EXE1	Programme risk management is actively included in programme execution in my sector's organisations
2	EXE2	Programme risk management is aligned with other programme management processes in my sector's organisations
3	EXE3	Organisations provide adequate resources (people, processes, systems, budget) to be able to manage programme risks

Although this research aimed at exploring programme risk management challenges, the survey items were phrased in a neutral fashion to allow the study participants to provide their opinions without leading them to focus on any negative aspects of programme risk management. In addition, the survey title, 'Programme Risk Management Survey', and the survey introduction were also couched in neutral language:

You are invited to participate in an academic research study on the status of programme risk management in Southern Africa. Study aim: Programme risk management is a key supporting process of programme management. However, implementing programme risk management principles in practice has not yet been well researched. The purpose of this survey is to get your views on the status of programme risk management in southern Africa. Here, southern Africa includes Angola, Botswana, eSwatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia, and Zimbabwe. Your input will allow me to obtain study findings that can be used by programme management stakeholders to improve programme risk management across sectors. I shall therefore greatly appreciate your inputs in this study.

The survey items were piloted by asking the 10 senior programme risk managers, interviewed in Phase 1 (Article 1) of the study, to complete and comment on the survey. Their comments were used to revise the questions posed before their distribution to all study participants. For example, the terms programme business complexity, programme technical complexity, and programme execution complexity were clarified with examples based on these comments.

Permission for online data collection via the professional association – whose support and cooperation were essential – was obtained after a meeting with its chief executive officer (CEO). This meeting highlighted the importance of the research aims and potential contribution of this research to programme risk management practitioners and the academic literature. The CEO distributed the survey’s web link to potential respondents via email. The survey data were captured anonymously – meaning that the study participants could not be identified – and the link was left open for a month. A reminder email to the target participants was sent by the CEO after two weeks.

The responses to the items in the questionnaire were based on a 5-point Likert scale (e.g. 1 = very low impact, and 5 = very high impact). Table 2 illustrates the survey item descriptors for the points 1–5 on the Likert scale, which relate to the nature of the question, and an example item per descriptor.

Table 2
Likert scale descriptors for the numbers 1–5, and an example item per descriptor

Number on scale		Scale descriptors for items in the questionnaire	
1	Extremely simple	Never	Not at all
2	Simple	Infrequently	Not well
3	Moderate	Sometimes	Moderately well
4	Complex	Usually	Well
5	Extremely complex	Always	Perfectly
Example item	Rate the business complexity (e.g. size and impact of change) of typical programmes in your sector	Senior managers in my sector are specifically trained in programme risk management	Senior managers in my sector understand programme risk management

2.3 Target study population(s) and sample(s)

In this study, I targeted participants with programme management experience across different economic sectors in southern Africa, including Angola, Botswana, eSwatini (formerly Swaziland), Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia, and Zimbabwe.

As programme risk management is a niche management area, organisations tend to employ small numbers of managers with corresponding experience. Moreover, there is no programme management-specific professional association in southern Africa. This research was therefore conducted through a southern African project management professional association (hereafter the association), rather than within specific organisations. Non-probability convenience sampling (Saunders et al., 2009, pp. 236, 241) was employed as the association provided access to potential participants with programme management expertise, which allowed for a broad view of the regional status of programme risk management. The association has an active membership of about 1300 project management professionals, of whom some could be expected to have programme risk management experience. However, the number of members of this group with such experience was not known, which means that the actual response rate of the sample drawn from the target population for this study could not be determined. A total of 42 responses were received. The relatively small number of responses compared to the total membership of the project management association reflects the niche nature of programme risk management skills and the corresponding relatively small prevalence of these skills in the subcontinent.

Table 3 provides an overview of the sectors in which the study participants were employed and their years of experience related to programme risk management. Although none was employed in the 'Mining and quarrying sector', the study population represents a wide range of employment sectors. Most of the participants had more than five years of experience, with 45% more than 10 years of programme management related experience. Although insufficient respondents completed the survey to allow sector- or experience-based analyses of the data, their demographic profile nevertheless provides comfort that the views they expressed represent valuable information about the perceived status of programme risk management in southern Africa.

Table 3*Demographic profile of participants of the study (n = 42)*

Demographic characteristic	Demographic variable	Frequency	Percentage
	Oil and gas (petrochemical)	5	12
	Mining and quarrying	0	0
<i>Participant's employment sector</i>	Government and public services	8	19
	Capital projects and infrastructure	17	40
	Other	12	29
	Total	42	100
	Less than or equal to 1 year	2	5
<i>Participant's programme management-related years of experience</i>	More than 1 and less than or equal to 5 years	8	19
	More than 5 and less than or equal to 10 years	13	31
	More than 10 years	19	45
	Total	42	100

Volunteer bias plays a role in the findings of any non-probability study (Belson, 1960; Demir et al., 2017). As this investigation was administered on a voluntary basis via a professional association, one can expect that the respondents cared about the purpose of the survey, as they took time to participate. This provides confidence in the trustworthiness of the findings. Moreover, the size of the study population was sufficient for purposes of ranking to be able to identify programme risk management challenges that need to improve first, and therefore satisfied the aims of this study.

2.4 Data analysis

Uncertainty about the size of the population of programme management practitioners, combined with the low number of survey responses, did not allow for inferential analyses to ascertain the generalisability of the data results to the target population and possible dimensions underlying the scale items. However, the data did provide an opportunity to explore the views of the participants on programme risk management challenges using descriptive data analysis. Descriptive analyses were performed using Microsoft Excel 2016. First, the programme risk management challenges were ranked, based on the frequency of responses from participants on the survey item:

To improve the execution of programme risk management in (southern African) organisations, I believe that we must start with improving (select only one of the options below – options provided in alphabetical sequence):

- 1) Programme complexity
- 2) Programme management standardisation
- 3) Programme risk management awareness
- 4) Programme risk management communication
- 5) Programme risk management knowledge
- 6) Programme risk management skills
- 7) Programme risk management strategy.

The purpose of this ranking was to establish which challenges were deemed to be most critical to improve programme risk management. In addition, responses to specific challenges were described using the following descriptive statistics: mean, standard deviation (SD), relative standard deviation (RSD), minimum (Min), maximum (Max), median, mode, and skewness. These statistics were used to identify response patterns per challenge, with the aim to explore the views of the study population on each challenge. Priority challenges were identified based on the ranking and insights gained from these analyses.

Appendices 1 and 2 provide frequency and percentage response data for the measurement items per challenge as well as the descriptive statistics used to produce the frequency distribution graphs, shown in Figures 6–13. The distributions give a pictorial view of how participants perceived the status of programme risk management in the subcontinent.

From the model provided in Figure 1, the first three challenges in Table 4 constitute structural challenges whereas the next four are behavioural challenges. Throughout this report, the structural challenges are presented first, followed by the behavioural challenges in the sequence shown in Table 4. The numbers in Table 4 correspond to those of these challenges in the model and their associated acronyms for ease of reference.

Table 4

Acronyms employed in this study to represent programme risk management challenges

Grouping	Acronym	Description
2.1 Structural challenges	STY	2.1.1 Programme risk management strategy
	STD	2.1.2 Programme risk management standardisation
	CXY	2.1.3 Programme complexity
2.2 Behavioural challenges	AWA	2.2.1. Programme risk management awareness
	SKL	2.2.2 Programme risk management skills
	KNW	2.2.3 Programme risk management knowledge
	COM	2.2.4 Programme risk management communication
3. Programme risk management execution	EXE	3. Programme risk management execution

An 'I do not know' option was provided per item to allow the respondent to opt out of an answer. Table 5 lists the frequencies and percentages of such responses, which were generally below 10% of the total number of 42 respondents and indicated that the items worked well for this target population. As shown in the table, the 'I do not know' response rates were high for two items, SKL2 and SKL3, which are further discussed under results.

Table 5*'I do not know' response frequencies and percentages per item (42 respondents)*

Item acronym	Description	'I do not know' response frequency	'I do not know' response as % of total responses per item
STY	Programme risk management strategy		
STY1	Organisations in my sector actively include programme risk management in strategic planning	0	0
STY2	Organisations in my sector actively consider the benefits of programme risk management during strategic planning	3	7
STY3	Organisations in my sector actively include programme risk management when strategies are executed	2	5
STD	Programme risk management standardisation		
STD1	Policies, written specifically for programme management, are available for use by organisations belonging to my sector.	2	5
STD2	Standards, written specifically for programme management, are available for use by organisations belonging to my sector.	2	5
STD3	Frameworks, written specifically for programme management, are available for use by organisations belonging to my sector.	1	2
CXY	Programme complexity		
CXY1	Rate the business complexity (e.g. size and impact of change) of typical programmes in your sector.	2	5
CXY2	Rate the technical complexity (e.g. processes involved) of typical programmes in your sector.	1	2
CXY3	Rate the programme execution complexity (time, cost and other resource requirements) of typical programmes in your sector.	0	0
AWA	Programme risk management awareness		
AWA1	Senior managers in my sector are familiar with the concept of programme risk management	0	0
AWA2	Senior managers in my sector understand programme risk management	0	0
AWA3	In my sector, organisations distinguish between project and programme risk management during programme execution	3	7

Item acronym	Description	'I do not know' response frequency	'I do not know' response as % of total responses per item
SKL	Programme risk management skills		
SKL1	Suitably experienced programme risk management resources are available in organisations in my sector to carry out programme risk management tasks	1	2
SKL2	Suitably experienced programme risk management resources are available in the southern African employee market	7	17
SKL3	Senior managers in my sector are specifically trained in programme risk management	4	10
KNW	Programme risk management knowledge		
KNW1	Organisational programme risk management frameworks in my sector allow us to actually manage programme risks, rather than only report on programme risks	2	5
KNW2	Organisations in my sector actively learn from programme risk events to improve the management of related risks	2	5
KNW3	Programme risk management is included in programme management frameworks used in organisations in my sector.	0	0
COM	Programme risk management communication		
COM1	Programme risk management reports are understood by programme management stakeholders in my sector	2	5
COM2	Organisations in my sector produce enough programme risk management reports to meet the needs of programme management stakeholders	1	2
COM3	Senior managers in my sector welcome discussions about programme risk	1	2
EXE	Programme risk management execution		
EXE1	Programme risk management is actively included in programme execution in my sector's organisations	3	7
EXE2	Programme risk management is aligned with other programme management processes in my sector's organisations	3	7
EXE3	Organisations provide adequate resources (of people, processes, systems, budget) to be able to manage programme risks	0	0
Total 'I do not know' responses		42	4

3. Results, discussion and implications

3.1 Ranking of programme risk management challenges

Figure 3 illustrates the ranking of programme risk management challenges, based on responses to the survey item: 'To improve the execution of programme risk management in organisations, I believe that we must start with improving...'.

The two most selected options, programme risk management skills (26%) and programme risk management awareness (24%), belong to the set of behavioural challenges, whereas the third most selected option, programme risk management strategy, belongs to the structural challenges in the programme risk management challenges model. This finding reflects the cultural work of Hofstede et al. (2010, pp. 7-10), in which a group's normative behaviours are seen to be more important indicators of its culture than the formal structures related to that culture – in this case, programme risk management culture in southern African organisations. The participants in our study therefore viewed programme risk management skills and awareness as the most important areas to address to improve programme risk management in their institutions.

One could logically link these options with improving skills leading to greater programme risk management awareness. For example, improving such skills and awareness could be expected to be both influenced by, and influence, programme risk management strategy, knowledge, communication and standardisation. Although simplifying programmes can be expected also to improve the execution of programme risk management, our study population seem to accept that programmes are complex entities, as shown in Figure 8. Therefore, improving programme risk management has to start with raising the corresponding skills and awareness needed by the stakeholders involved. This finding was explored further by analysing the frequency of response distributions of the items related to each challenge.

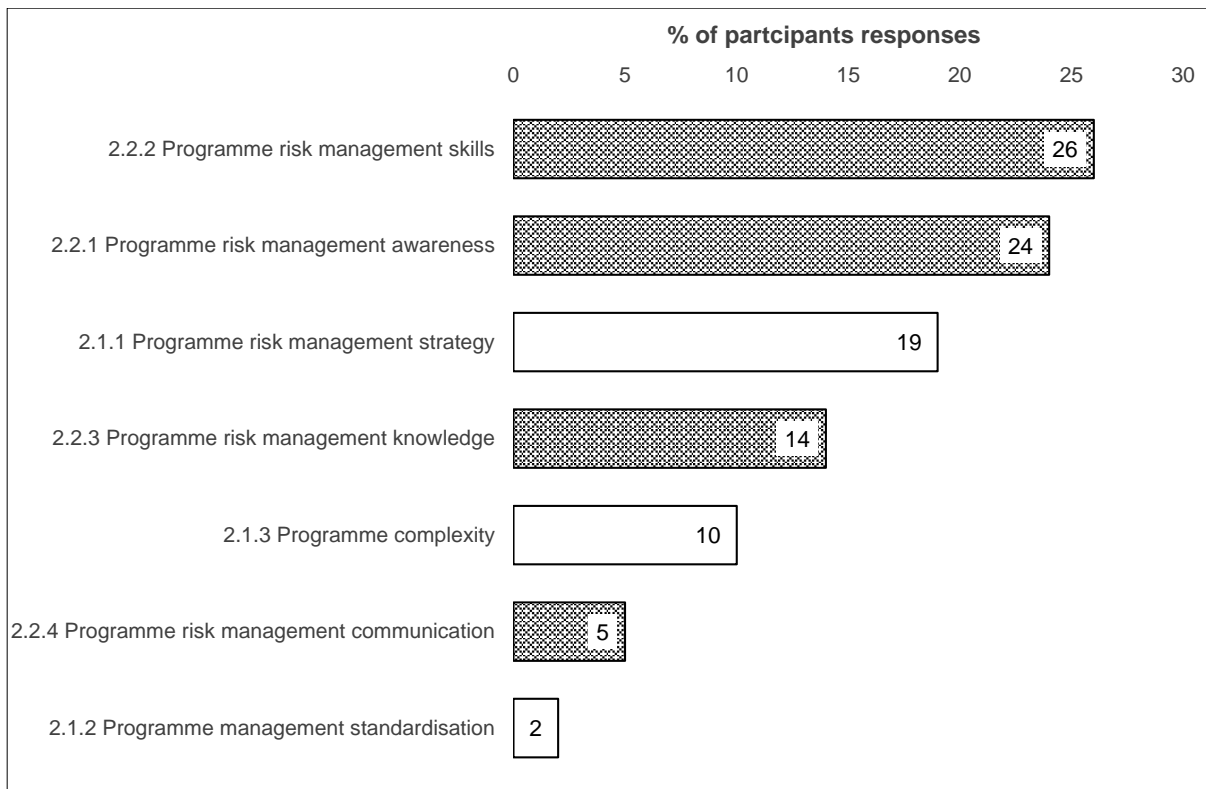


Figure 3: The ranking of seven programme risk management challenges derived from responses to the survey item: 'To improve the execution of programme risk management in organisations, I believe that we must start with improving...'. The shaded bars represent behavioural challenges; unshaded bars correspond to structural challenges.

3.2 Descriptive statistics and frequency distributions of programme risk management challenges

In this section, I consider the spread of the data in terms of measures of central tendency and skewness of the distribution in the context of the study. Skewness was deemed to provide useful information on the distribution of the data per challenge for the purpose of interpreting the responses. Kurtosis is not included in this discussion as there was no real benefit in evaluating the kurtoses of the response distributions against that of a normal distribution to achieve the aim of this study.

The frequency distributions of the participant responses to each challenge and related descriptive statistics are provided in Table 6. The values of these statistics are used to provide indications of the programme risk management challenges situation in southern Africa. Although the values cannot be shown to represent the association membership (population), the data distributions shown in Figures 6–13 provide coherent information that makes a useful contribution to the study findings.

3.2.1 Varied experiences of programme risk management in southern Africa

The statistics shown in Table 6 suggest that, apart from three responses where the minimum value was 2 and one response where the maximum was 4, all the responses had a minimum value of 1 and a maximum of 5. This means that 83% (20/24) of responses varied from the lowest to the highest point on the Likert scale or produced the largest possible range between maximum and minimum values in the response data. The high percentage of responses with the greatest possible range indicates a wide variation of reported programme risk management experiences. This result is further supported by the coefficient of variation or relative standard deviation (RSD) of the response data. Relative standard deviation expresses the standard deviation as a percentage of the mean and compares the extent to which two or more data values differ from the mean (Saunders et al., 2009, p. 448). In this study, the relative standard deviation varied from 16% to 52%.

Table 6

Descriptive statistics: mean, standard deviation (SD), relative standard deviation (RSD), minimum (Min), maximum (Max), median, mode and skewness

No.	Acronym	Description	Mean	SD	RSD (%)	Min	Max	Median	Mode	Skewness
2.1		Structural challenges								
2.1.1	STY	Programme risk management strategy								
1	STY1	Organisations in my sector actively include programme risk management in strategic planning	3.1	1.1	35	1	5	3	3	-0.1
2	STY2	Organisations in my sector actively consider the benefits of programme risk management during strategic planning	3.1	1.0	32	1	5	3	3	0.0
3	STY3	Organisations in my sector actively include programme risk management when strategies are executed	3.3	0.8	24	1	5	3	3	-0.2
2.1.2	STD	Programme management standardisation								
1	STD1	Policies, written specifically for programme management, are available for use by organisations belonging to my sector.	3.5	1.2	35	1	5	4	4	-0.4
2	STD2	Standards, written specifically for programme management, are available for use by organisations belonging to my sector.	3.5	1.2	33	1	5	4	4	-0.5
3	STD3	Frameworks, written specifically for programme management, are available for use by organisations belonging to my sector.	3.4	1.1	33	1	5	4	4	-0.4
2.1.3	CXY	Programme complexity								
1	CXY1	Rate the business complexity (e.g. size and impact of change) of typical programmes in your sector.	3.6	0.8	21	1	5	4	4	-1.0
2	CXY2	Rate the technical complexity (e.g. processes involved) of typical programmes in your sector.	3.6	0.6	16	2	5	4	4	-0.4
3	CXY3	Rate the programme execution complexity (time, cost and other resource requirements) of typical programmes in your sector.	3.6	0.8	19	2	5	4	3	0.2
2.2		Behavioural challenges								
2.2.1	AWA	Programme risk management awareness								
1	AWA1	Senior managers in my sector are familiar with the concept of programme risk management	3.0	1.0	33	1	5	3	3	0.3
2	AWA2	Senior managers in my sector understand programme risk management	2.9	0.9	30	1	5	3	3	-0.0
3	AWA3	In my sector, organisations distinguish between project and programme risk management during programme execution	2.7	1.0	36	1	5	3	2	0.2

No.	Acronym	Description	Mean	SD	RSD (%)	Min	Max	Median	Mode	Skewness
2.2.2	SKL	Programme risk management skills								
1	SKL1	Suitably experienced programme risk management resources are available in organisations in my sector to carry out programme risk management tasks	2.6	1.0	40	1	4	3	3	-0.2
2	SKL2	Suitably experienced programme risk management resources are available in the southern African employee market	2.9	0.8	28	2	5	3	3	0.6
3	SKL3	Senior managers in my sector are specifically trained in programme risk management	2.3	1.2	52	1	5	2	1	0.6
2.2.3	KNW	Programme risk management knowledge								
1	KNW1	Organisational programme risk management frameworks in my sector allow us to actually manage programme risks, rather than only report on programme risks	2.7	1.0	38	1	5	3	3	0.2
2	KNW2	Organisations in my sector actively learn from programme risk events to improve the management of related risks	2.9	1.2	41	1	5	3	3	0.2
3	KNW3	Programme risk management is included in programme management frameworks used in organisations in my sector.	3.6	1.0	29	1	5	4	3	-0.3
2.2.4	COM	Programme risk management communication								
1	COM1	Programme risk management reports are understood by programme management stakeholders in my sector	3.1	1.0	31	1	5	3	3	0.1
2	COM2	Organisations in my sector produce enough programme risk management reports to meet the needs of programme management stakeholders	2.6	1.0	41	1	5	2	2	0.4
3	COM3	Senior managers in my sector welcome discussions about programme risk	3.0	1.0	31	1	5	3	3	0.3
3	EXE	Programme risk management execution								
1	EXE1	Programme risk management is actively included in programme execution in my sector's organisations	3.2	1.1	34	1	5	3	4	-0.3
2	EXE2	Programme risk management is aligned with other programme management processes in my sector's organisations	2.8	1.1	41	1	5	3	2	0.2
3	EXE3	Organisations provide adequate resources (of people, processes, systems, budget) to be able to manage programme risks	2.6	1.2	45	1	5	3	2	0.3

3.2.2 Analysis of frequency distributions: what should change in programme risk management challenges in southern Africa?

The symmetry of a frequency distribution is measured using the skewness statistic shown in Table 6 (Collis & Hussey, 2014, p. 252; Saunders et al., 2009, p. 436). A frequency distribution or bar chart that shows a clustering to the left and a long tail to the right is positively skewed, and negatively skewed for the converse distribution. In a positively skewed distribution, the mode and the median would be expected to have values smaller than the mean, indicating that most responses lie below the mathematical mean. Figure 4 illustrates a positively skewed distribution.

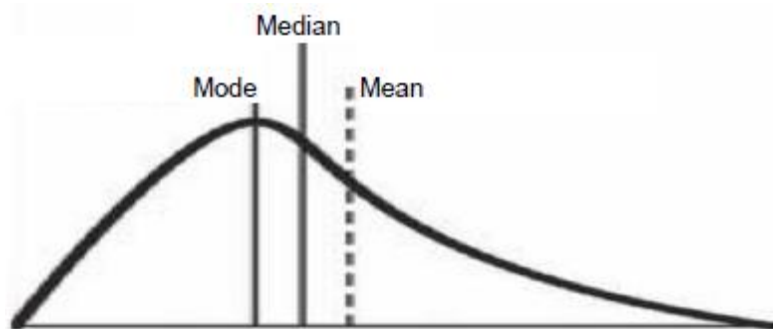


Figure 4: A positively skewed frequency distribution. Adapted from “Business Research, a practical guide for undergraduate and postgraduate students” by Collis and Hussey (2014, p. 252).

Conversely, in negatively skewed distributions, the mode and the median would be expected to have values greater than the mean, indicating that most of the responses were higher than the mean response value. Figure 5 illustrates a negatively skewed distribution.

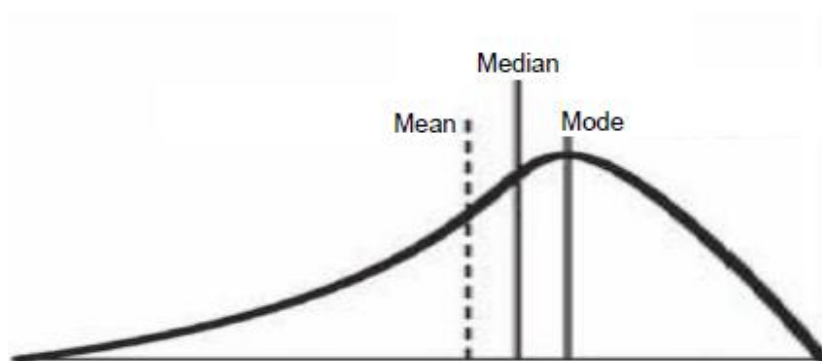


Figure 5: A negatively skewed frequency distribution. Adapted from “Business Research, a practical guide for undergraduate and postgraduate students” by Collis and Hussey (2014, p. 253).

The numbers 1–5 in the frequency distributions refer to each point on the 5-point Likert scale employed in this study. The line graph on frequency distributions or bar charts is a plot of the

average frequencies for each point on the Likert scale and was drawn to assist in visualising the general skewness of the distributions. Although the skewness data did not indicate noteworthy skewness in the responses per item, skewness was considered in visual inspection of the combined item distribution graphs for purposes of data interpretation. My findings on the challenge response distributions therefore provide preliminary indications of the current situation in programme risk management in southern Africa.

Programme risk culture-related challenges: 2.1 structural challenges

2.1.1 Programme risk management strategy

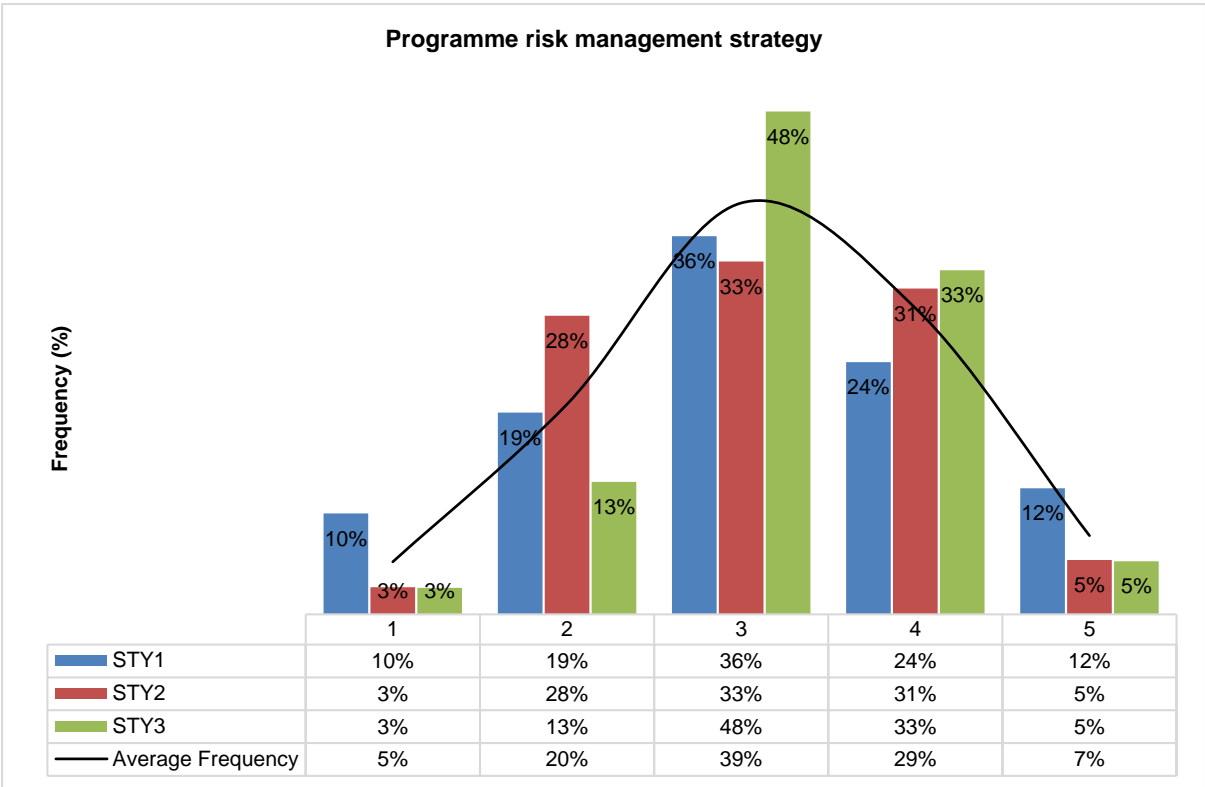


Figure 6. Programme risk management strategy frequency distribution.

The responses to STY1 (*organisations in my sector actively include programme risk management in strategic planning*), STY2 (*organisations in my sector actively consider the benefits of programme risk management during strategic planning*) and STY3 (*organisations in my sector actively include programme risk management when strategies are executed*), shown in Figure 6, appear to be uniformly distributed around the ‘moderate’/ ‘sometimes’/‘moderately well’ answer options (Table 3). This result indicates a mainly middling, unenthusiastic, to carefully positive view of the status of the inclusion of programme risk management in strategic planning and execution in southern African organisations.

2.2.2 Programme risk management standardisation

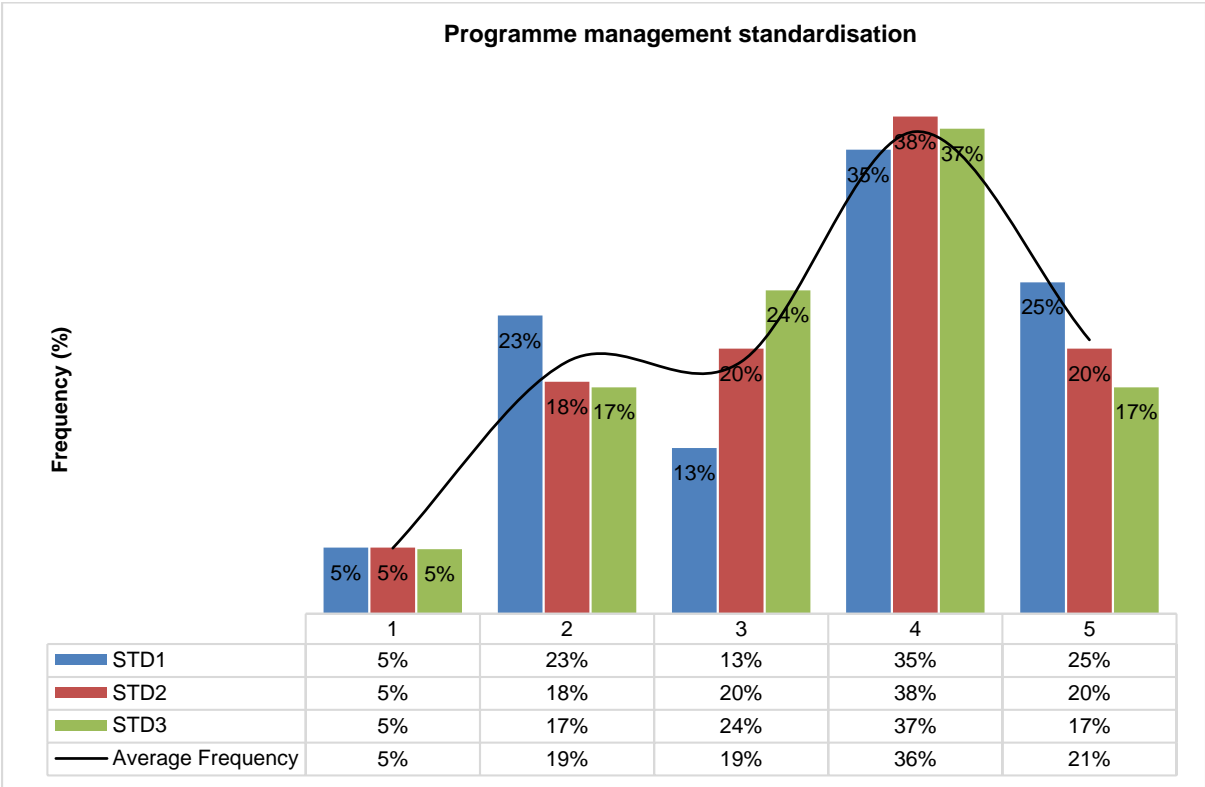


Figure 7: Programme risk management standardisation frequency distribution.

There is a noticeable skewness to the left in the distributions of responses to STD1 (*policies, written specifically for programme management, are available for use by organisations belonging to my sector*), STD2 (*standards, written specifically for programme management, are available for use by organisations belonging to my sector*) and STD3 (*frameworks, written specifically for programme management, are available for use by organisations belonging to my sector*) (Figure 7). This suggests that the study population considered that policies, standards and frameworks written specifically for programme management are usually available for use by organisations belonging to their employment sectors, and supports the lowest ranking of programme risk management standardisation on the question of 'which programme risk management challenge needs to improve first', shown in Figure 3. This also corresponds to the views of Hofstede et al. (2010) that behaviour, rather than formal structures, is more important to the culture of a group. Similarly, programme risk management behaviour ultimately determines the effectiveness of programme risk management in organisations.

2.1.3 Programme complexity

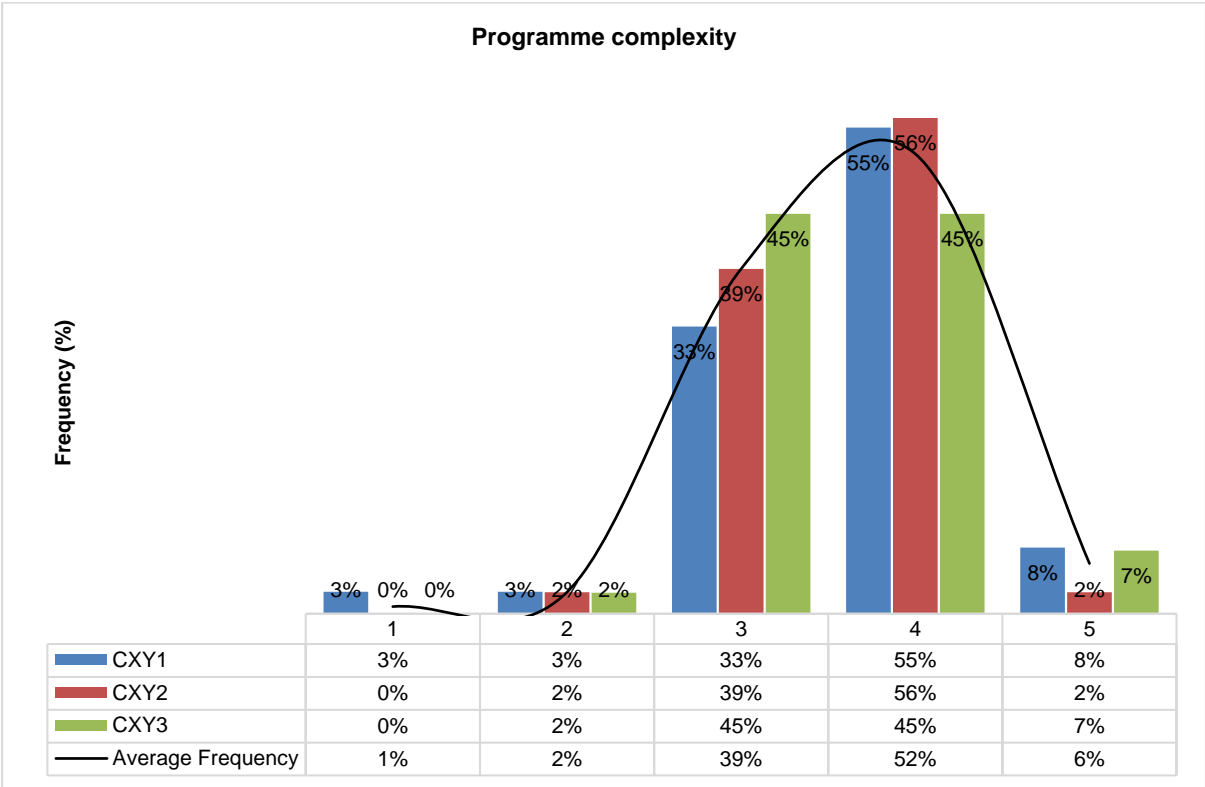


Figure 8: Programme complexity frequency distribution.

The distributions of responses to CXY1 (rate the business complexity, e.g. size and impact of change, of typical programmes in your sector), CXY2 (rate the technical complexity, e.g. processes involved, of typical programmes in your sector), and CXY3 (rate the programme execution complexity, e.g. time, cost and other resource requirements) were noticeably skewed to the left, as shown in Figure 8. This means that the study population mainly regarded programmes to be complex, which was expected as programmes consist of multiple projects and, often, comprise subsidiary programmes that have to be managed in a coordinated manner to obtain organisational benefits not available from managing constituent projects individually (PMI, 2017).

Programme risk culture-related challenges: 2.2 behavioural challenges

2.2.1 Programme risk management awareness

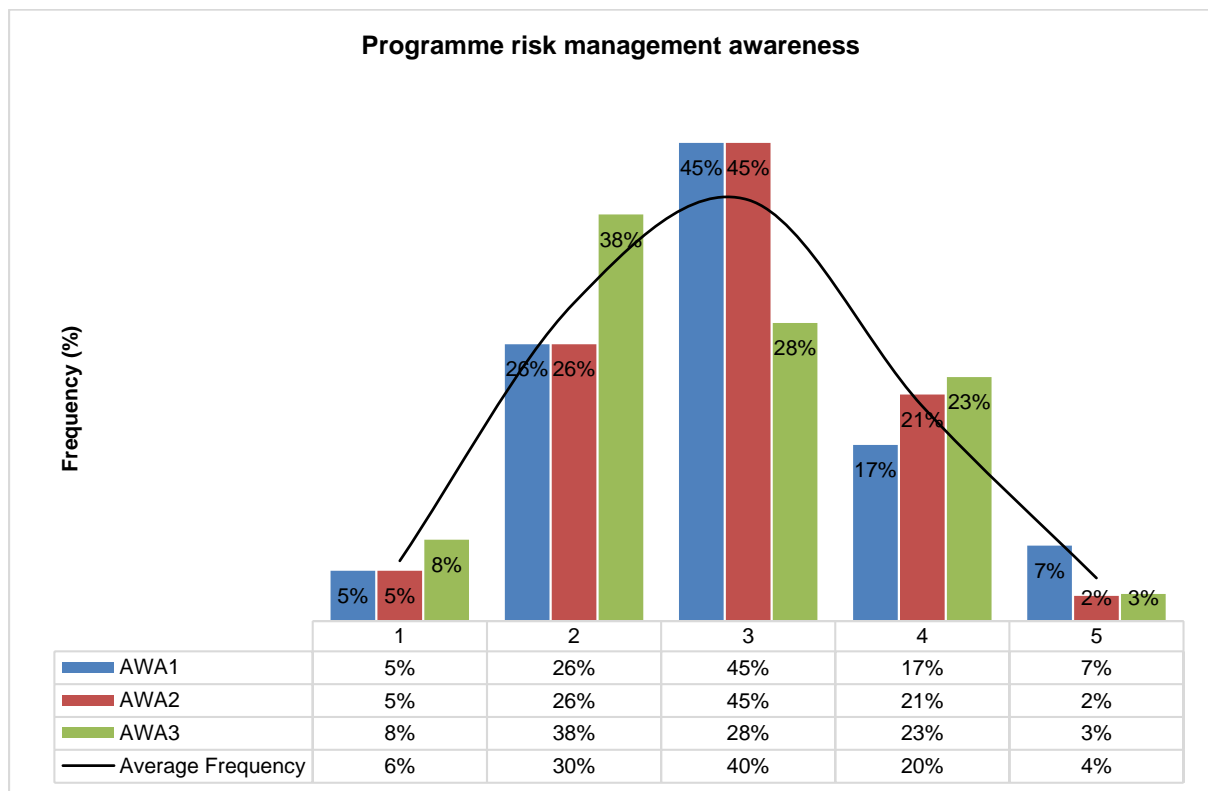


Figure 9: Programme risk management awareness frequency distribution.

The distributions of responses to AWA1 (*senior managers in my sector are familiar with the concept of programme risk management*), AWA2 (*senior managers in my sector understand programme risk management*) and AWA3 (*in my sector, organisations distinguish between project risk management and programme risk management during programme execution*) (Figure 9) appear to be symmetrical or uniformly distributed around the ‘Moderate’/‘Sometimes’/ ‘Moderately well’ answer options (Table 3). This result indicates an unenthusiastic to negative view of the status of awareness and understanding of programme risk management in southern African organisations.

2.2.2 Programme risk management skills

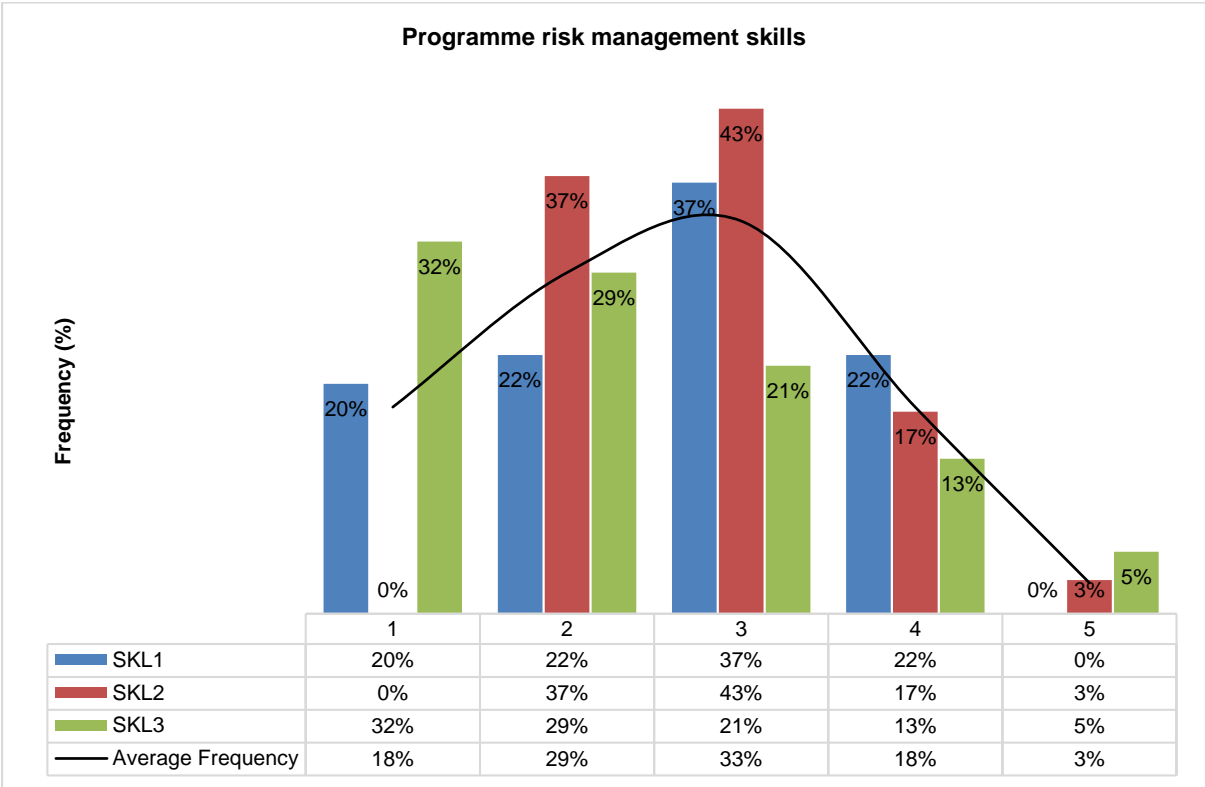


Figure 10: Programme risk management skills frequency distribution.

The data for responses to SKL1 (*suitably experienced programme risk management resources are available in organisations in my sector to carry out programme risk management tasks*), SKL2 (*suitably experienced programme risk management resources are available in the southern African employee market*), and SKL3 (*senior managers in my sector are specifically trained in programme risk management*) show noticeable skewness to the right. This result, in combination with the high percentages of ‘I do not know’ answers to items SKL2 and SKL3 shown in Table 4, indicate an issue with knowledge and general concern about the status of programme risk management skills in southern Africa. This finding, combined with programme risk management skills being the top ranked area for improvement of programme risk management in the region (Figure 3), indicate this as the most significant challenge to address to improve programme risk management locally.

2.2.3 Programme risk management knowledge

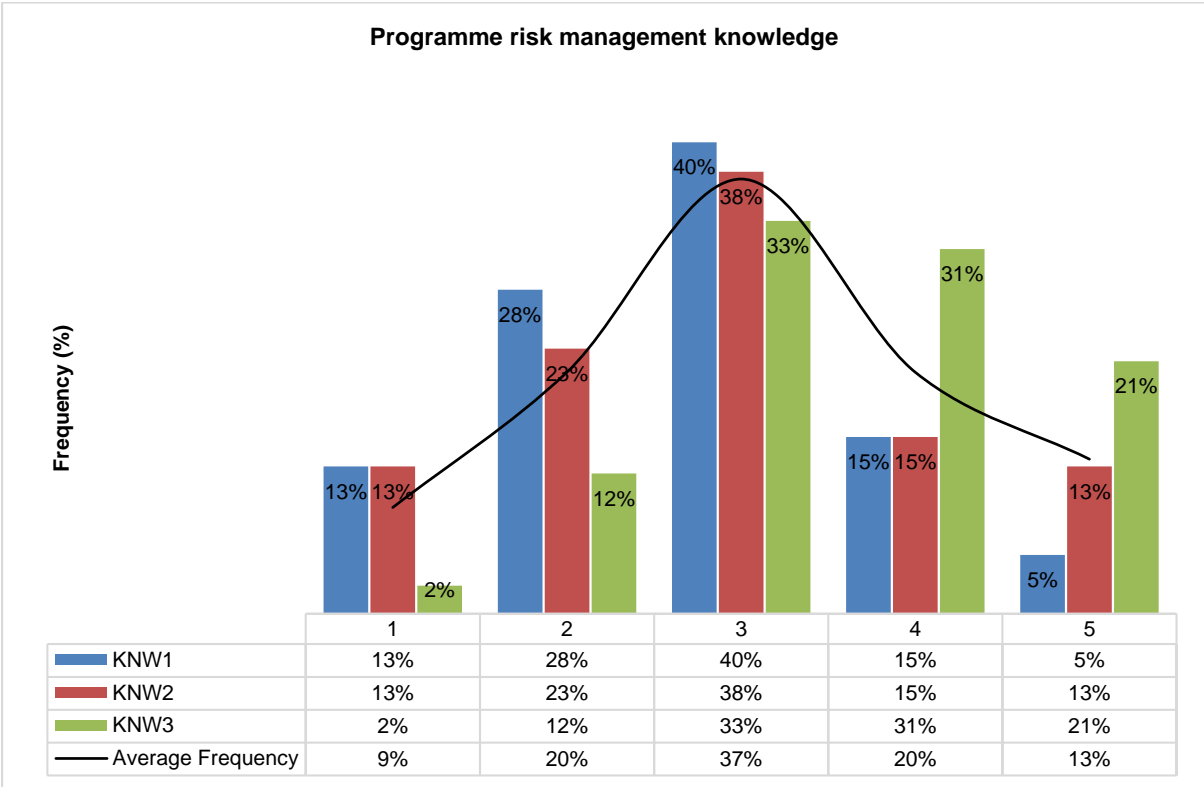


Figure 11: Programme risk management knowledge frequency distribution.

Here, the distributions of the three items differ, indicating that they are probably measuring different aspects of programme risk management knowledge: KNW1 (*organisational programme risk management frameworks in my sector allow us to actually manage programme risks, rather than only report on programme risks*) is skewed to the right; KNW2 (*organisations in my sector actively learn from programme risk events to improve the management of related risks*) is more uniformly distributed; and KNW3 (*programme risk management is included in programme management frameworks used in organisations in my sector*) is skewed to the left. These distributions indicate that in the participants’ employment sectors (1) organisational programme risk management frameworks infrequently allow them to manage programme risks and measures the effectiveness of imparting knowledge via these frameworks; (2) organisations sometimes actively learn from programme risk events to improve the management of related risks in southern Africa, which would improve programme risk management knowledge in these businesses; and (3) programme risk management tends to be well represented in programme management frameworks used.

This result indicates that the items to measure programme risk management knowledge should be revised in future applications of this survey. However, this knowledge measured low as a

priority area to address in responses to the item: 'To improve the execution of programme risk management in organisations, I believe that we must start with improving...' (Figure 3). The different response distributions to the items belonging to this challenge are therefore not expected to adversely affect the findings of this study.

2.2.4 Programme risk management communication

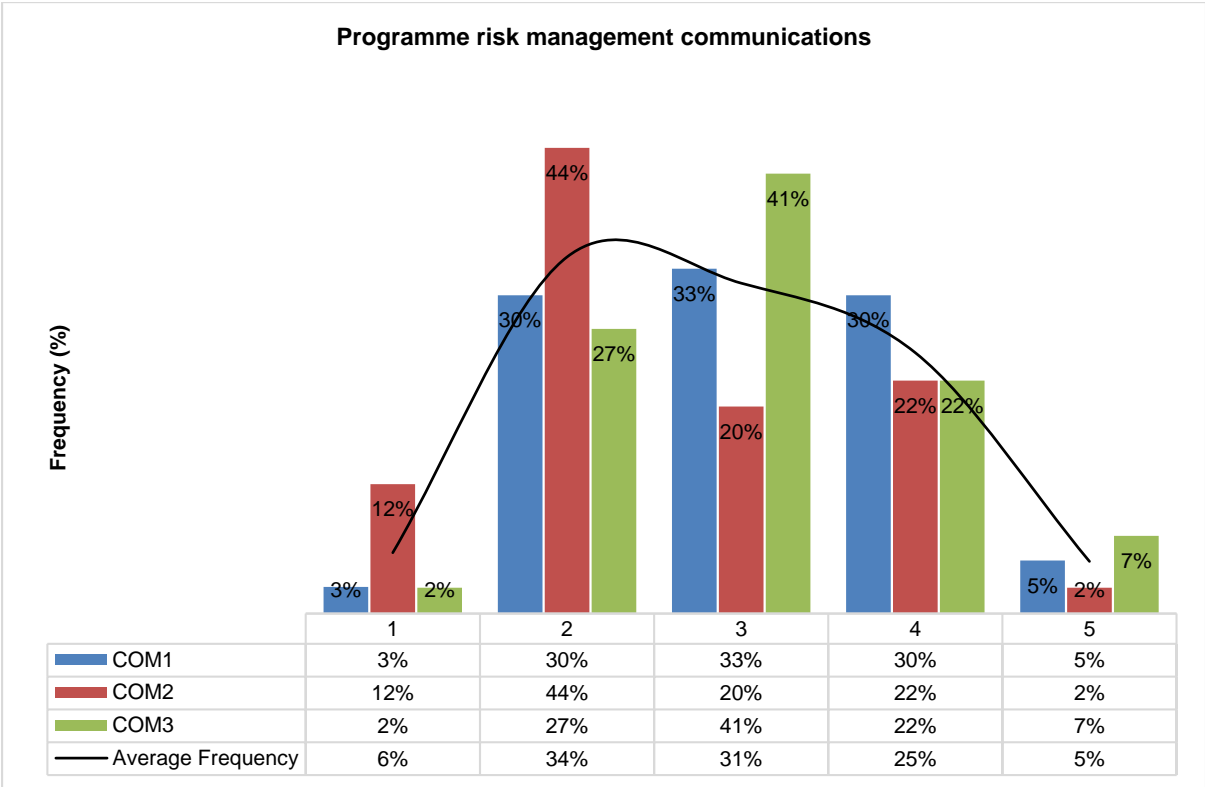


Figure 12: Programme risk management communication frequency distribution.

The average response line in Figure 12 for COM1 (*programme risk management reports are understood by programme management stakeholders in my sector*), COM2 (*organisations in my sector produce enough programme risk management reports to meet the needs of programme management stakeholders*), and COM3 (*senior managers in my sector welcome discussions about programme risk*) indicates that most communication-related responses lie in the 'Infrequently'/'Not well' and 'Sometimes'/'Moderately well' categories. The wide variety of perceptions reported here may be a contributing factor to how few respondents selected programme risk management communication as an area that needs to be improved first to improve programme risk management execution (Figure 3).

3 Programme risk management execution

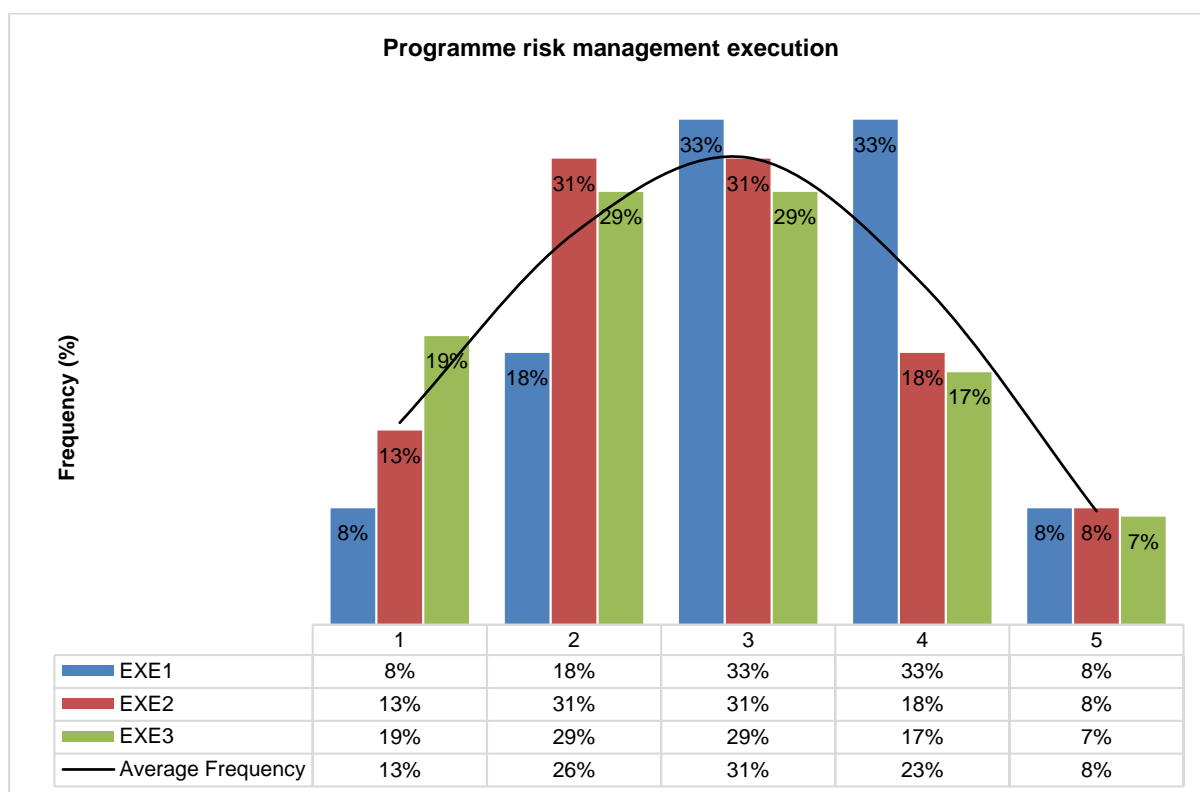


Figure 13: Programme risk management execution frequency distribution.

The average distribution of responses to EXE1 (*programme risk management is actively included in programme execution in my sector's organisations*), EXE2 (*programme risk management is aligned with other programme management processes in my sector's organisations*) and EXE3 [*organisations provide adequate resources (people, processes, systems, budget) to be able to manage programme risks*] indicates a symmetrical distribution of experiences of programme risk management by the study population, with most unenthusiastic about the status of programme risk management in the region.

4. Conclusions

This study sought to identify and describe priority areas of programme risk management improvement based on a ranking of the challenges contained in a particular model, combined with consideration of the interlinked nature of these challenges. The research question for this study was as follows: Which programme risk management challenges need to be addressed first to improve programme risk management in southern Africa? The initial ranking of these challenge areas indicated that improving programme risk management has to start with raising the relevant skills and awareness of the stakeholders involved. Subsequent consideration of the distributions of responses per challenge confirmed that improving programme risk management skills is the

one that needs to be addressed first for the purpose. This finding adds a specific improvement focus area to the current academic literature on programme risk management (Papadaki et al., 2014; Rasheed, Wang, & Lucena, 2015; Rasheed, Wang, & Yaqub, 2015; Sanchez et al., 2009; Shi et al., 2014; Smith et al., 2008), and is supported by the finding of Rasheed, Wang and Yaqub (2015) of a serious shortage of competent and skilled programme risk management professionals in industry.

4.1 Limitations and future research directions

This study provides new insights into programme risk management challenges with particular emphasis on southern Africa. It has not yet been extended to other regions in Africa or elsewhere. Such comparative studies – and among sectors not considered here – could allow for the discovery of similarities and differences in corresponding challenges among geographic areas and could also provide useful information to understand and improve programme risk management in practice.

In this study, membership of the target study population was unknown, which limits our knowledge of the generalisability of these findings. Descriptive research is usually considered preliminary for analytical studies (Lobo, 2005). However, this initial study did provide useful indications of which items could work well to measure essential aspects of each challenge. Further studies, on larger samples from known populations, could allow for inferential statistical analysis of an updated version of the scale items to be considered in future research on programme risk management challenges, to further understand their inherent characteristics. However, the study reported here sufficed for purposes of this research project. It has allowed adequate achievement of the study aim by providing southern African programme risk management stakeholders with areas to focus on in their initiatives to improve programme risk management.

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Appendix 1

Frequencies of responses of the measurement items for each programme risk management challenge

No.	Acronym	Description	Frequencies to responses 1, 2, 3, 4 or 5					Total
			1	2	3	4	5	
2.1		Structural challenges						
2.1.1	STY	Programme risk management strategy						
1	STY1	Organisations in my sector actively include programme risk management in strategic planning	4	8	15	10	5	42
2	STY2	Organisations in my sector actively consider the benefits of programme risk management during strategic planning	1	11	13	12	2	39
3	STY3	Organisations in my sector actively include programme risk management when strategies are executed	1	5	19	13	2	40
2.1.2	STD	Programme management standardisation						
1	STD1	Policies, written specifically for programme management, are available for use by organisations belonging to my sector.	2	9	5	14	10	40
2	STD2	Standards, written specifically for programme management, are available for use by organisations belonging to my sector.	2	7	8	15	8	40
3	STD3	Frameworks, written specifically for programme management, are available for use by organisations belonging to my sector.	2	7	10	15	7	41
2.1.3	CXY	Programme complexity						
1	CXY1	Rate the business complexity (e.g. size and impact of change) of typical programmes in your sector.	1	1	13	22	3	40
2	CXY2	Rate the technical complexity (e.g. processes involved) of typical programmes in your sector.	0	1	16	23	1	41
3	CXY3	Rate the programme execution complexity (time, cost and other resource requirements) of typical programmes in your sector.	0	1	19	19	3	42
2.2		Behavioural challenges						
2.2.1	AWA	Programme risk management awareness						
1	AWA1	Senior managers in my sector are familiar with the concept of programme risk management	2	11	19	7	3	42
2	AWA2	Senior managers in my sector understand programme risk management	2	11	19	9	1	42
3	AWA3	In my sector, organisations distinguish between project- and programme- risk management during programme execution	3	15	11	9	1	39

No.	Acronym	Description	Frequencies to responses 1, 2, 3, 4 or 5					Total
			1	2	3	4	5	
2.2.2	SKL	Programme risk management skills						
1	SKL1	Suitably experienced programme risk management resources are available in organisations in my sector to carry out programme risk management tasks	8	9	15	9	0	41
2	SKL2	Suitably experienced programme risk management resources are available in the southern African employee market	0	13	15	6	1	35
3	SKL3	Senior managers in my sector are specifically trained in programme risk management	12	11	8	5	2	38
2.2.3	KNW	Programme risk management knowledge						
1	KNW1	Organisational programme risk management frameworks in my sector allow us to actually manage programme risks, rather than only report on programme risks	5	11	16	6	2	40
2	KNW2	Organisations in my sector actively learn from programme risk events to improve the management of related risks	5	9	15	6	5	40
3	KNW3	Programme risk management is included in programme management frameworks used in organisations in my sector.	1	5	14	13	9	42
2.2.4	COM	Programme risk management communication						
1	COM1	Programme risk management reports are understood by programme management stakeholders in my sector	1	12	13	12	2	40
2	COM2	Organisations in my sector produce enough programme risk management reports to meet the needs of programme management stakeholders	5	18	8	9	1	41
3	COM3	Senior managers in my sector welcome discussions about programme risk	1	11	17	9	3	41
3	EXE	Programme risk management execution						
1	EXE1	Programme risk management is actively included in programme execution in my sector's organisations	3	7	13	13	3	39
2	EXE2	Programme risk management is aligned with other programme management processes in my sector's organisations	5	12	12	7	3	39
3	EXE3	Organisations provide adequate resources (people, processes, systems, budget) to be able to manage programme risks	8	12	12	7	3	42

Appendix 2

Frequencies of responses of the measurement items expressed as percentages

No.	Group	Description	Frequencies expressed as percentages for each item					
			1	2	3	4	5	Total
2.1		Structural challenges						
2.1.1	STY	Programme risk management strategy						
1	STY1	Organisations in my sector actively include programme risk management in strategic planning	10%	19%	36%	24%	12%	100%
2	STY2	Organisations in my sector actively consider the benefits of programme risk management during strategic planning	3%	28%	33%	31%	5%	100%
3	STY3	Organisations in my sector actively include programme risk management when strategies are executed	3%	13%	48%	33%	5%	100%
4	Average Frequency		5%	20%	39%	29%	7%	100%
2.1.2	STD	Programme management standardisation						
1	STD1	Policies, written specifically for programme management, are available for use by organisations belonging to my sector.	5%	23%	13%	35%	25%	100%
2	STD2	Standards, written specifically for programme management, are available for use by organisations belonging to my sector.	5%	18%	20%	38%	20%	100%
3	STD3	Frameworks, written specifically for programme management, are available for use by organisations belonging to my sector.	5%	17%	24%	37%	17%	100%
4	Average Frequency		5%	19%	19%	36%	21%	100%
2.1.3	CXY	Programme complexity						
1	CXY1	Rate the business complexity (e.g. size and impact of change) of typical programmes in your sector.	3%	3%	33%	55%	8%	100%
2	CXY2	Rate the technical complexity (e.g. processes involved) of typical programmes in your sector.	0%	2%	39%	56%	2%	100%
3	CXY3	Rate the programme execution complexity (time, cost and other resource requirements) of typical programmes in your sector.	0%	2%	45%	45%	7%	100%
4	Average Frequency		1%	2%	39%	52%	6%	100%

No.	Group	Description	Frequencies expressed as percentages for each item					
			1	2	3	4	5	Total
2.2		Behavioural challenges						
2.2.1	AWA	Programme risk management awareness						
1	AWA1	Senior managers in my sector are familiar with the concept of programme risk management	5%	26%	45%	17%	7%	100%
2	AWA2	Senior managers in my sector understand programme risk management	5%	26%	45%	21%	2%	100%
3	AWA3	In my sector, organisations distinguish between project- and programme- risk management during programme execution	8%	38%	28%	23%	3%	100%
4	Average Frequency		6%	30%	40%	20%	4%	100%
2.2.2	SKL	Programme risk management skills						
1	SKL1	Suitably experienced programme risk management resources are available in organisations in my sector to carry out programme risk management tasks	20%	22%	37%	22%	0%	100%
2	SKL2	Suitably experienced programme risk management resources are available in the southern African employee market	0%	37%	43%	17%	3%	100%
3	SKL3	Senior managers in my sector are specifically trained in programme risk management	32%	29%	21%	13%	5%	100%
4	Average Frequency		18%	29%	33%	18%	3%	100%
2.2.3	KNW	Programme risk management knowledge						
1	KNW1	Organisational programme risk management frameworks in my sector allow us to actually manage programme risks, rather than only report on programme risks	13%	28%	40%	15%	5%	100%
2	KNW2	Organisations in my sector actively learn from programme risk events to improve the management of related risks	13%	23%	38%	15%	13%	100%
3	KNW3	Programme risk management is included in programme management frameworks used in organisations in my sector.	2%	12%	33%	31%	21%	100%
4	Average Frequency		9%	20%	37%	20%	13%	100%
2.2.4	COM	Programme risk management communication						
1	COM1	Programme risk management reports are understood by programme management stakeholders in my sector	3%	30%	33%	30%	5%	100%
2	COM2	Organisations in my sector produce enough programme risk management reports to meet the needs of programme management stakeholders	12%	44%	20%	22%	2%	100%
3	COM3	Senior managers in my sector welcome discussions about programme risk	2%	27%	41%	22%	7%	100%

No.	Group	Description	Frequencies expressed as percentages for each item					
			1	2	3	4	5	Total
4	Average Frequency		6%	34%	31%	25%	5%	100%
3	EXE	Programme risk management execution						
1	EXE1	Programme risk management is actively included in programme execution in my sector's organisations	8%	18%	33%	33%	8%	100%
2	EXE2	Programme risk management is aligned with other programme management processes in my sector's organisations	13%	31%	31%	18%	8%	100%
3	EXE3	Organisations provide adequate resources (people, processes, systems, budget) to be able to manage programme risks	19%	29%	29%	17%	7%	100%
4	Average Frequency		13%	26%	31%	23%	8%	100%

CHAPTER 4

RESEARCH ARTICLE 3

Addressing southern Africa's programme risk management skills challenges

Abstract

The ranking of programme risk management challenges in the previous study indicated that improving programme risk management in southern Africa has to start with raising the relevant skills and awareness of the stakeholders involved. Accordingly, the purpose of this study was to explore ways to address programme risk management skills-related challenges in southern Africa to be able to improve programme risk management in the subcontinent. This qualitative study was based initially on a review and analysis of the skills-related literature. This was followed by semi-structured interviews to explore specific skills required to improve programme risk management in organisations. Purposeful sampling was used to select 15 interview participants with programme management experience across different southern African economic sectors. Inductive reflexive thematic analysis of the study data led to recommendations for areas of programme risk management skills improvement, and the creation of a programme risk management specification framework. Addressing the challenges of creating programme risk management skills in this part of the world requires interventions that are training and non-training related. The programme risk management specification framework, developed in this study, allows for increased understanding of the terms programme and programme management in organisations, thereby allowing for the proper definition of programme risk management within individual entities, and enhancing programme risk management skills in southern Africa.

Keywords: Programme risk management skills in southern Africa; Programme risk management skill improvements, Programme risk management specification framework

1. Introduction

Improvement of programme risk management skills in southern Africa has been identified as a priority area for enhancing programme risk management. In Article 3 (Chapter 4) of this thesis, I therefore investigated how these skills might be bettered. Even though skills development has become an increasingly important policy issue internationally (King, 2009; Palmer, 2009), the question of how to define the term 'skill' as a concept remains highly debatable (Allais, 2012; Reddy et al., 2018, p. 7). Based on multifaceted views of the term, two work-related components were used in this study to define it: (1) a skill is a competence belonging to an individual or a collective group of people who develop and exercise that skill in their workplace interactions; and (2) skills are the result of formal, non-formal and informal learning. Formal skills development leads to formal qualifications, whereas non-formal skills development refers to planned educational interventions not intended to lead to formal qualifications. Informal learning includes incidental learning that occurs during daily activities (Reddy et al., 2018, p. 7). Skills can therefore be learnt and a skilled workforce, important to a successful economy, can be created (Deal, 2017; Johnson et al., 2015; Salazar-Xirinachs, 2015). In the study described in this article (Chapter 4), I focused on exploring ways to address risk management skills-related challenges in southern Africa to be able to improve the practice of programme risk management. The principal research question of this study was: How could programme risk management skills challenges be addressed in southern Africa?

Skills shortages are a worldwide concern (Gamble et al., 2010; McGrath-Champ et al., 2011). They are not limited to any specific geographic region (Hall & Sandelands, 2009; McGrath-Champ et al., 2011; Rasool & Botha, 2014), and southern Africa is no exception (Hall & Sandelands, 2009; Rasool & Botha, 2014). Similarly, skills shortages are not limited to any specific field of expertise (McGrath-Champ et al., 2011). Skills shortages can be attributed to many causes, such as rapid advances in science and technology and intensified economic competition (Palmer, 2009), non-supportive legislation (Cullen, 2001; McGrath-Champ et al., 2011; Salmon et al., 2019), lack of investment in skills development (Jalbout & Farah, 2016; Royle & Laing, 2014) and out-of-date educational curricula (Caldwell, 2013; Fisher & Morin, 2017; Mazzeo et al., 2003). Interventions aimed at addressing skills challenges have therefore been employed in different parts of the world. For example, vocational education and training (VET) is widely acknowledged as assisting in matching the skills required by employers with those offered by workers (Baqadir et al., 2011; McGrath-Champ et al., 2011; Palmer, 2009; Raufflet & Lohmeyer, 2014). Other interventions such as supportive legislation (Cullen, 2001; Hall & Sandelands, 2009; McGrath-Champ et al., 2011; Rasool & Botha, 2014; Salmon et al., 2019; Strauss & Du Toit, 2010) and government, academic and industry partnerships or collaborations (Baqadir et al., 2011; Christo-Baker et al., 2017; Cullen, 2001; Raufflet &

Lohmeyer, 2014; Salazar-Xirinachs, 2015) have also been used to improve work-related skills. The study reported here explores the requirements for programme risk management skill development interventions, as little has been published on the topic, and especially not in southern Africa.

This study started with a review and analysis of the general academic literature and other documents related to addressing skills challenges. Then, 15 semi-structured, open-ended interviews were conducted with programme management practitioners to obtain practice-based information on how southern African programme risk management skills challenges could be addressed. The findings from the interviews were used in conjunction with those from the literature review to provide skills areas deemed in need of improvement, and the creation of a programme risk management specification framework. With programme management becoming increasingly important in practice, this study provides theoretical and practical insights into an underexplored area important to the southern African development agenda.

This article is structured as follows: The study research methods, including data collection and analysis, and the use of a reflexive approach to this qualitative research project are described next. This is followed by findings from the literature review and interview data. I conclude with how to address programme risk management skills challenges in southern Africa, the limitations of the study and recommendations for programme risk management skills-related future research and practice.

2. Research methods

2.1 Research approach

The qualitative approach to this study consisted of a qualitative analysis of selected skills-specific literature and open-ended interviews with programme management practitioners, as summarised in Figure 1.

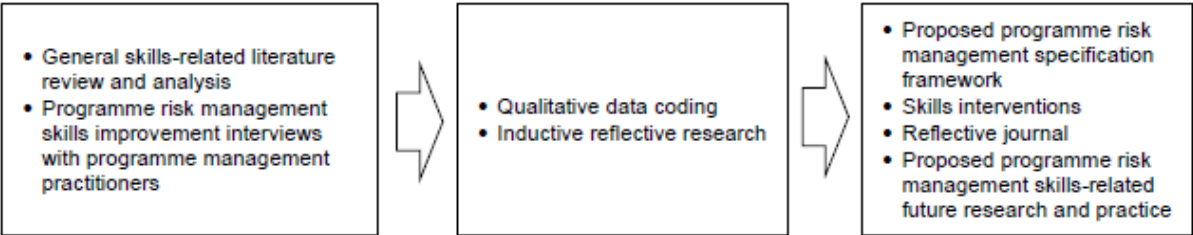


Figure 1. A visual summary of the research approach of Phase 3 of the study

2.2 Data sources

This study examined the skills challenge-related academic literature and other relevant documents published by such organisations as the South African Human Sciences Research Council (HSRC) and World Economic Forum (WEF). These two documents provided useful and beneficial information for this study such as the definition of the term ‘skill’, used in this study. The research objective also informed the formulation of two open-ended questions on how to address programme risk management skills challenges in southern Africa, which were used in semi-structured interviews with programme management practitioners. Fifteen interviews proved to be sufficient for this study as the consistency of information that emerged from them implied that adequate levels of data saturation had been achieved to satisfy the aims of the enquiry (Collis & Hussey, 2014, p. 182; Saunders et al., 2009, p. 235).

2.3 The interview questions

As shown in the interview guide that is provided in Appendix 1, the interviewees were informed that the purpose of the interview was:

A survey on programme risk management challenges ranked inadequate programme risk management skills as the number one challenge among other challenges. The purpose of this interview-based study is to propose solutions to inadequate programme risk management skills based on practitioner perspectives.

Table 1 presents the two questions that formed the basis of the semi-structured interviews. Question 1 sought information about how programme risk management skills challenges in southern Africa could be improved in practice. This information was used to identify the corresponding interventions aimed at improving programme risk management skills. Question 2 sought further information on why these improvements had been suggested.

Table 1

Interview questions

No.	Question
1	How should programme risk management skills challenges be improved?
2	Why do you think that programme risk management skills challenges should be improved as you suggest?

2.4 Data analysis

Qualitative coding was used to analyse and aggregate the selected literature and interview data into categories of information that share a common characteristic, as described by Collis and Hussey (2014, p. 162) and Creswell (2013, p. 184). Using inductive reflexive thematic analysis on the information contained in the literature examined and other documents, a list of thematic codes representing interventions to address general skills challenges was created (Table 3 and Appendix 2). These general thematic codes provided a guide against which the thematic codes from the interview data were evaluated, thereby allowing for a literature-based analysis and interpretation of the interview responses on how to address programme risk management skills challenges. The interview data per participant were analysed, resulting in an initial list of 184 programme risk management skill-specific codes (Appendix 3). Interview codes that were similar in meaning were aggregated into themes (Appendix 4), resulting in the theme codebook provided in Table 4. The constant comparative method of qualitative analysis was used to code the interview data per interviewee (Glaser, 1965). Thus, findings from newly collected data were continuously compared with those previously collected from earlier interviews to identify new information not yet obtained from the interviews. After analysing all 15 interviews, it was clear that adequate levels of data saturation had been reached, as no new study-related information had been disclosed in the analysis of the later interviews recorded.

2.5 Employing reflexivity to enhance the credibility of the study

Qualitative research methods are employed to explore the meaning of social phenomena through collection, analysis and interpretation of textual data. Qualitative research is still regarded with scepticism by some people because of its subjective nature and the absence of quantitative facts (Koch & Harrington, 1998; Malterud, 2001; Nadin & Cassell, 2006). This scepticism can be reduced by enhancing the rigour of a study. For example, researcher expectation bias can influence the outcomes of the research (Koch & Harrington, 1998; Patnaik, 2013). In the case of this study, the researcher's expectations would have been influenced by his experience in two previous studies. This means that the researcher has to be able to demonstrate that this qualitative research project has been conducted in a credible, transferable and trustworthy manner by his actively considering the influence of such bias on his interpretation of the study data and findings (Golafshani, 2003).

Reflexive research is characterised by ongoing self-critique and self-appraisal on the part of the researcher, which situates him in the research process (Koch & Harrington, 1998; Malterud, 2001; Patnaik, 2013). Thus, reflexivity contributes to the richness of qualitative research and its credibility (Patnaik, 2013). In this study, I employed reflexivity to mitigate

interpretation biases to further enhance the credibility of the outcomes of the study and their interpretations. Summary excerpts from my reflexive journal for this study are provided in the findings section (Table 8).

2.6 Demographic profile of participants

Purposeful sampling was employed to achieve the aim of the study. Participants were specifically selected because they could inform an understanding of this study's research problem (Creswell, 2013, p. 156; Suri, 2011). Table 2 provides a demographic profile of the 15 participants drawn from a wide range of organisational sectors in southern Africa. Each member of the study population had more than 10 years' experience of programme management. This high experience level provided comfort that the views expressed contributed valuable information about the interventions on addressing programme risk management skills challenges in their region.

Table 2

Demographic profile of the 15 participants in the study

Demographic characteristics	Demographic variable	Frequency	Percentage
<i>Participant's employment sector</i>	Oil and gas (petrochemical)	3	20
	Government and public services	3	20
	Capital projects and infrastructure	7	47
	Other	2	13
Total		15	100

3 Study findings

3.1 Thematic coding results

Analysing the literature revealed a number of thematic codes related to interventions on how to address skills challenges. These themes were classified into four categories shown in Table 3.

Table 3*Theme categories*

No.	Theme category	Description
1	Training	The process of acquiring programme management and programme risk management knowledge, and subsequently developing the skills required for the job at hand. This category refers to specific tasks or activities that address skills challenges to develop the required competency through formal, non-formal and informal learning.
2	Skills	A skill is a competence belonging to an individual or a collective group of people who develop and exercise that skill in their workplace interactions. Skills are the result of formal, non-formal and informal learning (Reddy et al., 2018, p. 7).
3	Skills development target groups	Skill development target groups consist of the individuals or groups of people who are intended recipients of skills development actions.
4	Structural skills enablers	Formal policies, legislation, regulations and systems that create the right environment or framework and make it possible to address skills challenges. The focus of an enabler is on 'how' rather than 'what' is being addressed.

Table 4 provides the thematic codes (interventions) derived from the selected study literature on how to address skills challenges mapped to the thematic categories provided in Table 3.

Table 4

General interventions (themes) on how to address skills challenges based on a review and analysis of general skills-related literature

No.	Thematic category	Theme No.	Theme or intervention construct	Theme description	Reference or source
1	Training	1	Training: definition	The process of acquiring (programme management and programme risk management) knowledge, typically in an institutional environment, and subsequently developing the skills required for the job at hand.	Johnson et al. (2015); Paxton and Griffiths (2017); Raufflet and Lohmeyer (2014); Royle and Laing (2014); Schmitz Jr et al. (2012)
		2	Training: vocational (type of training)	Vocational training, also known as technical and vocational education and training (TVET) or simply vocational education and training (VET), is training that provides job-specific technical training and hands-on instructions leading to certification upon successful completion.	Allais (2012); Baqadir et al. (2011); Raufflet and Lohmeyer (2014)
		3	Training: distance (type of training)	Distance education is the education of students who may not always be physically present at an institution of learning such as correspondence courses via post and today's online education.	Domingue et al. (2014); Erasmus (2001); Rasool and Botha (2014); Santandreu Calonge and Aman Shah (2016)
		4	Training: Massive open online courses (MOOC) (type of training)	Leveraging of technology to provide affordable and flexible learning. MOOC can be employed to address skills challenges.	Domingue et al. (2014); Sancho et al. (2015); Santandreu Calonge and Aman Shah (2016)
		5	Skills summits or conventions	Convening a symposium comprising leading voices from government, industry and academia to formulate recommendations and plans for implementing those recommendations in areas of concern.	Caldwell (2013); Calhoun et al. (2017); Domingue et al. (2014); Erasmus (2001); Jalbout and Farah (2016); Paxton and Griffiths (2017); Schmitz Jr et al. (2012)
2	Skills	6	Personal skills	The skills needed to interact with others within an organization and accomplish tasks such as communication, negotiation, customer/supplier relationships, problem solving and team working.	Baruah et al. (2018); Fisher and Morin (2017); Gamble et al. (2010); Mazzeo et al. (2003); Strauss and Du Toit (2010)
		7	Technical or professional skills	This is the knowledge needed to perform subject-specific or field-related tasks or duties, some of which might include engagement with technology.	Allais (2012); Baruah et al. (2018); Caldwell (2013); Christo-Baker et al. (2017); Gamble et al. (2010); Jalbout and Farah (2016); Mazzeo et al. (2003); Royle and Laing (2014); Salazar-Xirinachs (2015)
3	Skills development target groups	8	Attracting and developing young talent	Promoting careers and skills where there are gaps among young talent, and developing strategies that generate a sustainable supply or pipeline of young people in those careers.	Allais (2012); Baqadir et al. (2011); Hall and Sandelands (2009); Mazzeo et al. (2003)
		9	Skills development among mature and other existing employees	The task of up-skilling or re-skilling more mature workers already active in the workforce with specific vocational programmes.	Allais (2012); Caldwell (2013); Hall and Sandelands (2009); Jalbout and Farah (2016); Johnson et al. (2015); Royle and Laing (2014); Santandreu Calonge and Aman Shah (2016)

No.	Thematic category	Theme No.	Theme or intervention construct	Theme description	Reference or source
4	Structural skills enablers	10	Legislation	Using legislation as a catalyst for change to address the skills gaps in a post-education system.	Cullen (2001); Hall and Sandelands (2009); McGrath-Champ et al. (2011); Salmon et al. (2019); Strauss and Du Toit (2010)
		11	Immigration policy	Using immigration policy to address skills shortages. Migration is the movement of skilled persons from one geographic region to another with the intention of settling permanently or temporarily in those regions. This is a cohesive multifaceted approach providing a labour-force mix for delivery requirements of today, while developing a pool of home-grown skills for future industry requirements through experience, training and education.	Hall and Sandelands (2009); McGrath-Champ et al. (2011); Rasool and Botha (2014); Rasool et al. (2012)
		12	Accrediting or certifying bodies	Accreditation and certification organisations must (1) include skill-specific education and skill acquisition as part of their requirements for post qualification accreditation and certification, (2) verify that certified members have the requisite training, and (3) require skill-specific continuing education as a requirement for the renewal.	Caldwell (2013); Mazzeo et al. (2003); Salmon et al. (2019); Schmitz Jr et al. (2012)
		13	Creating clear career paths for areas with skills challenges	Creating career paths that could enhance the growth of persons in areas with skills challenges, especially niche areas.	Caldwell (2013); Christo-Baker et al. (2017); Jalbout and Farah (2016); Mazzeo et al. (2003); Salazar-Xirinachs (2015)
		14	Revising curricula of areas with skills challenges	Continuously updating or modifying curricula in line with changes in societal requirements such as changes in technology, science and mathematics.	Caldwell (2013); Fisher and Morin (2017); Mazzeo et al. (2003); Salazar-Xirinachs (2015)
		15	Government, academia and industry partnerships or collaborations	The requirement for government, education and industry to work together in addressing the skills challenge.	Baqadir et al. (2011); Christo-Baker et al. (2017); Cullen (2001); Raufflet and Lohmeyer (2014); Salazar-Xirinachs (2015)

Table 5 provides the corresponding southern African programme risk management thematic codebook derived from the interview data. There are thematic codes from the literature that were similar to those derived from the interviews.

Table 5

Programme risk management-specific thematic codes from the interview data mapped to the literature-based thematic categories

No.	Thematic category	Theme No.*	Theme	Description	Examples of interview quotes
1	Training	1 (N)	Improving policymakers' programme management and programme risk management knowledge	Provide programme management (and programme risk management) education and training to policymakers such as public sector officials and corporate executives, e.g. <ul style="list-style-type: none"> • Increase programme management knowledge among policymakers • Educate capital asset owners on programme management • Policy and planning happen at programme level and implementation at project level • Rewarding projects rather the overall macro-economic (programme) benefit • Budgeting for projects individually rather than as a programme 	1) 'I deal with public and private sector projects. A lot of them are under the impression that a good project manager can make a good programme manager, but that is not the case.' 2) 'Decision makers in southern Africa do not understand programme management.' 3) 'Senior corporate executives do not understand what a programme is. What do you mean by programme?'
		2 (L)	Introducing programme management and programme risk management in educational curricula	Introducing programme management (and programme risk management) in the curriculum of institutions of higher learning	1) 'I have never seen a course like that. I travelled abroad to gain that knowledge and training.' 4) 'The curricula need to emphasise it and equip the trainees and students.'
		3 (L)	Education and training (in programme management and programme risk management)	The process of acquiring programme management and programme risk management knowledge, typically in an institutional environment, and subsequently developing the skills required for the job at hand, e.g. <ul style="list-style-type: none"> • Using online or e-learning platforms • Holding skills summits or conventions • Distance education 	1) 'Training people that are responsible for programme risk management on this concept.' 2) 'Online training is also a good way of creating capacity in the organisation.' 5) 'Unless you have specifically been trained in programme risk management, it is difficult.'
2	Skills	Personal skills			
		4 (L)	Communication skills	Communicating or reporting programme risk management in a manner that is accurate, comprehensive, timely, clear and useful, e.g. <ul style="list-style-type: none"> • Reporting to the right stakeholders (project risk management reporting into programme risk management) • Using a language that is understood by stakeholders • Addressing barriers to communication that may be prevalent 	1) 'Risk managers do not simplify the risk management process and language for everyone to understand.' 2) 'Risk managers use a language that is not understood by programme managers. This creates a problem.' 3) 'So, it is very good communication skills, both verbally as well as written.'

No.	Thematic category	Theme No.*	Theme	Description	Examples of interview quotes
	(Skills continued)	5 (N)	Strategic thinking	An entity's or person's capacity for thinking conceptually and systematically in the context of achieving the programme's strategic objectives, e.g. <ul style="list-style-type: none"> Understanding the big picture (programme purpose) Balancing between big picture requirements and complexity Addressing a project manager's lack of big picture focus 	<p>1) 'The programme risk manager must keep his or her eyes on the bigger picture.'</p> <p>2) 'It is the person who has the capability to integrate complex ideas, and someone who can think and operate at process, strategic, operational and tactical levels.'</p> <p>3) 'The risk practitioner understands well, but has a challenge of linking risk management with the whole programme or the whole organisation.'</p>
		6 (N)	Knowledge sharing culture	The desired and shared values, attitudes, beliefs and understanding by employees of an organisation about programme risk management knowledge sharing, e.g. <ul style="list-style-type: none"> Cross-cultural pollination Desired culture about knowledge sharing 	<p>1) 'Those individuals that had the skills are gone. And those who have, do not want to share it for fear of creating competition for themselves.'</p> <p>2) 'Because of the enormous size and capital cost associated with programmes, owner organisation is seldom prepared to execute them. So invariably, they engage the services of engineering contractors thus getting into cross-cultural arrangements of organisation 1 to organisation 2.'</p> <p>3) 'Organisations do not pay adequate attention to the professional practice of risk management. It is dealt with as a tick box exercise.'</p>
Technical or professional skills					
		7 (N)	Requirement for generalists rather than specialists	A person with an extensive collection of knowledge on a variety of subjects about the organisation. Ideally this person should have worked in the organisation for some time, e.g. <ul style="list-style-type: none"> A generalist who is an all-rounder rather than a specialist A generalist who is an all-rounder who understands business rather than a specialist A multi-skilled and multi-persona generalist An inquisitive and analytical generalist 	<p>1) 'It is not just about the technical skills; you have to be an all-rounder.'</p> <p>2) 'I strongly feel that a good risk manager is more of a generalist than a specialist.'</p> <p>3) 'The primary thing is to get someone that has a clear vision and an understands how the programme fits into the organisation.'</p>
		8 (N)	Programme risk management execution	Programme risk management should be implemented and practised properly, e.g. <ul style="list-style-type: none"> Integrating risk management process into programme management Aligning risk management to programme management Institutionalising programme risk management across the organisation 	<p>1) 'We may struggle to introduce the risk management process in a programme without delaying the project or programme.'</p> <p>2) 'What I think was probably most difficult in terms of limiting success of our programme risk management was getting alignment on what is important and significant and where things fit.'</p> <p>3) 'How do you institutionalise programme risk management so that it becomes part of the organisation?'</p>

No.	Thematic category	Theme No.*	Theme	Description	Examples of interview quotes
	(Skills continued)	9 (N)	Programme benefits realisation	Identifying, defining and tracking the realisation of programme benefits, e.g. <ul style="list-style-type: none"> • Creating an understanding of programme benefits • Understanding the programme objectives • Benefits delivery 	<p>1) 'You need to give them the necessary understanding of the benefits of managing a programme instead of individual projects.'</p> <p>2) 'This relates to those risks or those uncertainties related to the ultimate benefits that have been planned.'</p> <p>3) 'A programme must deliver the planned benefits and the risk manager must support the programme manager.'</p>
		10 (N)	Value of risk management (business case for programme risk management)	The understanding of the value added by risk management to programme management should be contextualised, e.g. <ul style="list-style-type: none"> • The rationale for programme risk management • The positioning of risk management in the organisation 	<p>1) 'Risk management is looked upon as a product and as a report to tick the governance box, not as a capability that will save an organisation out of trouble.'</p> <p>2) 'Risk managers are not good at selling risk management.'</p> <p>3) 'And when he had discussions with his project managers about what went wrong and what they might have done, he came to the realisation that what was missing was risk management.'</p>
		11 (N)	Understanding the business	Adequate knowledge of, or familiarity with, the business. Risk management should be an integral part of the everyday running of the business and risk managers should understand the business, e.g. <ul style="list-style-type: none"> • Understanding the programme management environment well • Understanding the strategic intent of the organisation • Matching skills acquisition to the strategic intent of the organisation 	<p>1) 'If you want to be a good risk manager for your entity, your corporation or your company, you need to understand the business very well.'</p> <p>2) 'You can only do that level of risk analysis if you understand the business and if you understand the strategy.'</p> <p>3) 'I discovered that some of our risk managers themselves lacked an in-depth understanding of the business.'</p>
		12 (N)	Risk management capability	Risk management should evolve over time from being a process to a capability thereby enabling the organisation to perform risk management tasks at a certain performance level, e.g. <ul style="list-style-type: none"> • Build knowledge and capacity in the organisation • Organisational risk management capability • Programme risk management capability 	<p>1) 'It is to build knowledge and capacity in the organisation so that you can entrench programme risk management in the organisation.'</p> <p>2) 'Risk management must be transformed from a process to a capability. A capability then becomes a competitive advantage.'</p> <p>3) 'Can we create bodies of knowledge that are widely accessible, taught and understood so that we can create capabilities from a knowledge point of view?'</p>

No.	Thematic category	Theme No.*	Theme	Description	Examples of interview quotes
		13 (N)	Risk aggregation	<p>The process of adding up individual project risks in order to obtain an integrated bigger picture perspective, e.g.</p> <ul style="list-style-type: none"> • Integration of risk into one bucket • Aggregating project risks in relation to programme objectives 	<p>1) 'Project risk aggregation does not equal to programme risks.'</p> <p>2) 'We did take risk reviews and updated the risk register at project level and then rolled to programme level.'</p> <p>3) 'One can interpret project level risk in integrating and aggregating causes, consequences and controls so that you can deal with that at a programme level, or at least understand the impact at a programme level so that you can make appropriate decisions at that level.'</p>
	(Skills continued)	14 (N)	Interdependency and interface management	<p>Programme management interacts extensively with organisational strategic management and individual projects. Programme risk management should manage these interfaces, e.g.</p> <ul style="list-style-type: none"> • The interdependencies among projects within a programme • Bottom-up risk assessment (from projects to programme) • Top-down risk assessment (from programme to projects) 	<p>1) 'Understanding how one project affects another project is important in these scenarios.'</p> <p>2) 'From a programme, you are now looking at interrelationships. There is now the risk of relationships rather than risk that is confined to each project. Interdependency between projects creates risks on the programme itself.'</p> <p>3) 'You get your individual project risks based on quality, cost, scope and schedule. You will have bottom-up feed, but there will have to be a top-down risk assessment that will be focusing on programme objectives and not necessarily on project objectives. The projects then become the key performance indicators to the programme.'</p>
		15 (N)	Programme management and programme risk management maturity level	<p>Improving programme risk management maturity so that programme risk management can attain the level of maturity achieved by project risk management.</p>	<p>1) 'I do not think the construction industry is mature enough to have dedicated programme managers and programme risk managers.'</p> <p>2) 'External experience (international) reviewed a more mature programme management environment compared to southern Africa.' 'Some years ago, I was personally responsible for introducing risk management on a project in North America, and it wasn't something that they did or knew about or though it was necessary.'</p>
3	Skills development target groups	16 (N)	Stakeholder roles and responsibilities	<p>Clearly defined positions that people will occupy in the programme and the tasks or duties that those positions will perform on the programme, e.g.</p> <ul style="list-style-type: none"> • Provide the required organisation • Organisation of project and programme risk management 	<p>1) 'There are risks which affect every project in the programme. The question is who deals with those risks?'</p> <p>2) 'Individual projects must have their own risk manager.'</p> <p>3) 'The roles that certain stakeholders play, their accountabilities and responsibilities.'</p>

No.	Thematic category	Theme No.*	Theme	Description	Examples of interview quotes
		17 (L)	Attracting young talent	<p>Promoting careers and skills where there are gaps among young talent, and developing strategies that generate a sustainable supply or pipeline of young people in those careers, e.g.</p> <ul style="list-style-type: none"> • Millennials or new generation • Acknowledging an absolute skills deficit 	<p>1) 'I have much more faith in the new generation to whom mathematics, calculus, quantitative methods and stochastic thinking comes much more naturally than to old people.'</p> <p>2) 'The problem is that it is not something that you can learn from a book. This is learnt through practice.'</p> <p>3) 'I think the development work that needs to be done is identifying the right people at a young age.'</p>
4	Structural skills enablers	18 (N)	People, processes and procedures	<p>Adequate resources, guidelines, practices, procedures, rules, frameworks, metrics and tools employed in programme risk management, e.g.</p> <ul style="list-style-type: none"> • Having the right resources on programmes • Having the right systems and processes • Having the right procedures and tools • The requirement for both qualitative and quantitative methods • The role of technology as an enabler 	<p>1) 'But we are now looking at resources for the programme; it is a case of having the right resources allocated to the right projects with the right risk profile.'</p> <p>2) 'Because if you do not have the right resources, technology and skills, your organisation will fail.'</p> <p>3) 'Then there is an element of tools, processes and systems.'</p>
		19 (N)	Specification of programme, programme management, and programme risk management	<p>The terms programme and programme management are used in different ways, leading to confusion about what a programme or programme management is. These terms should be specified in the context or setting in which they are being employed, e.g.</p> <ul style="list-style-type: none"> • Differentiating a project and a programme, and project risks and programme risks • Understanding what programmes are and what they are not • Not running a programme like a project • A guide for programme managers • Consequently, lower level programme management processes, such as programme risk management, could then be adequately specified. 	<p>1) 'The awareness to reinforce the knowledge behind projects, programmes and portfolios. Let the people understand the difference.'</p> <p>2) 'Stop confusing programmes with mega projects or stop viewing programmes as simply large or extended projects.'</p> <p>3) 'Maybe, just start off by defining what programme management and programme risk management are.'</p>
		20 (L)	Skills migration	<p>The movement of skilled persons from one region to other geographic regions with the intention of settling permanently or temporarily in those regions, e.g.</p> <ul style="list-style-type: none"> • Skills migration from southern Africa to other regions • Programme risk management experts from other regions into southern Africa. 	<p>1) 'People that have those skills and those qualities are leaving – they are exiting because the work is elsewhere and there is no direct need for it in southern Africa.'</p> <p>2) 'I think we have lost people; people emigrated.'</p> <p>3) 'Bring in people from an environment where programme risk is a way of life to incubate it in a local context and to help us implement it and adopt it.'</p>

No.	Thematic category	Theme No.*	Theme	Description	Examples of interview quotes
		21 (N)	Being a learning organisation	Being an organisation that facilitates the learning of its stakeholders and continuously transforms itself so as to remain competitive in the business environment, e.g. <ul style="list-style-type: none"> Identifying the right competencies Observing risk management in successful programmes Benchmarking with organisations where programme risk management works 	<p>1) 'I am working with one professional body. Instead of putting people through qualifications and giving them degrees, they test the competency and upon qualifying, they issue you a competency certificate.'</p> <p>2) 'There are successful programmes that have been implemented before and worked well, but risk management is so well integrated into the programme that we fail to identify it and use it on the next programme.'</p> <p>3) 'Build a pipeline that continuously teaches other parts of your environment.'</p>
		22 (N)	Need for programme management in southern Africa	Creating awareness of the need for programme management in southern Africa. This may be done through, e.g.: <ul style="list-style-type: none"> Establishing more active programmes running in southern Africa The need for government intervention. This is a macro-economic issue 	<p>1) 'In my particular industry, you do have programme management, but on a very small scale.'</p> <p>2) 'I think it is a macro-economic policy that southern Africa needs to develop.'</p> <p>3) 'Real major projects are so complex that you have to apply the programme approach.'</p>
		23 (L)	Clear career path for niche areas such as programme risk management	Creating career paths that could enhance the growth of persons in areas with skills challenges, especially niche area, e.g. <ul style="list-style-type: none"> Address the niche nature of programme risk management work Invest in upskilling employees from project management to programme management 	<p>1) 'Because of the niche nature of this work, they have to go out there and find themselves valuable work. Unfortunately, that is where we are losing the skills.'</p> <p>2) 'There is no career path for programme management. Instead, most people start off with project management.'</p>
		24 (N)	Programme risk manager independence	The state or extent to which a programme risk manager may exercise sovereignty over his job without fear of any interference, e.g. <ul style="list-style-type: none"> Perceptions for risk managers Independence of risk managers Protection for risk managers 	<p>1) 'Perception of risk managers as bearers of bad news. So risk managers have been accused of not looking at opportunities.'</p> <p>2) 'If a risk manager does not do the right thing (not disclosing a wrong doing), he could get dismissed.'</p> <p>3) 'Risk managers are scared to say so when things are going wrong.'</p>
		25 (L)	Government, academic and industry partnerships	The requirement for government, education and industry to work together in addressing the skills challenge.	<p>1) 'Collaboration between government, academia and industry.'</p> <p>2) 'Academic and industry experts working together.'</p> <p>3) 'Training partnerships with organisations where programme risk management works well.'</p>

**Note: There are thematic codes from the literature that were similar to such codes from the interview data. Where similar thematic codes occurred in the literature studied, these are indicated using (L). New codes are indicated using (N).*

3.2 Discussion and practical implications

Table 5 shows that the interview-based programme risk management-specific themes mapped neatly onto the theme categories derived from the general skills-based literature. The interview data added specific areas for enhancing programme risk-specific skills to the general skills development information. Analysing the interview data provided programme risk-specific information related to all four literature-based theme categories, namely training, specific skills, skills development target groups, and structural skills enablers. Both codebooks show that training and non-training interventions are required to address programme risk management challenges in southern Africa. This convergent ability to map the programme risk management practitioner interview information to the literature-based categories and themes boosts confidence in the trustworthiness and credibility of the findings (Bowen, 2009).

3.2.1 Importance of understanding the terms programme, programme management and programme risk management

A notable finding was that the interview population felt the need to understand and explore the meaning of the terms programme, programme management and programme risk management during the interviews, rather than focusing on programme risk management training as the way to address skills challenges. This was unexpected as all interviewees reported having had more than 10 years' experience in programme risk management. This need to define the terms links to the currently undefined nature of the terms programme and programme management in practice, as discussed in Article 1 (Chapter 2) of this study, and indicates a need for clearly agreed definitions of the terms programme and programme management.

This finding also connects to the 'Inadequate programme management standardisation programme risk management challenge' identified in Article 1. This challenge was ranked the least critical to improve during Phase 2 of the study, as described in Article 2 (Chapter 3), with respondents being generally satisfied that standards were available. This apparent discrepancy could be due to the general, non-definition-specific nature of the items employed in the survey. The survey items also covered availability of policies, standards, and frameworks (structural enablers), rather than the adequacy of these programme management structural enablers. This indicates an area for improvement in the survey items that could be addressed in future studies. Figure 7 in Article 2 shows that some participants were unconvinced about the availability of these enablers. These findings indicate a need for more specific investigation into issues around programme management standardisation.

Correspondingly, definition of the terms programme, programme management, and programme risk management was identified as a structural skills enabler in the present study,

as shown in Table 5. A programme risk management policy and framework, incorporating these definitions, would represent such an enabler. I therefore recommend developing a specific framework for programme risk management for an organisation as the terms programme, programme management and programme risk management should be specified where these terms are employed. A specification is a precise plan, process, procedure or description of how something should be done, made or performed (Bochmann & Sunshine, 1980; Partridge & Galton, 1995).

Moreover, the terms programme and programme management are used in different ways, leading to confusion about what a programme or programme management is (Hillson, 2008; Lycett et al., 2004; Pellegrinelli, 1997, 2010; Pellegrinelli & Bowman, 1994; Shehu & Akintoye, 2010). I therefore recommend that these terms be specified in the context in which they are employed, and that these definitions be incorporated in the organisation’s programme risk management specification framework. Table 6 illustrates a programme risk management specification framework using themes derived from Table 5. The specifications require structural, technical, and personal skills enablers.

Table 6
Programme risk management specification framework

Thematic category	Description	Characteristics (themes)
Structural skills enablers	Formal policies, legislation, regulations and systems that create the right environment or framework and make it possible to address skills challenges. The focus of an enabler is on 'how' something is addressed rather than 'what' is being addressed.	<ul style="list-style-type: none"> • People, processes and procedures • Specification of programme, programme management, and programme risk management
Skills:	Technical	<ul style="list-style-type: none"> • Requirement for generalists rather than specialists • Programme risk management execution • Programme benefits realisation • Value of risk management (business case for programme risk management) • Understanding the business • Risk management capability • Risk aggregation • Interdependency and interface management • Programme management and programme risk management maturity level
Skills:	Personal	<ul style="list-style-type: none"> • Communication skills • Strategic thinking • Knowledge sharing culture

3.3 A reflexive journal of the study

A summative excerpt of my reflexive journal for this study is presented in Table 7. The journal entries demonstrate the continuous self-critique and self-appraisal on the part of the researcher, aimed at enhancing the credibility of the research process, as outlined in the Research Methods section. These entries further indicate that the literature review produced training-related interventions, whereas the interview data led to training-related and non-training-related interventions on addressing programme risk management skills challenges. One can therefore deduce that training alone may not suffice in addressing programme risk management skills challenges in southern Africa.

Table 7*Reflexive journal for addressing programme risk management skills challenges in southern Africa*

Period	Description	Experience, analysis, explanation or insight	What was learned, conclusions reached or outcomes
September 2019	Explore or identify interventions to address skills challenges from the literature, and document analysis.	<p>The findings from the literature included the following:</p> <ul style="list-style-type: none"> • Legislation • Education and training • Attracting and developing young talent • Skills development among mature and other employees • Using immigration policy to address skills shortages • Vocational training • Distance education • Personal skills • Technical or professional skills • Skills summits or conventions • Accrediting or certifying bodies • Massive open online courses (MOOC) • Creating clear career paths for areas with skills challenges • Revising curricula of areas with skills challenges • Government, academic and industry partnerships or collaborations 	<p>Establishing methods to address skills challenges from the literature review and from document analysis that provided a standard against which the responses from the interviews with programme management practitioners could be compared.</p>
November 2019	Explore or identify interventions to address the challenge of programme risk management skills from interviews with programme management practitioners.	<p>The findings from the interview data included:</p> <ul style="list-style-type: none"> • Value of risk management (business case for programme risk management) • Understanding the business • Strategic thinking • Specification of a programme, programme management, and programme risk management • Stakeholder roles and responsibilities • Skills migration • Risk management capability • Risk aggregation • Programme risk management execution • Programme benefits realisation • Improving policymakers' (programme management and programme risk management) knowledge • People, processes and procedures • Low programme management, and programme risk management, maturity level • Being a learning organisation • Knowledge sharing culture 	<ul style="list-style-type: none"> • When asked about how to address programme risk management skills challenges in southern Africa, participants kept on asking the meaning of the terms programme and programme management. • It became clear that the terms programme and programme management should be specified in the context in which they were being used. • Other observations from the study included the following: <ul style="list-style-type: none"> ▪ Training-related interventions ▪ Non-training-related interventions ▪ The similarity in responses of this study to an earlier study in Article 1 (Chapter 2). • Initially, we questioned the findings of this study due to their similarity to an earlier study mentioned above, but realised that convergence or similarities of thematic codes from different studies indicate greater confidence in the trustworthiness of the findings (Bowen, 2009).

Period	Description	Experience, analysis, explanation or insight	What was learned, conclusions reached or outcomes
		<ul style="list-style-type: none"> • Introducing programme management and programme risk management in educational curricula • Interdependency and interface management • Independence of risk manager • Government, academic and industry partnerships • The requirement for a generalist rather than a specialist • Education and training (in programme management and programme risk management) • Create requirement for programme management in southern Africa • Create clear career path for niche areas such as programme risk management • Communication skills • Attracting young talent 	
February 2020	Propose how programme risk management skills challenges should be addressed in southern Africa.	<ul style="list-style-type: none"> • Specification of the terms programme, programme management and programme risk management • Address the issues identified in the interview data using appropriate methodologies derived from the literature review and document analysis. 	In discussion with my study promotor, we noted the following observations: (1) the literature review and document analysis provided the training-related interventions to address programme risk management skills challenges, (2) the interviews with programme management practitioners provided training-related and non-training-related interventions to address programme risk management skills challenges in southern Africa.
April 2020	Propose directions of future programme risk management research in southern Africa.	A comparative study might be required or helpful to consolidate the study findings further.	This study sought to (1) explore or identify interventions to address skills challenges from the literature and documents from management consulting firms, (2) propose methods of addressing programme risk management skills challenges in southern Africa, and (3) propose directions of future programme risk management research in the region. Having improved our knowledge of the challenge of programme risk management skills, this study proposes that a further study be conducted on programme risk management skills to better understand the underlying nature of this challenge.

4 Conclusions

This study sought to explore ways of addressing skills challenges – using the academic literature and other documents – and propose suggestions for future research on programme risk management practice deemed relevant also to regions outside southern Africa. This study provides actionable recommendations for addressing programme risk management skills challenges in the subcontinent and a programme risk management specification framework.

4.1 Recommendations for addressing programme risk management skills challenges

Addressing programme risk management skills challenges in southern Africa requires more than just training interventions. This study proposes both training and non-training interventions for the purpose, based on the views of experienced practitioners in the region. Hence, this enquiry provides a holistic picture of what is required to address these skills challenges in the subcontinent.

4.2 A programme risk management specification framework

The programme risk management specification framework presented in this study provides a structure on which organisations can delineate their approach to programme risk management. The framework requires the entity to define the terms programme and programme management in its own context or setting. Given the ambiguities associated with the terms programme and programme management, this framework aims to facilitate a common understanding of how they are employed within individual organisations, thereby allowing for an appropriate definition of programme risk management in practice.

4.3 Programme risk management future research and practice

This research has enhanced our knowledge of programme risk management skills challenges in southern Africa in a qualitative study. The thematic codes produced for the purpose provide a basis on which further studies could be designed to understand better the underlying characteristics of these challenges.

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Appendix 1

Interview guide and letter of introduction and consent-to-participate

Programme risk management challenges: proposed solutions

Dear Participant

You are invited to participate in a research study on proposing solutions to programme risk management challenges. The study has been approved by the Research Ethics Committee of the Faculty of Economic Sciences of the North-West University.

Title of the study

Programme risk management challenges: proposed solutions

Researcher and promoter of the study

Direct all queries on this study to Emmanuel Mulambya (Researcher and Lecturer) on +27 83 638 0430 (mobile phone number) and Emmanuel.Mulambya@nwu.ac.za (email), or to Professor Hermien Zaaiman (Study Promoter) on +27 82 921 0463 (mobile phone number) and Hermien.Zaaiman@nwu.ac.za (email).

Purpose of the research

A survey on programme risk management challenges ranked inadequate programme risk management skills as the number one challenge among other challenges. The purpose of this interview-based study is to propose solutions to inadequate programme risk management skills based on practitioner perspectives. With your permission, the interviews will be voice recorded and later transcribed for the purpose of data analysis.

The research questions

The interview consists of two open-ended questions and should take about 20 minutes of your time. These questions are provided in Table 1.

Table 1

Interview questions

- | | |
|---|--|
| 1 | How should programme risk management skills challenges be improved? |
| 2 | Why do you think that programme risk management skills challenges should be improved as you suggest? |
-

Risks

There are no risks anticipated from your participation in the study.

Benefits

You will have access to the findings of the study after the study is completed.

Voluntary participation

Your participation in this study is voluntary and you may choose to withdraw from the study at any time. Your decision to withdraw from the study will not influence your relationship with the researcher nor with the North-West University. By participating in this study, you provide consent for anonymised quotations of what you say to be used in the discussion of the findings of the study.

Confidentiality

Confidentiality is guaranteed. No personal information collected during the study will be disclosed. Your name or the name of your organisation will not be associated with published research findings in any way.

Agreement and signatures of the Participant and the Researcher

Participant:

Name of Participant

Signature

Date

Researcher:

Name of Researcher

Signature

Date

Background or classification questions

Participant employment sector

- Oil and gas (petrochemical)
- Mining and quarrying
- Government and public services
- Capital projects and infrastructure
- Other (please specify)

Participant programme management experience in years

- Less than or equal to 1 year
 - More than 1 and less than or equal to 3 years
 - More than 3 and less than or equal to 5 years
 - More than 5 and less than or equal to 10 years
 - More than 10 years
-

Appendix 2

Codes generated from the interview data on addressing programme risk management skills challenges in southern Africa per participant

Participant No.	Code No.	Code	Description	Examples of interview quotes
1	1	Create the requirement for programme management in southern Africa	Creating the need for programme management in southern Africa. Consequently, the requirement for programme risk management will be created.	'In my particular industry, you do have programme management, but on a very small scale.'
	2	Grow the maturity of the programme management environment in southern Africa	Increasing the maturity level of programme management similar to project management.	'I do not think the construction industry is mature enough to have dedicated programme managers and programme risk managers.'
	3	Address skills migration from southern Africa	The movement of skilled persons from southern Africa to other geographic regions with the intentions of settling permanently or temporarily in those regions.	'People that have those skills and those qualities are leaving the country - they are exiting because the work is elsewhere and there is no direct need for it in southern Africa.'
	4	Get several to many programmes running in southern Africa	The economies of southern Africa are not mature enough to have several to many programmes running at any one time.	'We are not mature as an economy in that respect.'
	5	The need for government intervention	Programme management is a macro-economic policy issue that needs requires government intervention to start realising the long term benefits.	'I think it is a macro-economic policy that southern Africa needs to develop.'
	6	Address the niche nature of programme risk management work	Creating career paths that could enhance the growth of persons in areas with skills challenges, especially niche areas.	'Because of the niche nature of this work, they have to go out there and find themselves valuable work. Unfortunately, that is where we are losing the skills.'
	7	Education and training in programme risk management	Providing programme risk management education and training to persons responsible for programme risk management.	'Because young people are not taught how to manage things.'
	8	Collaboration between government, academia and industry	Partnerships between government, academic and industry professionals to foster programme risk management knowledge	'We have to find a medium where academic professionals and experienced industry professionals can assist in addressing this gap.'
	9	Increase programme management knowledge among policymakers.	Address the lack of programme management knowledge among policy makers e.g. government officials and corporate executives.	'I deal with public and private sector projects. A lot of them are under the impression that a good project manager can make a good programme manager, but that is not the case.'
	10	Create awareness on the differences among projects, programmes and portfolios	Create the understand that projects, programmes and portfolios are different.	'The awareness to reinforce the knowledge behind projects, programmes and portfolios. Let the people understand the difference.'
	11	Understanding the interdependencies among projects within a programme	Understanding the interfaces among projects, and how one projects impacts another project, in a programme.	'Understanding how one projects affects another project is important in these scenarios.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	12	Invest in upskilling employees from project management to programme management	Creating a career awareness that there is a level higher than project management - programme management.	'There is no career path for programme management. Instead, most people start off with project management.'
	13	Create the rationale (business case) for programme risk management	Putting in place interventions that could change the perceptions of corporate leadership for programme risk management.	'What I have seen is just project focus. Even companies do not see it differently because leaders themselves do not know any better.'
	14	Create a culture of programme risk management knowledge sharing	Establishing systems, processes and procedures of transferring or disseminating programme risk management experiences, lessons learnt or information from one person or group to another person or group.	'Those individuals that had the skills are gone. And those who have , do not want to share it for fear of creating competition for themselves.'
2	1	Create an understanding of programme management	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'You need to create the understanding of what the approach of programme management is.'
	2	Create an understanding of the benefits of programme benefits	Explaining the benefits of managing a programme rather than individual projects.	'You need to give them the necessary understanding of the benefits of managing a programme instead of individual projects.'
	3	Programme risk management training	Providing programme risk management education and training to persons responsible for programme risk management.	'Training people that are responsible for programme risk management on this concept.'
	4	Training the trainers	Providing education and training in programme risk management to persons that will train others.	'Once you have got these trainers in place, then they could train either the project teams or train other people that are meant to do programme risk management.'
	5	Provide required organisation	Organising the programme in a way that facilitates the flow of information from individual projects into the programme management team and vice versa.	'Give responsibility to a programme risk management team, and have project management teams report into those teams.'
	6	Having the right resources on programmes	Assigning and managing resource allocation to individual projects in a manner that supports the attainment of the programme's strategic objectives.	'But we are now looking at resources for the programme; it is a case of having the right resources allocated to the right projects with the right risk profile.'
	7	Differentiate programme and project	Creating an understanding that programmes are different from projects in order to stop the confusion between programmes and projects	'But you need to create the understanding on two levels: on the project level and then on the programme level.'
	8	Reporting on programme risk management	Organising the programme in a way that facilitates the flow of information from individual projects into the programme management team.	'Give responsibility to a programme risk management team, and have project management teams report into those teams.'
	9	Understanding individual projects risk profiles	Understanding the risk the risk profiles of individual projects.	'So it is important then to understand the overall risk profile of the individual projects in the programme.'
	10	Build knowledge and capacity in organisation	Creating new programme risk management knowledge based on lessons learnt from past experiences, programme goals and team discussions.	'It is to build knowledge and capacity in the organisation so that you can entrench programme risk management in the organisation.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	11	Online or e-learning training or platforms	Employing Internet based technologies and electronic media to train, educate and disseminate programme risk management knowledge.	'Online training is also a good way of creating capacity.'
	12	Seek support of experienced people	Employing persons with programme risk management experience that can provide support and guidance to persons that lack this experience.	'I think that the participation of hand-holding of people in a programme risk analysis is another way of building capacity.'
	13	Distinguish project and programme risks	Creating an understanding that programmes risks are different from project risks.	'You can distinguish between programme risk management and project risk management.'
3	1	Viewing programmes as temporary organisations	Conceptualising programme as a temporary organisation forming a bridge between the project management teams and the organisation's strategic team.	'Start viewing programmes as temporary organisational forms intended to achieve benefits.'
	2	Understanding what programmes are, and what they are not.	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'Stop confusing programmes with mega projects or stop viewing programmes as simply large or extended project.'
	3	Interdependencies between programme management, individual projects and organisational strategic management	A programme is an interconnected network of projects that must work together as parts of a larger and complex unit in order to realise the intended benefits.	'A programme could be classified as system of systems that involves individual projects and existing business as usual operations.'
	4	Managing interfaces with business as usual operations	Managing the points of contact or interactions between the programme, individual projects and the business as usual operations.	'A programme directly interfaces and impacts business as usual operations.'
	5	Educate capital asset owners on programme management	Providing education and training to capital asset owners on programmes and programme management e.g. government officials or corporate executives.	'Undertaking something that is multi-disciplinary or multi-activity impact, is better constituted as a programme.'
	6	Recognising the complexity of programmes	Programme management interacts extensively with organizational strategic management and individual projects. Hence, programme risk does not simply equal the sum of individual project risks.	'The recognition that a programme is inherently complex than a simple mega project.'
	7	Knowing the source of programme complexity	Identifying the sources of programme complexity for a given programme.	'A programme by definition involves many interfaces.'
	8	Clear roles and responsibilities	Clearly defined positions that people will occupy in the programme and the tasks or duties that those positions will perform on the programme.	'There are risks which affect every project in the programme. The question is who deals with those risks?'
	9	Benefits realisation	Identifying, defining and tracking the realisation of programme benefits.	'This relates to those risks or those uncertainties related to the ultimate benefits that have been planned.'
	10	Managing transversal risks	The process of managing risks that affect more than one project in the programme.	'So you have transversal risks.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	11	Strategic nature of risks	A category of programme risks that should be addressed by the organisation's strategic team.	'Programme risk relate to business case and benefits as well as projects.'
	12	Aggregation of project risks	The process of adding up project risks in order to obtain an integrated risk profile.	'Project risk aggregation does not equal to programme risks.'
	13	Methodology of aggregating of project risks	The lack of a universally agreed methodology of aggregating project risks.	'You cannot aggregate qualitative scores. I suggest a quantitative approach to aggregating risks.'
	14	Inclusion of programme management in university curricula	Unlike project management, programme management is not part of university or college curricula in southern Africa.	'I have never seen a course like that. I travelled abroad to gain that knowledge and training.'
	15	Education and training in programme risk management	Providing education and training in programme risk management.	'Unless you have specifically been trained in it, it is difficult.'
	16	Address the lack of knowledge among policymakers	Providing education and training to capital asset owners on programmes and programme management e.g. government officials or corporate executives.	'Decision makers in southern Africa do not understand it.'
	17	Young people or new generation	The preferential selection of persons that can learn the skill of programme risk management.	'I have much more faith in the new generation to whom mathematics, calculus, quantitative methods and stochastic thinking comes much more naturally than to old people.'
4	1	The requirement for programme approach in southern Africa	Creating the need for programme management in southern Africa. Consequently, the requirement for programme risk management will be created.	'Real major projects are so complex that you have to apply the programme approach.'
	2	Interactions or interface management	Managing the points of contact or interactions between the programme, individual projects and the business as usual operations.	'There is an owner team that takes care of the bigger picture and then you have got individual projects.'
	3	Procedures, tools and people	Guidelines, practices, procedures, rules, frameworks, metrics and tools employed in program risk management.	'Whether it is a complex programme, the three things my mind battles with are procedures, tools and people.'
	4	Size of programmes	Programs by nature are big. Hence, program risk management could be big.	'Projects are becoming larger and complex.'
	5	Organisation of project risk management and programme risk management	Differentiating between project and program risk management, and organising them accordingly.	'Individual projects must have their own risk manager.'
	6	Understanding of both qualitative and quantitative risk management	The requirement for both qualitative and quantitative risk management skills.	'There were people with engineering and technical background, and it is about having both qualitative and quantitative skills.'
	7	Generalist (all-rounder) rather than a specialist	A person with an extensive collection of knowledge on a variety of subjects about the organisation. Ideally this person should have worked in the organisation for some time.	'It is not just about the technical skills, you have to be an all-rounder.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	8	Cooperation between programme management team and risk manager	Supportive and team working culture between the programme team and the risk manager.	'There must be cooperation between the team and the risk manager.'
	9	Understanding big picture (programme purpose)	Understanding what the programme is required to deliver and not just what the individual projects should deliver.	'The programme risk manager must keep his or her eyes on the bigger picture.'
	10	Understanding business	Having adequate knowledge of, or familiarity with, the business. Risk management should be an integral part of the everyday running of the business and risk managers should understand the business.	'The risk manager must understand technical things and systems and how things can be put together.'
	11	Young people or new generation	Promoting careers and skills where they are gaps among young talent, especially in areas of concern.	'The problem is that it is not something that you can learn from a book. This is learnt through practice.'
	12	Balance between bigger picture and complexity	Putting in place a programme risk management process that is easy to understand, explain or use.	'The problem is that a complex system becomes difficult to manage and to operate.'
	13	Benefits delivery	Identifying, defining and tracking the realisation of programme benefits.	'A programme must deliver the planned benefits and the risk manager must support the programme manager.'
	14	Understanding the programme management environment well	Having adequate knowledge of, or familiarity with, the business. Risk management should be an integral part of the everyday running of the business and risk managers should understand the business.	'He must understand the programme environment well.'
	15	Procedures, tools and people	Guidelines, practices, procedures, rules, frameworks, metrics and tools employed in program risk management.	'The risk manager must have the ability to design better tools and procedures.'
5	1	Understanding programme expectations	Understanding what the programme is required to deliver and not just what the individual projects should deliver.	'You need to have an understanding of the broader expectations from the programme.'
	2	Not running a programme like a project	Managing a program in isolation or treating a program as though it was a single project.	'A good project manager does not equal a good programme manager.'
	3	Developing the skill of integration and facilitation	Enhancing the skill of coordinating the management of constituent projects and making easy the process of programme risk management.	'The skill is not with project management, it is probably more of integration and facilitation across different projects.'
	4	Understanding programme benefits	Identifying, defining and tracking the realisation of programme benefits.	'The skill is a person who can integrate, a person who can see the strategy of what the programme wants to achieve.'
	5	Programme versus projects	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'A programme is something different from a bunch of projects added together.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	6	Adaptive and versatile person	The willingness and ability to adjust one's project management behaviour in order to increase one's ability to operate at different levels competently.	'It is the person who has the capability to integrate complex ideas, and someone who can think and operate at process, strategic, operational and tactical levels.'
	7	Identification of strategic thinker	Identifying and attracting people with the capability of strategic thinking.	'I think that it is a question of identifying a person's capability to think at different levels. Doing an MBA could be one way.'
	8	Young people or new generation	Identifying and attracting the right people for programme risk management.	'I think the development work that needs to be done is identifying the right people at a young age.'
	9	Identify required competencies	Identifying the competencies that can be tested or assessed for programme management or programme risk management.	'I am working with one professional body. Instead of putting people through qualifications and giving them degrees, they test the competency and upon qualifying, they issue you a competency certificate.'
	10	Identify body of knowledge	Identifying a programme risk management body of knowledge	'Where is the best body of knowledge or of collective thinkers that can build the capacity of programme risk management?'
	11	A guide for programme managers	A handbook or standard that explains the thinking processes of a programme manager.	'This is what you must think about. We understand you were a project manager. You cannot think like that anymore.'
	12	Identify collective thinking to create capacity	Identifying and attracting people with the capability of strategic thinking.	'Where is the best body of knowledge or of collective thinkers that can build the capacity?'
	13	Understand programme objectives	Identifying, defining and tracking the realisation of programme benefits.	'Understand what the programme will achieve and what programme failure will entail.'
6	1	Good generic risk management process	Having a good generic risk management process in place.	'Leveraging one generic process for any areas of risk management.'
	2	One generic process of risk management	Having one generic process of risk management that can be applied to different situations or cases.	'One generic process of risk management applicable in all areas of risk management.'
	3	Understanding the business	Having adequate knowledge of, or familiarity with, the business. Risk management should be an integral part of the everyday running of the business and risk managers should understand the business.	'If you want to be a good risk manager for your entity, your corporation or your company, you need to understand the business very well.'
	4	Integration of risk into one bucket	The aggregation or integration of risks from across the enterprise or organisation in order to provide a combined and holistic view of risk on the enterprise or organisation.	'Risk management is the integration expert.'
	6	Generalist (all-rounder who understands business) rather than a specialist	A person with an extensive collection of knowledge on a variety of subjects about the organisation. Ideally this person should have worked in the organisation for some time.	'So I strongly feel that a good risk manager is more of a generalist than a specialist.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	7	Risk management evolution from a process to a capability	Risk management should evolve from process to capability	'That must be transformed from a process to a capability. A capability then becomes a competitive advantage.'
	8	Right resources, technology and skills	The process of having the right resources, and the appropriate technology to support these resources.	'Because if you do not have the right resources, technology and skills, your organisation will fail.'
	9	Not understanding what a programme is	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'Other risk areas such as safety are well understood. What does programme and programme risk mean? What is the meaning?'
	10	Create the requirement for programme management in southern Africa	Creating the need for programme management in southern Africa. Consequently, the requirement for programme risk management will be created.	'My counter to that is that I cannot apply the risk management to a programme if many companies do not have programmes.'
	11	Understanding the business	Having adequate knowledge of, or familiarity with, the business. Risk management should be an integral part of the everyday running of the business and risk managers should understand the business.	'You can only do that level of risk analysis if you understand the business, if you understand the strategy.'
	12	Provide knowledge on what a programme is	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'I do not even understand what the definition of a programme is. The challenge would be lack of programmes or lack of a clear definition of what a programme is.'
	13	Perception of risk managers	Institutional opinions and attitudes that influence the institution's behaviour towards risk managers.	'Perception of risk managers as bearers of bad news. So risk managers have been accused of not looking at opportunities.'
	14	Positioning of risk management in organisations	The institutional arrangements for risk management with organisations.	'Risk management is looked upon as a product and as a report to tick the governance box, not as a capability that will save an organisation out of trouble.'
	15	Independence of risk manager	The condition in, state or extent to which a risk manager may exercise sovereignty over his job without fear of any interference.	'A risk manager is not independent like an internal auditor. An auditor enjoys regulatory protection.'
	16	Communication skills	The lack of good communication skills on the part of risk managers.	'Risk managers do not simplify the risk management process and language for everyone to understand.'
	17	Risk manager lacks protection	An auditor enjoys regulatory protection and has direct access to the Audit Committee Chairperson. A risk manager does not.	'If a risk manager does not do the right thing (not disclosing a wrong doing), he could get dismissed.'
	18	Skills migration from southern Africa	The movement of skilled persons from southern Africa to other geographic regions with the intention of settling, permanently or temporarily, in those regions.	'I think we have lost people; people emigrated.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	19	Organisational lack of capability for risk management	A situation where an organisation lacks the ability to fulfil its obligations to the required standards.	'The failure was whether we still required capability in the company.'
7	1	Important for policymakers to understand what a programme is	Address the lack of programme management knowledge among policy makers, e.g. government officials or corporate executives.	'Senior corporate executives do not understand what a programme is. What do you mean by programme?'
	2	Generalist (multi-skilled)	A person with an extensive collection of knowledge on a variety of subjects about the organisation. Ideally this person should have worked in the organisation for some time.	'The primary thing is to get someone that has a clear vision and understands how the programme fits into the organisation.'
	3	Value of risk management is not clear	The lack of clarity on, or the subjectivity of, the value of risk management to both the project management and programme management environments.	'Risk managers are not good at selling risk management.'
	4	Communication / Language	The lack of good communication skills on the part of risk managers	'Risk managers use a language that is not understood by programme managers. This creates a problem.'
	5	Project managers' lack of big picture focus	The requirement for projects to take a strategy-focused and an emergent wider organisational view rather than inward-focused and task-orientated view.	'The risk practitioner understands well, but has a challenge of linking risk management with the whole programme or the whole organisation.'
	6	Integrating risk management process into programme management	Aligning or unifying programme risk management with other programme management processes.	'We may struggle to introduce the risk management process in a project or programme without delaying the project or programme.'
	7	Observing risk management in successful programmes	Learning from, or observing, people's behaviour and actions in successful programmes.	'There are successful programmes that have been implemented before and worked well, but risk management is so well integrated into the programme that we fail to identify it and use it on the next programme.'
	9	Independence, or fear, of risk managers	The condition in, state or extent to which a risk manager may exercise sovereignty over his job without fear of any interference.	'Risk managers are scared to say so when things are going wrong.'
	8	1	Meaning of programme	Create an understanding of programme management, in order to stop the confusion between project management and programme management.
2		Maturity of international programme management environment	The extent or stage of advancement in the process of development of programme risk management.	'External experience (international) revealed a more mature programme management environment compared to southern Africa.'
3		Low programme risk management maturity internationally	The extent or stage of advancement in the process of development of programme risk management internationally.	'Some years ago, I was personally responsible for introducing risk management on a project in North America, and it wasn't something that they did or knew about or thought was necessary.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	4	Value of risk management	The lack of clarity on, or the subjectivity of, the value of risk management to both the project management and programme management environments.	'And when he had discussions with his project managers about what went wrong and what they might have done, he came to the realisation that what was missing was risk management.'
	5	Aligning risk management to programme management	Aligning programme risk management process and other programme management processes.	'What I think was probably most difficult in terms of limiting success of our programme risk management was getting alignment on what is important and significant and where things fit.'
	6	Programme risk ownership	Program risks are not appropriately assigned to persons or entities that will be accountable to ensure that the risk is managed.	'When you have a group of people, everyone tries to pass the parcel to someone else.'
	7	Lack of standard approaches to programme management	Inadequate guidelines, practices, procedures, rules, frameworks, metrics and tools employed in program risk management.	'I would probably raise it because I do not particularly like that approach that we are taking at a programme.'
	8	Clearly defined levels of project, programme and portfolio management	Create an understanding of project, programme and portfolio management, in order to stop the confusion between project, programme and portfolio management.	'So getting that understanding that who owns which part of a risk or a response mechanism, that was something that I think on our projects or programmes needed to be delivered to realise the full value of risk management.'
	9	Stakeholder (interface) management	The formalisation of relationships, roles and communication channels between project stakeholders.	'You have to spend quite a lot of time with people who represent the different stakeholder groups.'
	10	Aggregating project risk	The process of adding up project risks in order to obtain an integrated risk profile.	'We did take risk reviews and updated the risk register at project level and then rolled to programme level.'
	11	Barriers to communication and alignment	Anything that prevents one entity from receiving and understanding the messages from other entities.	'Those of us at project level did not necessarily get any real insight or chance to participate in the programme level discussion.'
	12	Understanding the business by programme risk managers	Having adequate knowledge of, or familiarity with, the business. Risk management should be an integral part of the everyday running of the business and risk managers should understand the business.	'You are the facilitator and the person who owns the process; you might not find it easier to champion the perspective of the person who put something down in risk register.'
	13	Change management when introducing programme risk management	Tools and processes employed to manage change (anything that transforms or impacts programme, tasks, processes or structures), within a project or programme and its project or programme team.	'And quite frankly, the process was not owned by the people.'
	14	Reporting and programme risk reviews (communication)	The lack of good communication skills on the part of risk managers.	'There was a general lack of understanding of this report.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
9	1	Concept of programme and programme risk management	Create an understanding of programme management, in order to stop the confusion between project management and programme management.	'Risk is a very broad subject and permeates all disciplines on a project or a programme.'
	2	Engage highly skilled resources to lead less skilled resources	An integrated approach that enables less skilled members of the workforce to work under the supervision of highly skilled members as a way of bridging gaps in skills.	'Use skilled resources for skilling others.'
	4	Absolute skills deficit	A shortage of experienced programme risk management resources to carry out programme risk management tasks or activities	'There is no direct answer nor a single answer to this issue.'
	5	Academic and industry experts working together	Collaborations or partnerships among governments, industry and academia in addressing skills challenges.	'The challenge is that we have people who are academically strong in risk management but lack practical experience and application in real life projects, or practitioners who know what the risks are but lack the depth of systematically dealing with risk.'
	6	Tools, processes and systems	Guidelines, practices, procedures, rules, frameworks, metrics and tools employed in program risk management.	'Then there is an element of tools, processes and systems.'
	7	Programme and programme management: what are they?	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'Well again, a programme is multi-faceted.'
	8	Technology enablers (digitisation technology)	A technology enabler is an invention or innovation, that alone or in combination with other technologies, produces noticeable changes in performance and capabilities of the user.	'The process of risk management will remain the same. However, risk management will have to be done differently.'
	9	Alignment of stakeholders	The formalisation of relationships and communication channels between project stakeholders.	'Programmes cut across different stakeholders, so alignment of different stakeholders.'
	10	Cross-cultural pollination	The transfer of knowledge, beliefs, values, norms and practices between two or more different organisational cultures.	'Because of the size and capital associated with programmes, owner organisation are seldom geared to execute them. So invariably, they engage the services of engineering contractors thus getting into cross-cultural arrangements of organisation 1 to organisation 2.'
	10	Required cultural change is lacking	The required change in knowledge, beliefs, values, norms and practices.	'Organisations do not pay adequate attention to the professional practice of risk management. It is dealt with as a tick box exercise.'
	11	Understanding the business	Having adequate knowledge of, or familiarity with, the business. Risk management should be an integral part of the everyday running of the business and risk managers should understand the business.	'I discovered that some of our risk managers themselves lacked an in-depth understanding of the business.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	12	Realisation of benefits	Identifying, defining and tracking the realisation of programme benefits.	'And if you do not understand the business, you might be misaligned on the project delivery side of it.'
10	1	Programme risk management knowledge capability	The requirement for programme risk management knowledge to be created.	'There is an element of knowledge that is obviously not there. Can we create bodies of knowledge that are widely accessible, taught and understood so that we can create capabilities from a knowledge point of view?'
	2	Programme risk management training	Providing education and training in programme risk management.	'So people actually have the whole thing where they can then have that schooling point of view.'
	3	Programme risk management frameworks	Guidelines, practices, procedures, rules, frameworks, metrics and tools employed in program risk management.	'Most organisations will show you frameworks of how they deal with project risks, but none for programme risks.'
	4	Programme risk management training in active environment	Providing education and training in programme risk management in a place where programme risk management is being practised and culture is more mature.	'You have got to go and train people in an active environment where programme risk management is more mature.'
	5	Benchmarking with organisations where programme risk management works	Comparison with organisations where programme risk management culture is mature and works well.	'This is where programme risk management is working and we can benchmark with.'
	6	Training partnerships with organisations where programme risk management works	Providing education and training in programme risk management in collaboration with other organisations.	'We can partner with training our people in those organisations where programme risk management works.'
	7	Hire programme risk management experts to incubate locally available talent	The requirement for programme risk management knowledgeable or skilful persons from outside southern Africa.	'Bring in people from an environment where programme risk is a way of life to incubate it in a local context and to help us implement it and adopt it.'
	8	Piloting and adoption of programme risk management across the organisation	Experimenting programme risk management on a smaller scale in order to learn how it (programme risk management) might work across the entire organisation in practice.	'Obviously, you start by piloting a few of your organisations. Adoption is key thing.'
	8	Clearly defined roles and responsibilities	Clearly defined positions that people will occupy in the programme and the tasks or duties that those positions will perform on the programme.	'The roles that certain stakeholders play, their accountabilities and responsibilities.'
	9	Institutionalise programme risk management across the organisation	Establishing programme risk management across the entire organisation.	'How do you institutionalise programme risk management so that it becomes part of the organisation?'
10	Programme risk management reporting (communication).	The lack of good communication skills on the part of risk managers.	'But there are certain people who need certain information to make decisions required to manage other things.'	

Participant No.	Code No.	Code	Description	Examples of interview quotes
	11	Being a learning organisation	An organisation that facilitates the learning of its stakeholders and continuously transforms itself so as to remain competitive in the business environment.	'Build a pipeline that continuously teaches other parts of your environment.'
	12	Systems, processes and people	Guidelines, practices, procedures, rules, frameworks, metrics and tools employed in programme risk management.	'There must be the control frameworks, the governance frameworks and the delivery framework of how it should work and it is tested that it is working.'
	13	The role of technology as an enabler	A technology enabler is an invention or innovation, that alone or in combination with other technologies, produces noticeable changes in performance and capabilities of the user.	'The role of technology in how you implement it and obviously the need for people to learn it.'
	14	Policy and planning happens at programme level and implementation at project level	The requirement for implementation to happen at programme level in order to harmonise the planning, budgeting and implementation levels.	'When we are setting policy, we are encouraging programmes due to the focus on benefits realisation. But I do not think that we have done anything from a policy viewpoint that encourages or incentivises programme management let alone programme risk management.'
	15	Selling programme management (value of programme risk management)	The lack of clarity on, or the subjectivity of, the value of risk management to both the project management and programme management.	'Engineers are still trained on managing projects rather than programmes.'
11	1	Differentiating between enterprise risk management (ERM) and programme risk management	Employing people that understand project management to do this kind of work	'One thing that is actually undermining it is that institutions are not able to differentiate between programme risk management and enterprise risk management.'
	2	Employ people that understand project and programme management to do this kind of work	Employing skilled project and programme management resources.	'Most institutions assume that you do not need to get a programme or project risk management resource.'
	3	Inclusion of programme risk management in implementing teams	Programme risk management should be included right from the start when teams to implement are formed	'The department where the implementing teams are formed should be specific that this particular discipline is required.'
	4	Educational curricula	Including programme risk management in curricula of educational institutions.	'The curricula need to emphasise it and equip the trainees and students.'
	5	Training	Providing education and training in programme risk management.	'Training in programme risk management.'
	6	Enough resources	Enough allocation of human resources needed to deliver a programme such as people, and technology.	'You get somebody being assigned to maybe ten or twenty projects.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
12	1	Definition of programme	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'Can you brief me again as to what was your definition of your programme risk management?'
	2	Focus on project risk management	The inability to differentiate between project and program risk management, or simply applying the project risk management process at a higher level, or simply aggregating project risks.	'We do programme risk management according to your definition. However, our focus is on project risk management, which is the sub-component of a programme.'
	3	Employing different skills set covering entire business	Employing skilled project and programme management resources.	'So I think the challenge is to ensure that you get complementary types of skills to be able to manage the strategic intent of the organisation.'
	4	Leveraging of existing skills to produce new skills	Having the different specialist skills required in the business rather than a risk management specialist.	'Process of risk management can be learnt easily.'
	5	Emphasis on employing people with technical skills	Addressing the technical skills required in the business.	'I believe that, from a risk management perspective, to do risk management, you need to have prior skill sets before risk management.'
	6	Generalist (inquisitive and analytical) person	A person with an extensive collection of knowledge on a variety of subjects about the organisation. Ideally, this person should have worked in the organisation for some time.	'Somebody that is analytical, who can or who could be able to tie things together.'
	7	Good negotiation skills	The need for good negotiation skills on the part of risk managers.	'There needs to be a person who has good negotiation skills, who will be able to advise management as to what the risks and mitigation actions are.'
	8	Good communication skills	The lack of good communication skills on the part of risk managers.	'So it is very good communication skills, both verbally as well as written.'
	9	Understanding the strategic intent of the organisation	Understanding concisely where the organisation is going and what the organisation wants to achieve in the long term.	'I think the biggest challenge is that I have to understand what the strategic intent of the organisation is.'
	10	Matching skills acquisition to strategic intent	Having the specialist skills that can deliver the organisation's strategic intent.	'I can then ensure that I have the correct skills to be able to manage the future of the organisation. Not risk management skills but technical skills.'
	11	Training existing skills	Providing education and training in programme risk management to existing skills.	'Do I go about improving my existing skill set so that they can be re-deployed into the new strategy for the organisation.'
13	1	What is programme management and what is programme risk management?	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'Maybe, just start off by defining what programme management and programme risk management are.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	2	Education and training (emphasis on public sector)	Providing education and training in programme management to public sector officials.	'You certainly get programmes in the private sector, but you get a lot of programmes in the public sector, and quite often the programme benefit gets lost.'
	3	Losing of programme benefits	A programme delivers projects, long-term benefits and other strategic objectives. Programme risk management should protect the value of programme benefits and ensure that this value is not lost.	'You certainly get programmes in the private sector, but you get a lot of programmes in the public sector, and quite often the programme benefit gets lost.'
	4	Educating and training public sector officials in programme management	Providing education and training in programme management to public sector officials.	'You certainly get programmes in the private sector, but you get a lot of programmes in the public sector, and quite often the programme benefit gets lost.'
	5	Budgeting for projects individually rather than as a programme	The requirement for implementation to happen at programme level in order to harmonise the planning, budgeting and implementation levels.	'Instead of having a programme that needs to deliver a set of benefits, you have individual projects which are probably anecdotally linked back to delivery. You are kind of doing the whole process back to front.'
	6	Delivering a programme as individual projects (working back to front)	The requirement for implementation to happen at programme level in order to harmonise the planning, budgeting and implementation levels.	'Instead of having a programme that needs to deliver a set of benefits, you have individual projects which are probably anecdotally linked back to delivery. You are kind of doing the whole process back to front.'
	7	Rewarding projects rather than overall macro-economic (programme) benefit	The requirement to reward programme delivery rather than rewarding individual project delivery.	'I am an important project because I belong to that programme. I think that this is one of the problems, that is the traditional approach to granular budgeting and delivery of projects.'
	8	Macro-economic issue	Programme management is a macro-economic policy issue that requires government intervention to start realising the long-term benefits.	'They have a kind of a macro strategic programme that they have developed.'
	9	Training public sector officials	Providing education and training in programme management to public sector officials, e.g. government officials or corporate executives.	'Programme, especially in the public sector more than private sector, reduce projects to balance your budget.' E.g. having one programme instead of several projects.
14	1	Clarity on programme or programme management	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'When you say programme risk management, are you talking of programme as in programme management?'
	2	Confusion between project and programme	Create an understanding that programmes are different from projects in order to stop the confusion between projects and programmes.	'Most people tend to confuse programme and project management.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	3	Project management mentality	Simply applying the project risk management process at a higher level or treating programme risk management as amplified project risk management or simply aggregating project risks.	'So when you are talking of programme management or risk, they have to start with a project management mentality.'
	4	Education or training on difference between projects and programmes	Providing education and training that programmes are different from projects in order to stop the confusion between projects and programmes.	'So they are looking at project management and assuming that if they can have a collection of project management risk, then they have programme management risk, which is not exactly the same thing.'
	5	Interdependency between projects	Programme management interacts extensively with organisational strategic management and individual projects. Hence, programme risk does not simply equal the sum of individual project risks.	'From a programme, you are now looking at interrelationships. There is now the risk of relationships rather than risk that is confined to each project. Interdependency between projects creates risks on the programme itself.'
	6	Understanding interdependencies	Understanding the interdependencies between programme management, organisational strategic management and individual projects.	'If you understand the interdependencies and you manage them very well, then the risk to the programme is mitigated.'
15	1	Definition of programme and programme risk management	The terms programme and programme management should be specified in order to stop the confusion about what a programme or programme management is.	'So at least we agree on the definition of what programme risk management is.'
	2	Calling programmes mega projects	Create an understanding that programmes are different from projects in order to stop the confusion between projects and programmes.	'We did not call it a programme. We called it a mega project, which was sort of risk management.'
	3	Singular view of projects versus multi-views of programmes	Understanding the interdependencies between programme management, organisational strategic management and individual projects.	'Project objectives are pretty easy to respond to because they are typically project based. It is a singular view on delivering one project that needs to achieve one objective. And that objective is linked to a business plan. Four things – time, budget (or cost), quality and scope. This is the focus of project risk.'
	4	Programme objectives are based on business plan (and not just cost, time and quality)	A programme delivers projects, long-term benefits and other strategic objectives. Programme risk management should protect the value of programme benefits and ensure that this value is not lost.	'It is about a higher level objective that you need to achieve. It was a much higher level strategic view (big stream national level, citizens and economic growth). And to assess risk against that was not the same as the risk assessment against individual projects.'
	5	Programme objectives are high level, less defined and less quantitative	A programme delivers projects, long-term benefits and other strategic objectives. Programme risk management should protect the value of programme benefits and ensure that this value is not lost.	'Objectives are far less quantitative, far less defined. Objectives were more political, socio-economic and so on. Why we need the skill and how to get the skill is to be able to incorporate both the qualitative and the quantitative at the programme level.'

Participant No.	Code No.	Code	Description	Examples of interview quotes
	6	Requires qualitative and quantitative risk assessment at programme level	The requirement for both qualitative and quantitative methods of risk assessment.	'Objectives are far less quantitative, far less defined. Objectives were more political, socio-economic and so on. Why we need the skill and how to get the skill is to be able to incorporate both the qualitative and the quantitative at the programme level.'
	7	Bottom-up risk assessment (from projects to programme)	Risks emanating from projects and escalated to programme level.	'You get your individual project risks based on quality, cost, scope and schedule. You will have bottom-up feed, but there will have to be a top-down risk assessment that will be focusing on programme objectives and not necessarily on project objectives. The projects then become the key performance indicators to the programme.'
	8	Top-down risk assessment (from programme to projects)	Risks identified at programme level and delegated downwards to projects.	'You get your individual project risks based on quality, cost, scope and schedule. You will have bottom-up feed, but there will have to be a top-down risk assessment that will be focusing on programme objectives and not necessarily on project objectives. The projects then become the key performance indicators to the programme.'
	9	Modifying project risk management	Enhancing the project risk management process to construct a probable programme risk management process.	'I would certainly ensure that we do not just rely on things like Monte Carlo analysis or any of those quantitative tools. So I would supplement the sort of project risk management thinking with something like COSO, ISO and so on.'
	10	Scenario planning	A strategic planning method that allows organisations to get a view of a wider range of possible futures, which enables them to develop strategies for those future.	'I would also supplement the thinking with skills in as far as scenario planning is concerned, which is not something big in project risk management, but I believe in programme risk management; that is something really, really important for us to deal with.'
	11	Integration and aggregation of project risks in relation to programme objectives	The process of adding up project risks in order to obtain an integrated risk profile.	'One can interpret project level risk in integrating and aggregating causes, consequences and controls so that you can deal with that at a programme level, or at least understand the impact at a programme level so that you can make appropriate decisions at that level.'
	12	Use same methodology as project risk management but different language	Simply applying the project risk management process at a higher level or treating programme risk management as amplified project risk management or simply aggregating project risks.	'I believe that there should be no different methodology for any approach to project risk assessment or programme risk assessment. The difference would come in when I assess, when I evaluate my risk, and that is where I want to use different tools.'

Appendix 3

A listing of the initial 184 codes generated from the interview data

Code No.	Code
1	Create the rationale (business case) for programme risk management
2	Positioning of risk management in organisations
3	Value of risk management is not clear
4	Value of risk management
5	Selling programme management (value of programme risk management)
6	Differentiating between enterprise risk management (ERM) and programme risk management
7	Understanding the business (interviewee 6)
8	Understanding the programme management environment well
9	Understanding the business (interviewee 8)
10	Understanding the business (interviewee 9)
11	Understanding the business by programme risk managers
12	Understanding the business
13	Understanding the strategic intent of the organisation
14	Matching skills acquisition to strategic intent
15	Understanding big picture (programme purpose)
16	Balance between bigger picture and complexity
17	Adaptive and versatile person
18	Identification of strategic thinker
19	Identify collective thinking to create capacity
20	Project managers' lack of big picture focus
21	Scenario planning
22	Create awareness on the differences among projects, programmes and portfolios
23	Create an understanding of programme management
24	Differentiate programme and project
25	Distinguish project and programme risks
26	Viewing programmes as temporary organisations
27	Understanding what programmes are, and what they are not
28	Not running a programme like a project
29	Programme versus projects
30	Identify programme management body of knowledge
31	A guide for programme managers
32	Not understanding what a programme is
33	Provide knowledge on what a programme is
34	Meaning of programme
35	Lack of standard approaches to programme management
36	Clearly defined levels of project, programme and portfolio management
37	Concept of programme and programme risk management
38	Programme and programme management: what are they?
39	Definition of programme
40	Focus on project management
41	What is programme management and what is programme risk management?
42	Clarity on programme or programme management
43	Confusion between project and programme
44	Project management mentality
45	Calling programmes mega projects

Code No.	Code
46	Definition of programme and programme risk management
47	Singular view of projects versus multi-views of programmes
48	Provide required organisation
49	Clear roles and responsibilities
50	Organisation of project risk management and programme risk management
51	Cooperation between programme management team and risk manager
52	Clearly defined roles and responsibilities
53	Address skills migration from southern Africa
54	Skills migration from southern Africa
55	Engage highly skilled resources to lead less skilled resources
56	Hire programme risk management experts to incubate locally available talent
57	Understanding individual projects risk profiles
58	Build knowledge and capacity in the organisation
59	Risk management evolution from a process to a capability
60	Lack of organisational risk management capability
61	Programme risk management knowledge capability
62	Aggregation of project risks
63	Integration of risk into one bucket
64	Aggregating project risk
65	Aggregating project risks in relation to programme objectives
66	Integrating risk management process into programme management
67	Aligning risk management to programme management
68	Programme risk ownership
69	Piloting and adoption of programme risk management across the organisation
70	Institutionalise programme risk management across the organisation
71	Inclusion of programme risk management in implementing teams
72	Create an understanding of programme benefits
73	Benefits realisation
74	Benefits delivery
75	Understanding programme expectations
76	Understanding programme benefits
77	Understanding programme objectives
78	Realisation of benefits
79	Losing of programme benefits
80	Programme objectives are based on business plan (and not just cost, time and quality)
81	Programme objectives are high level, less defined and less quantitative
82	Increase programme management knowledge among policymakers
83	Educate capital asset owners on programme management
84	Address the lack of knowledge among policymakers
85	Important for policymakers to understand what a programme is
86	Policy and planning happens at programme level and implementation at project level
87	Rewarding projects rather than overall macro-economic (programme) benefit
88	Budgeting for projects individually rather than as a programme
89	Delivering a programme as individual projects (working back to front)
90	Training public sector officials
91	Having the right resources on programmes
92	Methodology of aggregating of project risks

Code No.	Code
93	Procedures, tools and people
94	Understanding of both qualitative and quantitative risk management
95	Procedures, tools and people
96	Good generic risk management process
97	One generic process of risk management
98	Right resources, technology and skills
99	Tools, processes and systems
100	Technology enablers (digitisation technology)
101	Programme risk management frameworks
102	Systems, processes, and people
103	The role of technology as an enabler
104	Employ people that understand project and programme management to do this kind of work
105	Enough resources
106	Employing different skills set covering entire business
107	Leveraging of existing skills to produce new skills
108	Emphasis on employing people with technical skills
109	Requires qualitative and quantitative risk assessment at programme level
110	Modifying project risk management process
111	Use same methodology as project risk management but different language
112	Grow the maturity of the programme management environment in southern Africa
113	Low programme risk management maturity internationally
114	Maturity of international programme management environment
115	Identify required competencies
116	Observing risk management in successful programmes
117	Benchmarking with organisations where programme risk management works
118	Being a learning organisation
119	Create a culture of programme risk management knowledge sharing
120	Cross-cultural pollination
121	Required cultural change is lacking
122	Inclusion of programme management in university curricula
123	Educational curricula
124	Understanding the interdependencies among projects within a programme
125	Recognising the complexity of programmes
126	Strategic nature of risks
127	Interdependencies between programme management, individual projects and organizational strategic management
128	Managing interfaces with business as usual operations
129	Knowing the source of programme complexity
130	Managing transversal risks
131	Interactions or interface management
132	Size of programmes
133	Developing the skill of integration and facilitation
134	Stakeholder (interface) management
135	Alignment of stakeholders
136	Interdependency of projects
137	Understanding interdependencies
138	Bottom-up risk assessment (from projects to programme)
139	Top-down risk assessment (from programme to projects)

Code No.	Code
140	Perception of risk managers
141	Independence of risk manager
142	Risk manager lacks protection
143	Independence, or fear, of risk managers
144	Collaboration between government, academia and industry
145	Seek support of experienced people
146	Academic and industry experts working together
147	Training partnerships with organisations where programme risk management works
148	Generalist (all-rounder) rather than a specialist
149	Generalist (all-rounder who understands business) rather than a specialist
150	Generalist (Multi-skilled)
151	Generalist (inquisitive and analytical) person
152	Education and training in programme risk management
153	Programme risk management training
154	Training the trainers
155	Online or e-learning training or platforms
156	Education and training in programme risk management
157	Programme risk management training
158	Programme risk management training in active environment
159	Training
160	Re-training existing skills with new skills
161	Education and training (emphasis on public sector)
162	Educating and training public sector officials in programme management
163	Education or training on difference between projects and programmes
164	Create the requirement for programme management in southern Africa
165	Get several to many programmes running in southern Africa
166	The need for government intervention
167	The requirement for programme approach in southern Africa
168	Create the requirement for programme management in southern Africa
169	Macro-economic issue
170	Address the niche nature of programme risk management work
171	Invest in upskilling employees from project management to programme management
172	Reporting into programme risk management
173	Communication skills
174	Communication / language
175	Barriers to communication and alignment
176	Change management when introducing programme risk management
177	Reporting and programme risk reviews (communication)
178	Programme risk management reporting (communication)
179	Good negotiation skills
180	Good communication skills
181	Young people or new generation
182	Young talent
183	Identifying young people
184	Absolute skills deficit

Appendix 4

The 25 thematic codes generated from the interview data

No	Thematic code	Code
1	Value of risk management	1) Create the rationale (business case) for programme risk management 2) Positioning of risk management in organisations 3) Value of risk management is not clear 4) Value of risk management 5) Selling programme management (value of programme risk management) 6) Differentiating between enterprise risk management (ERM) and programme risk management
2	Understanding the business	7) Understanding the business 8) Understanding the programme management environment well 9) Understanding the business 10) Understanding the business 11) Understanding the business by programme risk managers 12) Understanding the business 13) Understanding the strategic intent of the organisation 14) Matching skills acquisition to strategic intent
3	Strategic thinking	15) Understanding big picture (programme purpose) 16) Balance between bigger picture and complexity 17) Adaptive and versatile person 18) Identification of strategic thinker 19) Identify collective thinking to create capacity 20) Project managers' lack of big picture focus 21) Scenario planning
4	Specification of a programme, programme management, and programme risk management	22) Create awareness on the differences among projects, programmes and portfolios 23) Create an understanding of programme management 24) Differentiate programme and project 25) Distinguish project and programme risks 26) Viewing programmes as temporary organisations 27) Understanding what programmes are, and what they are not 28) Not running a programme like a project 29) Programme versus projects 30) Identify programme management body of knowledge 31) A guide for programme managers 32) Not understanding what a programme is 33) Provide knowledge on what a programme is 34) Meaning of programme 35) Lack of standard approaches to programme management 36) Clearly defined levels of project, programme and portfolio management 37) Concept of programme and programme risk management 38) Programme and programme management: what are they? 39) Definition of programme 40) Focus on project management 41) What is programme management and what is programme risk management? 42) Clarity on programme or programme management 43) Confusion between project and programme 44) Project management mentality 45) Calling programmes mega projects 46) Definition of programme and programme risk management 47) Singular view of projects versus multi-views of programmes
5	Stakeholder roles and responsibilities	48) Provide required organisation 49) Clear roles and responsibilities 50) Organisation of project risk management and programme risk management 51) Cooperation between programme management team and risk manager 52) Clearly defined roles and responsibilities
6	Skills migration	53) Address skills migration from southern Africa 54) Skills migration from southern Africa 55) Engage highly skilled resources to lead less skilled resources 56) Hire programme risk management experts to incubate locally available talent

No	Thematic code	Code
7	Risk management capability	57) Understanding individual projects risk profiles 58) Build knowledge and capacity in the organisation 59) Risk management evolution from a process to a capability 60) Lack of organisational risk management capability 61) Programme risk management knowledge capability
8	Risk aggregation	62) Aggregation of project risks 63) Integration of risk into one bucket 64) Aggregating project risk 65) Aggregating project risks in relation to programme objectives
9	Programme risk management execution	66) Integrating risk management process into programme management 67) Aligning risk management to programme management 68) Programme risk ownership 69) Piloting and adoption of programme risk management across the organisation 70) Institutionalise programme risk management across the organisation 71) Inclusion of programme risk management in implementing teams
10	Programme benefits realisation	72) Create an understanding of programme benefits 73) Benefits realisation 74) Benefits delivery 75) Understanding programme expectations 76) Understanding programme benefits 77) Understand programme objectives 78) Realisation of benefits 79) Losing of programme benefits 80) Programme objectives are based on business plan (and not just cost, time and quality) 81) Programme objectives are high level, less defined and less quantitative
11	Improving policymakers' (programme management and programme risk management) knowledge	82) Increase programme management knowledge among policymakers 83) Educate capital asset owners on programme management 84) Address the lack of knowledge among policymakers 85) Important for policymakers to understand what a programme is 86) Policy and planning happen at programme level and implementation at project level 87) Rewarding projects rather than overall macro-economic (programme) benefit 88) Budgeting for projects individually rather than as a programme 89) Delivering a programme as individual projects (working back to front) 90) Training public sector officials
12	People, processes and procedures	91) Having the right resources on programmes 92) Methodology of aggregating of project risks 93) Procedures, tools and people 94) Understanding of both qualitative and quantitative risk management 95) Procedures, tools and people 96) Good generic risk management process 97) One generic process of risk management 98) Right resources, technology and skills 99) Tools, processes and systems 100) Technology enablers (digitisation technology) 101) Programme risk management frameworks 102) Systems, processes, and people 103) The role of technology as an enabler 104) Employ people that understand project and programme management to do this kind of work 105) Enough resources 106) Employing different skills set covering entire business 107) Leveraging of existing skills to produce new skills 108) Emphasis on employing people with technical skills 109) Requires qualitative and quantitative risk assessment at programme level 110) Modifying project risk management process 111) Use same methodology as project risk management but different language
13	Low programme management and programme risk management maturity level	112) Grow the maturity of the programme management environment in southern Africa 113) Low programme risk management maturity internationally 114) Maturity of international programme management environment

No	Thematic code	Code
14	Being a learning organisation	115) Identify required competencies 116) Observing risk management in successful programmes 117) Benchmarking with organisations where programme risk management works 118) Being a learning organisation
15	Knowledge sharing culture	119) Create a culture of programme risk management knowledge sharing 120) Cross-cultural pollination 121) Required cultural change is lacking
16	Introducing programme management and programme risk management in educational curricula	122) Inclusion of programme management in university curricula 123) Educational curricula
17	Interdependency and interface management	124) Understanding the interdependencies among projects within a programme 125) Recognising the complexity of programmes 126) Strategic nature of risks 127) Interdependencies between programme management, individual projects and organizational strategic management 128) Managing interfaces with business as usual operations 129) Knowing the source of programme complexity 130) Managing transversal risks 131) Interactions or interface management 132) Size of programmes 133) Developing the skill of integration and facilitation 134) Stakeholder (interface) management 135) Alignment of stakeholders 136) Interdependency between projects 137) Understanding interdependencies 138) Bottom-up risk assessment (from projects to programme) 139) Top-down risk assessment (from programme to projects)
18	Independence of risk manager	140) Perception of risk managers 141) Independence of risk manager 142) Risk manager lacks protection 143) Independence, or fear, of risk managers
19	Government, academic and industry partnerships	144) Collaboration between government, academia and industry 145) Seek support of experienced people 146) Academic and industry experts working together 147) Training partnerships with organisations where programme risk management works
20	Generalist	148) Generalist (all-rounder) rather than a specialist 149) Generalist (all-rounder who understands business) rather than a specialist 150) Generalist (multi-skilled) 151) Generalist (inquisitive and analytical) person
21	Education and training (in programme management and programme risk management)	152) Education and training in programme risk management 153) Programme risk management training 154) Training the trainers 155) Online or e-learning training or platforms 156) Education and training in programme risk management 157) Programme risk management training 158) Programme risk management training in active environment 159) Training 160) Re-training existing skills with new skills 161) Education and training (emphasis on public sector) 162) Educating and training public sector officials in programme management 163) Education or training on difference between projects and programmes
22	Create requirement for programme management in southern Africa	164) Create the requirement for programme management in southern Africa 165) Get several to many programmes running in southern Africa 166) The need for government intervention 167) The requirement for programme approach in southern Africa 168) Create the requirement for programme management in southern Africa 169) Macro-economic issue

No	Thematic code	Code
23	Create clear career path for niche areas such as programme risk management	170) Address the niche nature of programme risk management work 171) Invest in upskilling employees from project management to programme management
24	Communication skills	172) Reporting into programme risk management 173) Communication skills 174) Communication / Language 175) Barriers to communication and alignment 176) Change management when introducing programme risk management 177) Reporting and programme risk reviews (communication) 178) Programme risk management reporting (communication) 179) Good negotiation skills 180) Good communication skills
25	Attracting young talent	181) Young people or new generation 182) Young talent 183) Identifying young people 184) Absolute skills deficit

CHAPTER 5

CONCLUSIONS, CONTRIBUTIONS, LIMITATIONS, RECOMMENDATIONS AND REFLEXIVE JOURNAL

The purpose of this chapter is to present the conclusions of the three studies according to the objectives and the research questions that guided them. The conclusions, contributions, limitations of the study and recommendations for future research and practice are also presented. The chapter concludes by providing a reflexive journal for the three studies reported in this thesis.

5.1 Conclusions

The research questions of this study were:

- Which programme risk management challenges are described in the literature? (Article 1)
- Which programme risk management challenges are experienced in practice in southern Africa? (Article 1)
- How do these challenges relate to each other? (Article 1)
- Which programme risk management challenges need to be addressed first to improve programme risk management in southern Africa? (Article 2)
- How could programme risk management skills challenges be addressed in southern Africa? (Article 3)

These research questions were addressed in three separate studies.

5.1.1 Article 1 (Chapter 2): A literature- and practitioner-informed model of programme risk management challenges

The purpose of Article 1 (Chapter 2) was to explore programme risk management challenges as described in the literature and as experienced in practice in southern Africa. Article 1 was based on a literature review and interviews. The literature review revealed the underdeveloped nature of programme risk management. This study led to a consolidated list of 10 programme risk management challenges in southern Africa. Inductive thematic analysis of these challenges led to the creation of a risk culture-based model of the challenges, which revealed that they could be reduced to three main components, namely, programme risk management maturity, programme risk culture, and programme risk management execution; and, moreover, that programme risk culture could further be split into structural challenges (inadequate

programme risk management strategy, inadequate programme management standardisation and programme complexity), and behavioural challenges (occasioned by inadequacy, of programme risk management awareness, of programme risk management skills, of programme risk management knowledge and of programme risk management communication). The model provides a novel practitioner-informed diagrammatic view of the relationship between these challenges and facilitates a holistic understanding of programme risk management challenges, thereby assisting with the successful delivery of programmes in practice.

Article 1 produced a codebook and a risk culture-based model. The codebook and the model together provide a framework and a tool for (1) academics to position and structure their research and (2) practitioners to analyse and evaluate their programme risk management at work.

5.1.2 Article 2 (Chapter 3): Southern African programme risk management challenge priorities and suggested improvements: An empirical descriptive study

The purpose of Article 2 (Chapter 3) was to identify and describe priority areas of programme risk management improvement based on a ranking of the challenges contained in the model created in Article 1, combined with consideration of the interlinked nature of these challenges. Article 2 described quantitative descriptive research. The ranking of programme risk management challenge areas indicated that improving programme risk management has to start with augmenting programme risk management skills and awareness. Article 2 therefore provides a probable sequence for addressing programme risk management challenges in southern Africa – and agrees with the finding of Rasheed, Wang and Yaqub (2015), of a serious shortage of competent and skilled programme risk management professionals in industry.

5.1.3 Article 3 (Chapter 4): Addressing southern Africa's programme risk management skills challenges

Article 3 (Chapter 4) sought to explore ways of addressing skills challenges derived from the academic literature and other documents. Article 3 reports a qualitative study based on a literature review, document analysis and 15 semi-structured interviews. Inductive reflexive thematic analysis of the study data led to recommendations for addressing programme risk management skills-related challenges in and the creation of a programme risk management specification framework for use by organisations. Addressing these skills challenges requires interventions that are both training and non-training related, indicating that this objective is a

much broader issue than simply implementing training interventions. The programme risk management specification framework provides a structure for organisations to delineate their approaches to programme risk management.

This study has enhanced our knowledge of how to address programme risk management skills challenges in southern Africa through a qualitative study. The thematic codes listed here provide a basis on which further studies can be designed to achieve quantitative validation of these findings.

5.2 Integration and conclusion of this research project

The purpose of the three studies comprising this research project was to reach conclusions on programme risk management challenges as described in the literature and as experienced in practice in southern Africa, and to propose solutions to them. In the three corresponding articles, challenges described in the existing literature were found to be prevalent or experienced in southern Africa. The three studies further showed that addressing these programme risk management challenges is a broader issue than simply providing training in programme risk management skills. I conclude that addressing programme risk management skills challenges requires intervention that requires training and non-training, and supports the finding of Hall and Sandelands (2009) and Schmitz Jr et al. (2012) that addressing skills challenges requires a broad and integrated approach.

5.3 Contributions

Article 1 (Chapter 2) contributed to the academic literature and programme management practice by identifying the challenges of programme risk management that are specific to southern Africa through a literature- and interview-based study, a codebook of programme risk management challenges and a risk culture-based model of programme risk management challenges. This model provides a novel practitioner-informed diagrammatic view of these challenges, whilst illustrating the relationships among them. The model is intended to facilitate a holistic understanding of programme risk management challenges, thereby assisting with the successful delivery of programmes in practice.

Article 2 (Chapter 3) contributed by identifying priority areas of programme risk management improvement based on a ranking of the challenges contained in the model, and by indicating what could be improved in the individual challenges. The ranking provides a possible sequence for addressing these challenges. Furthermore, in such an underdeveloped area (Papadaki et al., 2014; Rasheed, Wang, & Lucena, 2015; Rasheed, Wang, & Yaqub, 2015; Sanchez et al.,

2009; Shi et al., 2014; Smith et al., 2008; Teller, 2013), it is important to know *what* the phenomena look like in order to hypothesise about, or test, them. Theories must be founded on identified and recognisable concepts. Article 2 provided a novel data-informed view on programme risk management challenges in southern Africa, and adds valuable insights to the programme risk management literature.

Key outcomes of the study described in Article 3 (Chapter 4) included recommendations for addressing programme risk management skills challenges in southern Africa, and a programme risk management specification framework that organisations can use to design their approach to the multifaceted discipline of programme risk management. Article 3 further provided areas for future research on programme risk management in southern Africa and globally.

Overall, these three articles provided theoretical and practical insights into a field important to the southern African development agenda, but where current knowledge appears to be inadequate to facilitate the implementation of large project programmes.

5.4 Limitations of the study

As with any research in a new area, I encountered methodological and structural limitations that are worth considering for the design of similar and follow-up studies. To provide solutions for these limitations and to address the final objective of this thesis, I offer recommendations for future research.

Determination of possible underlying variables and of the internal consistency and reliability of the full survey designed for Study 2, was limited by the small number of programme risk management respondents available to participate. However, as discussed in Article 2, the survey-based study results nevertheless indicated improvements that can be taken into account in future research of this kind on the subject. In addition, using the responses to fewer items than initially conceived was adequate to satisfy the aims of this study, taking into account the small number of participants.

This research project added value to our understanding of programme risk management, on which there is a limited literature compared to that on project management (Papadaki et al., 2014; Sanchez et al., 2009; Shi et al., 2014; Smith et al., 2008). Furthermore, there is a general lack of awareness of programme risk management in practice (Hillson, 2008; Smith et al., 2008) and most probably a general lack of understanding of the subject. The survey attracted

42 responses from an estimated 1300 practitioners in southern Africa, corresponding to a response rate of 3%. Such a low return is probably mainly due to a lack of awareness and understanding of the research area, as also found by Shehu and Akintoye (2009, 2010), in this case due to the relatively few programme risk management practitioners in .

5.5 Recommendations for future research and practice

5.5.1 Recommendations for future research

The thematic codebook and model from Article 1, and the thematic codebook and specification framework from Article 3, provide a basis for academics and researchers to position and structure their research, and a foundation on which further analytical studies can be designed to cross-validate the findings from the two qualitative studies. The findings reported in Article 2 could be validated with a larger sample.

5.5.2 Recommendations for practice

Article 1 (thematic codebook and risk culture-based model of programme risk management challenges) provides a framework for practitioners at work to evaluate their work in practice, whereas Article 2 describes programme risk management priority areas for improvement. Article 3 presents practitioners with what is required to address programme risk management skills challenges in southern Africa, and a framework to allow individual organisations to specify their approaches to programme risk management.

5.6 Reflexive journal of the study

There is a growing call for reflexivity in research (Koch & Harrington, 1998; Nadin & Cassell, 2006). Accordingly, this thesis closes with a summary reflexive journal for the entire study (Table 1).

Table 1*Reflexive journal for programme risk management: challenges and proposed solutions*

Period	Description	Experience, analysis, explanation or insight	What was learned, conclusions reached or outcomes
September 2016	Perform literature review on programme risk management challenges. The literature review and interviews were independently carried out.	The literature review produced the following challenges of programme risk management: 1) Inadequate programme risk management strategy 2) Inadequate programme management standardisation 3) Programme complexity 4) Inadequate programme risk management awareness 5) Inadequate programme risk management skills 6) Inadequate programme risk management knowledge 7) Inadequate programme risk management communication 8) Non-supportive programme risk culture 9) Low programme risk management maturity	Initially, I did not expect to get these findings. However, having read and analysed the literature, my knowledge of programme risk management challenges was significantly improved.
February 2017	Conduct interviews with programme management practitioners on programme risk management challenges in southern Africa. The literature review and interviews were independently carried out.	The interviews with practitioners produced the following challenges of programme risk management: 1) Inadequate programme risk management strategy 2) Inadequate programme management standardisation 3) Programme complexity 4) Inadequate programme risk management awareness 5) Inadequate programme risk management skills 6) Inadequate programme risk management knowledge 7) Inadequate programme risk management communication 8) Non-supportive programme risk culture 9) Low programme risk management maturity 10) Inadequate programme risk management execution	For me, the most significant issue was formulating the right research objectives. The research objectives informed the formulation of open-ended question for semi-structured interview questions on programme risk management challenges. Formulating the right questions means that I could get the right responses for my research.
August 2017	Critically compare the findings from the literature review and the interviews.	The findings from the literature review were similar to the findings from the interview data.	At first, I questioned the similarity of the findings from the literature reviews and the interviews, but later realised that the convergence of outcomes from the literature review and from the interviews enhanced the credibility of the research process (Bowen, 2009).

Period	Description	Experience, analysis, explanation or insight	What was learned, conclusions reached or outcomes
August 2017	Provide a consolidated list of programme risk management challenges.	At the time of consolidation, I noticed that the challenges emanating from the literature review mapped to the challenges emanating from the interview data with one additional practice-specific challenge from the interviews.	This mapping was useful because it simplified the consolidation process.
November 2017	Develop a consolidated model of programme risk management challenges	Research is an iterative or repetitive process that requires continual reflection. Subsequently, inductive reflexive analysis of this study led to the creation of a model of programme risk management challenges. The model was refined several times.	Incorporating reflexive research characterised by ongoing self-critique and self-appraisal into the study, enhanced the credibility of the model of programme risk management challenges.
September 2018	Commence a southern African descriptive study with a larger group to better understand priority programme risk management challenges and what needs to improve in individual programme risk management challenges.	Descriptive research is used to describe a phenomenon and its characteristics, and is more concerned with <i>what</i> rather than <i>how</i> or <i>why</i> something has occurred. It is important to know what the phenomena look like in order to hypothesise about, or test, these phenomena. In such an underdeveloped field, it was important to know what the phenomena are prior to hypothesising about these phenomena.	Employing descriptive research significantly improved my understanding of priority programme risk management challenges and what needs to improve in individual challenges.
November 2018	Identify priority areas of programme risk management improvement based on a ranking of the challenges contained in the model.	A ranking of programme risk management challenges was as follows: 1) Programme risk management skills 2) Programme risk management awareness 3) Programme risk management strategy 4) Programme risk management knowledge 5) Programme complexity 6) Programme risk management communication 7) Programme risk management standardisation	Having accepted this ranking based on the participants' responses meant that I had a preliminary sequence of addressing programme risk management challenges.
August 2019	Identify what should be improved in the individual programme risk management challenges.	In this study, I used descriptive research to show what needs to improve in the individual programme risk management challenges. The skewness values were particularly useful in this instance.	Having gone through this study, I have significantly improved my knowledge and understanding of skewness.

Period	Description	Experience, analysis, explanation or insight	What was learned, conclusions reached or outcomes
September 2019	Explore or identify ways of addressing programme risk management skills challenges from interviews with programme management practitioners in southern Africa.	<p>The findings from the interview data included:</p> <ol style="list-style-type: none"> 1) Value of risk management (business case for programme risk management) 2) Understanding the business 3) Strategic thinking 4) Specification of a programme, programme management, and programme risk management 5) Stakeholder roles and responsibilities 6) Skills migration 7) Risk management capability 8) Risk aggregation 9) Programme risk management execution 10) Programme benefits realisation 11) Improving policymakers' (programme management and programme risk management) knowledge 12) People, processes and procedures 13) Low programme management and programme risk management maturity level 14) Learning organisation 15) Knowledge sharing culture 16) Introducing programme management and programme risk management in educational curricula 17) Interdependency and interface management 18) Independence of risk manager 19) Government, academia and industry partnerships 20) Generalist 21) Education and training (in programme management and programme risk management) 22) Create requirement for programme management in southern Africa 23) Create clear career path for niche areas such as programme risk management 24) Communication skills 25) Attracting young talent 	<ol style="list-style-type: none"> 1) When asked about how to address programme risk management skills challenges in southern Africa, participants kept on asking the meaning of the terms programme and programme management. 2) It became clear that the terms programme and programme management should be specified in the context in which they are being used. In this study, I devised a specification framework for these terms to address this shortcoming. 3) Other observations in the outcomes of the study included the following: <ul style="list-style-type: none"> ▪ Training interventions, ▪ Non-training interventions, ▪ The similarity in responses of this study to an earlier study in Article 1 (Chapter 2). 4) Initially, I questioned the findings of this study due to their similarity to an earlier study mentioned above, but realised that convergence or similarities of thematic codes from different studies indicate greater confidence in the trustworthiness (credibility) of the findings (Bowen, 2009). 5) I split the themes from Article 3 into two: (1) training-related and non-training-related recommendations for addressing programme risk management challenges in southern Africa, and (2) themes constituting a programme risk management specification framework.

Period	Description	Experience, analysis, explanation or insight	What was learned, conclusions reached or outcomes
November 2019	Explore or identify ways of addressing skills challenges from the literature review and document analysis.	The findings from the literature included the following: 1) Legislation 2) Education and training 3) Attracting and developing young talent 4) Skills development among mature and other existing employees 5) Using immigration policy to address skills shortages 6) Vocational training 7) Distance education 8) Personal skills 9) Technical or professional skills 10) Skills summits or conventions 11) Accrediting or certifying bodies 12) Massive open online courses (MOOC) 13) Creating clear career paths for areas with skills challenges 14) Revising curricula of areas with skills challenges 15) Government, academia and industry partnerships or collaborations	Establishing the methods of addressing skills challenges from the literature review and from document analysis provided a standard with which the responses from the interviews with programme management practitioners could be compared.
February 2020	Propose how programme risk management skills challenges should be addressed in southern Africa.	1) A specification of the terms programme, programme management and programme risk management 2) Addressing the issues identified in the interview data using appropriate methodologies derived from the literature review and document analysis.	I noted the following observations: (1) it appears that the interviews with programme management practitioners provided the issues that should be addressed, and that (2) the literature review and document analysis provided the methodologies on how these issues can be addressed.
April 2020	Propose directions of future programme risk management research in southern Africa.	A comparative study might be required or helpful to further enhance our findings.	This study sought to (1) explore or identify ways of addressing skills challenges from the literature and documents from management consulting firms, (2) propose the methods of addressing the programme risk management skills challenge in southern Africa, and (3) propose directions of future programme risk management research in southern Africa. Having improved our knowledge of addressing the challenge of programme risk management skills, this study proposes that a similar study be done on the challenge of programme risk management awareness. A comparison could then be made on the issues that emanate from these studies.

5.7 Chapter summary

This chapter presented the conclusions according to the objectives formulated in this study. The chapter also detailed the contributions and limitations of the study, and recommendations for future research and practice. The study ended with a reflection of the entire research process presented in the form of a tabular reflexive journal.

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ANNEXURE A

ETHICS APPROVAL FOR INTERVIEWS



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FACULTY OF ECONOMIC SCIENCES AND INFORMATION TECHNOLOGY

ETHICS CLEARANCE DOCUMENT

Dissertation (M)	
Thesis (PhD)	X
Article	
Hons	

SUPERVISOR			
Study Leader / Promoter / Author(s)	Prof Hermien Zaaiman		
STUDENT / AUTHOR			
Name	E Mulambya		
Student / Staff Number			
Registered Title of Dissertation or Thesis or Project Title of Article	Programme risk management challenges: an exploratory study		
School	Accounting	Economics	Information Technology
		X	
ETHICAL CLEARANCE			
Ethics clearance number	ECONIT-2017-032		
Date (of Ethics Sub Committee Meeting)	5 May 2017		


.....
CHAIRPERSON: ETHICS COMMITTEE

10 May 2017
DATE


.....
RESEARCH DIRECTOR

10 May 2017
DATE

ANNEXURE B

ETHICS APPROVAL FOR SURVEY



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Economic and Management Sciences Research
Ethics Committee (EMS-REC)
Tel: 018 299-1427
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24 June 2019

Prof H Zaaiman
Per e-mail

Dear Prof H Zaaiman,

FEEDBACK – ETHICS APPLICATION 21062019 – E Mulambya (24276804)(NWU-00759-19-A4)PhD in Risk Management – Prof H Zaaiman

Your ethics application on, *Empirical analysis of a model of programme risk management challenges*, that served on the EMS-REC meeting of 21 June 2019 refers.

Outcome:

Approved as a minimal risk study. A number, NWU-00759-19-A4, is given for three years of ethics clearance.

Kind regards,

AL Bevan-Dye

Prof Ayesha Bevan-Dye
Deputy Chairperson: Economic and Management Sciences Research Ethics Committee (EMS-REC) Vaal Campus