University of KwaZulu-Natal

The role of leadership in implementing a safety culture in a chemical manufacturing company, KwaZulu-Natal

by

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DECLARATION

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ABSTRACT

Senior management is obligated to prevent work-related injuries, ill health and the safety of the natural environment, society and future generations. In other words, one of the most important duties of a leader of an organisation is creating a safety culture, which depends on his/her leadership approach as a major indicator of safety performance. For example, if a leader is not committed to safety, a safety culture will not be established in an organisation Therefore, the study aimed to assess different leadership approaches to implementing a safety culture in a chemical manufacturing processing organisation in KwaZulu-Natal, South Africa.

Although there have been several studies on leadership approaches to health and safety globally, little research has been conducted on the topic of safety in South Africa's chemical manufacturing industries different socio-cultural practices and norms are factors that need to be considered.

The study gathered qualitative data through interviews with 12 participants (managers and subordinates). Thematic analysis was used to analyse the data whereby ideas were given codes and then sorted into themes. The findings indicated that subordinates preferred a transformational leadership approach, whereas managers preferred a transactional leadership approach. Therefore, based on the findings, the recommendation was that leaders be aware of the impact of their leadership approach in terms of formulating and implementing safety policies and that managers need to merge their preferred leadership approach with that of their subordinates.

Keywords: safety culture, safety leadership, leadership approach,

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

ABBREVIATIONS AND ACRONYMS

CDC	Centre for Diseases Control
ILO	International Labour Organisation
MHI	Major hazard industries
OHS	Occupational health and safety
SHERQ	Safety health environment and risk quality
SL	Safety leadership
SOP	Standard operating procedure
STAL	Safety-specific active transactional leadership
STFL	Safety-specific transformational leadership

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter contains a description of the background of the study and the problem statement. The research aim, objectives and questions as well as the significance of the study are explained. In addition, a brief description of the methodology that was used, the limitations of the study and a description of the structure of this dissertation are provided at the end.

1.2 Background of the study

Buckman, a manufacturer of speciality chemicals, works with industries worldwide in providing chemical treatment technologies and extensive technical service to solve industrial problems. In addition, Buckman manufactures a range of speciality chemicals for use in water treatment (swimming pool), sugar mill, pulp/paper and leather industries. Speciality chemicals that are manufactured by Buckman include polymers, microbicides, scale and corrosion inhibitors, dispersants and defoamers.

The Buckman manufacturing site, which is based in Hammarsdale, 50km west of Durban, is a major hazard installation (MHI), which meets the requirements of an MHI as set out in section 43 of the Occupational Health and Safety Act 85 of 1995 (South Africa 1995). This site at any given time can contain a high quantity of substances that can pose a risk to the health and safety of employees, the surrounding public, the environment and even future generations.

In the chemical manufacturing industry, process safety, which is the prevention of accidents in chemical processing facilities, is a priority. However, although incidents are infrequent occurrences, when they occur, they often involve devastating consequences (Wang, Henriksen, Deo, & Mentzer, 2020). These consequences include an ability to contain hazardous substances, criminal charges, damage to a company's reputation, serious financial implications and a far-reaching impact on staff, the facility, the environment and sometimes, the nearby community (Ismail, Kong, Othman, Law, Khoo, Ong & Shirazi, 2014; Wang *et al*, 2021).

Often, workers' unsafe practices or violations of safety procedures result in incidents (George & Renjith, 2021; Mina, Yexiang, Tang, Weilina & Jiajie, 2020). George and Renjith (2021) opine that process industries which handle hazardous substances at high temperatures and pressure always present a major safety concern. However, it is the responsibility of the industry to reduce the occurrence of events resulting in incidents (George & Renjith, 2021). One key factor in maintaining good industrial and environmental safety is demonstrating a commitment that treats safety as a priority organisational goal (Ismail *et al*., 2020).

Everyone in the organisation, especially leaders, has to play crucial role in refining a safety culture and safety performance in an organisation. However, the leadership approach of the manager could be the greatest determinant of organisational safety. For example, a study by Khan, Ahmad and Ilyas (2018) suggests that an ethical leadership style, which concentrates on moral factors, will guarantee the working out of effective health and safety policies and procedures; give the employees the required training; communicate the required performance standards and establish a safety culture.

1.3 Problem statement

According to the International Labour Organisation (ILO), globally, an average of 6000 people die owing to work-related accidents or diseases per day resulting in more than 2.2 million work-related deaths annually (ILO, 2005). Additionally, of the more than 2.2 million work-related deaths, approximately 350 000 are from accidents at work. More concerning, these incidents continue to increase at an alarming rate (Khan *et al.,* 2018). However, as stated above, although incidents do not occur often when they do, they have catastrophic effects. Moreover, although they have occurred at Buckman, they have not resulted in fatalities.

The Centre for Diseases Control (CDC) reports that work-related accidents result in both human and economic loss, which for the year 2003, amounted to approximately 170 billion dollars in the United States alone (CDC, 2007). Although a few studies are reporting on these statistics in South Africa (Hedlund, 2013), work-related incidents remain problematic. Moreover, even at the Buckman site where safety is the company's number one priority and the company motto is that people matter most, safety incidents are a problem.

According to Vekinis, Kielkowski, Wilson and Rees (2010), in the construction industry alone, fatalities reported in the United States and in the United Kingdom between the period 2004 and 2006 were three times lower and eight times lower than the fatalities that were reported in South Africa in that period. Although there is insufficient literature on work-related incidents in the chemical processing industry in South Africa, Mabele and Hoque (2020) maintain that there are a variety of indicators contributing to the occurrence and re-occurrence of accidents in the workplace and that the safety climate and culture are the leading indicators.

Safety culture refers to a mixture of team values and behaviours that determine how process safety is managed. Moreover, it determines how tasks are completed and how personnel behave when no one is watching. Creating a culture of safety wherein employees are responsible of their safety and that of other employees is crucial in an organisation (Mabele & Hoque, 2020; Ismail *et al*., 2014).

The literature provides many definitions of a safety culture, although there is no generally accepted one. A culture of safety can be regarded too as that component of the organisational culture, which refers to individual, job and organisational factors influencing health and safety (Copper, 2001). However, Mabele and Hoque (2020) maintain the UK Health and Safety Commission defines safety culture as “the product of individual and group perceptions, values, competencies, attitudes and patterns of actions that determine the level of commitment to, proficiency in and style of an organisation’s safety and health management”. Safety culture is the part of organisational culture that addresses errors and risk management and requires urgent attention in an organisation (Kalteh, Salesi, Cousins, & Mokarami, 2020; Mabele & Hoque, 2020).

For an organisation to implement a process safety culture successfully, it would have to engage in a series of tasks, which include communicating expectations; continuing positive reinforcement; linking change to the benefits it will bring; gradually managing the process over a period; demonstrating acceptable behaviour starting from top management; and clarifying specific areas of accountability (Holtzhausen, 2020). Therefore, creating a process safety culture, which is strongly connected to what senior management wants, is one of the most important duties of a leader in a process

safety culture. In other words, a culture of safety needs to start from the top and then flow down to employees with every individual adopting positive behavioural norms.

Research has indicated that safety culture in an organisation is linked to the leadership style of the individual in charge (Kristensen, Christensen, Jaquet, Beck, Sabroe, Bartels & Mainz, 2016; Mabele & Hoque, 2020). Therefore, Buckman has a top-down approach to its safety culture whereby people in leadership positions implement safety-related initiatives and foster a safety culture. Thus, a manager's leadership style is a major indicator of safety performance, and leaders should not formulate health and safety policies but also ensure their implementation through personal commitment and rewarding positive behaviour.

Although several studies have been conducted on leadership approaches to health and safety globally (Bandura, 1986; Shen, Tas Yong Koh, Rowlinson, & Bridge, 2017), little research has been conducted on leadership approaches that could ensure the establishment of a safety culture in South Africa's chemical manufacturing sector. Moreover, research is scant on the effect of different socio-cultural contexts, practices and norms on the formation of a safety culture. Additionally, the majority of the studies about leadership and safety culture are conducted within the health and medical fields, making those studies in the chemical manufacturing industry limited (Clay-Williams, Taylor, Ting, Winata, Arnolda & Braithwaite, 2020; Sammer, Lykens, Singh, Mains & Lacken, 2010; Yang, Wang, Chang & Guo, 2009).

Significance of the study

Studies on leadership approaches to safety culture tend to focus on a single approach instead of comparing and contrasting several approaches to find which would be the most effective (Bandura, 1986; Khan *et al*., 2018; Shen *et al*., 2017). However, this is what the current study did in the context of the chemical manufacturing industry in South Africa, KwaZulu-Natal using the perspective of both leaders and subordinates to add to the body of knowledge and fill a research gap.

Research has not shown consistency in revealing how various leadership approaches can influence a culture of safety in the workplace. Therefore, the study examined several leadership approaches in terms of their effectiveness in promoting a culture of safety in the chemical processing industry.

Research aim

The research aim was to assess different leadership approaches in terms of their effectiveness in promoting a safety culture in chemical processing organisations.

Research objectives

To achieve the research aim, the following research objectives were formulated:

To determine the challenges that leadership experiences in ensuring a safety culture in a chemical manufacturing company, KwaZulu-Natal.

To identify the factors enabling a safety culture in a chemical manufacturing company, KwaZulu-Natal.

To identify the leadership approaches employed to ensure a safety culture in a chemical manufacturing company, KwaZulu-Natal.

To determine the leadership approaches deemed effective in achieving a safety culture in a chemical manufacturing company, KwaZulu-Natal.

To determine how to promote and support a safety culture supported in a chemical manufacturing company, KwaZulu-Natal.

Research questions

In line with the above research objectives, the following research questions were formulated:

- What challenges did leadership experience in ensuring a safety culture in a chemical manufacturing company, KwaZulu-Natal?
- What factors enabled a safety culture in a chemical manufacturing company, KwaZulu-Natal
- What leadership approaches were employed to ensure a safety culture in a chemical manufacturing company, KwaZulu-Natal?
- What leadership approaches were deemed effective in achieving a safety culture in a chemical manufacturing company, KwaZulu-Natal?
- How can a safety culture be promoted and supported in a chemical manufacturing company, KwaZulu-Natal?

1.4 Limitations of the study

A study's limitations are usually associated with the chosen research methods, which may represent weaknesses in the research that the author acknowledges to prevent future studies from experiencing the same problems (Creswell & Creswell, 2018). Thus, the main limitations of the current study were an inadequate sample size due to difficulties in recruiting participants and time constraints due to the participants' work commitments.

1.5 Theoretical framework

The study was underpinned by the theory of operant conditioning, which developed by B. F Skinner in 1937 to explain behaviour as being controlled by its consequences (Staddon & Cerutti, 2003). According to Olufemi (2012), this theory proposes that when an individual is been given positive response to a behaviour, the behaviour is reinforced and is thus repeated. However, if the behaviour is given a negative response, the chances that the behaviour will be repeated are less.

The behaviour could be an action or an attitude, which would be strengthened or weakened depending on whether it is reinforced or not (Ciroka, 2015). Thus, in the context of the study, a leader subscribing to a particular leadership approach to safety culture may continue following it if he/she perceives it to have produced positive results in the past. Similarly, subordinates who are subjected to a specific leadership approach may perceive it to be effective if it has led to positive outcomes.

1.6 Research methodology

The study gathered qualitative data using interviews as the data collection method, thereby unearthing the in-depth views and opinions of the research participants. The permission of the gatekeeper, who was the individual in the company under study who controlled access to the participants, was obtained, and ethical clearance was obtained from the Humanities and Social Sciences Research Ethics Committee at the University of KwaZulu-Natal.

The purposive sampling method was used in selecting participants that meet the criteria take part in the study, which meant that the researcher chose individuals who could provide in-depth and rich data on the research phenomenon. Moreover, two types of respondents were interviewed: Managers and subordinates working in a

chemical manufacturing company in KwaZulu-Natal province, South Africa. Thus, two sets of semi-structured interview guides were used to gather the participants' perceptions of safety leadership (SL) approaches and safety culture.

The interviews were recorded and transcribed verbatim using Microsoft Teams. Furthermore, thematic analyses was used as the data analysis method.

1.7 Structure of the dissertation

Chapter 1 consists of an overview to the study, a brief background and the problem statement. It also consists of the research aim, objectives and questions. A brief description of the research methodology is also provided in this chapter.

Chapter 2 comprises the literature review whereby the literature on safety culture and leadership approaches is synthesised. Journal articles and textbooks were the main sources of information for the literature study.

Chapter 3 describes the research design and methodology in detail, thereby explaining the research methods used in the study in detail.

Chapter 4 presents and interprets the findings of the data analysis in the form of themes.

Chapter 5 presents a discussion of the findings and links them to the literature.

Chapter 6 concludes the dissertation by determining whether the study answered the research questions and achieved the research aim/objectives. In addition, based on the research findings, recommendations are made to fill the gaps identified in the company under study.

1.8 Conclusion

This chapter introduced the study by briefly explaining the background and presenting the research problem, aim, objectives and questions. A brief description of theresearch methodology and the layout of the chapters of the dissertation were also provided in this chapter.

The study aimed to assess leadership approaches to implementing a safety culture in a chemical manufacturing company in KwaZulu-Natal. Safety leaders in the chemical industry subscribe to different leadership approaches and therefore the study assessed which leadership approach elicited subordinates' positive responses. However, the next chapter explains the literature on safety culture, SL and SL approaches.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Safety culture is an important aspect of leadership that has gained significant attention in the literature. In the context of a safety culture, leaders have the unique opportunity to shape the attitude of their organisation and its members. Leadership approaches can take many forms, such as empowering employees to take ownership of their safety responsibilities, reinforcing safety as a core value, and rewarding employees for demonstrating safe behaviour. Effective leadership in terms of safety culture can positively impact the overall safety performance of the organisation and its members (Khan *et al*., 2018; Seljemo, Viksveen & Ree, 2020). This chapter reviews the literature relevant to the topic of interest by explaining safety culture; leaders' and subordinates' perceptions of safety culture in the chemical processing industry; leadership approaches and the role of leadership approaches in promoting safety culture in an organisation.

2.2 Safety culture

According to Khan *et al*. (2018) and Ostrom, Wilhelmsen and Kaplan (1993), the term "safety culture" was introduced after the 1986 Chernobyl disaster. This disaster occurred in the then-Soviet Union where a nuclear reactor exploded, which resulted in a large cloud of radioactive material, thereby causing 3940 deaths from radiation-induced cancer and leukaemia (Aitsi-Selmi & Murray, 2016). Following the incident, several definitions of safety culture were introduced from different industry perspectives (Khan *et al*., 2018). Moreover, the two decades preceding 2000 saw an unprecedented increase in research on safety culture and safety climate. However, theoretical progress has not been as rapid as the growth in research (Guldenmund, 2000).

According to Ostrom *et al*. (1993:163), safety culture is defined by the American Heritage Dictionary as "the totality of socially transmitted behaviour patterns, arts, beliefs, institutions, and all other products of human work and thought characteristic of a community or population". However, Ambroz (2015) defines safety culture as a

consistent approach to an organisation's actions, policies and procedures that influences its safety performance. Ostrom (1993) and Guldenmund (2000) concur. It is important to note that the definition of safety culture can vary and is dependent on the context and culture of the organisation, so it should be custom-made for meeting the different needs of different organisations. Additionally, to ensure long-term success, a safety culture must be actively nurtured. The literature maintains that safety culture is both a leading indicator of safety in the workplace and an important aspect of safe operation within an organisation (Khan *et al*., 2018; Mabele & Hoque, 2020). According to Gracia, Silla, Renecle, Goilean and Mesquita (2020), safety culture is so important that it has reached the point at which it is considered the cornerstone of all human safety behaviour, especially in nuclear power plants.

In any organisation, safe operations are necessary and improving safety culture is a constant concern, especially in high-risk organisations because the possibility of an accident can cause irreparable damage and end the lives of many (Gracia *et al*., 2020). Therefore, organisations are constantly seeking methods to ensure safe operations. However, this is not an easy task as there are several standards with which organisations have to comply and be compatible (Gracia *et al.*, 2020).

Creating and practising a good safety culture is an important task, but it can be difficult due to a range of external and internal factors. Factors from the external environment, such as the marketplace and the organisation’s local context, can have an impact on its safety culture. Internally, the organisation’s leaders and their vision, values and beliefs can influence safety culture (Ostrom *et al.,* 1993). For example, an organisation’s leaders may have values and beliefs that prioritise cost efficiency over safety, which could lead to a safety culture that is not as strong as it could be. To cultivate a good safety culture, organisations need to be aware of the external factors that can affect it as well as the behaviours and attitudes of their leaders.

The concept of safety culture is important and should be applied to all matters about safety. However, for major hazard companies, it is necessary to distinguish between personal safety and process safety (Zwetsloot, Van Middelaar & Van der Beek, 2020). Moreover, within an organisation, two kinds of safety can be identified: perceived safety and ideal safety (Lee, Huffman & Wang, 2022). Perceived safety refers to the safety that is experienced by employees daily, while ideal safety is the safety that is

desired by the organisation. An organisation must consider both of these aspects when implementing a safety culture in their workplace. Employees should be providedwith adequate training and resources to ensure that they can identify and respond to potential safety risks. Additionally, the organisation should make sure that the right systems and processes are put into place to make sure that their safety culture is effective and that the safety of both their employees and their processes is optimised. Perceived safety is also referred to as process safety, which is related to the growth and reputation of process-related industries as well as their license to operate. It is also related to society's trust in the industries and their sustainability (Lee *et al*., 2022; Zwetsloot *et al*., 2020). Process safety culture in MHI means cleaner production and the prevention of accidents that can result in catastrophic events that include loss of life, damage to property, ineffective containment of toxic, explosive or flammable chemical products and a negative impact on society and the environment (Zwetsloot *et al*., 2020).

Organisations prioritise safety to protect their workers and ensure that the attitudes and behaviours of the employees reflect the desired organisational culture. This has an impact on the way employees act and behave, and ultimately influences the organisational culture (Lee *et al*., 2022). Ideal safety means that no one is injured in the workplace, thereby preserving the human dignity of all (Lee *et al*., 2022), which is an organisation's goal. However, ideal safety is not openly related to the growth and survival of an organisation and therefore might not be prioritised or become part of organisational culture (Lee *et al*., 2022).

Safety culture is an integral portion of the organisational culture and can be seen as a subset of it. To be effective, it must be consistent with and in line with the organisational culture and its core values. The intended designed of a safety culture is to ensure that safety is prioritised and taken seriously in any organisation. However, it is necessary to take into consideration that a strong safety culture does notguarantee perfect safety, but it can help to create a strong safety-oriented mindset and atmosphere. It is ultimately up to each individual to practise safety measures and procedures and to ensure that safety is always an integral part of the organizational culture (Lee *et al*., 2022).

Organisational culture is the collective behaviour of the people within an organization and defines the values, beliefs, and expectations of the organisation. It is an essential part of an organisation's identity and is created and maintained through a variety of means, such as leadership style and vision, organisational structures, communication patterns, and incentives. The culture of an organisation should promote efficiency and productivity, allowing it to achieve its set aims and objectives, while also considering the individual needs of the employees.

Organisational culture should provide employees with a sense of direction, purpose, and value, as well as a trusting, collaborative working environment. This can be accomplished through the adoption and implementation of clear policies and procedures, effective communication, and the allocation of resources. Additionally, the organisation should create and sustain a culture that encourages innovation and creativity and rewards performance and achievement to remain competitive in the long-term.

Organisational culture is an important factor in achieving workplace safety, as it shapes how employees interact and behave in the workplace. This can impact how safety is managed, as an organisation may struggle to maintain high safety standards if the culture does not value and support safety. A strong organizational culture can help ensure that safety procedures are followed, even if it requires an investment of time and resources (Lee *et al*., 2022). However, an organisational culture that does not prioritise safety can lead to a lack of attention to detail and an increased likelihood of accidents and injuries. Organisational culture and ideal safety must be balanced to ensure a safe workplace. A workplace SL team should be responsible for maintaining this balance by setting and enforcing safety standards, while also promoting a culture of safety and accountability (Çalış & Büyükakıncı, 2019).

In today's competitive and aggressive business environment, decision-makers within organisations often prioritize short-term financial gains and survival over long-term considerations, such as employee welfare, safety, and environmental protection. This focus on immediate, tangible results often results in the neglect of larger, long-term objectives that can have a greater long-term impact on a company's success and sustainability. Such decisions, while often necessary in the short term, can lead to detrimental outcomes in the long run when they take precedence over more

sustainable approaches. (Lee *et al*., 2022). Therefore, it is not easy for ideal safety to become a subset of organisational culture and change the organisational culture into a safety-first culture (Lee *et al*., 2022).

It seems that despite the efforts of many organizations to promote a safety-first culture, it is not achieving the desired results (Lee *et al*., 2022). Organisational culture does not change significantly even with government subsidies to improve their safety culture (Hale. Guldenmund, Van Loenhout & Oh, 2010). In practice, substantial change in an organisation takes at least 25 years (Guldenmund, 2010). Moreover, the interest in safety culture has led to a lot of research, although is questionable whether this has improved safety levels and helped organisations to realise their safety objectives (Lee *et al*., 2022).

Many researchers, including Cole, Stevens-Adams and Wenner (2013), have expressed uncertainty regarding the safety culture concept. They argue that the definition of safety culture remains unclear and lacks empirical validation and is often used to encompass all social and organisational factors related to accident rates (Clarke, 2000). The uncertainty is further reinforced by the fact that not all dimensions of safety culture are fully understood (Kalteh *et al*., 2022). The application of safety culture is uncertain, making it difficult to differentiate it from other safety concepts. The relationship that exist between safety performance and safety culture was examined by several studies, nonetheless it remains unclear if safety culture contributes to the goal of improving safety levels within an organization (Guldenmund, 2010).

In terms of the improvement of a safety culture, development of a safety management system (SMS) is required and a dedicated focus on organisational processes and structures will gradually improve the organisational culture (Guldenmund, 2010). Safety management system is defined as the management procedures, elements and activities that are aimed at developing the safety performance within the organisation (Li & Guldenmund, 2018). From the requirements of the International Organisation for Standardization (ISO) 45001 (2018), SMS thoroughly covers the complete requirements for safety management within an organisation. The maturity of safety culture can gradually be replaced by SMS development, however it requires the appropriate support of leadership and supervisors, and depends on the extent an organisation has been able to implement

its SMS processes and structures effectively (Guldenmund, 2010). The role that a safety management system has in addressing a workplace safety and health issues, increasing worker safety, reducing workplace threats, and establishing better and safer workplace safety is crucial (Mohammadfam, Kamloinia, Momeni, Golmohammadi, Hamidi & Soltanian, 2017). Safety management techniques have an impact on and may determine the safety performance (Razali, Redzuan, Kamaruddin, Dahlan, Nobli, Atan & Hanafi, 2018). Therefore a good SMS play a strategic role in improving workplace safety and performance. Furthermore, to improve workplace safety, management commitment was found to be one of the means for it (Akosah, 2023). Management commitment to safety refers to extent to which top management within an organisation display their commitment to safety by encouraging and assisting workers in safety related matters (Hassan & Esmail, 2018).

Safety culture maturity refers to how high management and workers value safety and the manner in which they consider safety when performing their tasks (Reiman, Rollenhagen, Pietikainen & Heikkila, 2015). This is closely related to safety performance, however safety culture maturity and safety performance do not take place concurrently, a delay of safety culture maturity can only impact safety performance at a later stage. When safety culture levels are measured in a organisation, the result will reveal whether the safety culture is positive or negative (Duca, Angelo, Sangermano & Di Palma, 2022).

A positive safety culture commonly known characteristics are: a collection of commitment of individuals and management in all levels to always conduct themselves safely; safety accidents, issues and reports are not responded to in a negative manner such as punishment and reprimand; workers should know their role towards safety and are committed in maintaining their work area free from danger; tasks are allocated according to the availability of resources and resources should be reasonably available; safety issues should be freely discussed at all levels of the organisation; workers who bring up safety concerns should not ridiculed, blamed or retaliated against (Duca, Angelo, Sangermano & Di Palma, 2022).

A positive safety culture assists in balancing the understanding of risks and the consequences of a disaster, and it also promotes the employment of considerable

actions and the behaviour of individuals with the purpose of guaranteeing enough cover by preparing individuals for emergencies, incident prevention and emergency response (Duca & Gugg, 2023).

On the other hand, commonly known characteristics of a negative safety culture are: the violation of safety procedures; management not taking into consideration the safety concerns and reports of workers; failure to improve unsafe working conditions that have caused an accident in the past; allowing workers to take unsafe actions; management that have a tendency to put the interest of the customer first at the expense of the workers safety; avoiding the responsibility of acting safe; a disagreement between workers and management about documented safety events and perceptions that an accident is imminent (Duca *et al*., 2022)

Civil Air Navigation Service Organisation (CANSO) (2008) (as cited by Duca *et al*., 2022) proposed a safety culture model based on eight elements and three dimensions in a occupational health and safety context. The elements are: A just culture, Learning Culture, Informed Culture, Flexible Culture, Safety Related behaviour, Attitudes to Safety, Risk Perception and the dimensions are: Psychological Aspects, Behavioural Aspect, Situational Aspects.

A Just Culture refers to situation where there is trust and crucial safety related information is shared amongst colleagues. There is clarity and sharing when it comes to acceptable and unacceptable behaviour.

Risk perception refers to a situation where workers within an organisation know the consequences and seriousness of risks and share the same perceptions. They can all take appropriate action when it comes to safety matters.

Flexible culture refers to the ability of an organisation to reconfigure its reporting structure, from a conventional hierarchical mode to a flatter mode when it is faced with a crisis situation.

Informed Culture refers to when workers of an organisation are aware and are able to recognise the risks that they are exposed, the know the warning signs and emergency procedures. They are aware of the risk impact that the organisation has to the local environment.

Reporting Culture refers to a situation where managers and subordinates share critical information with regard to safety freely without the fair of being subjected to a disciplinary action.

A Learning Culture refers to the willingness and ability of learn and obtain knowledge from crisis event. Preparedness to put into place relevant changes from the knowledge gained from the event.

Attitudes to safety refers to the attitudes that is mostly applicable to management in connection to the risks in the workplace, the safety within the organisation and surrounding environment and production.

Safety-related behaviour refers to acknowledgement of the relevance of rules and regulations and ensuring everyone within the organisation compliance with safety procedures. Actively fostering the compliance to safety procedures through communication, caring and recognition.

Safety culture and safety climate are often used interchangeably in practice and are sometimes defined similarly (Wiegmann, Zhang, Von Thaden, Sharma & Gibbons, 2004). However, there is a close connection between safety climate and culture, and some researchers use the term “safety culture” in place of “safety climate” (Zhao, Yang, Liu & Nkrumah, 2022). Safety climate refers to the collective perception of organisational members about how safety matters are managed (Griffin & Neal, 2000; Zohar, 1980, as cited by Casey, Griffin, Harrison & Neal, 2017). Safety climate is a shared understanding among employees about what behaviours, procedures and practices are acceptable for supporting high-risk operations (Zohar, 2000, as cited by Wong, Kelloway, & Makhan, 2016). The research on safety climate within the psychological and management literature has reached a mature stage of development(Casey *et al*., 2017).

Studies have shown that employees perform their work more safely when there is a shared social context that values and prioritises safety. Therefore, in an organisation safety climate is seen as a leading indicator of safety performance (Casey *et al*., 2017). Safety climate is believed to mediate the relationship between transformational and transactional leadership and safety behaviours (Wong *et al.,* 2016). It also acts as a mediator in the trust relationship between leadership attitudes and injury rates within an organisation (Luria, 2010). The mediating role of safety climate can be traced back

to safety awareness, which serves as a link between a positive safety climate and safety-specific transformational leadership. This, in turn, is associated with fewer safety violations and injuries (Barling, Loughlin & Kelloway, 2002).

2.3 Safety leadership

The King IV Code on Corporate Governance states that a governing body should continually monitor and oversee the impact of an organisation's activities and outcomes on its status as a responsible corporate citizen (Ramalho, 2016). Thus, a governing body, in agreement with management, will monitor and oversee targets and measures related to workplace safety, health, dignity, and employee development, as well as public health and safety, human rights protection, consumer protection and community development.

Additionally, a governing body should monitor and oversee an organisation's environmental responsibilities in terms of pollution, waste disposal, and the protection of biodiversity (Ramalho, 2016). The senior management of an organisation is responsible for ensuring overall accountability in preventing work-related injuries and illnesses (Xue, Fan & Xie, 2020). Moreover, it is accountable for providing a healthy and safe workplace and safe work activities for employees. Specifically, senior management must establish and comply with occupational health and safety (OSH) risk management procedures for employees and support the OSH management system (Xue *et al.,* 2020).

It has been established through previous discussions that leaders play a crucial role in shaping an organisation's safety culture. One aspect of leadership that can impact safety culture is the leadership styles or approaches adopted by leaders. Common leadership styles include transformational leadership, servant leadership, adaptive leadership, ethical leadership, authentic leadership and transactional leadership, amongst others (Northouse, 2019). These different leadership approaches entail distinct roles for both leaders and subordinates. For instance, the transformational leadership approach involves the leader creating a connection with subordinates to increase their motivation and morality, while servant leadership emphasises the leader serving others. Adaptive leadership, however, focuses on helping others adapt to new environments.

According to a study by Bandura (1986, cited in Khan *et al.,* 2018), ethical leaders promote trust amongst employees and encourage them to actively participate in implementing health and safety procedures. Thus, leaders serve as role models for health and safety regulations and prioritise safety culture through effective communication, training, motivation, rewarding and disciplining. This, in turn, leads to improved safety performance.

The leadership approach of an organisation has a significant impact on its SL, and vice versa. The commitment of leaders to safety can enhance the organization's safety performance, while poor SL can have a detrimental effect on the organization's safety culture (Stiles, Ryan & Golightly, 2018). The safety climate serves as a bridge between SL and safety performance, and both the safety climate and performance are influenced by SL (Çalış & Büyükakıncı, 2019).

SL refers to the interaction between leaders and subordinates and the exertion of influence by leaders to encourage subordinates to meet the organization's safety goals (Wu, Li & Fang, 2017). It involves the application of leadership principles in the context of safety, also known as the concept of SL (Rahlin, Bahkiar, Awang, Idris, Lily & Razak 2022). Other definitions of SL can be found in the literature. Table 2.1 below presents a few definitions of SL.

Table 2.1. SL definitions

Author	Definition
Negoro *et al.* (2022)	Leaders use their influence to encourage workers/followers to achieve the organisational and individual safety goals
Zhao *et al*. (2022)	The process whereby a safety leader enhances the safety of the work environment in an organisation guides employees to adjust their safety behaviours, and provides them with organizational support to accomplish the overall safety requirements of the enterprise.

Source: Negoro, Eliyana, Anggraini & Adiyani, 2022; Zhao et al. (2022)

The benefits of SL include improved safety attitudes, behaviours and job outcomes for employees and a reduction in workplace accidents (Negoro *et al*., 2022). In addition, SL enhances the safety awareness of employees and strengthens the safety culture within an organisation (Krause, 2004, as cited in Zhao *et al*., 2022).

Leaders can influence safety through both direct and indirect methods. The indirect method involves establishing safety norms that link practices and procedures and creating a positive safety climate within the organization (Rahlin *et al*., 2022). This can be achieved through the leader's safety-related behaviours, thereby acting as a role model for subordinates and by monitoring and praising safe behaviours amongst subordinates (Rahlin *et al*., 2022). Moreover, SL is associated with three main leadership styles developed by Bass (1985), including safety transformational leadership, safety transactional leadership, and safety passive leadership (also known as laissez-faire leadership) (Çalış & Büyükakıncı, 2019; Zhao *et al*., 2022).

In practice, the two most widely used leadership styles are transactional and transformational (Xue *et al*., 2020). However, SL is a subfield of both transformational and transactional leadership approaches (Rahlin *et al*., 2022). Nevertheless, it requires greater emphasis on the use of the transformational leadership approach, compared to the transactional leadership approach (Rahlin *et al*., 2022). Transactional leadership is a leadership style that is based on rewards and punishments (Burns, 1978, as cited by Xue *et al*., 2020). Managers are mindful of the demands and expectations of their subordinates, and those subordinates who

meet the goals set by the managers are

rewarded, either spiritually or materially. This leadership style focuses on the leader's response to the actions of the subordinates (Wong *et al*., 2016). Transactional leadership also involves giving negative feedback, such as withholding recognition and punishment in response to failures and poor performance (Wong *et al*., 2016).

Transactional leadership can be divided into two types: active and passive. Active management-by-exception (allowing employees to work mostly independently) occurs when the leader monitors and corrects subordinates' actions before mistakes happen, while passive management-by-exception only takes place after mistakes have been made (Wong *et al*., 2016). Bass (1985) also recognized that transactional leadership has a positive aspect, as it provides rewards and recognition to subordinates based on their good performance (Wong *et al*., 2016). Thus, safety-specific active transactional leadership (STAL) can be defined as the leader's monitoring of employee safety behaviour, giving individual attention to employees, facilitating discussions on safety issues with employees and proactively addressing safety concerns before accidents occur (Zhao *et al*., 2022).

The transformational leadership style involves leaders inspiring and motivating their subordinates to exceed expectations by using their charisma and personal strengths. This style focuses on creating meaningful and challenging work, promoting intellectual stimulation and providing opportunities for growth and development (Wong *et al*., 2016). It has four key components: role modelling, inspirational motivation, intellectual stimulation, and individualized consideration (Wong *et al*., 2016). Safety-specific transformational leadership (STFL) describes a leadership style where the leader inspires and motivates his/her followers to buy into the organisation's vision and take initiatives aligned with its objectives. The leader instils his/her vision and confidence in the followers, creating an ideal state (Barling, *et al*., 1996, cited in Zhao, *et al*., 2022). However, Safety-specific passive leadership, also known as management-by- exception or laissez-faire leadership, involves a safety leader who takes minimal or no active role in safety management but instead takes harsh action after a serious safety accident occurs and punishes those who caused the accident severely (Avolio *et al*., 1999, cited in Zhao *et al*., 2022).

2.4 Influence of safety leadership on safety culture

In the study, the chemical processing industry was limited to organisations where raw materials are converted into final products after undergoing chemical conversion, which includes the petrochemical and the chemical industries, amongst others. In these industries, owing to the inherent nature of handling hazardous substances, safety is a continued concern (George & Renjith, 2021) and maintaining a safety culture is crucial.

Although safety is considered important, Cox and Cheyne (2001) found that there are varying perceptions of safety culture among subordinates, leaders and contractors in the industry. Some subordinates may perceive themselves as not being actively involved in creating a safety culture in the workplace and delegate the responsibility to leaders. Research has also shown that both leaders and subordinates play different roles in shaping the safety culture. For instance, Martínez-Córcoles, Gracia, Tomás & Peiró (2011) found that in an organisation where safety culture is strong, is the result of leaders fostering a positive safety climate, which leads to employees adopting safer behaviours.

This highlights the importance of the role leaders have in creating a safety culture. Shen *et al*. (2017) based their investigation in the construction industry of Hong Kong on the influential role that transformational leadership has on safety climate. They posited that transformational leadership foster close relationships amongst leaders and subordinates, which is vital in the context of Hong Kong as the construction workers are relationship oriented.

Transformational leaders inspire their subordinates to prioritise collective goals and improve their performance through four key strategies: being a role model, motivating subordinates, participating in problem-solving and building personal connections with subordinates. The findings of the study showed that transformational leadership has a substantial effect on the safety climate which is mediated by safety leader-subordinate exchange and that a positive safety climate, also fosters behaviour of safety and knowledge of safety.

Both STFL and STAL styles can enhance near-miss recognition of employees'. The latter does so by stimulating their learning goal orientation, whereas transformational leadership promotes their performance goal orientation (Lu, Wu, Shao, Liu & Wang,

2019). According to Clarke (2013), a meta-analysis showed that transformational leadership improves employees' safety participation, wherein safety climate is serving as a partial mediator in the relationship. Clarke's meta-analysis also indicate that with safety climate as a partial mediator, transactional leadership improves employees' safety compliance (Wong *et al*., 2016). The positive effect of STAL on performance goal orientation is strengthened by a high safety climate, therefore, for this leadership style to have a significant impact on performance goal orientation, a robust safety climate is necessary (Lu *et al*., 2019). The relationship between STAL and employee participation is fully mediated by the safety climate (Clarke, 2013 as cited in Wong, *et al*., 2016). On the other hand, STFL does not depend on a strong safety climate to improve subordinates learning goal orientation. Both STFL and STAL affect employees' near-miss recognition, but they promote different goal orientations (Lu *et al*., 2019).

Transformational leadership is effective in influencing employee safety behaviours and process safety management activities (Xue *et al*., 2020). In Zohar's (2002) study of
411 metal processing plant workers, the use of the full-range transformational leadership model was found to predict the injury rate through a negotiation of a team-level safety climate (Martínez-Córcoles *et al*., 2011).

Kelloway *et al*. (2006) studied the connections between transformational and passive leadership that is specific to safety and its impact on direct managers and safety incidents. They discovered that safety behaviours are determined by the safety climate and that the safety climate is positively influenced by transformational leadership and negatively impacted by passive leadership (Barling *et al.,* 2002). The four key characteristics of transformational leadership can be applied to workplace safety. Leaders who exhibit strong role-modelling qualities can prioritise long-term safety over productivity pressures (Barling *et al.,* 2002).

Transformational leaders also possess the trade of inspirational motivation, as they defy their subordinates towards a shared safety goal. Another characteristic of transformational leadership is the ability to encourage subordinates to find innovative solutions while still adhering to safety regulations. Finally, a good safety leader should exhibit a genuine concern for the well-being of their subordinates (Wong *et al.,* 2016).

In the petrochemical industry, transformational leadership has been found to play a more active role in improving employee safety behaviours compared with transactional leadership (Xue *et al*., 2020). When the effects of transactional and transformational leadership were compared, transformational leadership showed to have a more significant impact. (Wu, Li & Fang, 2017).

2.4.1 Safety commitment, safety vision and personal character

Senior managers should demonstrate a commitment to safety by regularly communicating with employees, providing adequate safety resources, and staying informed about the company's current safety status (Xue *et al*., 2020). They must also keep employees updated on the company's future safety goals and emphasize the significance of safety in the workplace (Xue *et al.,* 2020).

Leaders can set a safety example for their subordinates and inspire them through virtue and charisma, which can be effective methods for promoting safety in the workplace (Wu *et al.,* 20170). In petrochemical companies, senior managers should leverage their personalities to engage and motivate employees to enhance performance in process safety management activities (Xue *et al.,* 2020).

The consistent presence of senior management and leading by example can promote the spread of positive safety values, perceptions and behaviours, thereby fostering a strong safety culture (Wu *et al.,* 2017). To manage safety matters, effectively senior managers should update their knowledge and skills in safety by continuously acquiring professional safety studies, as well as display confidence and character in their approach (Xue *et al.,* 2020). Additionally, senior managers must excel at handling challenging safety issues and have an open-minded and innovative mindset (Xue *et al.,* 2020).

For effective safety performance, it is crucial to engage subordinates in a participatory manner and empower them to generate ideas for improving safety (Kim & Gausdal, 2020). Leaders can improve their subordinates' safety behaviours by being relationship-oriented, as a relationship-oriented leadership style is effective (Kim & Gausdal, 2020). Influence leadership should be based on personal characteristics such as illustration, knowledge and inner power. In addition, it can be achieved through soft and rational tactics, rather than coercion and rewards (Kim & Gausdal, 2020).

2.4.2 Safety inspiration, through the use of safety awards and punishment When senior managers make work arrangements without considering the available manpower, it can lead to overworking of employees and result in a high injury rate (Barling *et al.,* 2002; Xue *et al*., 2020). Rather than solely focusing on reducing costs, senior managers should address manpower shortages through collaboration with their human resources department to avoid overloading workers and prioritise safety over production (Wong *et al*., 2016). In a good SL context, it is important to avoid overburdening workers, even if there is a risk of lost profits.

When employees are overburdened with work, they may not be able to complete it, and if safety accidents occur, senior managers may blame the employees instead of taking responsibility for ensuring safety (Xue *et al*., 2020). Work overload and production pressure are common challenges that make it difficult for supervisors to maintain safety standards (Conchie, Moon & Duncan, 2013). Moreover, the human resources department may not be held accountable for ensuring adequate manpower to handle the workload. When safety accidents occur, employees may be blamed, penalised and punished, leading to a feeling of dissatisfaction with the workload compared with their salaries (Xue *et al*., 2020).

When compared to punishments in other departments, the punishments for frontline employees are often excessively harsh, leading to dissatisfaction and a sense that their job is not worth the trouble. This can cause frontline employees to question senior management's work arrangements and lead to some seeking job changes or accepting demotions to avoid unfair punishments (Xue *et al.*, 2020).

Using safety awards and punishments as incentives for safety can have a detrimental effect on achieving safety compliance (Xue *et al*., 2020). This is evidenced during performance evaluations and is perceived as insincere. Moreover, this is due to a shortage of manpower and unfair task distribution that leads to overworking, causing employees not to have time to focus on safety procedures and ensure the quality of their work (Xue *et al*., 2020).

Using influence tactics alone is not enough to ensure safety in operations, as merely constraining and controlling people to follow regulations and complete checklists is not enough (Kim & Gausdal, 2020). However, Clarke (2013) found mixed results in a meta- analysis of the role of active corrective leadership, suggesting that active

monitoring and enforcement of rule-based safety compliance through active management-by-exception can lead to increased adherence and help prevent errors from occurring (Wong *et al*., 2016).

2.5 Empowering leadership

A recent leadership model, known as empowering leadership, has been adapted for use in the workplace safety setting by a research team from Spain (Martínez-Córcoles, *et al*., 2011). This model is based on the ideology that a leader's primary goal is to develop a sense of self-management amongst their employees (Arnold *et al*., 2000, cited in Wong *et al*., 2016). Empowering leadership focuses not only on the leader's behaviour towards their subordinates but also on how he/she communicates and helps his/her subordinates to understand the procedures for performing their tasks. Empowering leadership is characterised by five behavioural traits: coaching, sharing information, leading by example, empathy and involving subordinates in decision- making (Wong *et al*., 2016).

The empowering leadership model addresses distinct behaviours, in contrast to the transformational leadership model, which considers leadership as a personality trait, which is difficult to modify (Martínez-Córcoles *et al*., 2011). According to the empowering leadership model, a leader should create a safety environment that enables employees to exhibit safe behaviour by demonstrating the following behaviours: clearly outlining what needs to be achieved and the reasons behind it; explaining the reasons for doing certain tasks in a specific manner; boosting employee confidence and enhancing their belief in their ability to accomplish a task; offering relevant examples of good practices for employees to follow; developing employees' capabilities to gradually increase their contribution; providing emotional support by giving credit where it is due and caring for employees' well-being; and allocating tasks in a way that allows employees to succeed, feel satisfied with their work, increase their sense of self-efficacy and strive for higher goals (Martínez-Córcoles *et al*., 2011).

Empowering leadership has been found to predict a more favourable safety climate and increased safety behaviours. The relationship between empowering leadership and safety climate is strong in contexts with a weak safety culture, indicating that empowering leadership can be effective even in organisations with a less developed safety culture (Martínez-Córcoles *et al*., 2011; Wong *et al*., 2016).

The comparison of the empowering leadership model with the full-range leadership model, (which is based on three types of leadership: laissez-faire, transactional and transformational leadership), is a relatively new area of research in the field of safety, and there are few studies available on the topic. To date, there has not been research conducted to determine the differences between empowering leadership, transformational and transactional leadership. As a result, the value that empowering leadership adds to the full-range leadership model (Bass, 1985) remains to be determined (Wong *et al*., 2016).

2.6 Safety assessment for explosives risk model

The safety assessment for explosives risk (SAFER) model identifies effective leadership behaviours in the context of explosives risk. The model consists of six behaviours: emphasising safety; walking the talk; maintaining safety standards; influencing others to prioritise safety; recognising and rewarding workers who adhere to safety protocols; and demonstrating a commitment to safety through actions (Wong *et al*., 2016). These behaviours are explained below. Although SAFER model is subject to empirical validation, it offers a platform for research and can even be used in the workplace to improve safety (Wong *et al*., 2016).

2.6.1 Emphasising safety

Behaviours that emphasise safety are single route communication of safety information. It can either be giving feedback, data reporting and sharing of safety-related matters. Communication about safety is a major factor in SL, as it demonstrates the leader's standpoint when it comes to safety. The value and capacity of safety communication are important, and meaningful information needs to be shared frequently (Wong *et al*., 2016). Safety communication mediates the leader-member exchange relationship and safety commitment, and in return a high safety commitment leads to fewer accidents in the workplace (Hofmann & Morgeson, 1999 as cited by Wont *et al*., 2016).

2.6.2 Walking the talk

The physical visibility of safety leaders is critical in reinforcing the safety requirements communicated to the subordinates. Safety leaders must walk the talk by aligning their

expectations and actions with the safety requirements. This is known as behavioural integrity and is perceived as a crucial aspect of effective leadership in the context of safety. Subordinates are more likely to prioritise safety and have a sense of psychological safety when leaders exhibit integrity in their safety behaviours. On the other hand, hypocrisy in safety matters is perceived as a poor display of behavioural integrity and can have negative impacts on safety outcomes (Biggs, Davey & Freeman, 2013). Safety communication, both in terms of quality and frequency, is also important in building a positive safety culture and promoting safety commitment amongst subordinates (Hofmann & Morgeson, 1999 as cited by Wont *et al*., 2016).

2.6.3 Maintaining safety standards

Safety leaders must consistently demonstrate their commitment to maintaining safey requirements and display behaviours that reflect their perseverance and dedication to safety (Wong *et al*., 2016). A leader's commitment to safety is a crucial aspect of strong safety culture (Biggs *et al*., 2013). Examples of behaviours that demonstrate a leader's commitment to safety include monitoring subordinate safety performance and being flexible enough to adjust his/her strategy when he/she identifies non-compliance with safety requirements (Wont *et al*., 2016).

2.6.4 Influencing others to prioritise safety

Engaging behaviours is a way of influencing subordinates to prioritise safety. In addition, demonstrating concern for subordinates' well-being and fostering a psychologically safe work environment where subordinates feel comfortable reporting safety concerns are key factors in promoting safety behaviours (Wong *et al*., 2016).

2.6.5 Recognising and rewarding workers who adhere to safety protocols

Monetary incentives are a common form of reward for good performance, but this is not always cost-effective. In terms of safety, good safety leaders should look to non-monetary forms of recognition to encourage desired safety behaviours, as these can be more cost-effective and still have a positive impact on behaviour. Examples of non- monetary recognition include verbal praise, time off, or additional responsibilities (Wong *et al*., 2016). By using non-monetary forms of recognition, leaders can foster a sense of pride and accomplishment in their subordinates and encourage the development of a safety-oriented culture.

2.6.6 Demonstrating a commitment to safety through action

A safety leader can demonstrate a commitment to safety through action by

- Consistently following and enforcing safety protocols and procedures
- Continuously monitoring and addressing potential safety hazards
- Providing ongoing training and resources to employees to promote safe behaviours
- Actively listening to and addressing safety concerns raised by employees
- Regularly reviewing and updating safety policies to ensure they are current and effective
- Demonstrating flexibility and a willingness to change strategies when needed to improve safety outcomes
- Regularly inspecting worksites to identify and correct any safety issues
- Encouraging and recognising safe behaviours and actions amongst employees
- Actively promoting a safety culture and leading by example (Worksafe BC, n.d.).

2.7 Conclusion

From the literature review, it is evident that leaders play a crucial role in creating a safe workplace for their employees. Research has shown that a leader's approach affects workers' perceptions of safety and can even enhance safety performance. The literature reveals that the transformational leadership style has a significant impact on employees' safety behaviour and process safety management activities, whereas transactional leadership has a positive influence on safety compliance, which is partially mediated by a safety climate. The SAFER and empowering leadership models can be adopted by safety leaders in the workplace to enhance safety, although both models are relatively new and require further empirical validation.

The next chapter presents the research methodology that was followed for the study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

A research methodology comprises conventions, claims, rules and approaches that the researcher employs to make his/her work open to analysis, critique, replication and adaptation. It also involves the selection of research methods (Schensul, 2008). A research methodology is a systematic approach to solving a research problem through logical and scientific steps (Patel & Patel, 2019).

The previous chapter discussed the theory of SL approaches and safety culture. This chapter focuses on the methodology and design of the research process, including the location of the study, participants, method for collection of data, analysis of data, and the reliability and validity of the data.

3.2 Research paradigm

A paradigm is a set of basic beliefs and a theoretical framework that guide a research investigation. It includes assumptions about ontology, epistemology, methodology, and methods. Guba & Lincoln (1994) as cited by Burrel and Morgan (2016) are leaders in the study of paradigms, also known as worldviews. They define a paradigm as a basic set of beliefs that guide a research investigation. Burrell and Morgan (2016) describe a paradigm as a set of taken-for-granted assumptions that underwrite the frame of reference, mode of theorising and ways of working in a particular group. (Saunders, Lewis & Thornhill, 2019).

Every researcher, whether aware or not, makes assumptions at every stage of their research. These assumptions include ontological (perceptions of reality in the research), epistemological (valid and legitimate knowledge), and axiological (values and ethics) assumptions (Burrell & Morgan, 2016; Saunders *et al.*, 2019). Researchers must have a clear understanding of these assumptions, as their research will be guided by them as well as the beliefs, norms, and values of the chosen paradigm (Kivunja & Ahmed, 2017). In this section, the three research assumptions of ontology, epistemology, and axiology will be briefly discussed.

3.2.1 Ontology

Ontology, as defined by Richards (2003:33), is "the nature of our beliefs about reality" (Rehman & Khalid, 2016). It shapes the way researchers view and achieves their research objectives. In the field of business management, ontology determines the researcher's perspective on the world of business and management and has an impact on the choice of a research project (Saunders *et al.*, 2019).

3.2.2 Epistemology

Epistemology refers to assumptions about knowledge and what constitutes valid, acceptable and legitimate knowledge. It encompasses the ways knowledge can be communicated to others (Burrell & Morgan, 2016). In the context of business management, it means that different types of knowledge, such as numerical data, textual and visual data, facts, opinions and narratives, can all be considered legitimate data (Saunders *et al.*, 2019).

3.2.3 Axiology

Axiology concerns the role of ethics and values in planning a research proposal (Saunders *et al.*, 2019; Kivunja & Ahmed, 2017). It involves considering the values that will be attributed to different aspects of the research, including the data, participants and the audience to whom the results will be reported (Kivunja & Ahmed, 2017).

3.2.4 Five business management philosophies

The five major philosophical positions in business management research are positivism, critical realism, interpretivism, postmodernism and pragmatism as presented in Table 3.1 below.

Table 3.1: Five research philosophical positions in business management research.

	Ontology	Epistemology	Axiology	Typical methods
Positivism	Real, external, independent, one true reality, granular, ordered	Scientific method, measurable facts, generalisations, numbers	Value-free research, research detached, maintains objective stance	Highly structured, large samples, measurements, quantitative methods
Critical realism	Layered, external, independent, intransient, objective structures, causal mechanisms	Epistemological relativism. knowledge historically situated and transient, facts are social constructions	Value-laden, biased by worldviews, objectivity minimises bias. culture and upbringing	Range of methods and data types fit subject matter
Interpretivism	Complex, rich socially constructed through culture and language multiple, meanings, interpretations, realities, flux of processes, experiences, practices	Theories and concepts too simplistic, focus on narratives, stories, perceptions and interpretations	Value-bound research, subjective, key contribution by researcher, reflexive	Small samples, in-depth investigation, qualitative methods of analysis, wide range of data can be interpreted
Postmodernism	Nominal, complex, rich socially constructed through power relations, interpretations, realities are dominated and silenced by others flux of processes, experiences, practices	what counts is 'truth', knowledge is decided by dominant ideologies, focus on absences, silences and oppressed/ repressed meanings, interpretations and voices, exposure of power relations, challenge of dominant views	Value-constituted research, research embedded in power relations, some narratives are repressed and silenced at the expense of others, researcher radically reflexive	Typically deconstructive – reading texts and realities against themselves, in-depth investigations of anomalies, silences and absences range of data types, typically qualitative methods of analysis
Pragmatism	Complex, rich, external 'reality' is the practical consequences of ideas, flux of processes, experiences, practices	Practical meaning of knowledge in specific contexts, 'true' theories and knowledge are those that enable successful action, focus on problems, practices and relevance, problem-solving and informed future practice as contribution	Value-driven research, research initiated and sustained by researcher's doubts and beliefs, researcher reflexive	Following research problem and research question, range of methods: mixed, multiple, qualitative, quantitative, action research, emphasis on practical solutions and outcomes

Source: Saunders, Lewis and Thornhill (2019:144)

As stated above, the research methodology of the current study was grounded in interpretivism.

3.3 Research methods

There are various research methods available, of which the most common ones are qualitative, quantitative and mixed methods. This three research methods will be briefly explained below.

3.3.1 Qualitative research

Qualitative research involves examining the experiences, beliefs, perceptions and perspectives of individuals or groups concerning a particular issue. It aims to describe and analyse human behaviour and culture from the perspective of those being studied. Qualitative research is rooted in the philosophy of empiricism and follows an unstructured, flexible and open approach to inquiry. It values in-depth understanding and focuses on exploring perceptions, feelings and experiences rather than facts and figures (Kumar, 2020).

The researcher chose a qualitative approach for the study to gain a deep understanding of and rich insights into the participants' experiences and practices related to safety culture and SL. Moreover, a small sample size was selected to gain an in-depth understanding of the perceptions of different groups within the organisation.

3.3.2 Quantitative research

Quantitative research is a systematic and empirical investigation of a phenomenon using numerical and statistical data. The approach is used to test objective theories and examine relationships between variables. The data collected in a quantitative study is measured using instruments and then analysed through statistical procedures. This method was not used because, the researcher had a small sample to work with, did not seek generalisability of the findings and rich data from interviews was more suitable for this study.

3.3.3 Mixed-methods research

Mixed methods research is a research approach that involves collecting data using both qualitative and quantitative research methods and integrating the results. This approach is based on the philosophical assumptions of combining qualitative and quantitative data collection and analysis methods. This method was not used because,

the research had a small sample to work with, did not seek generalisability of the findings and rich data from interviews was more suitable for this study.

3.4 Sampling

Sampling is the process of selecting a portion of a larger population to use as a data source. This process involves defining the population and selecting a sample that represents it. Qualitative research is often best suited for small, systematically selected samples and intense investigations, as the goal is to uncover in-depth views and opinions.

In the study, purposive sampling was used to recruit participants from a chemical manufacturing company in KwaZulu-Natal. A minimum sample size of 20 participants (5 leaders and 15 subordinates) was selected, and data saturation was reached after interviewing 4 leaders and 8 subordinates of participants. To be eligible to participate in the study, participants had to meet the following criteria:

- Currently employed in the chemical processing industry
- Worked in the industry for at least a year
- Understood English

The researcher was employed in the case study company, which meant that recruiting the participants and organising interviews was easy, as the participants were colleagues. However, there was the risk of bias and a lack of objectivity on the part of the researcher. Therefore, the researcher had to consider these factors and take steps to address them to ensure the study's validity and reliability, which is explained later in this chapter.

3.5 Data collection

The researcher used interviews as the method for collecting data from the participants in the study. An interview can be defined as a structured conversation between an interviewer and a participant whereby the interviewer asks questions, and the participant provides answers. The purpose of an interview is to gather information on a particular topic. In the study, the researcher used a semi-structured interview format, where the interview schedule/guide, which was the data collection instrument, provided a set of questions to be asked but allowed for additional questions to be

asked to gather in-depth information. The interview schedule (see Appendices 4 and 5) was designed based on the research questions and existing theory on SL. Before conducting the study, the researcher obtained permission from the general manager of a chemical manufacturing company in KwaZulu-Natal (see Appendix 1) and ethical approval from the Humanities & Social Sciences Research Ethics Committee at the University of KwaZulu-Natal.

A recruitment letter was then sent to the company inviting interested members to participate. After interest was established, study information and informed consent details were shared with participants electronically. Participants who consented to participate had a date and time arranged for their interview, which would last between 60-90 minutes. Data collection for the study took place from August to September 2022. The interviews were recorded and transcribed verbatim into Microsoft Word documents using Microsoft Teams for preparation for data analysis.

3.6 Ethical considerations

To ensure the ethical treatment of participants during the study, the researcher adhered to the ethical principles of informed consent, anonymity, confidentiality, no harm and respect, which are explained below. Additionally, prior permission was obtained from the Humanities & Social Sciences Research Ethics Committee at the University of KwaZulu-Natal to conduct the study (see Appendix 2). Participants were informed that that their participation was voluntary and they were free to withdraw from the study at any time (Saunders *et al*., 2019).

3.6.1 Informed consent

Before participating in the study, participants were thoroughly informed of the study details through electronic means (in soft-copy format). They were given a minimum of 24 hours to familiarise themselves with the contents of the study. After ensuring that the participants understood the information about their participation, such as the purpose of the study and what their participation would entail, they were then asked to provide their consent to participate in the study (see Appendix 3).

3.6.2 Anonymity

In research, anonymity is concerned with concealing the identity of research participants in all data related to the study (Saunders *et al.*, 2019). To maintain anonymity, the researcher assigned participants a unique code or pseudonym, instead of using their real names, to ensure that they were not at risk of being marginalised because of their identity being known by individuals outside of the study.

3.6.3 Confidentiality

Confidentiality refers to ensuring that information shared by participants is kept private and is not made available to everyone. Only individuals directly involved in the study were to have access to the data, and this was communicated to participants. It was further communicated that the study results may potentially be published, in which case, only partial confidentiality will be maintained. However, participants' anonymity will still be protected.

3.6.4 No harm

The researcher took steps to ensure that participants were not subjected to physical, psychological, social, legal or financial harm during the study. In other words, the researcher identified potential sources of harm and took steps to minimise them to protect participants.

3.6.5 Respect

Participants were treated with respect and dignity during and after their participation. The researcher also demonstrated sensitivity when communicating with participants.

3.7 Data analysis

The data were analysed using the qualitative data analysis method of thematic analysis. Thematic analysis in research helps to identify key themes from a dataset and draw conclusions leading to rich descriptions and explanations (Saunders *et al.*, 2019).

3.8 Summary of the research process

Figure 3.1 below is a flow chart of the research process, which the study followed and was explained in the sections above:

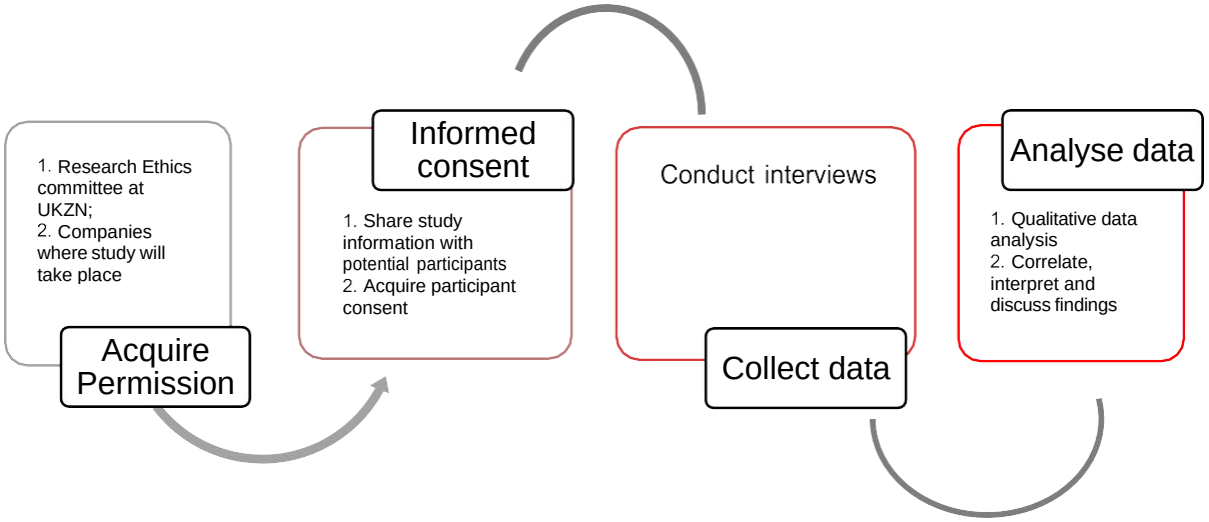

Figure 3.1: Research process

Source: Saunders et al. (2018:12)

3.9 Validity

Qualitative validity refers to the accuracy of the findings (Gibbs, 2007, cited in Creswell & Creswell, 2018). To ensure validity, the researcher employed the procedure of triangulating data sources through the use of different data sources and by examining evidence and using it to create themes. To further enhance validity, the researcher used rich, thick descriptions to convey the findings and provided a detailed description of the study setting to offer different perspectives on the themes. The researcher's experience with participants in the study setting because of being employed by the company where the study was conducted may also have contributed to the validity of the findings.

3.10 Reliability or trustworthiness

In qualitative research, reliability refers to the consistency of the research approach with that of other researchers and projects. In addition, the term “reliability” serves as a stand-in for trustworthiness or quality research, which indicates credibility, confirmability, dependability and transferability (Lincoln & Guba, 1985, cited in Hafeez-Baig, Abdul & Chakraborty, 2016).

3.10.1 Credibility

Credibility, in qualitative research, ensures that the researcher's representations of the participants' socially constructed realities accurately match what the participants intended (Saunders *et al.*, 2019). In the study, many participants used the interviews as a platform to voice their challenges with the leadership. This gave the researcher a chance to capture the participants’ perceptions through prolonged engagement, thereby enhancing the credibility of the study (Hadi & Closs, 2016).

3.10.2 Confirmability

Confirmability, in qualitative research, refers to the researcher’s provision of evidence that his/her interpretations of the data are rooted in the participants' constructions and that the findings, analysis of data, and conclusions can be verified as reflective of and grounded in the participants' perceptions (Schensul, 2008). In addition, the researcher ensured the confirmability of the data by recording the interviews, which enabled the researcher to check that his interpretations were evidenced by the participants’ words as transcribed in written form.

3.10.3 Dependability

Dependability, in qualitative research, refers to the trustworthiness of the data to answer the research questions and produce consistent findings through repeated analysis (Hafeez-Baig *et al.,* 2016).

3.10.4 Transferability

Transferability, in qualitative research, is demonstrated by providing a fully detailed narrative of the research context, design, questions, interpretations and findings to the reader (Saunders *et al.,* 2019). This information enables the reader to assess the potential for the research study to be applied to another similar setting.

3.11 Conclusion

This chapter explained the research methodology in detail including the paradigm and research methods used. In addition, the chapter explained what a paradigm is and compared different paradigms followed in business management research, although the current study was grounded in interpretivism as the paradigm, which indicates qualitative research methods, which were also explained in the chapter.

The sampling, collection of data and data analysis conducted in the study were covered in this chapter. In addition, the ethical considerations as well as the validity and reliability of the research were described and discussed.

The next chapter will present the findings of the analysis of the data gathered through interviews.

CHAPTER 4

FINDINGS

4.1 Introduction

The previous chapter looked at the research methodology followed to conduct the study. This chapter presents the findings of the analysis of the data gathered to answer the research questions and achieve the research aim and objectives. The explanation and interpretation of the findings are accompanied by tables and graphs, and to protect the participants' identity, pseudonyms are used. However, before, the presentation of the finding, the participant profiles are explained.

4.2 Participant profiles

The researcher recruited 20 participants, who were employees in the chemical manufacturing industry occupying either a leadership or subordinate position. However, only 12 participants participated in the study, indicating a 60% response rate. Of the 12, 3 were female and 9 were male, and the mean age of the participants was 40 years old. Of this cohort of participants, 4 occupied a leadership position in a company while 8 were subordinates. All the participants had been with their company for at least a year. The following figures and tables represent the demographic profiles of the participants.

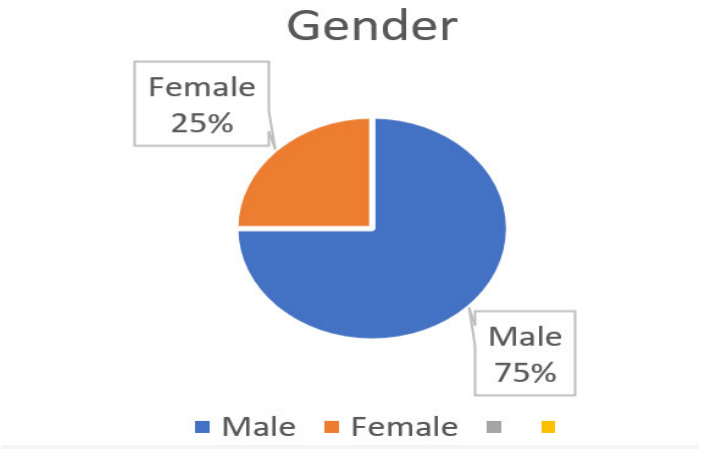

Figure 4.2a: Gender composition

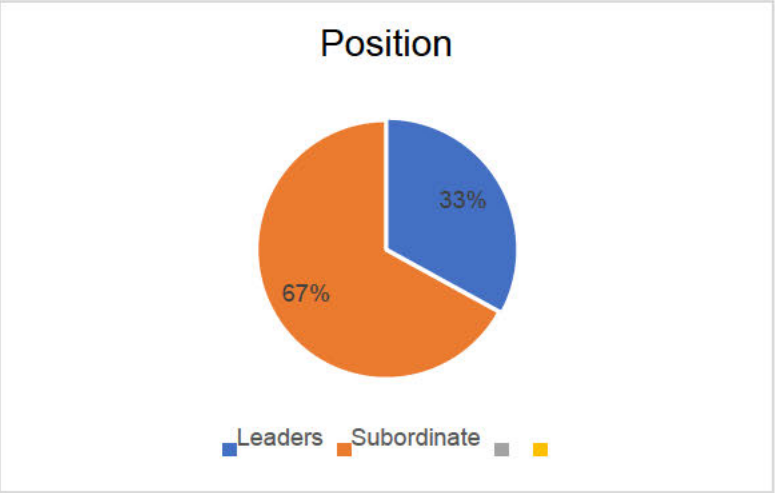

Figure 4.2b: Position

As indicated in the figures above, most of the participants were male and subordinates.

Table 4.1: Participant Profiles

Participants' pseudonyms	Position	Age (in years)	Years in current position
P1	Leadership	54	15
P2	Leadership	58	20
P3	Leadership	44	6
P4	Leadership	34	2
P5	Subordinate	36	12
P6	Subordinate	35	9
P7	Subordinate	36	4
P8	Subordinate	44	14
P9	Subordinate	33	3
P10	Subordinate	32	2
P11	Subordinate	45	15
P12	Subordinate	28	7
Average:		**40**	**9.1**

4.3 Findings

4.3.1 Perceptions of safety and safety culture

The study aimed to understand the current perceptions of safety and safety culture amongst both leaders and subordinates in the company under study. Thus, the participants were asked questions about their views on safety culture, safety practices, the importance of safety, enabling factors for safety and challenges related to safety in their workplace. To draw conclusions, the participants' responses were analysed using thematic analysis. The themes and sub-themes that emerged are presented in Tables 4.2a and 4.2b below.

Table.4.2a: Leaders' perceptions of safety and safety culture

Theme	Sub-theme(s)	Participant quotes
Safety	● Priority ● Prioritising the lives of employees	*"Uh, it's like it's our number one priority." P1* *"People matter most" P2*
Safety culture	● Mindset of ensuring safe working environment ● Good safety values and continuous improvement	*"Umm, we've got good values as well and we have a continuous approved." P4*
Practices	● Safety training ● Safety dialogues ● Peer observations ● Openness regarding safety ● Managerial support for safety programmes	*"It's all about training. Big thing for me is training." P1* *"We start with our meeting with the safety talk." P3* *"...having an open-door policy, having an open-door culture." P2*
Enabling factors	● Trusting employees to implement safety ● Responding to safety issues effectively ● Involving and implementing employee ideas about safety ● Continuous engagement and communication	*"I do trust that…that they will work safe" P3* *"Have the authority to make some make those decisions to improve safety and come up with ideas. You know it shouldn't be only coming from top management. We should actually be listening to the people on the ground as well." P2* *"Reiterating the fact that training and communication are most important" P2*
Challenges	● Poor communication and training ● Poor monitoring and evaluation practices	*"Again, it's lack of communication I think…and a lack of training and monitoring" P2*

Table 4.2b: Subordinates perceptions of safety and safety culture

Theme	Sub-theme(s)	Participant quotes
Safety	● Priority ● Prioritising lives of employees	*"Umm OK safety. In my company it's actually our number one priority." P9* *"People matter most." P11*
Safety culture	● Adherence to safety instructions ● Continuous encouragement on acting safely	*"Just answer to that question is to follow the company regulations in terms of safety." P12* *"it's a continuous improvement journey as well" P7*
Practices	● Safety awareness programmes ● Safety training ● Peer observations ● Subscription to safety international safety standards	*"So, it's all about making sure that you, you, you, you do what you're supposed to do basedon, on your procedures and all those things that that that have been put forward." P8* *"Uhm… just to ensure that I'm safe and also making sure that people around me are also safe. "P9* *"But basically, I follow my policies and procedures" P10*
Enabling factors	● Allocating sufficient time for safety ● Providing sufficient human and equipment resources ● Safety mindset ● Clear safety policies and procedures	*"Have that safety mindset" P10* *"It's the procedures and equipment that we are using" P5* *"It's a leadership who initiate safety culture" P12*

Tables 4.2a and 4.2b above show views held by both subordinates and their leaders that were both consistent and divergent. Both groups had a common understanding of the importance of safety and safety culture in the workplace. As most participants indicated, safety was a priority in their company owing to the hazardous nature of the work performed, which posed a risk to human life and the environment.

Both subordinates and leaders agreed on the safety practices in the company, such as training, peer observation and regular safety talks to raise awareness. While leaders included support as a way to practice safety, there was a clear consensus on how safety was being executed in the company.

Regarding factors that promote safety in the workplace, there was a discrepancy in the views of the participants. From a leader's perspective, the enabling factors appeared to focus on the emotional responses of the leaders, while from the perspective of subordinates, the enabling factors seemed more technical. For

instance, leaders frequently cited elements such as trust in employees, involvement, and engagement as enabling safety. Leaders believed that the emotional actions of leaders play a significant role in promoting safety in the workplace. This differed from the views of subordinates, who believed that technical support such as adequate time, human, and equipment resources, as well as clear policies and procedures, were the key factors in promoting safety in the workplace.

Greater disparities were also noted in terms of obstacles hindering a safe work culture. Managers frequently cited inadequate training and inadequate communication as a threat to safety, while employees indicated that the company's and management's actions posed a risk to safety in the workplace. These actions included overexertion of employees to meet customer demand for profit, which significantly impacted safety, and assigning employees tasks for which they were not trained due to time pressure and customer requirements.

4.3.2 Leaders' perceptions of leadership approaches to safety

Table 4.3 below presents the results of the thematic analysis of leaders' responses in terms of leadership approaches to safety.

Table.4.3: Leaders' perceptions of leadership approaches to safety

Theme	Sub-theme	Participant Quotes
Current leadership approaches to safety	• Transformational • Transactional	*"...having an open-door policy, having an open-door culture. Where people can approach leadership with ideas, people can approach leadership with stuff that is not going well. You know, if there's machinery that is showing signs of getting out of control" P2* *"Rather I need to understand that person's role and understand what the limitations are to that role and the challenges that person is facing …and also leading by example" P4* *"If something is not safe, it's not safe…we don't discuss the issue, we don't do it!"-P1*
Leaders' actions to inspire safety in employees	• Rewards and recognition • Encouragement • Empowerment • Shared understanding • Fostering good communication • Involvement	*"We've got this A and R awards, you know, like if someone has done exceptionally well, they can get an award…"-P1* *"Irrespective of how minor the thing is that the subordinate brings into the awareness of the leaders, they need to be applauded for raising those issues to the leaders so that if so and so have done something good, they need to be appreciated and it's going to encourage them with coming up with ideas to reduce or to stop any incident that is related to safety" P3* *"Also empowering the subordinates who…who are understanding safety ideas by means of like sending them to short courses around safety so that they too feel empowered" P4* *"Communicate with the rest of the subordinates…encourage the guys to talk to each other and to encourage each other to learn more about the organization, to learn more about the reason why we insist on safety." P2* *"We need to start involving them if we're not doing it. So, if we're not doing it enough, we need to start involving them." P4*
Techniques applied by leaders to influence safety	• Coach and disciplinary actions • Rewards • modelling	*"You first coach and punish them." P1* *"In doing that (rewards), you encourage everyone that…just to say if you're working safely, you're being noticed, you're being recognised and you're being rewarded…" P3*
Leaders' views of employees' adherence to safety	• Common understanding of consequences of unsafe practices	*"I do believe that even if I am not around, they will do the right thing" P3* *"And I've been there for the past many years. I haven't seen any major incidents. That tells me the guys are taking safety seriously"* *"...because I think each and every associate, whether it be a process technician and an inventory click, a person working in admin has a good foundation of safety. " P4*
Actions to prioritise safety over production/profits	• Demonstrate benefits of safety • Foster greater emphasis on safety • Empowerment of leaders	*"Everything that you do, safety must take precedence over any requirement that you are rushing to achieve" P3* *"And if you as a leader come into that situation and the guy has actually put a stop to an operation because he feels unsafe or he sees an unsafe situation, you shouldn't be punishing that guy" P2* • *So, it's also empowering leaders because not all the leaders have a safety background.' P4*

4.3.2.1 Current leadership approaches to safety

As shown in the table above, leaders in the study adopted two leadership styles: transformational and transactional. Leaders who subscribed to the transformational leadership style placed a strong emphasis on communicating the company's stance on safety to their subordinates and promoting the importance and benefits of safe practices in the workplace. They also set an example for safe behaviours, encouraged open communication about safety issues and made subordinates feel valued and appreciated.

For leaders who embraced the transactional leadership style, the main focus was on using rewards and punishments to motivate safety among subordinates. They established safety goals through manuals and standard operating procedures (SOPs) trained and coached subordinates on these procedures and enforced penalties for non-compliance.

4.3.2.2 Leaders' perceptions of actions to inspire safety

Although leaders embraced different leadership approaches when asked about the actions they believed to be most effective in promoting a safety culture in the workplace, there was a clear agreement that rewards and recognition, encouragement, empowerment, shared understanding, communication and involvement were crucial. Although not all of these actions may have been implemented, they were considered valuable for a safe work environment.

By acknowledging and rewarding employees who made an effort to contribute to safety, leaders believed this would motivate other employees to do the same. Furthermore, involving employees in safety-related decisions was seen as a way to encourage them to carry out these decisions as they had a stake in the decision-making process. Empowerment was a popular method amongst all leaders for promoting safety, which often took the form of safety training whereby employees could attend courses to remain aware of the importance of maintaining a safe work environment.

4.3.2.3 Perceptions of current techniques for inspiring safety

Leaders were asked about the techniques they currently applied to promote a culture of safety in their company. It was found that most leaders used three methods:

coaching/punishment; rewards; and modelling. In line with the transactional leadership approach, leaders who believe in coaching and punishment maintained that although safety was a high priority, employees had to be first trained in expected safety behaviours and given the chance to practice them. However, if there was non-compliance, then disciplinary action would be taken. These leaders believed, however, that discipline should not be the first response to non-compliance, and employees should have multiple chances to act safely before punishment was imposed. In addition to punishment for non-compliance.

Leaders also rewarded employees who consistently demonstrated a commitment to safety. In addition, leaders recognised that their own behaviour affected their subordinates, so they modelled safe behaviour to encourage their subordinates to do the same.

4.3.2.4 Leaders' views of employees' adherence to safety

After determining the actions and approaches used by leaders to promote a safety culture, the leaders were asked about the effectiveness of these methods. There was agreement amongst the leaders that all employees understood the importance of safety in their workplace owing to the hazardous chemicals they work with and thus they were able to work safely on their own without constant supervision from leaders. This was further evidence of the success of the leaders' methods as there had not been any major safety incidents in the company despite the many years of operation.

4.3.2.5 Perspectives on safety versus production and profits

The prioritisation of profits and customer needs over safety practices is a common issue, as mentioned in Chapter 2 of this dissertation. To understand the leaders' views on this matter, their opinions were gathered. All leaders agreed that safety is not sacrificed for production and profits and that safety is given precedence over these factors. They stated that subordinates had the authority to halt production if they believed it compromised safety, and they would not face disciplinary measures for doing so. The leaders emphasised that safety should never be compromised, even when there was pressure to meet customer demands. For example, P3, a leader, said, “Everything that you do, safety must take precedence over any requirement that you are rushing to achieve”. However, this view differed from that of subordinates, who

believed that at times, leaders asked them to prioritise customer needs over other aspects of safety during busy periods. For example, P7, a subordinate said, "*But sometimes there's other goals that the company wants to achieve, like yourselves are good, could be sales, it could be profits and things like that. I feel sometimes they prioritise that more".*

4.3.3 Subordinates' perceptions of leadership approaches to safety

Table 4.4 below indicates the subordinates' perceptions of leadership approaches to safety.

Table 4.4: Subordinates' perceptions of leadership approaches to safety

Theme	Sub-theme	Participant quotes
Current leadership approaches	• Transformational • Transactional	*"I think their approaches is OK, they are always motivating us to be safe every time before you do anything you have to know what you're doing." P9* *"It's transparent to everyone, everyone. Everyone has a have a voice when it comes to safety, you can write your opinion and they will go with it and change whatever, amend whatever you do" P5* *" I think it's a combination ff a sort of leadership style whereby you force people to do something and if they if they don't do that, then they can punish…And also there's also just a little bit of rewarding good, good, good safety practices and stuff. But I think there's more of you do this. If you don't do it, then you're going to get punished. Like for example, you're not going to get the bonus, you're not going to get this... And this and this and this. " P8*
Effect of current leadership approaches to safety	• Inspire commitment to safety • Inspire all round participation • Foster compliance • Foster accountability	*"We can always go for training to improve and understand better, improve ourselves and understand better. So yeah, that's how they commit" P7* *"It shows that they are promoting safety" P9* *they* *"they're making sure that everyone in this company participates in all the safety trainings" P11* *"*
Current actions of leaders to influence safety	• Training • Communication of procedures • Observations and monitoring • Timeous response • Clear policies, procedures and programs	*"The leadership also ensure that we have a much training, trainings, yearly trainings, computer-based trainings…" P11* *"They constantly, constantly communicate issues around safety " P11* *"And I've seen safety management walkabouts whereby they just walk around, and they look at safety issues around different departments" P8* *"They don't turn a blind eye…Whenever there's an issue as a safety issue. we address it!" P10*
Preferred leadership approaches	• Listener and team worker • Coach • Model • Empathetic • Visionary leader • Servant leader	*"So, I would love to have a leader that can listen to me and also take…Uh, whatever views that I have for health and safety views that I I'm putting on a table and to see those implemented." P7* *"I prefer a leader with the A coaching leadership styles" P11* *"Leaders who walk the talk." P12* *".So, I'll say a strong safety conscious leader with empathy will do so much good. " P8* *"The first one is vision leaders must have their ability to see what their safety excellence looks like and a capability to agree to articulate each through the throughout the organization. The second one is going to be a collaboration effectively does work well with employees, promote cooperation and collaboration, actively seek input from people " P12* *"A leader who's genuine generally cares about us and associates…who's passionate to serve" P10*
Effects of preferred leadership approaches to safety	• Inspire safety through motivation instead of punishment • Empowering • Inspire teamwork • Intrinsically inspire compliance • Promote innovation regarding to safety	*"I think he approachable shouldn't be about blaming you because if you feel blamed then at the end of the day you won't be able to report…solve the…the root cause of the problem instead of a going to the individual first." P9* *"it will help me as an individual to recognize my strengths and weaknesses and motivate me to improve in terms of safety practice." P7* *"a leader will actually work with the employee throughout the whole process " P8* *"because as you as associate will be motivated to do their work in the safety manner, which means no injuries on duty and compound will be saving money and time." P12* *"We need to transform, sometimes the leadership may come with inventions but at the floor, we tend to use old methods. because we normally say these things don't work" P6*
Preferred actions of leaders for influencing safety	• Openness and freedom in job execution • Empathy • Continuous training • Effective communication • Training • Rewards • Empowerment	*"…because it's going to allow me to work freely. So, if I work freely, not stressed, that means because I'm going to be able to do my job well and safe." P9* *"They should be effectively communicating with us…they should be involved too" P7* *"I think the company needs to give a reward to the people that are working on the floor." P5* *"So, basically people employee should be empowered during the whole process." P8*

4.3.3.1 Current leadership approaches to safety

Table 4.4 above demonstrates the alignment between leaders' reported leadership styles and how their subordinates perceived their leadership. The leaders in the study were found to exhibit both transactional and transformational leadership styles. Moreover, the subordinates perceived their leaders as shifting between the two styles.

The leaders were perceived as supportive, involving their subordinates in decision-making, and receptive to their ideas, which aligned with the characteristics of transformational leadership. This style of leadership involves good communication and a focus on guiding subordinates towards meeting safety goals within the company.

Additionally, elements of transactional leadership were observed by the subordinates, as some leaders would clearly outline safety objectives and expect their subordinates to meet them with the promise of rewards. However, if performance was below expectations, punishment would be applied. Despite this, most subordinates felt that their leaders leaned more towards the transformational leadership style rather than the transactional style. It was also noted that leaders did not consistently adhere to one style, but rather shifted between the two depending on the seriousness of the safety issues at hand.

4.3.3.2 Effects of current leadership approaches to safety.

Upon establishing the approaches leaders were perceived to be using, subordinates were asked to indicate how these approaches (transformational and transactional) influenced their behaviour. Four sub-themes emerged from the analysis:

- *Inspire commitment to safety*

Subordinates felt that when leaders inspired them to work towards a safety objective through participation, involvement and sharing of ideas, they were inspired to be more committed to safety. In addition, the commitment became intrinsic, and they worked safely, even when they were not being watched or observed. This was because their leaders make it clear why employees needed to commit to safety practices, which meant that understood that they would return to their families safely. After all, the goal and vision for safety had been well-established and articulated. P7 articulated this as follows:

The activities that we have employed for, and we go home the same way. We're not injured, we're not hurt. So, it's important to practice safety and make sure that people are safe and also as a marketing tool for a company. So, the company that doesn't have a lot of incidents and things like that it's easy to get business and other companies want to associate with that company. (P7)

- *Inspire all-round participation*

The perception that the leadership approaches inspired all-around participation aligned with the transformational approach. Subordinates believed that the training that their leaders encouraged them to attend as a team not only inspired all-round participation in the courses but also made them believe that their opinions were valued. The safety discussions which were held with their leaders regularly allowed them to share their views and helped them to feel valued as employees in the company.

In turn, they felt that any safety issue and ideas they had to share with their leaders would be well received and their recommendations might even be implemented as part of the company's safety practices. This was consistent with what the leaders perceived to be an effect of their practice whereby an open door policy created a spacefor their subordinates to express themselves freely.

- *Foster compliance*

Although not generally favoured, there was consensus that the transactional approach led to compliance. This was because subordinates would lose privileges if found to be non-compliant. For example, they might have lost their bonus, which was effective because employees value their privileges., However, this approach was also seen as ineffective in instilling good values for safety because the emphasis was not placed on ensuring that subordinates understood the importance of safety. Instead, they complied only because they feared losing privileges. This perception was summed up by P8:

...like for example, you're not going to get the bonus, you're not going to get this… and this and this and this. Obviously, that means people you are forcing people to do it whether they like it, or they don't. (P8)

- *Foster accountability*

Accountability was recognised as an effect associated with the transactional leadership approach sometimes employed by leaders. Subordinates believed that when objectives are met, employees were rewarded. However, when there were deviations in meeting objectives, disciplinary actions were taken. This then made subordinates more accountable for their actions and inspired them to watch out for their colleagues, as most of their work involved a team effort, and rewards were often awarded to teams performing their work safely. Thus, to ensure that rewards were earned, each team member kept everyone in check, thereby fostering accountability within the team. P10 expressed this perception as follows:

> *And I'm also my brother's keeper, so whenever I see I can also see it working as unsafe. Always ensure that I speak to the associates and help them do everything accordingly*. (P10)

4.3.3.3 Current actions by leaders to promote safety

Subordinates were asked to describe some practices and techniques their current leaders used to promote safety in their company. Regular training, communication, policies, procedures and programmes and a timeous response to safety issues were listed by subordinates. Although this was inconsistent with what leaders had previously mentioned as their actions to promote a safety culture (rewards and recognition, shared understanding, encouragement, good communication and involvement), it was evident that subordinates primarily noticed those actions and techniques, which were technical, as opposed to leaders who recognised affective actions as being needed for the promotion of a culture of safety in the workplace.

In addition to the techniques described by subordinates, monitoring in the form of observation whereby leaders would perform walkabouts to watch their subordinates execute their tasks was also mentioned by subordinates. Leaders had not mentioned this.

4.3.3.4 Subordinates' preferred leadership approaches to safety

Although most subordinates expressed being satisfied with their leaders' approaches, when asked to respond to the type of leadership they would prefer to instil a culture of

safety in their company, many described a leader who would meet the following characteristics:

- *A listener and team worker*

According to the subordinates, a leader who is a listener and teamer would be willing to hear and understand the concerns of his/her subordinates. Often, managers, as leaders are detached from the daily tasks subordinates have to execute and the challenges they may come across and thus they may not always be aware of the conditions under which they work.

Given that subordinates feel that the term "safety" is being overused within the company, leaders must listen to their concerns and issues. This is particularly relevant when new tools and equipment are introduced, as they may not perform as anticipated. In such cases, leaders must be able to listen and comprehend these difficulties so they can work with their subordinates to address them effectively.

- *Coach*

A leader who gives subordinates ample time to learn and adapt to the work environment and provides them with necessary support is seen as effective. However, subordinates also report a tendency to immediately place blame on individuals in the event of an incident, without attempting to understand the underlying cause. As leaders, it is important to support individuals rather than immediately applying blame or disciplinary measures, as incidents may sometimes be the result of equipment failures. When subordinates feel supported, they are more likely to report incidents. Conversely, a lack of support can foster an environment where subordinates hide incidents to avoid being blamed.

- *Leader as model*

A leader who walks the talk sets an example for their subordinates to follow. As such, leaders should emulate the behaviours they expect from their subordinates, which shows their dedication to safety and reduces the perception of double standards. Some subordinates may feel that leaders prioritise meeting deadlines and customer demands over safety, despite emphasizing the importance of safety.

- *Leader as an empath*

A leader who is empathetic exercises patience with their subordinates and gives them sufficient time to learn, recognising that mistakes are a natural part of the learning process. This can help leaders earn the trust of their subordinates, as it shows that they care for them.

- *Leader as a visionary*

A visionary leader can successfully communicate his/her vision for safety, engaging subordinates and inspiring them to share this vision. With a clear and shared understanding of the goal, subordinates are energised, and their focus is directed towards achieving excellence in safety.

- *Leader as servant*

According to subordinates, a servant leader has genuine care for people and wants to see them thrive in their environments. This leader would put the needs of people first and instead of using his/her position to control and limit what people can or cannot do, goes to extreme lengths to foster growth and development in subordinates.

4.3.3.5 Effects of preferred leadership approaches to safety

Upon expressing the types of leadership approaches they would prefer, subordinates were asked to comment on how their preferred leadership approaches would influence their safety. The responses indicated that preferred leadership approaches would do as follows:

- Inspire safety through motivation instead of punishment to ensure safe practices are upheld even without leadership presence.
- Empower employees to act with safety in mind.
- Encourage teamwork among leaders and employees in addressing safety concerns.
- Drive compliance through the clear benefits of following safety procedures.
- Foster innovation in safety by giving employees the autonomy to experiment and implement their ideas

4.3.3.6 Preferred actions by leaders to promote safety

Given that both leaders and subordinates reported that steps were being taken to foster a culture of safety, it was deemed important to assess the effectiveness of these efforts by seeking feedback from subordinates on which actions would have the greatest impact. Subordinates consistently cited aspects such as openness, empathy, ongoing training, effective communication, incentives and empowerment as preferred methods. Many of these aligned with actions that leaders were already implementing, such as incentives, communication, training and empowerment opportunities, thereby indicating a good alignment between current efforts and what subordinates prefer.

4.4 Conclusion

In this chapter, the researcher presented and interpreted the findings from the thematic analysis of the data that was collected from the participants. The objective of the analysis was to determine and assess leadership approaches for promoting a safety culture in a chemical manufacturing company located in the KwaZulu-Natal region. The chapter profiled the study participants, including their demographic information such as age, gender, current position (as either a leader or a subordinate) and years of service. The findings of the data analysis were explained and illustrated through a combination of text, graphs and tables. The next chapter will discuss the findings in greater depth and connect them to the findings from the literature review.

CHAPTER 5

DISCUSSION OF FINDINGS

5.1 Introduction

The previous chapter presented and interpreted the findings of a thematic analysis of the data that was collected using interviews with leaders and subordinates in a chemical manufacturing company in KwaZulu-Natal, South Africa. This chapter will discuss the findings and compare them with the findings of the literature review.

5.2 Addressing the research objectives

In this section, the themes that emerged from the data analysis will be discussed in terms of the research objectives, which as stated in Chapter 1 were to do as follows:

- Determine the challenges that leadership experiences in ensuring a safety culture in a chemical manufacturing company in KwaZulu-Natal
- Identify factors enabling a safety culture
- Identify the leadership approaches employed to ensure a safety culture in a chemical manufacturing company in KwaZulu-Natal
- Determine the leadership approaches deemed effective in achieving a safety culture in a chemical manufacturing company in KwaZulu-Natal.
- Determine how to promote and support a safety culture in a chemical manufacturing company in KwaZulu-Natal.

5.2.1 Challenges to leadership in ensuring a safety culture

The challenges identified from the data analysis differed in what leaders and subordinates reported. The majority of subordinates cited increased workloads to meet customer demands for profit as a major challenge that compromises safety. This challenge is also noted in studies of manufacturing and heavy industries in other countries, as highlighted by Wong *et al.* (2016), who emphasise that safety should be prioritised over production and overloading workers should be avoided, even if profits are at risk. Xue *et al.* (2020) similarly suggest that senior managers failing to consider the available manpower when making work arrangements can lead to overworking employees and a higher risk of injury (as noted by Barling *et al.,* 2002).

In the current study, leaders frequently reported communication as a hindrance to safety. Conversely, subordinates reported feeling demotivated to report safety issues because they felt that their concerns were not being addressed even after they communicated them to their leaders.

This challenge aligns with the findings of Xue *et al.* (2020), who stress the importance of senior managers displaying a strong commitment to safety by regularly communicating with employees, allocating appropriate safety resources and being knowledgeable about the company's current safety status. To promote a safety culture, senior managers should keep employees informed about the company's future safety objectives and emphasise the significance of safety in the workplace (Xue *et al.,* 2020).

5.2.2. Factors enabling a safety culture

In the current study, there was a discrepancy between the perceptions of leaders and subordinates on what would enable safety. Subordinates felt that having access to technical support, such as adequate time, human and equipment resources, as well as clear policies and procedures, would promote safety in the workplace. They also believed that their leaders may at times prioritise meeting customer demands over ensuring safety, which could result in shortcuts being taken.

This finding aligns with the research by Lee *et al.* (2022), who argue that an ideal safety culture, which prioritises strictly following procedures even if it takes longer and costs more, is not always favoured in organisational culture. According to Zwetsloot *et al*. (2020), organisations prioritize process safety culture because it is essential for the growth, reputation and sustainability of process-related industries and society's trust in the organisation. However, ideal safety culture is not naturally prioritised and does not become part of the organisational culture (Lee *et al*., 2022).

Leaders regarded the following as factors enabling a safety culture:

- Trusting employees to implement safety
- Responding to safety issues effectively
- Involving and implementing employee ideas about safety
- Continuous engagement and communication

5.2.3 Current leadership approaches

In the current study, it was found that leaders adopt both transformational and transactional leadership approaches in implementing a safety culture. This is supported by previous research, which has shown that both approaches have been seen as effective in managing safety in organisations (Skeepers & Mbohwa, 2015). In addition, the literature suggests that there are three main leadership styles for SL, as proposed by Bass (1985), namely transformational, transactional and passive (laissez-faire) leadership (Çalış & Büyükakıncı, 2019; Zhao *et al*., 2022). However, the two most widely used leadership styles are transformational and transactional (Xue *etal.,* 2020).

In the study, it was noted that leaders who subscribe to the transactional leadership approaches primarily rely on rewards and punishments to inspire safety in subordinates. This approach involves setting goals for safety through manuals and procedures, training/coaching subordinates and punishing non-compliance. This aligns with the concept of safety transactional leadership, which involves monitoring the safety behaviour of employees, showing individual care, discussing safety matters, and proactively managing safety issues (Zhao *et al.,* 2022).

Clarke (2013) finds that active management-by-exception, also known as active, corrective leadership, can be valuable in promoting safety compliance amongst employees. This approach involves clarifying rules to prevent safety incidents and then allowing employees to work independently (Wong *et al.,* 2016). However, Kim and Gausdal (2020) argue that safety in operations cannot be solely achieved through the control and constraint of people to comply with regulations. They emphasise that leadership should involve illustration, knowledge and inner power, and be carried out through soft and rational tactics, rather than coercion and rewards (Kim & Gausdal, 2020). In addition, the literature suggests that transformational leadership is more effective in promoting SL than transactional leadership (Rahlin *et al.,* 2022).

5.2.4 Leadership approaches deemed effective in achieving a safety culture

Leaders in the study agreed on key approaches, which would be effective in achieving a culture of safety in the workplace, including rewards and recognition, encouragement, empowerment, shared understanding, communication, and involvement. These actions aligned with the characteristics of the SAFER model,

which encompasses behaviours such as emphasising safety, maintaining safety standards, encouraging others to prioritise safety, recognising safe behaviour and leading by example (Wong, *et al.*, 2016). The SAFER model is yet to be validated through empirical research, but it provides a foundation for further exploration and can be applied in the workplace to improve safety (Wong, *et al*., 2016).

5.2.5 Promoting and supporting a safety culture

The findings of the study showed that subordinates had different preferred leadership styles when it came to promoting a culture of safety in the workplace. The most preferred leadership style was transformational, characterised by empathy, listening, teamwork, coaching and visionary leadership. According to the literature, this style is preferred because transformational leaders serve as role models, engage in problem-solving, show empathy and inspire commitment to organisational goals (Shen *et al.,* 2017). This approach is consistent with Labrague and Obeidat (2022), who find that workers in the healthcare sector prefer transformational leadership for safety objectives.

Transformational leadership, as reported by Umer and Maha (2020), encourages innovative behaviour and learning, leads to higher job engagement, fewer incidents of adverse events and improved quality of service (Labrague & Obeidat, 2022). To promote safety in the workplace, leaders should focus on teamwork and motivation, rather than non-compliance (Skeepers & Mbohwa, 2015).

Actions and techniques that are commonly mentioned in the literature to promote a safety culture in the workplace include job execution freedom, empathy, continuous training, effective communication, rewards and empowerment (Guiteress, Santos, Peiter, Menegon, Sebold & Erdmann, 2018). Wong *et al*. (2016) also recognise awarding employees for compliance with safety standards as a strategy for promoting safety. These literature findings are consistent with the results of the study.

5.3 Conclusion

The findings showed similarities with the existing literature in terms of the approaches that leaders should use to promote safety in the workplace. The responses from subordinates were largely consistent with the preferred SL approach described in the literature, which was the transformational style. Some leaders in the study displayed characteristics of a transformational leadership style, while others exhibited traits of a transactional leadership style. This also aligned with the literature, which finds both leadership styles to be associated with promoting safety in the workplace.

The conclusion and recommendations will be presented in the next chapter.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter, which concludes the dissertation, presents a summary of the findings in light of the research objectives and based on the findings makes recommendations for SL practice and future studies.

6.2 Summary of the findings

The findings revealed that leaders and their subordinates who were interviewed gave both similar and different responses. Some leaders used a transactional leadership approach and some used a transformational leadership approach. Moreover, subordinates agreed that they do apply transformational leadership however, the transactional leadership approach was the approach that was mostly applied.

6.2.1 Challenges to leadership

As mentioned in Chapters 1 and 5, the first research objective was to determine the challenges that leadership experiences in ensuring a safety culture in a chemical manufacturing company in KwaZulu-Natal. This objective was achieved because leaders commonly reported communication as a threat to safety. However, ironically, subordinates reported that although they did communicate their safety concerns, management did not address them, which led to the subordinates feeling demotivated to report issues in the future. This suggests that leaders must show concern for safety issues by communicating regularly, allocating appropriate safety-related resources and they should have up to date knowledge of the company's safety status.

Subordinates mentioned increased workloads to meet customer demands and profit gains as a challenge, which compromised safety. As indicated in the literature, leadership needs to increase manpower instead of workload to ensure safety and not prioritise production and profits (Wong, *et al.*, 2016).

6.2.2. Factors promoting a safety culture

The second research objective was to identify the factors enabling a safety culture in a chemical manufacturing company in KwaZulu-Natal. This was achieved, but the perceptions of leaders and subordinates differed on what would enable safety. Subordinates felt that having access to technical support, such as adequate time, human and equipment resources, as well as clear policies and procedures, would promote safety in the workplace.

Leaders regarded trusting their employees to implement safety, responding effectively to safety issues, involving and implementing employee ideas about safety and maintaining continuous engagement and communication as key factors in enabling a positive safety culture.

These are organisational and cultural factors that contribute to a positive safety culture. Moreover, these factors can have an emotional impact on employees and contribute to a sense of shared responsibility for safety in the workplace.

6.2.3 Leadership approaches

The third research objective was to determine the leadership approaches used to establish a safety culture in a chemical manufacturing company located in KwaZulu-Natal. This objective was met through data analysis, which showed that the leaders in the study utilised both transformational and transactional leadership approaches to create a safety culture. Literature supports the use of both transformational and transactional leadership approaches for effectively managing safety in an organization (Skeepers & Mbohwa, 2015; Xue *et al*., 2020).

Leaders in the study who subscribed to the transactional leadership approach utilised rewards and punishments to motivate their subordinates to prioritise safety. They set safety goals through manuals and SOPs, monitored adherence to policies and procedures, trained and coached their subordinates and punished those who did not comply.

Leaders who subscribed to the transformational leadership approach communicated the company's stance on safety to their subordinates, emphasising the importance and benefits of safety practices in the workplace. They encouraged employees to prioritise safety without coercion and created an environment that fostered open

communication about safety issues. The leaders also emphasised the role of each individual in promoting safety and ensured that their subordinates felt valued and appreciated.

6.2.4 Effective leadership approaches

The fourth research objective was to identify the leadership approaches deemed effective in promoting a safety culture in a chemical manufacturing company located in KwaZulu-Natal. This objective was accomplished through feedback from subordinates, who stated that they preferred compassionate leaders, good listeners, team players, coaches, role models and visionaries. These characteristics are largely associated with a transformational leadership approach.

Leaders utilising this approach employ tactics, such as serving as a role model for desired behaviours, collaborating with subordinates on problem-solving, demonstrating empathy towards their subordinates and developing their subordinates' commitment to goals. These tactics aim to inspire subordinates and transcend their interests (Shen *et al.,* 2017).

6.2.5 Promotion and support of a safety culture

The fifth research objective was to determine how to promote and support a safety culture in a chemical manufacturing company in KwaZulu-Natal. This objective was achieved by finding that leaders and their subordinates aligned with the characteristics of the SAFER and empowering leadership models.

The SAFER model, which stands for the safety assessment for explosives risk model, encompasses five behavio***u***rs: emphasi***s***ing safety-related matters, maintaining safety standards, encouraging others to take safety initiatives, recogni***s***ing and rewarding workers who follow safety protocols and leading by example (Wong *et al*., 2016).

The empowering leadership model is characterised by five behaviours: coaching, sharing information, leading by example, demonstrating empathy and involving subordinates in decision-making (Wong *et al.,* 2016). Unlike the transformational leadership model, which views leadership as a personality trait, the empowering leadership model involves the adoption of specific behaviours (Martínez-Córcoles *et al.,* 2011).

6.3 Recommendations

6.3.1 Safety leadership practice

For leaders to improve safety culture it is recommended that they should do the following:

- Empower themselves by attending safety courses
- Adopt the SAFER model, which has the characteristics of both transactional and transformational leadership models and was recommended by subordinates in the study — although SL requires the use of transformational leadership, which emphasises awards and recognition, more than transactional leadership, transactional leadership is an active management-by-exception approach, which can enforce adherence to rules and prevent errors before they occur.
- Adopt the empowering leadership model to improve the notable inadequacies of a leader

6.4 Recommendations for future research

Future studies on safety culture and SL should explore the benefits of adopting the empowering leadership and SAFER models in promoting and improving safety in the workplace, particularly in MHIs.

6.5 Conclusion

The study aimed to evaluate the effectiveness of different leadership approaches in promoting a safety culture in chemical processing organisations. The data collected from interviews with managers and subordinates indicated a preference for transformational leadership amongst subordinates and a mix of transactional and transformational leadership amongst leaders. The findings of the literature review supported the idea that transformational leadership approach is more effective in promoting a safety culture than transactional leadership.

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APPENDICES

Appendix 1: Permission from gatekeeper to conduct the study

Prof Cecile Gerwel Proches
Graduate School of Business and Leadership
University Of KwaZulu-Natal
Westville Campus
Durban
3630

14 February 2022

Dear Prof Cecile Gerwel Proches

RE: PERMISSION TO CONDUCT RESEARCH

This letter serves to confirm that I, Rolf Breidenbach, General Manager of Buckman Laboratories (Pty) Ltd hereby acknowledge and approve the research of Motheiwane Emmanuel Mphafudi within Buckman for the completion of his MBA degree.
Sincerely,

Rolf Breidenbach
General Manager

Appendix 2: Ethical approval to conduct the study

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

03 June 2022

Motheiwane Emmanuel Mphafudi (221010188)
Grad School Of Bus & Leadership
Westville Campus

Dear ME Mphafudi,

Protocol reference number: HSSREC/00004136/2022
Project title: The role of leadership in implementing a safety culture in a chemical manufacturing company, KwaZulu-Natal
Degree: Masters

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 27 May 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted FULL APPROVAL.

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

This approval is valid until 03 June 2023.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

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

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

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)

/dd

Humanities and Social Sciences Research Ethics Committee
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 8350/4557/3587 **Email:** hssrec@ukzn.ac.za **Website:** http://research.ukzn.ac.za/Research-Ethics
Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix 3: Informed consent form

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL
For research with human participants

INFORMED CONSENT RESOURCE TEMPLATE

Note to researchers: Notwithstanding the need for scientific and legal accuracy, every effort should be made to produce a consent document that is as linguistically clear and simple as possible, without omitting important details as outlined below. Certified translated versions will be required once the original version is approved.

There are specific circumstances where witnessed verbal consent might be acceptable, and circumstances where individual informed consent may be waived by HSSREC.

Information Sheet and Consent to Participate in Research

Date: May 2022

Dear colleagues

My name is Emmanuel Mphafudi from the Graduate School of Business and Leadership, at the University of KwaZulu-Natal. My contact numbers are [redacted] and my email address is 221010188@stu.ukzn.ac.za

You are being invited to consider participating in a study that explores the role of leadership in implementing a safety culture in a chemical manufacturing company in KwaZulu-Natal, South Africa. The aim and purpose of this research are to assess different leadership approaches on their effectiveness to promote a safety culture in a chemical processing company. The study is expected to enroll 20 participants, 15 technicians and 5 managers working at Buckman Laboratories at Hammarsdale, KwaZulu-Natal province in South Africa. A qualitative research method will be used, and a purposive sampling method will be used to recruit participants to take part in the study. The interview will be done face-to-face. The duration of your participation, if you choose to enroll and remain in the study, is expected to be 45-60min.

We hope that the study will create the following benefits: The study will therefore compare the different leadership approaches from the perspective of both managers and technicians to ascertain their effectiveness within the chemical manufacturing industry in South Africa to add to the body of knowledge and fill the existing research gap. The study will provide no direct benefits to participants.

The study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number: HSSREC/00004136/2022).

In the event of any problems or concerns/questions you may contact the researcher on this number: [redacted] or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details are as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Prior, to participating in the study, participants will have the study details and information thoroughly explained to them by electronic means (video, voice note, soft-copy format) or physical means (printout of study details). They will be given a minimum of 24 hours to familiarise themselves with the contents of the study should they present any questions, these would be answered. After ascertaining that participants understand information regarding their participation, such as why the study is being conducted and what their participation entails, they will then be asked to consent to participate in the study. If they decide to withdraw their participation, they will not be disadvantaged in any way.

Confidentiality speaks to ensuring that information shared by participants is not made available to everyone. Only those directly involved in the study will be able to access data and this will also be communicated to participants. It will be further communicated that there is potential for the study results to be published and in such a case, only partial confidentiality will be guaranteed. However, their anonymity will still be protected.

All the data from the interview will be recorded on a tape recorder and it will be transcribed into a Microsoft Word document. The document will be password protected and it will be shared with the supervisor. Before the data is shared there will be a log to keep a record of all the events of data sharing. After five years following the study, all electronic data will be permanently deleted from all the devices and hard copy data will be shredded.

CONSENT (Edit as required)

I (Name) have been informed about the study entitled (provide details) by Emmanuel Mphafudi.

I understand the purpose and procedures of the study (add these again if appropriate).

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in the study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits to that I usually am entitled.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at ([redacted], 221010188@stu.ukzn.ac.za).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact Emmanuel Mphafudi ([redacted], 221010188@stu.ukzn.ac.za)

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
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4000
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Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview YES / NO

_____ _____
Signature of Participant **Date**

_____ _____
Signature of Witness (Where applicable) **Date**

_____ _____
Signature of Translator (Where applicable) **Date**

Appendix 4 : Leaders' interview questions

Leaders' interview questions

- How would you describe the safety culture in your company?
- Do you trust technicians to work safely even if they are not monitored? Please elaborate.
- What do you do to ensure a safety culture in your company?
- What challenges are being experienced in terms of ensuring a safety culture?
- Which factors can enable a safety culture?
- How would you describe your leadership approach when it comes to promoting a culture of safety in your company?
- What do you think should be done for a technician to respond more positively towards safety in the company?
- How would you encourage technicians who understand your ideas of a safety culture to influence other technicians to buy into those ideas?
- Given the statement: Safety will take precedence over production. Which are some of the methods that should be used by the management to ensure that safety is prioritised over production?
- Given the fact that you are working in a highly hazardous work environment, how would you describe the technicians' approach to safety in everything they do?
- What do you think should be done to ensure that technicians follow safety procedures?
- Is there anything else that you would like to add?

Appendix 5: Subordinates' interview questions

Subordinates' interview questions

- What do you think about safety in your current company?
- What do you do to ensure safety in your company?
- Do you have a culture of safety in your company? Please elaborate.
- Why is it important to practice safety in your company?
- What challenges are being experienced in terms of ensuring a safety culture?
- How would you describe the leadership in your company?
- How do you think the current leadership at your company influences a culture of safety?
- What do your current leaders do to promote a culture of safety?
- Can you describe the kind of leader you would prefer in your work environment?
- How would your preferred leader affect your practices of safety?
- What do you think leaders should be doing to promote a culture of safety in your company?
- Which factors can enable a safety culture?
- Why is it necessary for leaders to inspire technicians to work safely by sharing their vision, values and ideas to promote a safety culture?
- Is there anything else that you would like to add?

DR MAUREEN LILIAN KLOS
PROFESSIONAL EDITOR
BA; STD; BEd (*cum laude*); MEd (*cum laude*); DEd
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EDITOR'S DECLARATION

I,

DR MAUREEN LILIAN KLOS,

Being the holder of the following qualifications:

BA; STD; BEd (*cum laude*); MEd *(cum laude)*; DEd

Hereby certify that I am the English language editor of the following document:

THE ROLE OF LEADERSHIP IN IMPLEMENTING A SAFETY CULTURE IN A CHEMICAL MANUFACTURING COMPANY, KWAZULU-NATAL

by

Motheiwane Emmanuel Mphafudi

221010188

I hereby certify that I have edited the language, formatting and referencing in the above-mentioned document in their entirety. However, I assume no responsibility or liability for any post-editing changes, errors or omissions.

[redacted]

6 February 2023

Appendix 6: Editor's cert