

**DEVELOPING AND EVALUATING A COACHING PROGRAM TO IMPROVE
SAFETY LEADERSHIP**

by

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DECLARATION

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I declare that “**DEVELOPING AND EVALUATING A COACHING PROGRAM TO IMPROVE SAFETY LEADERSHIP**” is my own work and that all the sources I have consulted or quoted have been indicated and acknowledged by means of full references.

Signature

Wika Esterhuizen

Date

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DEVELOPING AND EVALUATING A COACHING PROGRAM TO IMPROVE SAFETY LEADERSHIP

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SUMMARY

Legislators are placing increased pressure on mining companies to improve their safety performance. The importance of safety leadership is highlighted by its role in safety culture and improving safety performance. The aim of this study was to develop and evaluate the impact of a coaching program on safety leadership.

The main constructs namely safety culture, safety leadership and coaching was conceptualised along the humanistic paradigm, with theoretical definitions and models. In this study, safety culture is employees' *shared* attitudes, beliefs, perceptions and values about safety that affect their behaviour in the workplace. Safety leadership is the interpersonal influence that a leader exercises to achieve the organisation's safety performance goals. Coaching is an interpersonal interaction that aims to improve individual performance through increased self-awareness and action plans. A theoretical model was developed to explain the elements that constitute effective safety leadership. A coaching program was developed based on executive coaching and leadership development principles.

The empirical investigation was conducted in an organisation in the South African mining industry. A nested mixed methods design was followed. In the quantitative

study, a 360 degree survey was employed to assess the ratings of a purposive sample (n=54) along eight dimensions before and after the coaching. Data was analysed with descriptive and inferential analysis. Results showed statistically significant improvements on accountability, collaboration, and feedback and recognition after the coaching. The results reflected differences in 360 degree ratings according to gender, race, job level, age and geographical location. The most significant improvements were for females, Africans, management, age 51-60 years, and site 2.

In the qualitative study, a semi-structured interview was employed to study four cases to investigate managers' personal experiences and changes in attitude toward safety. Data was analysed utilising thematic analysis. The findings revealed that coaching was a positive experience and contributed to changing managers' attitudes toward safety.

The research added to the field of organisational behaviour by presenting a theoretical model that enhances the understanding of safety leadership, the development of a coaching program and providing empirical evidence that the principles of coaching and leadership development can be applied to improve safety leadership.

KEYWORDS

Occupational health and safety, South African mining industry, safety culture, safety leadership, leadership development, executive coaching, mixed methods research, 360 degree assessment, thematic analysis

CHAPTER 1

SCIENTIFIC OVERVIEW OF THE RESEARCH

The focus of this research is on the development and evaluation of an executive coaching program as a tool to improve safety leadership. In this chapter the scientific overview including the background to and motivation for the research that underwrites the problem statement, research questions and aims are presented.

1.1. BACKGROUND TO AND MOTIVATION FOR THE RESEARCH

The right to life is a fundamental human right (SA Constitution, 1994). It is a right that must also be protected in the working environment (Alli, 2001; ILO, 2011). Employers have a moral and in many countries, including South Africa, a legal obligation to provide a healthy and safe working environment for all employees (Alli, 2001). Thus, concerns about occupational health and safety are omnipresent in organisations (Hudson, 1999).

In the last few decades significant progress in occupational health and safety (OHS) has been made and many governments, employers and employees have begun to acknowledge the importance of preventing occupational injuries and illness (ILO, 2011). This is mainly because of people's increased expectations for decent working conditions as well as the growing recognition of the dire consequences that unsafe and unhealthy working environments can have on humans, productivity, employment and the economy in general (ILO, 2011). There is an increasing acceptance that OHS should not be viewed as a burden on the business or production but that all stakeholders must commit to and invest in OHS as a key management and performance indicator (Alli, 2001). Many organisations have implemented Safety Management Systems (SMS's) as an effective way of

ensuring compliance with technical, organisational and legal safety aspects (Hudson, 1999).

Many governments are also starting to place a higher priority on the prevention of occupational injury and disease and have adapted their health and safety policies and brought national legislation in line with international standards (ILO, 2011). South Africa has followed suit with the promulgation of the Occupational Health and Safety Act (OHSA) 85 of 1993 and the Compensation for Occupational Injuries and Diseases Act (COIDA) for general industry and the Compensation for Occupational Injuries and Diseases in Mines and Works Act (COIDMWA) and the Mine Health and safety Act 29 of 1996 specifically for the mining industry.

In spite of these advances in occupational health and safety awareness and legislation, many workers still face unsafe or unhealthy conditions in the workplace today (ILO, 2011). Worldwide, millions of workers still die every year from occupational injuries and diseases (Alli, 2001; ILO, 2011). The situation in the South African mining industry is no different and despite a decrease in the number of mine fatalities and injuries since 1999, the mining industry continues to have unacceptably high fatalities (Jansen & Brent, 2005; Pyoos, 2008; Shabangu, 2012). This state of affairs has led to a growing recognition that depending on SMS's alone is not enough to ensure that organizations achieve their occupational health and safety goals (Jansen & Brent, 2005; Pyoos, 2008).

A concept that is becoming more and more prominent in discussions about occupational health and safety is the impact of *safety culture* on the outcome of an accident (Gadd & Collins, 2002; Guldenmund, 2006; Wiegmann, von Thaden & Gibbons, 2007). The concept of safety culture is not new as it already emerged from the investigation after the Russian Nuclear disaster at Chernobyl back in 1986 (Gadd & Collins, 2002; Guldenmund, 2006; Ostrom, Wilhelmsen & Kaplan, 1993; Zhang, Wiegmann, von Thaden, Sharma & Mitchell, 2002).

The importance of management commitment to safety has lead researchers to consider the concept of safety leadership (Cooper, 2001; Dunlap, 2011; Flynn & Shaw, 2011; Krause, 2004). Safety culture is considered to be a sub component of organisational culture (Pater, 2012). Just as leadership culture has a significant influence on organisational culture the safety leadership also has a significant influence on organisational safety culture, whether positive or negative (Burman & Evans, 2008; Werner, 2007).

Earlier research about the role of safety culture and safety leadership in preventing occupational accidents focused on occupations traditionally considered to being high risk such as in manufacturing, shipping, aviation, chemical processing, nuclear and offshore oil and gas companies (Hudson, 1999; Wiegmann et al., 2007). However, organisations in other industries, such as healthcare (Clark, 2002), traffic (Wiegmann et al., 2007) and mining (Geller, Carter, De Pasquale, Pettinger & Williams, 2001; Pyoos, 2008; Wortman-Wunder, 2010) are increasingly acknowledging and exploring the impact of safety culture and safety leadership in their respective occupational fields. After more than two decades of research, safety culture has been found to play an important role in safety performance across a variety of organisations and industries (Guldenmund, 2006; Wiegmann et al., 2007).

Given that existing research on the impact of safety leadership on safety culture has yielded valuable information to address safety concerns in other hazardous industries it would be appropriate to also research this concept in the South African mining industry. With increased pressure from legislative bodies to transform the safety culture of mines it is important for the field of industrial and organisational psychology to investigate safety leadership by means of empirical research.

1.2. PROBLEM STATEMENT

In general, the literature about safety culture addresses five main aspects namely types or levels of safety culture, key elements of a positive safety culture, assessment of safety culture, the importance of safety leadership and recommendations for improvement (Burman & Evans, 2008; Cooper, 2001; Guldenmund, 2000; Guldenmund, 2006; Hudson, 1999; Keil Centre, 2000; Krause, 2005; Ostrom et al., 1993; Reason, 1997; Westrum, 1993; Wiegmann et al., 2007). One aspect that seems to be emphasised as a key element in the establishment and development of safety culture is the importance of safety leadership.

There is a wealth of information available on *what* management and leaders must do to establish and improve the organisational safety culture. However, little attention is given to *how* the safety leadership could be improved. If the safety leadership plays such a key role in the organisation's safety culture (Burman & Evans, 2008) then it seems critical that it should receive priority in safety culture research.

In most of the literature, training and learning is identified as another critical aspect for the improvement of safety culture. Many acknowledge that a safety coaching program is a practical and effective means of training and educating employees in order to change and sustain safe behaviour at work (Geller, 1995; Geller, Perdue and French, 2004; Mathis, 2009; Neenan & Palmer, 2001; Richardson, 1996; Ronning, 2007). The literature on safety coaching seems to focus on two main aspects namely the skills and attributes required by safety coaches and the coaching process or model. The point of departure is teaching management to coach their employees for safety and not coaching the managers or executives themselves.

In summary, the review of current literature on safety culture, safety leadership and safety coaching indicated a lack of research in terms of the following:

- (1) The resources are mostly of international origin and very little South African research or research specific to safety leadership in the mining industry could be found.
- (2) The literature focuses on the role of leadership in improving organisational culture but lacks information on how the safety leadership *per se* could be changed or improved.
- (3) The literature that addresses safety coaching focus on training managers to coach employees as opposed to coaching managers to improve their own safety leadership.

It appears as if research on coaching as a method to improve safety leadership will contribute to the discipline of industrial and organisational psychology in terms of the increasing demands placed on leaders to develop their skills to deal with a dynamic and changing work environment. Safety leadership is one of the critical skills needed by leaders in the South African mining industry today. Thus, it could provide a practical tool for industrial and organisational development practitioners to assist mines with the development of their safety leadership and subsequent transformation of safety culture.

1.2.1. Research questions with regard to the literature review

With regard to the literature review the following research questions were posed:

Research question 1: What is the background of occupational health and safety in the South African mining industry?

Research question 2: How is organisational safety culture conceptualised and explained by theoretical models in the literature?

Research question 3: How is safety leadership conceptualised and explained by theoretical models in the literature?

Research question 4: How is coaching conceptualised and explained by theoretical models in the literature?

Research question 5: How can theoretical coaching principles be applied to develop a safety leadership coaching program?

1.2.2. Research questions with regard to the empirical study

With regard to the empirical study the following research questions were posed:

Research question 1: How can the safety leadership of the organisation be investigated?

Research question 2: How do the ratings of safety leadership differ according to the different biographical groups?

Research question 3: What impact does a safety coaching program have on the safety leadership?

Research question 4: What impact does a safety coaching program have on managers' attitudes with regard to safety?

Research question 5: What are the managers' personal experiences of the coaching process?

Research question 6: What recommendations can be made to the organisation in terms of improving the safety leadership and organisational safety culture?

Research question 7: What recommendations can be made for the field of Industrial and organisational psychology in terms of utilising a coaching program as a tool for improving safety leadership?

1.3. AIMS OF THE RESEARCH

From the research questions the aims of the research were formulated as follow:

1.3.1. General aim of the research

The general aim of the research was two-fold namely 1) to develop a safety leadership coaching program and 2) to evaluate the impact of a coaching program on safety leadership.

1.3.2. Specific aims of the research

Following from the general aim of the research, specific aims in terms of the literature review and the empirical study were formulated.

1.3.2.1. Aims of the literature review

In terms of the literature review the specific aims were:

Research aim 1: To describe the background of occupational health and safety in the South African mining industry.

Research aim 2: To conceptualise safety culture.

Sub-aim 2.1: To discuss different models and types of safety culture

Research aim 3: To conceptualise safety leadership and its role in safety culture.

Sub-aim 3.1: To discuss different models of safety leadership and safety leadership development.

Research aim 4: To define and describe coaching.

Sub-aim 4.1: To discuss different coaching models.

Research aim 5: To develop a safety coaching program.

1.3.2.2. Aims of the empirical study

The specific aims of the empirical study were:

Research aim 1: To assess and describe the safety leadership of the mine before the coaching program.

Research aim 2: To compare the different biographical groups' assessment of the safety leadership to determine if there are any significant differences.

Research aim 3: To assess the safety leadership after completion of the coaching program to determine the impact thereof on safety leadership.

Research aim 4: To determine the impact of the safety coaching program on managers' attitudes with regard to safety.

Research aim 5: To determine the managers' personal experiences of the coaching program.

Research aim 6: To formulate recommendations for the organisation to improve safety leadership.

Research aim 7: To formulate recommendations in terms of the utilisation of a coaching program as a tool to improve safety leadership.

1.4. PARADIGM PERSPECTIVES

Paradigms are systems of interrelated practice and thinking that define the nature of the study along three dimensions namely ontology, epistemology and methodology (Terre Blanche & Durrheim, 1999). Ontology refers to the nature of the reality that is to be studied. Epistemology describes the nature of the relationship between the researcher and the reality that is studied. Methodology specifies how the researcher may practically go about studying that reality. The three dimensions of paradigms constrain each other and commit the researcher to specific perspectives and methods of data collection and analysis (Terre Blanche & Durrheim, 1999). For example if the researcher believes that the object of study consists of a stable, external reality then the researcher adopts an objective and detached epistemological stance and employ experimental or quantitative methodology or if the researcher believes that the reality to be studied consists of people's subjective experiences then an empathetic stance is adopted and interactional or qualitative methodology employed.

Many researchers prefer to conduct their research within a single paradigm (Terre Blanche & Durrheim, 1999). Traditionally, specific fields of study for example organisational research have been dominated by the application of a specific paradigm namely positivism (Swanson, 2005). Organisations consist of human beings who bring with them their own knowledge, attitudes, values, beliefs, worries, prejudices and other characteristics. Thus, single paradigm research on efforts to improve organisations is often left incomplete because it cannot always account for the unseen factors that may play a role (Lincoln, 2005). Therefore, researchers often draw on more than one paradigm depending on the type and aim of the research (Terre Blanche & Durrheim, 1999).

Three paradigms were applicable to this research. The humanistic paradigm was adopted in the literature review phase. The empirical research followed a positivist – interpretive paradigm. To investigate the safety leadership and determine the impact of a coaching program on the safety leadership the positivist paradigm was adopted. The interpretive paradigm was followed in the final stage of the study to understand the changes in managers' attitudes towards safety and their experiences of the coaching process.

1.4.1. Literature review

The literature review was presented from the humanistic paradigm.

1.4.1.1. The humanistic paradigm

The humanistic approach maintains that people have the ability for self-direction and do not simply react to instincts or external factors (Meyer, Moore & Viljoen, 1997; Nevid, Rathus & Green, 2003). Individuals have an innate tendency to self-actualisation and to realise their full potential (Nevid et al., 2003). Each person has unique traits and talents that create a unique perspective of life (Nevid et al., 2003). This view holds that human nature is inherently good and conflict or antisocial

behaviour manifests only when people become frustrated in striving to reach their full potential (Meyer et al., 1997; Nevid et al., 2003).

1.4.2. Empirical study

The empirical study was presented from the positivist and the interpretive paradigm perspective.

1.4.2.1. The positivist paradigm

The positivist approach “aims to provide an accurate description of the laws and mechanisms that operate in social life” (Terre Blanche & Durrheim, 1999, p. 6). Positivism is concerned with facts and the basic assumption (ontology) is that the world is objective and that relationships among variables can be objectively and accurately described (epistemology). This is achieved by employing quantitative methodology such as standardised questionnaires to test and verify hypotheses (Swanson, 2005).

1.4.2.2. The interpretive paradigm

The interpretive approach is concerned with meaning and “seeks to understand organisational member’s meaning of a situation” (Swanson, 2005, p. 19). The basic assumption (ontology) of this approach is that people’s subjective experiences are real and should be taken seriously and that other’s experiences can be understood (epistemology) through interaction and listening (Terre Blanche & Kelly, 1999). The interpretive approach applies subjective methodology that relies on the relationship between the researcher and the subject such as interviewing or participant observation (Terre Blanche & Durrheim, 1999).

1.4.3. The psychological paradigm

This study was conducted within the social-cognitive paradigm. The social-cognitive theory was developed by researchers such as Albert Bandura and Julian B. Rotter (Nevid, Rathus & Greene, 2003). According to social-cognitive theory people do not just respond automatically to the stimuli that impacts on them but are self-aware and purposeful learners that can assert influence on their environments (Bandura, 2001).

Social-cognitive theory emphasises the roles of thinking and of learning by observing others (Nevid et al., 2003). Social-cognitive theorists concur with the traditional behavioural perspective that explaining human nature should be based on observable behaviour but also acknowledge that behaviour cannot be predicted from situational factors alone - factors within the person must also be considered (Rotter, 1990).

1.4.4. The disciplinary relationship

The research was conducted within the discipline of industrial and organisational psychology. This discipline has as its basic aim the understanding, explaining, prediction and influencing of human behaviour and experience in the work context. This study falls within the sub-field of organisational behaviour. This sub-field aims to identify and explain behaviour at the individual, group and organisational level as well as the interaction between members and their external environment (Werner, 2007). The study of organisational behaviour provides information to managers and employees in order to understand behaviour, make decisions, motivate and coordinate people and other resources and achieve the organisational goals (Werner, 2007).

1.5. META-THEORETICAL CONSTRUCTS

There are several meta-theoretical concepts that underlie this research. The meta-theoretical concepts that were referred to, but not necessarily discussed, in this study were defined as follow:

1.5.1. Occupational health and safety

According to the Oxford English Mini-dictionary (1999) the word *health* means “the state of being well and free from illness” and *safety* means “freedom from risk or danger”. Combined with the meaning of the word *occupational*, i.e. related to one’s employment, the concept can be defined as being “free from illness or injury attributable to occupational causes” (Mine Health and Safety Act no 29 of 1996). The objective of occupational health and safety is not to prevent anyone from doing dangerous work *per se* but to ensure that dangerous activities are performed without causing harm to oneself or others (Hudson, 1999).

1.5.2. Behaviour based safety

In the past, attempts to improve workplace safety had focused on technical or engineering aspects such as the design of safer systems, machinery and equipment (Carelse, 2011; Gadd & Collins, 2002). The presumption was that employees could be adequately protected by making the physical environment safe (Geller, Carter, De Pasquale, Pettinger & Williams, 2001; Jansen & Brent, 2005). Eventually safety professionals came to realise that technical solutions alone are not sufficient to reduce accidents and injuries at work (Boling, 1995; Geller et al., 2001; Jansen & Brent, 2005; Reason, 1997 as cited in Hudson, 1999). The impact of individual behavioural aspects on safety, for example operator error, was identified and gave rise to a behaviour based approach to safety (Gadd & Collins, 2002, Geller et al., 2001).

The concept of behaviour based safety originated in the United States in the 1970's and is founded on the science of the analysis of observable behaviour and it is widely used to facilitate safety culture change (Geller et al., 2001; Krause, 1997; Perdue, 2000). Behaviour based safety can be defined as the process of identifying (through observation) and correcting (through feedback) at risk or unsafe behaviours (Geller et al., 2001; Krause, 1997; Perdue, 2000).

1.5.3. 360 Degree assessment and feedback

360 Degree assessment and feedback broadens the base of information about a person's behaviour at work by including input from the self, superiors, subordinates, peers, customers and other role players (Cascio, 1998). This method of collecting feedback is focused on increasing managers' self-awareness and to encourage them to change certain behaviours (Becton & Schraeder, 2004; Cacioppe & Albrecht, 2000; Maurer, Mitchell & Barbeite, 2002). 360 Degree instruments are often utilised when the feedback information is required for developmental rather than evaluative purposes (Cacioppe & Albrecht, 2000).

1.5.4. Personality

Personality is of interest during organizational related studies because of its influence on individual behaviour and performance (Werner, 2007). Traditionally personality testing is used during the selection process to determine whether the applicant's personality is suited to the requirements of the job and subsequently to make predictions about how successful the applicant will be in that job (Werner, 2007). Currently, specific personality traits are being examined as an aspect that could also influence safety behaviour at work (Cellar, Nelson & Bauer, 2001; Geller & Wiegand, 2005; Jeffries, 2011; Werner, 2007).

1.5.4.1. *Emotional intelligence*

One aspect of personality that is considered to have an influence on safety behaviours at work is emotional intelligence (Jeffries, 2011). Emotional intelligence can be defined as “the ability to monitor, one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” (Salovey & Mayer, 1990). Goleman (1995, as cited by Jeffries, 2011) identified five components of emotional intelligence namely self-awareness, self-regulation, motivation, empathy and social skills. Self-awareness refers to the ability to identify your own moods and emotions and understand why you are experiencing them. Self-regulation refers to the ability to control your emotions and disruptive impulses. Motivation refers to the ability to direct your own emotions towards achieving a goal. Empathy is the ability to be sensitive to others’ feelings and emotions. Social skills involves being able to effectively communicate, negotiate and resolve conflict. A personality that is more inclined to consider the consequences of behaviour for themselves and other’s is what is believed to represent the intrinsic drive or motivation for safe behaviour (Jeffries, 2011).

In addition, the level of emotional intelligence of both the coach and the person being coached could influence the success of the intervention and should be considered in a coaching or safety coaching process (Wiegand, 2007). Safety coaching is a complex process and although people usually appreciate observation and feedback regarding how to improve their performance, for example in sports or even at work, advice on safety behaviour is often perceived as a personal attack (Geller, 1995). Understanding the complexities of their own and other’s emotions will facilitate successful feedback and communication regarding recommended actions in a positive manner (Wiegand, 2007).

1.6. THEORETICAL MODELS

The research was conducted based on theoretical models for safety culture, safety leadership, and coaching.

1.6.1. Safety culture models

Several theoretical models describe the elements and levels of safety culture such as the models of Westrum (1993), Cooper (1999) Hudson (1999), Guldenmund (2000), the Keil Centre (2001) and Krause (2005). The different models were discussed in order to explain safety culture and how it could be developed.

1.6.2. Safety leadership models

Safety leadership models such as the models of Carrillo (2002), Krause (2005) and Pater (2012) were discussed and evaluated. In addition, the leadership development models of Locke and Tarantino (2006) and Cacioppe (1998) were discussed. Based on the literature, the researcher developed an integrated safety leadership model that incorporated all the elements of effective safety leadership, as purported by other models, into one model. The researchers' integrated safety leadership model was applied to the research.

1.6.3. Coaching models

Different coaching models such as the models of Koonce (1994), O'Neill (2000), Dembkowski and Eldridge (2004), and Koortzen and Oosthuizen (2010) were discussed and evaluated. The researcher applied the principles of coaching and developed a safety leadership coaching program.

1.6.4. Theoretical constructs

The core concepts applicable to this research are defined in the sections below. These concepts were further described in the literature review.

1.6.4.1. Safety culture

There are many definitions of safety culture and essentially it refers to employees' *shared* attitudes, beliefs, perceptions and values about safety that affect their behaviour in the workplace (Cox & Cox, 1991; Schein, 1992; Wortman-Wunder, 2010; Zhang, Wiegmann, Von Thaden, Sharma & Mitchell, 2002). For the purpose of this study the definition of von Thaden and Gibbons (2008) was adopted:

“Safety culture is defined as the enduring value of prioritization of worker and public safety by each member of each group and in every level of an organization. It refers to the extent to which individuals and groups will commit to personal responsibility for safety; act to preserve, enhance and communicate safety concerns; strive to actively learn, adapt and modify (both individual and organizational) behaviour based on lessons learned from mistakes; and strive to be honored in association with these values.”

This definition combines the key elements for a positive safety culture as identified in the literature. These elements include aspects such as personal commitment, communication, learning and the importance of the involvement of all levels of the organisation (Reason 1997, as cited in Hudson, 1999; Keil Centre, 2000).

1.6.4.2. Safety leadership

Safety leadership starts at the executive level where senior managers develop and set safety objectives for the organisation (Cooper, 2001; Krause, 2004). It refers to the interpersonal influence that a leader exercises to achieve the organisation's safety performance goals. In the literature, a distinction is made between safety

management and safety leadership. Safety management refers to “what gets done” and it has an impact on safety improvement mechanisms, whereas safety leadership refers to “how it gets done” and it has an impact on organisational safety culture (Krause, 2004).

According to Cooper (2001, p. 21) the effective leadership of safety “requires senior managers to develop and implement a strategic plan for safety that captures the hearts and minds of the organisation’s employees, personally demonstrate excitement and enthusiasm for the changes and model the behaviours that others are expected to follow, while also maximizing the use of the organisation’s resources to deliver a productive but safe working environment”.

1.6.4.3. *Coaching*

According to Downey (1999, p. 15) coaching is “the art of facilitating the performance, learning and development of another”. Coaching is an interpersonal interaction that aims to understand and direct individual behaviour and performance through increased self-awareness and action plans (Becket, 2000; Neenan & Palmer, 2001). Coaching can focus on any area of a person’s life to assist in personal and professional growth. The concept of *executive coaching* emerged as a means to address specific skills deficiencies to enhance the performance of *executives* and *managers* (Bougae, 2005; Long, 2003).

1.7. Central research hypotheses

The following central research hypotheses were put forward for the study:

Hypothesis 1: A coaching program will positively impact on the safety leadership of the organisation.

Hypothesis 2: A safety coaching program will positively impact on manager's attitudes about safety.

1.8. Methodological convictions

Methodological convictions are beliefs concerning the nature of social sciences research and are informed by the research questions and paradigm (Mouton & Marais, 1996; Swanson, 2005). Phenomena that are well understood and are observable, such as behaviours, will give rise to research questions of verification that lends itself naturally to quantitative methods (Swanson, 2005). Phenomena that are not well understood and not easily observable, such as subjective experiences, will give rise to questions of meaning that lends itself to qualitative methods (Swanson, 2005). The following methodological convictions are applicable to this research:

- The assessment, description and comparison of safety leadership behaviours would best be investigated by quantitative methods.
- The investigation of the attitudes and experiences of participants would best be investigated by qualitative methods.

1.9. RESEARCH DESIGN

Research designs are strategic frameworks that guide “the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure” (Sellitz, Jahoda, Deutsch & Cook, 1965, p. 50). The research design can be defined as the way in which the research is conducted in order to best answer the research questions and achieve the aim of the study (Durrheim, 1999a).

According to Mouton and Marais (1996, p. 33) the “aim of research design is to plan and structure a given research project in such a manner that the eventual

validity of the research findings is maximized". A good research design provides the reader with a clear view of what was done, why it was done, how it was done, what was found, and what recommendations were made for future research (Bryant, 2005). In other words, the research questions, aims and paradigm perspectives will have an impact on the research design.

1.9.1. Dimensions of research design

Mouton and Marais (1996) identified five dimensions of the research design process namely the sociological, ontological, teleological, epistemological and methodological dimensions. A distinction is made between the disciplinary and project perspective of the five dimensions. The disciplinary perspectives are based in the discipline within which the research is conducted and the project perspective highlights the manner in which the five dimensions manifest in the individual research project. The five dimensions are briefly described in the next sections.

1.9.1.1. The sociological dimension

The existence of networks or research communities, mechanisms of social control, research ethics and the influence of ideologies and interest are important aspects of the sociological dimension. This dimension also highlights that research could be a joint or collaborative activity. On the project level the sociological dimension involves decisions pertaining to:

- Individual versus team projects
- The differences between contract versus self-initiated research
- Issues of project supervision and management
- Planning and control of time and resources

1.9.1.2. The ontological dimension

Research in the social sciences is always directed at an aspect of social reality and the ontological dimension refers to the various ways in which research domains can be defined and classified. On the project level it manifests in the proper classification of the unit of analysis of the project, for example:

- Individuals
- Groups or collectives
- Interactions
- Objects

1.9.1.3. The teleological dimension

Social science, as a typical human activity, is goal driven and the traditional distinction between theoretical and practical goals is useful in classifying research goals. Within the project perspective the teleological dimension refers to the objective of the specific research such as:

- Theoretical: Exploratory, descriptive and explanatory
- Practical: To provide information, diagnose and solve problems, and planning and monitoring social programmes.

1.9.1.4. The epistemological dimension

This refers to the epistemic ideal of science as not merely to understand phenomena but rather to provide a valid and reliable understanding of reality. On the project level this manifests in the validity, demonstrability, reliability and replicability of the research findings.

1.9.1.5. The methodological dimension

This refers to the methodological approach to the research. At the project level three general methodologies are distinguished in the social sciences, namely:

- The quantitative approach
- The qualitative approach
- The participatory action approach

Decisions regarding the methodology or combination of methods that is employed entail further specific choices in terms of the various methods of:

- Data collection (questionnaires/interview/documents)
- Data analysis (statistical/mathematical/interpretive)
- Inference (inductive/deductive/retroductive)

The decisions made for the research design of this specific research project along the above five dimensions are discussed in the next sections. Ethical considerations, the unit of analysis and variables, types of research conducted and methodology of the research are discussed. A discussion of aspects pertaining to validity and reliability is also included.

1.9.2. Ethical considerations in the research design

Research ethics and the influence of ideologies and interest are important aspects of the sociological dimension (Mouton & Marais, 1996). Three main ethical principles have been identified that guide research design namely the principle of autonomy, the principle of non-maleficence, and the principle of beneficence (Bryant, 2005; Durrheim & Wassenaar, 1999).

The *principle of autonomy* requires the researcher to respect the autonomy of all persons in the sense that they are capable of making their own decisions and choices. *Non-maleficence* is best explained by the term “do no harm” and the researcher must identify potential risks or harm that the research may inflict on participants and design the research in a manner that minimises or eliminates the risks. Risks refer to physical, emotional, social or any other forms of harm that could come to participant during the study. *Beneficence* means that the research must be of benefit to the individual subject and the larger society and researcher must give consideration to both in the design.

Guidelines to comply with the above translate into three aspects namely informed consent, confidentiality and competence (Bryant, 2005; Durrheim & Wassenaar, 1999). These aspects are briefly described as follow:

1.9.2.1. Consent

Participation in research must be based on informed consent. Participants must be given a full, clear, non-technical explanation of what is expected of them and their right to withdraw. Informed consent for participation in the quantitative study was obtained with a consent form that set out the purpose, activities and expectations of the research. Consent for participation in the qualitative study was obtained by verbally requesting and recording consent during the interview.

1.9.2.2. Confidentiality

The parameters of confidentiality should be clearly stated in terms of the data collection method as well as the reporting and publishing of the research results. Confidentiality was maintained and quantitative data was collected without requiring any identifying information. Qualitative findings were reported in group context without identifying the individuals.

1.9.2.3. Competence

Researchers should only engage in and plan to carry out research activities and procedures that they are competent to conduct. Particularly if there is a risk that emotional or physical harm could come to the participant. Competence is also enhanced by attending to issues such as validity and reliability of instruments and techniques applied to the research. The researcher has previously demonstrated competence in coaching and mentoring. Ethical clearance was obtained from the university's Ethics Committee and is attached as Appendix A.

In addition to the above three aspects, researchers should acknowledge and correctly reference all their sources and not make themselves guilty of plagiarism (Bryant, 2005). Falsifying data and results either by means of constructing data that does not exist or omitting significant data that would change the outcome of the research also constitutes unethical behaviour (Bryant, 2005).

1.9.3. The unit of analysis

The ontological dimension involves the classification of the unit of analysis of the project (Mouton & Marais, 1996). The objects of research are called the units of analysis and it specifies who or what the researcher wants to draw conclusions about (Durrheim, 1999a). The unit of analysis for the quantitative as well as qualitative part of this study was the group.

1.9.4. The variables

According to Holton and Burnett (2005), variables refer to the phenomena that change depending on the conditions affecting it. There are two types of variables, namely independent and dependent. The independent variable is not dependent on anything else and is manipulated to determine its effects on the dependent variable (Durrheim, 1999a). The empirical aim of this study was to determine the

impact of the coaching program on safety leadership, therefore the coaching program was the independent variable and safety leadership was the dependent variable.

1.9.5. Type of research

In terms of the teleological dimension the type of research that is conducted depends on the objectives or aims of the specific research project (Mouton & Marais, 1996). This study had a theoretical as well as practical aim. The theoretical aims of this study were to describe the characteristics of the domain as well as certain aspects of groups and to make comparisons between groups. Thus, the research was descriptive and comparative. Practically, the general aim of the study was to develop and evaluate the impact of a coaching program on safety leadership.

1.9.5.1. Descriptive research

To describe the characteristics of a domain or a certain group of people usually forms part of the aims of most studies (Holton & Burnett, 2005). Descriptive studies aim to describe phenomena accurately by means of narrative-type descriptions, classification or the measurement of relationships (Durrheim, 1999a). Surveys are often employed in descriptive studies to collect information about people, groups and organisations in order to describe it (Holton & Burnett, 2005). The literature review and the qualitative part of the empirical study constituted descriptive research.

1.9.5.2. Comparative research

Comparative studies aim to describe the differences between groups (Durrheim, 1999a). Statistical methods are applied to identify, compare and then describe the differences between groups (Holton & Burnett, 2005). The quantitative study

constituted descriptive as well as comparative research in that the organisation's safety leadership was described and the results of different groups of participants were compared.

1.9.5.3. Programme evaluation research

Evaluation research tracks the effectiveness of social programmes in human and social terms (Cronbach, 1963; Potter, 1999). According to Potter (1999, p. 210), the term social programme means "any kind of organised endeavour ranging from an industrial company to a political movement". The types of programmes most commonly evaluated are those aimed at educational or social development (Potter, 1999). The central aim of programme evaluation, as was also the general aim of this study, is to answer practical questions about programme development, implementation, outcomes, and the quality of the service provided in order to provide information for decision making (Cronbach, 1963; Guskey, 2002; Potter, 1999).

1.9.6. Validity and reliability

The epistemological dimension of research design requires that researchers consider the measures that could be implemented to ensure that a valid and reliable understanding of the phenomena being studied is achieved (Mouton & Marais, 1996). This involves aspects pertaining to the demonstrability, generalisability and replicability of the study.

In terms of the literature review, validity was ensured by consulting literature that relates to the nature, problems and aims of the research. Every effort was made to include the most recent as well as academically and scientifically acceptable sources pertinent to the concepts relevant to this research. However, a number of contemporary, mainstream sources were also referred to because of their applicability to the study. A variety of types of resources were consulted including

books, chapters in books, journal articles, on-line articles, unpublished theses, and conference papers. An attempt was also made to include South African resources where possible although they were limited in number.

In terms of the quantitative study, the measurement and content validity of the measuring instrument was addressed in a logical manner and also by means of statistical analysis. The procedure followed is described in the relevant sections of chapters 6 and 7. Aspects that was considered in establishing the internal and external validity of the study is described in chapter 7.

In terms of the qualitative study, strategies were implemented to ensure the quality and trustworthiness of the data. The strategies employed to enhance the credibility, transferability, dependability, and confirmability of the qualitative study were described in the relevant sections of chapters 6 and 8.

1.9.7. Methodological approach

The methodological dimension refers to decisions about what methodological approach to follow in the research, as well as choices regarding the data collection, analysis and inference methods to employ (Mouton & Marais, 1996). A mixed methods research design that consisted of a quantitative and qualitative study was followed. Quantitative research collects data in numerical format and utilises statistical methods for data analysis (Durrheim, 1999a). Qualitative research collects data in the form of written or spoken language and analyse the data by identifying themes (Durrheim, 1999a). A mixed method research design is appropriate when the researcher wants to examine outcomes along with processes or experiences (Plano Clark, 2010).The sequence was quantitative followed by qualitative. The background of and rationale for conducting mixed methods research as well as the specific mixed methods design chosen for this study is described in detail in chapter 6.

1.10. RESEARCH METHOD

The research was conducted in three phases namely the literature review, the quantitative study and the qualitative study.

1.10.1. Phase 1: Literature review

The literature review consisted of a review of the literature on mining health and safety in South Africa, safety culture, safety leadership and coaching.

Step 1: Background to Mining health and safety in South Africa

The background of health and safety in the South African mining industry and relevant legislation was provided.

Step 2: Safety culture

The concept of safety culture was conceptualised. Related theory and research was examined and the following aspects were discussed:

- Different types and models of safety culture;
- The key components of and barriers to safety culture; and
- Ways in which safety culture can be improved.

Step 3: Safety leadership

Safety leadership was conceptualised. Related theory and research was examined and information on the following was provided:

- The importance of safety leadership and its role in safety culture;
- The elements of safety leadership;
- Different safety leadership models; and
- Leadership development models.

An integrated model of safety leadership and a safety leadership development model were presented.

Step 4: Coaching

Theory and research related to coaching was reviewed in order to:

- Define and describe coaching.
- Discuss different coaching models.

Step 5: Develop a leadership safety coaching program

A safety coaching program for managers aimed at improving the safety leadership was developed based on the knowledge gained from the literature review.

1.10.2. Phase 2: Quantitative study

The quantitative study was conducted as set out in the next section.

Step 1: Selection of the population and sample

The selected case organisation was a clay mining operation that employed approximately 480 employees at the time of the study. The organisation consisted of two mining sites and adjacent works that are situated in close geographical proximity.

This company was selected as the case organisation for a number of reasons. Firstly, the researcher was in the company's employment and therefore already had access to the organisation. Secondly, the researcher was employed in the capacity of a safety practitioner and this meant that she already had some background knowledge as to the company's safety policies and procedures as well as the challenges experienced in this area. Thirdly, the researcher was originally

appointed to assist with implementing and improving safety management at the company. Therefore, this study was not only an academic exercise in order for the researcher to achieve the degree but it was also to help the case organisation in a practical manner. Nevertheless, a formal memorandum of agreement, that set out the research aims, activities, duration, roles and responsibilities, were signed between the researcher and the company.

The aim of the quantitative study was to determine the safety leadership by means of a 360 degree rating process. To achieve this aim and based on 360 degree methods, specific employees had to be included in the sample. Thus, a purposive sample consisted of managers, supervisors, foremen, health and safety representatives, and some employees of both sites who rated themselves and each other in their respective capacities as superiors, peers and subordinates.

Step 2: Selection of the measuring instrument

In this study the Leadership Assessment Tool developed by the Mine Health and Safety Council (MHSC) in 2011 was employed as measuring instrument. The assessment group, in accordance with the instructions of the instrument, included the individual manager concerned, his/her immediate superior, some peers, some subordinates and the health and safety representatives.

This assessment tool was developed based on the internationally recognised work of Behavior Safety Technologies (BST) and the International Council for Minerals and Metals (ICMM.) The rationale for utilising this instrument was that it measures safety leadership whereas other available instruments only measured organisational safety culture, with safety leadership as one aspect thereof. It is also compulsory for mines to utilise this tool as part of their Mining Charter commitments and was therefore considered to be an appropriate instrument to apply for this study. A full description of the instrument and discussion of issues

pertaining to its validity and reliability is provided in the data analysis and collection chapter.

Step 3: Administer the pre-test survey

The researcher conducted an initial meeting with the respective groups in order to introduce the study and explain its aims and the procedure that will be followed. Participants' questions and concerns regarding the study were addressed during this meeting. The main questions addressed pertained to protecting the confidentiality of the information provided as well as in reporting the results.

This session also included training on the purpose and format of 360 degree assessments and particularly on how to avoid the so called "rater pitfalls". A printed copy of the Leadership Assessment Tool was given to each manager, their superiors, subordinates, peers and the health and safety representatives to complete with respect to the specific manager. The researcher explained to participants how the questionnaire was set up and how the demographic section must be completed. She also explained the scale and participants could ask if they did not understand any of the questions or words. After completing the questionnaires participants placed it in a slotted container.

Step 4: Conduct the coaching

The researcher conducted the coaching program as per the coaching schedule agreed upon with each individual participant. The coaching program consisted of more or less one hour sessions every two weeks and was completed within a period of approximately 3 months. The program included one workshop where participant's received training on the legislative requirements and their responsibilities in terms of safety.

Step 5: Administer the post-test survey

Approximately one month after the coaching program was concluded the Assessment Leadership Tool was given to the participants to complete again. Upon the request of participants, brief refresher training on how to complete the questionnaire was provided again.

Step 6: Process and analyse the data

The same procedure for the processing and analysis of data was followed for both the pre-test and post-test. The data was captured into an excel spreadsheet and the results were analysed in a quantitative manner with a statistical computer software package namely Statistical Package for the Social Sciences (SPSS). Descriptive statistics (means, standard deviations and frequency tables) were generated and further analysis was performed. The particular statistical tests that were employed were discussed in detail in the chapter on data collection and analysis methods.

The statistical analysis of the results generated information on the safety leadership according to the various demographic groups (gender, race, job level, age and geographical location) as well as an individual profile for each manager. In the interest of confidentiality the individual results of each manager were not reported on as part of the study but were only considered as a point of departure for the coaching program.

Step 7: Reporting and interpretation of results

Results of the quantitative study were presented in graphic as well as table format. The results were discussed and integrated with the findings of the literature review to allow for meaningful interpretation.

Step 8: Formulate conclusions, limitations and recommendations

The results were reviewed in relation to the aims of the study. The implications of the results for the case organisation were discussed. The limitations of the study were indicated and suggestions for further research were made.

Recommendations for the case organisation to improve safety leadership were formulated based on the results of the study. Recommendations for industrial and organisational practitioners on utilising coaching as a tool to improve safety leadership were made based on the results of the research.

1.10.3. Phase 3: Qualitative study

The qualitative study was conducted as follows:

Step 1: Selection of the sample

The sample for the qualitative study was a purposive sample consisting of the managers who completed the coaching program (Terre Blanche & Durrheim, 1999). This decision was based on recommendations from the literature as well as the Mine Health and Safety Council that efforts to change safety culture must start with top management (Cooper, 2001; Krause, 2004; Werner, 2007).

Step 2: Data collection method

A semi-structured interview was the main source of data collection for this phase of the study. Semi-structured interviews are used in interpretive research to discover the meaning participants give to a process (Terre Blanche & Durrheim, 1999). The interview template consisted of eight open ended questions. Sample questions that were included in the interview are:

How has your attitude about safety changed?

What is your overall opinion of the coaching experience?

What suggestions do you have for the improvement of the coaching program?

For the qualitative study the data was collected by means of recording the semi-structured interviews with a voice recording device. The researcher also made notes of additional aspects that may not have been evident from the recordings during the interviews (Terre Blanche & Kelly, 1999). In the interest of ethics the participant's verbal consent that the interview may be recorded was recorded as the first question of the session. The researcher transcribed the recordings after each interview onto a computerised word processing program namely Microsoft Word and added the interview notes where applicable.

Step 3: Data analysis

The content of the interview transcripts were analysed by means of thematic analysis (Braun & Clarke, 2006; Terre Blanche & Kelly, 1999). This involved employing various data reduction and theme identification techniques and coding the segmented data (Braun & Clarke, 2006; Ryan & Bernard, 2003). The themes were named and the data further analysed as part of the theme and in relation to other themes.

Step 4: Reporting of findings

The findings of the qualitative study were presented in a descriptive style. The theme headings were utilised to organise the data into categories. The findings were integrated with the literature as well as the results of the qualitative study, where applicable. The findings were reviewed in relation to the aims of the study. The implications of the results for the case organisation were highlighted. The limitations of the study were indicated and suggestions for further research were made.

Recommendations for the case organisation to improve safety leadership were formulated based on the results of the study. Recommendations for industrial and organisational practitioners on utilising coaching as a tool to improve safety leadership were made based on the results of the research.

The research process followed in this study consisted of nine steps as set out in Figure 1.1 on page 35. The steps are summarised as follow:

Step 1: Provide the background to and motivation for conducting the research.

Step 2: Formulate the problem statement and research questions.

Step 3: Formulate the general aim, specific aims and sub-aims based to address the research questions.

Step 4: Describe the paradigm perspective.

Step 5: Conduct literature review about research designs and methods.

Step 6.1: Describe the research approach.

Step 6.2: Implement the research method according to the three phases.

Step 7: Report the quantitative results and the qualitative findings.

Step 8: Discuss the results and findings and integrate with the literature.

Step 9: Draw conclusions from the results and address the achievement of the research aims, indicate the limitations of the study and formulate recommendations.

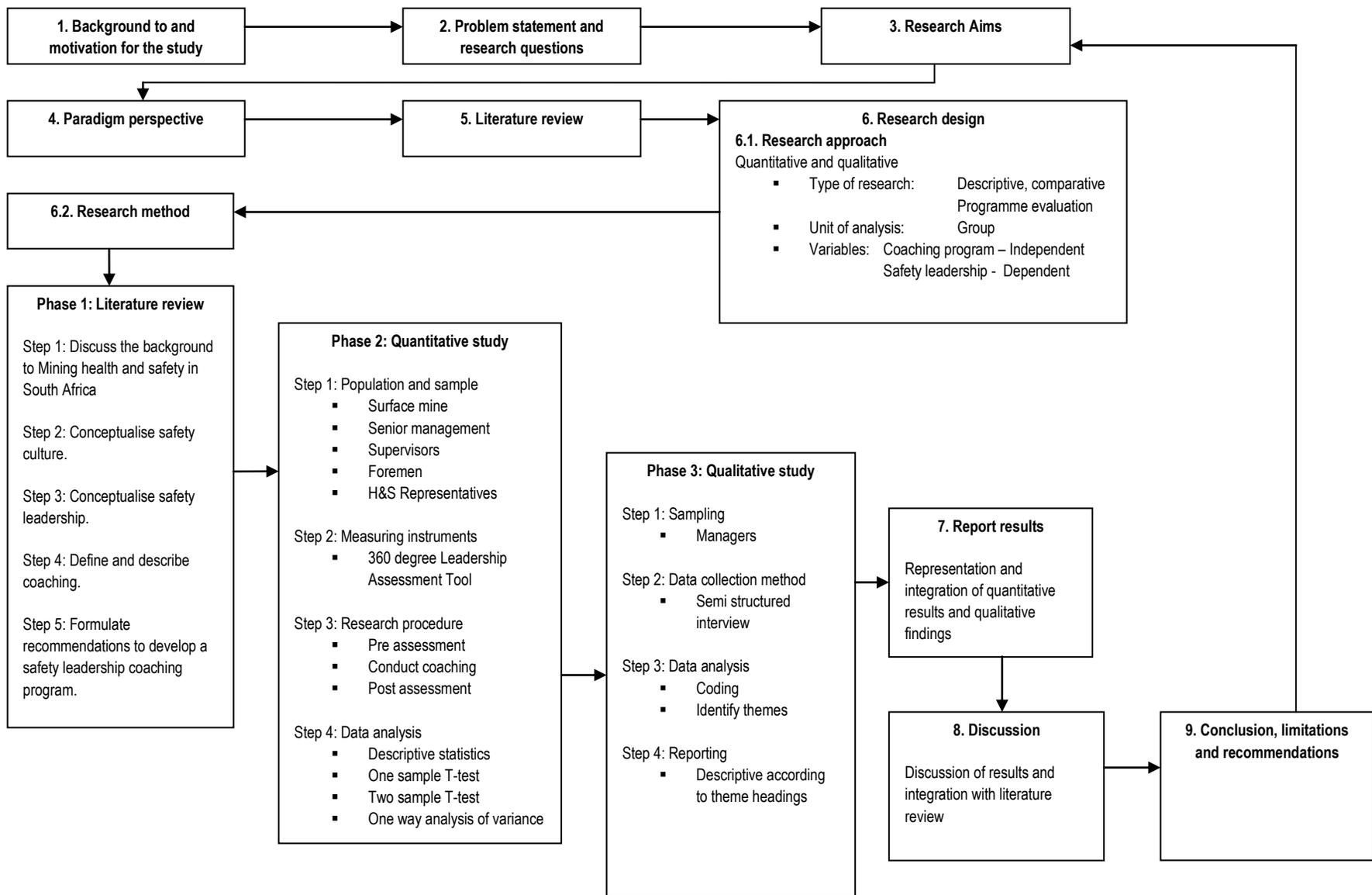


Figure 1.1 Flow diagram of research process

1.11. CHAPTER LAYOUT

This thesis consists of 9 chapters, set out as follow:

Chapter 1	Scientific overview of the research
Chapter 2	Overview of Mining health and safety in South Africa
Chapter 3	Safety culture
Chapter 4	Safety leadership
Chapter 5	Executive coaching
Chapter 6	Data collection and analysis methods: Empirical study
Chapter 7	Reporting of quantitative results
Chapter 8	Reporting of qualitative findings
Chapter 9	Conclusions, limitations and recommendations

1.12. CHAPTER SUMMARY

In this chapter the scientific overview of the research was presented. This included a discussion of the background to and motivation for the study, the problem statement, research questions and aims of the research. The paradigm perspectives, meta-theoretical constructs, theoretical models and theoretical constructs applicable to the research were described. Two central research hypotheses were put forward for the study. The research design and method was discussed. Ethical considerations as well as aspects pertaining to the validity and reliability of the research were included in the discussion. The steps in the research process were illustrated and the division of the chapters of the thesis was set out.

The next chapter will provide an overview of mining health and safety in South Africa.

CHAPTER 2

OVERVIEW OF MINING HEALTH AND SAFETY IN SOUTH AFRICA

Chapter 2 provides the background to the main factors that have shaped mine health and safety policies and practices in South Africa. An overview of relevant health and safety legislation is presented. The current state of health and safety in the South African mining industry is discussed.

2.1. INTRODUCTION

South Africa's current mining safety order is largely the result of the Leon Commission's in depth investigation into conditions at mines in 1995 (Van Rensburg & De Lange, 2011). The Leon Commission concluded that the mining industry had not taken adequate steps to protect workers from work related injuries and diseases (Stanton, 2003). Major legislative restructuring in conjunction with the allocation of greater resources to enforce mine health and safety standards were recommended (Stanton, 2003). This and other recommendations, such as upgrading standards for measuring workplace exposure and medical surveillance, lead to the promulgation of the Mine Health and Safety Act No 29 of 1996 (MHSA).

2.2. THE MINE HEALTH AND SAFETY ACT NO 29 OF 1996

The MHSA replaced the Minerals Act No 50 of 1991 as the main legislation for governing mining health and safety in South Africa (Masilo & Rautenbach, 2008). The MHSA also replaced the Sections of the Occupational Diseases in Mines and Works Act No 78 of 1973 that regulated the control of occupational health hazards. Subsequently, the provisions for dealing with occupational health and safety in mines were consolidated into a single statute (Masilo & Rautenbach, 2008).

Since its promulgation, the MHSA has been amended by the Mine Health and Safety Amendment Act No. 72 of 1997, the Skills Development Amendment Act No. 31 of 2003, the Mineral and Petroleum Resources Development Act No. 28 of 2002 and the Mine Health and Safety Amendment Act No. 74 of 2008. For the purpose of this study any reference made to the MHSA means as amended by the above.

2.2.1. Objectives of the MHSA

Broadly speaking, the overall objective of the Mine Health and Safety Act No 29 of 1996 (MHSA) is to make provisions for the protection of the health and safety of employees and other persons at mines. The specific objectives of the Act are listed in *Section 1* of Chapter 1, namely:

- To protect the health and safety of persons at mines;
- To require employers and employees to conduct hazard identification and risk assessment;
- To give effect to the international law obligations of the Republic concerning health and safety at mines;
- To provide for employee participation in health and safety matters through health and safety representatives and committees;
- To provide for the effective monitoring of health and safety conditions at mines;
- To provide for the enforcement of health and safety measures at mines;
- To provide for investigations and inquiries to improve health and safety at mines; and
- To promote health and safety culture, training, co-operation and consultation in the mining industry.

2.2.2. The main principles of the MHSA

From an analysis of the Act it can be concluded that the main principles that feature in the MHSA are:

- Responsibility;
- Duties, rights and powers; and
- Reasonable practicability.

The MHSa places the primary responsibility for ensuring a healthy and safe working environment on the *employer* i.e. the owner of the mine. Subsequently, the steps that the employer must take to ensure the health and safety of employees and other persons are set out in detail.

The MHSa also places a responsibility on *employees* to protect their own and other's health and safety while at work. The Act sets out employees' duties and rights in order to achieve this.

The Minister of Minerals and Energy in conjunction with the Mine Health and Safety Inspectorate (MHSI) is responsible to enforce the requirements of the MHSa. The duties and powers of the Minister and the MHSI to achieve this are set out in the Act.

The duties assigned in the MHSa are usually qualified with the words "as far as reasonably practicable". However, what is considered to be "reasonably practicable" is not clearly defined. Whether it is reasonably practicable for an employer to implement a health and safety measure can be determined by the following factors (Masilo & Rautenbach, 2008).

- The severity and scope of the hazard or risk;
- The information available about the risk and the measures to eliminate or minimise it; and
- The cost and benefit of eliminating or minimising the risk.

2.2.3. The requirements of the MHSa

In order to highlight the practical implications of the MHSa the following overview of its requirements is presented in terms of the duties, rights and

powers of the four main role players namely the employer, employees, MHSI and the Minister. Other important provisions of the Act are also briefly discussed.

2.2.3.1. *The duties of employers*

The MHSI places the main responsibility for health and safety at mines on the employer. Various Sections in Chapters 2 and 3 set out the specific responsibilities of employers as listed in Table 2.1 below.

TABLE 2.1
List of Employer Duties

SECTION IN THE MHSI	DUTY
2	Ensure safety at a mine
2A, 3, 4	Appoint managers and other persons
5	Maintain a healthy and safe mine environment
6	Ensure adequate supply of health and safety equipment
7	Staff the mine with due regard to health and safety
8	Establish a health and safety policy
9	Prepare and implement codes of practice
10	Provide health and safety training
11	Assess and respond to risk
11(5)	Conduct investigations
12	Conduct occupational hygiene measurements
13, 14, 15, 16, 17, 18	Establish a system of medical surveillance
25, 31, 32, 37, 38	Appoint and assist health and safety representatives and committees
52, 53, 56, 62	Assist inspectors

- ***Ensure safety at a mine***

Section 2 requires the employer of every mine that is being worked to ensure that the mine is designed, constructed, equipped and operated in such a way that employees can perform their work without any danger to their own or any other person's health and safety. This section also requires the employer of a

mine that is not being worked to takes steps to ensure safety at the mine until a closure certificate is issued.

- ***Appoint managers and other persons***

The employer may appoint managers and other persons to assist with performing its functions as required by the MHSA. However, these appointments do not relieve the employer of any duty or responsibility imposed on employers by the Act.

The chief executive officer is charged with the duty to ensure that the employer's functions in terms of the Act are properly performed. The chief executive officer may also entrust any function to another person under his control (Section 2A). The employer must appoint one or more managers to be responsible for the day to day management and operation of the mine (Section 3) and may appoint any other person to perform any function of the employer according to Sections 2 and 3 (Section 4).

- ***Maintain a healthy and safe mine environment***

The duty of employers to maintain a healthy and safe mine environment (Section 5) is twofold. Firstly, the employer must provide and maintain a working environment that is safe and without risk to the health of *employees*. Secondly, the employer must ensure that persons who are *not employees* but who may be affected by the mine's activities, are not exposed to any health and safety hazards.

- ***Ensure adequate supply of health and safety equipment***

Section 6 specifies the employer's duties in terms of health and safety equipment. Every employer must supply and maintain all necessary health and safety equipment and facilities to each employee. Employers must also ensure that sufficient quantities of the necessary personal protective equipment are

available so that all who is required to use it is able to do so. Employers must further take reasonable steps to ensure that employees are instructed in the use, limitations and maintenance of personal protective equipment.

- ***Staff the mine with due regard to health and safety***

Every employer must institute the necessary health and safety measures, take reasonable steps to ensure that every employee complies with the requirements of the Act (Section 7) and provide appointed persons with the means to comply with the Act or any instruction from an inspector. When staffing the mine, the employer must consider an employee's training and capabilities before assigning any task to that employee. The employer must ensure that work is performed under the general supervision of a person with the relevant training and authority to deal with the hazards associated with the work. Sections 7.2 and 7.4 again provide for the employer and the manager to appoint persons to perform any of their functions without relieving them of any duty imposed on them by the Act.

- ***Establish a health and safety policy***

Every employer must prepare a health and safety policy that describes the organisation of work as well as how the health and safety of employees and non-employees will be protected (Section 8). This policy must be consulted with the health and safety committee and be prominently displayed in the workplace for employees to read it.

- ***Prepare and implement codes of practice***

According to Section 9 any employer may prepare and implement a code of practice on any health and safety matter that may affect employees or non-employees. The Chief Inspector of Mines may require specific codes of practice and then it must be compiled and implemented according to the guidelines issued by the Chief Inspector. The employer must consult with the health and

safety committee on the preparation, implementation and revision of any code of practice.

- ***Provide health and safety training***

Every employer must provide employees with any information, instruction, training or supervision necessary to enable them to perform their work safely and without risk to their health (Section 10). This must include training about work related hazards and risks and the measures that must be taken to eliminate, control and minimise the hazards and risks. It must also include job related training such as the procedures to be followed to perform the work and relevant emergency procedures. This training must be provided before the employee starts work, at intervals determined by the employer and before significant changes are made to mining procedures, equipment, material or the nature of the employee's work.

A record of all training in respect of each employee must be kept. Mines are further required to submit a workplace skills plan and the annual training report to the Mining Qualifications Authority.

- ***Assess and respond to risk***

Section 11(1) to 11(4) contemplates the employer's responsibility to identify work related health and safety hazards and to assess the risks to which employees may be exposed. Employers must determine the measures necessary to eliminate, control and minimise the risk and in so far as the risk remains, must provide for personal protective equipment and implement programmes to monitor the risk. The hazard identification and risk assessment must be reviewed periodically and also be consulted with the health and safety committee.

- **Conduct investigations**

Section 11(5) to 11(8) determines that every employer must conduct an investigation into a serious accident, injury, illness and health-threatening occurrence. Investigations must be conducted in co-operation with health and safety representatives and the health and safety committee. A report must be prepared that identifies the underlying causes of the incident, identifies the unsafe conditions, act or procedures that contributed to the incident and makes recommendations to prevent a similar incident. A copy of this report must be given to the Principal Inspector of Mines and the health and safety committee.

- ***Conduct occupational hygiene measurements***

Section 12 requires an employer to establish a system of occupational hygiene measurements to measure employees' levels of exposure to hazards at the mine. This system must provide information that can be used to determine measures to eliminate, control and minimise the health hazards and risks to which employees may be exposed. The part-time or full-time services of a person qualified in occupational hygiene techniques must be employed to conduct the measurements. Record of these measurements must be kept in a manner that can be linked to each employee's record of medical surveillance.

- ***Establish a system of medical surveillance***

Based on the risk assessment, or if required by a regulation, the employer must establish and maintain a system of medical surveillance of employees who are exposed to health hazards (Section 13). The medical surveillance system must be designed to provide information that can be used to determine measures to eliminate, control and minimise the health hazards and risks to which employees may be exposed and to prevent, detect and treat occupational diseases. This must include an initial medical examination and other medical examinations at appropriate intervals as well as an exit medical examination (Section 17). The employer must engage the part-time or full-time services of an

occupational medical practitioner to conduct the medical surveillance and examinations. The employer is responsible for all costs related to medical examinations in terms of this Act (Section 18).

The employer must keep a service record of employees who perform hazardous work in respect of which medical surveillance is conducted (Section 14). The employer must also keep the record of an employee's medical surveillance confidential and stored safely for a period of 40 years (Section 15). The occupational medical practitioner must compile an annual report containing an analysis of the results of the medical surveillance and the employer must submit this report to the health and safety committee and the Medical Inspector (Section 16).

- ***Appoint and assist health and safety representatives and committees***

Section 25 stipulates the conditions for the appointment of health and safety representatives and the establishment of health and safety committees. Sections 31 and 32 stipulate employers' duties towards representatives namely the duty to compensate, assist and inform health and safety representatives. Sections 37 and 38 stipulate the employer's duty to support and inform the health and safety committee.

- ***Assist inspectors***

Employers' duties in terms of inspectors include:

- The duty to assist the inspector and answer questions (*Section 52*);
- The duty to produce documents required by the inspector (*Section 53*);
- To display any instructions given by the inspector at the mine (*Section 56*);
and
- The duty to answer questions during an investigation (*Section 62*).

2.2.3.2. *The duties of employees*

Employees also have a responsibility in terms of health and safety at mines. The MHSa imposes several duties on employees as listed in Table 2.2 on the next page.

TABLE 2.2
List of Employee Duties

SECTION IN MHSa	DUTY
22	General duties
52, 53, 62	Assist inspectors
84	Not to interfere with safety equipment

- ***General duties***

Section 22 stipulates the general duties of employees at a mine. Every employee at a mine must:

- Take reasonable care to protect their own health and safety;
- Take reasonable care to protect the health and safety of other persons;
- Use and take proper care of protective clothing and other facilities and equipment provided for their health and safety;
- Report promptly to their immediate supervisor any health and safety risk with which the employee cannot properly deal;
- Co-operate with any person to permit compliance with the Act; and
- Comply with prescribed health and safety measures.

- ***Assist inspectors***

Employees' duties in terms of inspectors include:

- The duty to assist the inspector and answer questions (*Section 52*);

- The duty to produce documents required by the inspector (*Section 53*); and
 - The duty to answer questions during an investigation (*Section 62*).
- ***Not to interfere with safety equipment***

Section 84 states that:

Unless specifically authorized by the employer or inspector, no person may:

- Remove personal protective equipment from a mine or cause it to be removed.
- Remove anything that is provided in the interest in health and safety or cause that equipment to be removed.
- Alter, damage, misuse, render ineffective or interfere with anything that is provided in the interest of health and safety or cause it to be altered, damaged, misused, rendered ineffective or interfered with.

2.2.3.3. *The rights of employees*

Several sections highlight the rights of employees in terms of the Act as summarised in Table 2.3.

TABLE 2.3
The Rights of Employees

SECTION IN MHSA	RIGHT
19	Employees' right to information
20	Employee may dispute a finding of unfitness to perform work
23	Employees' right to leave a dangerous working place
24	Employees not to pay for safety measures
83	No discrimination against employees who exercise rights

- ***Employees' right to information***

Employees have the right to the information in their medical records.

- ***Employee may dispute finding of unfitness to perform work***

Employees have the right to appeal a decision of medical unfitness within the prescribed time frame and by means of the prescribed process.

- ***Employees' right to leave dangerous working place***

Employees have the right to withdraw from a workplace if there appears to be a reasonably justifiable and serious risk to their health and safety.

- ***Employees not to pay for safety measures***

Employers may not deduct any payment from employees for any equipment provided in the interest of health and safety. This includes personal protective equipment.

- ***No discrimination against employees who exercise rights***

Employees may not be victimised for exercising their rights in terms of this act. This includes dismissal or any other conduct that prejudices or disadvantages the employee.

2.2.3.4. The rights and powers of inspectors

Chapter 5 covers the Inspectorate of Mine Health and Safety. The inspectorate is established under *Section 47*. The appointment of the Chief Inspector of Mines (CIOM) is outlined in *Section 48* and the functions of the CIOM are stipulated in *Section 49*. In *Sections 49 A and B* details relating to the financial and judicial management of the Mine Health and safety Inspectorate are provided.

One of the functions of the CIOM is to appoint other inspectors to assist with the enforcement of the provisions of the Act. Inspectors have certain powers, namely:

- To enter a mine at any time without notice, question any person, request documents, inspect any workplace or machinery, remove any article – *Section 50*;
- To be accompanied when performing functions – *Section 51*;
- To deal with dangerous situations by stopping operations at a mine or section of a mine – *Section 54*;
- To order compliance by giving the employer written instructions of corrective steps to take – *Section 55*.

Sections 57 to 59 stipulate the right and procedure to follow to appeal a decision of an inspector or the CIOM. *Sections 60 to 64* deal with the procedures for investigations by inspectors of accidents and occurrences at a mine that has resulted in the death of any person. The CIOM must direct an inspector to conduct an inquiry into any accident or occurrence at a mine that resulted in the death of any person (*Section 65*).

2.2.3.5. The rights and powers of the Minister

Chapter 6 contemplates the Minister's powers. The Minister's powers include the right to prohibit or restrict work (*Section 75*), to declare health hazards (*Section 76*), to give a mine exemption from all or part of this Act (*Section 79*), and to apply other laws to a mine (*Section 80*).

Chapter 8 stipulates additional powers of the Minister namely the right to delegate powers to the COIM (*Section 96*), to add and change Schedules (*Section 97*) and to make regulations (*Section 98*).

2.2.4. Other provisions of the Act

In addition to the duties, rights and powers of employers, employees, inspectors and the Minister, the MHSA also makes provision for manufacturers and suppliers, tripartite institutions, legal proceedings and offences.

2.2.4.1. *Manufacturers and suppliers*

Section 21 covers the duty of manufacturers and suppliers in terms of health and safety. Any person who manufactures, repairs or supplies any article for use at a mine must ensure that the article is safe and without risk to health and safety when used correctly.

2.2.4.2. *Tripartite institutions*

Chapter 4 makes provision for the establishment of tripartite institutions with the task to promote a culture of health and safety and develop legislation, policies and regulations. A Mine Health and Safety Council (MHSC), other committees such as the Safety in Mines Research Advisory Committee and a Mining Qualifications Authority (MQA) is established under *Section 41*.

Sections 42 and 43 provide details of the establishment and functions of the MHSC. *Sections 45 and 46* describe the establishment and functions of the MQA.

2.2.4.3. *Legal proceedings and offences*

Chapter 7 stipulates the legal proceedings and offences. The offences that can be committed under the Act are:

- Negligent acts or omissions – *Section 86*;
- Breach of confidence – *Section 87*;
- Hindering the administration of the Act – *Section 88*;
- Falsifying documents – *Section 89*;
- Failure to attend an inquiry when summoned – *Section 90*;
- Failure to comply with the Act (including regulations) – *Section 91*.

2.2.4.4. *General provisions*

Chapter 8 deals with general provisions of the Act. It provides for the amendment of laws (*Section 99*), transitional arrangements (*Section 100*) and interpretation (*Section 101*). *Section 102* contains the definitions of the terms

used in the Act. According to *Section 103* the Occupational Health and Safety Act No. 85 of 1993 is not applicable at a mine in respect of any matter that is provided for under the MHSA.

2.2.5. MHSA Schedules

There are 8 schedules that form part of the MHSA.

Schedule 1 provides guidelines for determining the number of full-time health and safety representatives. The number of full-time health and safety representatives should be determined taking the following into account:

- The volume, nature, size and physical location of the mine;
- The health and safety record of the mine;
- The number of designated working places;
- The number of health and safety representatives;
- The number of shafts and the number of employees at the shaft; and
- The objectives of the Act.

Schedule 2 outlines the procedures for the nomination and appointment of members to tripartite institutions. Broadly speaking, members appointed to represent employees should be nominated by agreement between registered trade unions that represent at least 75% of employees in the mining industry. Members that represent employers should be nominated by agreement between employer's organisations who employ at least 75% of their employees in the mining industry.

Schedule 3 provides for the amendment of laws. Several sections of the Minerals Act No 50 of 1991 are amended by this Schedule.

Schedule 4 stipulates the provisional transitions. With this schedule certain standards, provisions and regulations of other laws that were in force prior to the commencement of the MHSA remains in force.

Schedule 5 stipulates the suspension and variation of application of the Occupational Diseases in Mines and Works Act No 78 of 1973 (ODIMWA). Several sections of the ODIMWA are repealed by this Schedule.

Schedule 6 sets out the constitution of the Mine health and Safety Council. This includes provisions and procedures for its establishment, legal status, functions, nomination and appointment of members, meetings and accountability.

Schedule 7 sets out the constitution of the Mining Qualifications Authority (MQA). It includes provisions for the MQA's constitution, objectives, functions, nomination and appointment of members and meetings.

Schedule 8 tables the maximum fines or period of imprisonment that can be imposed for offences committed under the Act. Table 1 contains the fine or period of imprisonment for convictions under the respective Sections. Fines that can be imposed vary between R 50 000 and R 1 000 000. The period of imprisonment that can be imposed varies between 6 months and 5 years. Table 2 specifies that the maximum fine that can be imposed for failure to comply with any provision of the Act or regulation is R 1 000 000.

2.3. THE MHSA REGULATIONS

Under Section 98 of the MHSA the Minister may make regulations regarding any aspect relating to health and safety at mines. This includes aspects that are not specifically addressed in the Act such as regulations about conditions for the use of explosives, machinery, equipment, material and environmental aspects. It also includes regulations regarding aspects already contemplated in the Act such as the standards for occupational hygiene measurements and medical surveillance. A summary of the regulations that have been made in terms of the MHSA are presented in Appendix B.

2.4. THE MINERALS ACT REGULATIONS

The MHSA repealed the Minerals Act No 50 of 1991 (MA). However, Schedule 4.4 of the MHSA states that any Minerals Act Regulation (MAR) relating to health and safety that can be regulated by the MHSA, remains in force until repealed under the MHSA. This means that the regulations of the MA that has not been repealed yet must still be complied with. A summary of the regulations, or parts thereof, that are still in force is presented in Appendix B.

2.5. THE STATE OF MINE HEALTH AND SAFETY IN SOUTH AFRICA

Historically, South African (SA) mines have mostly dealt with health and safety matters in a reactive manner with measures of improvement only being implemented after major incidents occurred (Pyoos, 2008). However, in the last decade or so, a shift to a more preventative approach has taken place (Pyoos, 2008). This is partly because of pressure from international bodies such as the International Labour Organisation (ILO) to improve occupational health and safety and partly because of mine workers themselves that are demanding safer working conditions (ILO, 2011; Pyoos, 2008).

The SA Government has followed global trends by investigating the working conditions at mines and subsequently developing and enforcing legislation in order to improve occupational health and safety in the mining industry (Stanton, 2003; Van Rensburg & De Lange, 2011). Stricter enforcement of legislation is evident in the growing number of Section 54 instructions that are being issued (Van Rensburg & De Lange, 2011). Section 54 of the MHSA gives inspectors the power to close all or parts of the mining operation if they identify a threat to health and safety. All indications are that the Department of Mineral Resources (DMR) will continue with the practice of stopping work in unsafe areas or mines (Shabangu, 2012; Van Rensburg & De Lange, 2011). In addition, the MHSA is currently under review in order to strengthen enforcement provisions and penalties, clarify certain definitions and ensure consistency with other laws (Shabangu, 2012). The question now, some 17 years after the promulgation of

the MHSA, is what is the current state of mining health and safety in South Africa?

Prior to 1994, the mining industry reported up to 500 occupational fatalities per year but there has been an improvement since then (Shabangu, 2012). In 1999 the South African mining industry recorded 309 fatalities and statistics further improved with 285 fatalities recorded in 2000, 202 in 2005 and 199 in 2006 (Bonelli, 2007; Hall, Sage & Dodd, 2005). More recent statistics, presented by the SA Minister of Mineral Resources, Ms. Susan Shabangu, also show an improvement, although marginal, for example 127 fatalities in 2010 compared to 123 in 2011 (Shabangu, 2012).

With the main focus on the reduction of fatalities, the number of serious and disabling injuries in the industry is often overlooked (Van Rensburg & De Lange, 2011). Again, statistics indicate an improvement with a 3 % reduction in serious injuries between 2007 (3974 reported injuries) and 2010 (3436 reported injuries) and a further reduction of 15% between 2010 and 2011 when 2918 injuries were reported (Shabangu, 2012; Van Rensburg & De Lange, 2011).

In addition to the number of mine injuries and fatalities, there is a growing concern about issues that impact the health of employees and cause occupational diseases such as Silicosis and Noise Induced Hearing Loss (NIHL). In 2010 the mines reported 4500 cases of Pulmonary Tuberculosis, 1200 cases of NIHL and 1700 cases of Silicosis and there was no improvement on the previous reporting cycle (Shabangu, 2012). According to Minister Shabangu (2012) more employees are currently losing their lives as a result of exposure to health hazards than as a result of mine accidents.

Overall, the statistics seem to indicate that health and safety in the South African mining industry is in a state of improvement. However, the statistics, as important as they are, do not adequately represent the state of health and safety in the South African mining industry (Shabangu, 2012; Van Rensburg & De Lange, 2011). According to the current SA Minister of Labour, Ms. Mildred

Oliphant, it must also be taken into account that many injuries go unreported and that the exact number of people who are injured or killed at work may never be known (Oliphant, 2012). Thus, in spite of what the statistics show, the South African mining industry is still considered to have unacceptably high rates of injuries, fatalities and diseases (Jansen & Brent, 2005; Pyoos, 2008; Shabangu, 2012).

2.6. CHAPTER SUMMARY

The Mine Health and Safety Act no 29 of 1996 (MHSA) was the result of the Leon Commission's investigation into conditions at mines. The MHSA sets out the duties, powers and rights of employers, employees, the Mine Health and Safety Inspectorate as well as the Minister in order to improve health and safety at mines. The MHSA Regulations and the Minerals Act Regulations that are still in force, provide additional guidelines on specific aspects relating to health and safety.

Although statistics show a decrease in the number of mining injuries and fatalities in the South African mining industry, it is still considered to be unacceptably high. Thus, a review of the MHSA and even stricter enforcement of legislative compliance by the Department of Mineral Resources has ensued in an effort to improve the safety performance of mining companies.

In the next chapter, the concept of safety culture and its role in improving safety performance will be discussed.

CHAPTER 3

SAFETY CULTURE

In chapter 3, the term safety culture is conceptualised and defined. Various safety culture models and the different types of safety cultures are discussed. The key components of and barriers to safety culture is identified. Ways in which organisations can improve safety culture are presented.

3.1. INTRODUCTION

The term *safety culture* was first used in the Post Accident Review Report of the International Nuclear Safety Advisory Group (INSAG) following the Chernobyl nuclear disaster in 1986 (Guldenmund, 2006; Ostrom, Wilhelmsen & Kaplan, 1993; Wiegmann, Von Thaden & Gibbons, 2007). The International Atomic Energy Agency as well as the OECD Nuclear Agency identified a “poor safety culture” as a contributing factor to this disaster (Wiegmann et.al., 2007; Zhang, Wiegmann, Von Thaden, Sharma & Mitchell, 2002). Investigations into other major industrial disasters such as the Piper Alpha oil platform explosion also highlighted the role that safety culture plays in the failure of safety systems (Gadd & Collins, 2002; Hudson, 1999; Zhang et.al., 2002).

Since these disasters, more than two decades of research has shown that safety culture plays an important role in improving safety performance across a variety of organisations and industries (Guldenmund, 2006; Wiegmann et al., 2007). If organisations are to capitalise on the proposed benefits it is necessary to understand what the term *safety culture* refers to.

3.2. THE CONCEPT OF SAFETY CULTURE

In every organisation there are certain internal characteristics such as norms, values, assumptions and attitudes that are shared by its members and this is called the “culture” of the organisation (Clark, 2002; Cooper, 2001; Hudson, 1999; Werner, 2007). Organisational culture refers to how members of the

organisation think, behave and believe. In short: how things are done around here (Cooper, 2001; Hudson, 1999; Rousseau, 1988). The prevailing organisational culture guides the behaviour of employees in their everyday work activities and provides the context that binds the different aspects of an organisation together in order to achieve corporate goals (Cooper, 2001). The culture of an organisation is primarily established by the founders or owners and those in powerful leadership positions (Burman & Evans, 2008; Guldenmund, 2006; Werner, 2007). The attitudes and behaviours displayed by the leadership cascades through every level of the organisation thus becoming the accepted way of thinking, believing and behaving (Guldenmund, 2006).

Although organisational culture is described as *shared* assumptions, beliefs, values and behaviours, organisations often have subcultures that develop from the overall or dominant culture (Werner, 2007). Subcultures usually develop because of geographical separation or departmental designations (Werner, 2007). Subsequently, if a uniform dominant culture is lacking then different sections of the organisation could have a different view of which behaviours and attitudes are acceptable or not.

Safety culture can be described as a sub component of organisational culture (Cooper, 2001; Hudson, 1999; Pater, 2012). The safety culture is reflected in how safety is managed and how safety policies and procedures are implemented in the workplace (Brazier, 2007; Kennedy & Kirwin, 1998). However, it is more than just a set of procedures that make up the Safety Management System; it also refers to the attitudes, beliefs and level of concern that members across all levels of the organisation have with regard to safety that influence their behaviour at work (Brazier, 2007; Hudson, 1999).

Geographical separation or departmental designations can also lead to the development of safety subcultures or so called 'site-level cultures' (Krause, 2004). This means that different sites can have identical safety improvement mechanisms, similar work activities and workforces and yet have very different scores on safety performance in terms of incident rates (Krause, 2004).

Safety culture is a subcomponent of organisational culture and as such the prevailing organisational culture has an influence on the safety culture (Cooper, 2001). This means that the safety culture is also primarily established and maintained by the owners and leaders and cascades down to every level of the organisation (Burman & Evans, 2008; Guldenmund, 2006). The dynamic relationship between management, employees and the working environment plays a critical role in developing and maintaining a safety culture (Clark, 2002).

The safety culture is also influenced by how organisations find solutions to safety incidents such as explosions and fatal accidents (Guldenmund, 2006). According to Reason (as cited by Hudson, 1999) the safety culture of an organisation “develops as a result of history, work environment, the workforce, health and safety practices and management leadership”.

3.2.1. Definition of Safety Culture

The literature review revealed that several definitions of safety culture have been developed over the years but it seems that there is still not a single universally accepted definition of the concept. Zhang, Wiegmann, Von Thaden, Sharma and Mitchell (2002) analysed 18 definitions of safety culture and identified certain commonalities set out below.

Safety culture:

- Is a concept defined at group level that refers to the *shared values* among all members of the group or organisation;
- Is concerned with formal safety issues and closely related but not restricted to the management and supervisory systems;
- Emphasises the contribution from everyone at every level of an organisation;
- Has an impact on its members' behaviour at work;
- Is usually reflected in the contingency between reward system and safety performance;

- Is reflected in an organisation's willingness to develop and learn from errors, incidents and accidents; and
- Is relatively enduring, stable and resistant to change.

A prominent and widely used definition was developed by the Advisory Committee on the Safety of Nuclear Installations in 1993 (Gadd & Collins, 2002) namely: The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies and patterns of behavior that determine the commitment to, and the style of proficiency of, an organization's health and safety management. Other definitions include the following:

- Safety cultures reflect the attitudes, beliefs, perceptions and values that employees share in relation to safety (Cox & Cox, 1991);
- The set of beliefs, norms, attitudes, roles and social and technical practices that are concerned with minimizing the exposure of employees, managers, customers and members of the public to conditions considered dangerous or injurious (Pidgeon, 1991);
- Those aspects of the organizational culture which will impact on attitudes and behavior related to increasing or decreasing risk (Guldenmund, 2000); and
- Safety culture is defined as the enduring value of prioritization of worker and public safety by each member of each group and in every level of an organization. It refers to the extent to which individuals and groups will commit to personal responsibility for safety; act to preserve, enhance and communicate safety concerns; strive to actively learn, adapt and modify (both individual and organizational) behavior based on lessons learned from mistakes; and strive to be honored in association with these values (Von Thaden & Gibbons, 2008).

For the purpose of this study the definition of Von Thaden & Gibbons (2008) is adopted because this definition combines the key elements for a positive safety culture as identified in the literature such as group values, personal

commitment, learning and the importance of the involvement of all levels of the organisation (Hudson, 1999, Keil Centre, 2000).

3.2.2. Safety culture versus safety climate

In the literature a similar term namely safety climate is referred to and sometimes used interchangeably with the term safety culture. Zhang, Wiegmann, Von Thaden, Sharma and Mitchell (2002) analysed 12 definitions of safety climate and identified certain aspects of safety climate as follow:

Safety climate is:

- A psychological phenomenon that can be defined as the perception of the state of safety at a specific time;
- Closely concerned with intangible issues such as situational and environmental factors; and
- A temporal phenomenon, a “snapshot” of safety culture that is relatively unstable and subject to change.

Safety climate refers to employees’ descriptions of everyday experiences and depends on a specific situation and the prevailing environment (Cooper, 2001; Zhang et al., 2002). For example, the statement “I do not wear a hard hat because it gets in the way of doing my job” reflects the climate, whereas the statement “this is a hard hat zone” reflects a behavioural norm i.e. the culture. If the employee subsequently sustains a head injury it may change their perception of the hard hat rule. Thus, safety culture refers to the prevailing behavioural norms and climate reflects employees’ perceptions of those norms and the reasons why they do or do not comply with them (Cooper, 2001).

Safety culture and safety climate are clearly interrelated but different concepts (Cooper, 2001). Safety culture is viewed as an enduring characteristic of an organisation that reflects the value and priority placed on safety by everyone in every group at all levels of the organisation whereas safety climate is viewed as

the temporary perceived state of safety at a particular place and time based on operational and environmental conditions (Wiegmann, von Thaden & Gibbons, 2007; Zhang et al., 2002).

3.3. SAFETY CULTURE MODELS

Over the years theoretical frameworks and models to explain safety culture have been developed.

3.3.1. Cooper’s Safety culture framework and models

According to Cooper (1991) there are three interrelated aspects that comprise safety culture namely, psychological, behavioural and situational aspects. These aspects are described in Table 3.1 below.

TABLE 3.1
Cooper’s Safety Culture Framework

SAFETY CULTURE		
Psychological aspects	Behavioural aspects	Situational aspects
‘How people feel’	‘What people do’	‘What the organisation has’
This aspect refers to how employees feel about safety and the safety management system in the organisation. It can also be described as the safety climate i.e. the values, attitudes and perceptions of individuals and groups at a specific point in time.	This aspect refers to which behaviours are exhibited when safety actions are performed. Management commitment is a critical behavioural aspect.	This aspect includes structures, safety management systems, policies, procedures and organisational structure.

Cooper (2001) developed this framework further into a Reciprocal Safety Culture Model, as illustrated in Figure 3.1. According to this model the three framework aspects that constitute safety culture are grouped under person, job and organisation factors and the interrelatedness between the factors are indicated.

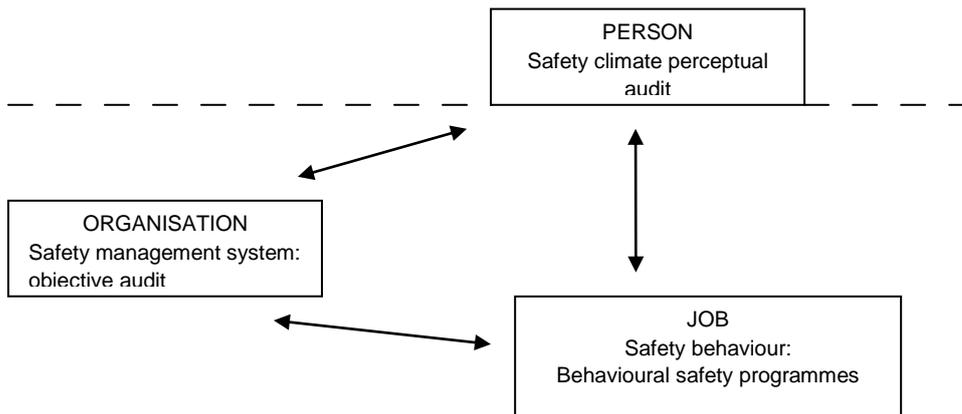


Figure 3.1 Cooper's Reciprocal Safety Culture Model (Source: Cooper, 2001, p. 16)

Cooper (2002) also developed a Business Process Model of Safety Cultures as illustrated in Figure 3.2 below. This model shows that safety culture is the output when 'transforming' the various psychological, behavioural and organizational inputs. The safety culture contributes to an outcome where the level of commitment to safety is observable as the degree of effort that all members of the organisation direct towards improving safety.

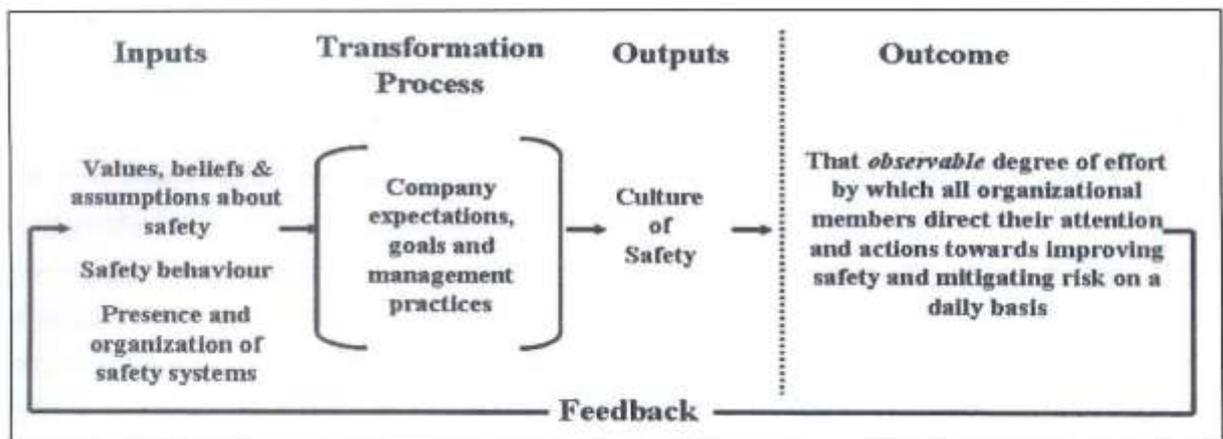


Figure 3.2 Cooper's Business Process Model (Source: Cooper, 2002)

3.3.2. Krause's Organisational Safety Model

Krause highlights the importance of leadership in influencing safety culture as illustrated in Figure 3.3 below.



Figure 3.3 Krause's Organisational Safety Model (Source: Krause, 2005)

The role of leadership is to effectively manage the interaction between equipment, facilities, procedures and the worker referred to as the *working interface*. Leadership utilises *safety enabling systems* such as hazard identification, risk assessment and training programs, as well as *organisational sustaining systems* such as selection, performance management and employee engagement to manage the working interface. The manner in which leadership combines and implements these systems establishes the organisational culture and is directly related to safety performance and culture at the working interface.

3.4. TYPES OF SAFETY CULTURE

Some researchers argue that safety culture is either present or absent in an organisation (Wiegmann, von Thaden & Gibbons, 2007). However, just as every organisation has an organisational culture, every organisation also has a safety culture as sub component thereof (Cooper, 2001; Hudson, 1999; Pater, 2012). Thus, the question is not whether an organisation has a safety culture but rather what type of safety culture exists or prevails in the organisation. Different models to explain the type of safety culture that is present in an organisation have been developed.

3.4.1. Westrum’s Safety Culture Model

Westrum (as cited in Hudson, 1999) developed a safety culture model based on the manner in which organisations process and respond to information. This model describes three basic types or stages of safety culture namely Pathological, Bureaucratic and Generative. A summary of Westrum’s three cultures in relation to dealing with various aspects of communication is presented in Table 3.2 below.

TABLE 3.2
Westrum’s Types of Safety Cultures

Elements of culture	Type of safety culture		
	Pathological	Bureaucratic	Generative
Information	Hidden	Ignored	Sought
Messengers	Shouted	Tolerated	Trained
Responsibilities	Shirked	Boxed	Shared
Reports	Discouraged	Allowed	Rewarded
Failures	Covered up	Merciful	Scrutinized
New ideas	Crushed	Problematic	Welcomed
Resulting organization	Conflicted organization	“Red tape” Organization	Reliable organization

At the pathological stage there is a *closed* culture in terms of communication. Information is hidden or withheld and messengers are shouted into silence. Management tends to delegate their responsibilities and abdicate their accountability, while reporting of deviations or shortcomings is discouraged and failures are covered up. Any new ideas are criticized and discarded. At this stage the organisation is not even interested in hearing information about safety related issues and concerns and even less interested in acting on it.

At the bureaucratic stage management deals with safety information as required by legislation, policies and procedures. Some information is still ignored and messengers are tolerated to an extent. Acceptance of accountability and responsibilities are restricted to certain designations for example the Health and Safety Manager. Reporting of deviations is allowed and employees are generally “forgiven” for failures because at this stage management believes that accidents are caused by stupidity, inattention and even wilfulness of employees. New ideas are considered but the implementation thereof remains problematic.

The generative stage involves a more proactive approach to safety. Information about safety issues and concerns are actively sought and the necessary channels to gather and share information are provided. Messengers are trained and reporting of deviances is encouraged to the point of being rewarded. Management accepts their accountability for safety matters and responsibilities are shared between all concerned. Failures are taken seriously and are investigated to determine the causes and appropriate preventative actions. Following a proactive approach, new ideas and ideas for improvement are welcomed.

3.4.2. Hudson’s Safety Culture Model

Hudson’s model (1999) was developed in co-operation with and expanded on Westrum’s model. A summary of Hudson’s description of types of safety culture is presented in Table 3.3 on the next page.

TABLE 3.3

Hudson's Types of Safety Culture

	PATHOLOGICAL	REACTIVE	CALCULATIVE	PROACTIVE	GENERATIVE
COMMUNICATION	Nobody is informed No feedback given Everybody is passive No knowledge about safety Don't care about safety Collect what is legally required	Management demands data on HSE failures Denial until forced to admit Top-down flow of information Lots of statistics Safety is a hot issue after accidents	Environment of command and control by management, lots of HSE graphs and statistics but no follow up, info goes top down, failure bottom up, little top down feedback, toolbox meetings, procedures exist but are only once read Action is delayed after knowledge.	Management goes out and seek, discuss for themselves they know what to change and how to manage, the feedback loop (bottom-up and top-down) is closing at supervisory level Safety topics become part of other meetings, asked for by workforce, they need detail to understand WHY accidents happen.	No threshold between management – workforce, management participates / shares activities (dialogue) HSE is nr 1, all feedback loops are closed, safety is integrated in other meetings, no special safety meetings required, workforce keeps itself up to date, they demand information so they can prevent problems.
ORGANISATIONAL ATTITUDES	No belief or trust Environment of punishing, blaming and control	Failures caused by individuals. No blame but responsibility, workforce needs to be educated and follow the procedures. Management overreacts in the eyes of the workforce	Workforce is more involved, little effect on procedures, designs, practices Workforce does not understand the problem, management is seen as obsessive with HSE, but they don't mean it. (Walk-talk)	Workforce involvement is promoted but ruled / organized by supervisory staff which is obsessed by HSE statistics	Management is recognized as a partner by workforce, management respects workforce, management has to fix systematic failures; workforce has to identify them.
HEALTH, SAFETY AND ENVIRONMENT (HSE)	HSE issues are ignored Meet minimum requirements No rewards for good performance Reliance on experience Safety is inherited	Meets legal requirements Statistics are collected but no follow up, design is changed after accidents, and procedures are rewritten to prevent previous accidents. No updates or improvements	HSE well accepted, advisor collects data and creates own statistics, HSE rewards for positive and negative performance, design: quantitative methods, procedures to solve unsolved problems, standard procedures preferred from the shelf, large number of procedures but few checks on use/knowledge	Separate line HSE advisors promoting improvement, but try to reduce the inconvenience to line, for good HSE initiatives there is career enhancement for Snr. Staff, HSE is in the early stages of design, procedures are rewritten by workforce, integration with competency, complaints about externally set targets.	HSE department is small, advising the management on strategy, group, no special rewards, individual pride, procedures are written by workforce, continuous improvement, small numbers of procedures are integrated in training.
ORGANISATIONAL BEHAVIOUR	Denial of problems Avoidance of discussions Focus on profits not workforce Resistant to change	Management holds workforce responsible for failures. Management states that it takes safety seriously but is not always believed by workforce	Detail focused / playing with numbers, believe company is doing well in spite of contrary, targets are not challenged, inability to admit that solutions may not work the first time	Management knows the risks, interested in HSE, takes culture into account, safety priority over production which leads to incompatible goals, lots of management walk-about, communication and assessments about accidents and near-misses and their consequences.	Safety is equal to production, enthusiastic communication between workforce and management Workforce has a lot of freedom > trust.
WORKING BEHAVIOUR	Workplace is dangerous and messy No health standards Management does not CARE and does not KNOW	Basic legal requirements implemented Housekeeping is temporarily improved when inspection comes Management KNOWS but not always CARES	Clean and tidy working environment, housekeeping is very important (prizes) Management CARES but not always KNOWS	Management CARES and KNOWS. Discussion about prioritization, time and resources are available for improvements even before accidents happen.	Management CARES and KNOWS. Workforce furnishes its own environment; management passes the experience around to other sites.

Hudson's model (1999) offers an extended and more practical version of Westrum's original model. In addition to aspects relating to communication,

other elements of culture were added namely, organisational attitudes, health, safety and environment (HSE), organisational behaviour and working behaviour. The bureaucratic stage, although remaining basically the same in principle, was renamed to the calculative stage. Changing to the term 'calculative' is meant to show that at this stage safety is *calculated*. In other words quantitative risk assessments and cost-benefit analyses are utilised to justify and measure safety.

Two additional stages were included namely the reactive and proactive stages. At the reactive stage, safety issues begin to gain importance often as a result of internal or external factors such as having a serious or fatal accident. At the proactive stage management start to believe that safety is worthwhile in its own right and subsequently actively seek to improve safety and to implement preventative measures.

According to Hudson (1999) safety culture develops along a continuum of stages from pathological, not caring about safety, through calculative, blindly following steps and regulations, to generative, where safe behaviour is an integral part of every aspect of the business. Safety performance will improve as the culture matures through the stages but an organisation can only start claiming to have a 'culture of safety' once the calculative stage has been passed. Thus, the optimal stage of safety culture can only be achieved in an organisational context where the technical steps and procedures are already in place. The stages of safety culture are illustrated in figure 3.4 below.

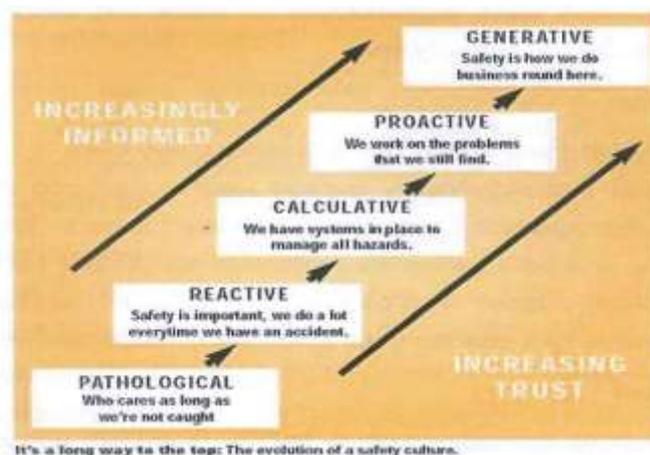


Figure 3.4 Hudson's Model (Source: Carelse, 2011)

3.4.3. The Safety Culture Maturity Model

The Safety Culture Maturity Model (SCMM) was developed by the Keil Centre (2001). Based on the most common components of theoretical as well as measurement models, the SCMM identifies 10 elements of safety culture, namely:

- Management commitment and visibility
- Communication
- Productivity versus safety
- Learning organisation
- Safety resources
- Participation
- Shared perceptions about safety
- Trust
- Industrial relations and job satisfaction
- Training

The maturity of an organisation's safety culture is determined by the level of their maturity on each of these elements. An organisation can be at different levels of maturity on each of the elements and therefore the average outcome will give an indication of the overall safety culture maturity of the organisation.

The SCMM consists of five iterative stages as illustrated in Figure 3.5 on the next page. Much in the same fashion as Hudson's model, this model purports that organisations progress sequentially through the levels and that safety performance will improve, i.e. accident rates will decline, as the organisation's culture matures. The SCMM is also based on the assumption that the technical and systems aspects of safety are in place and working adequately.

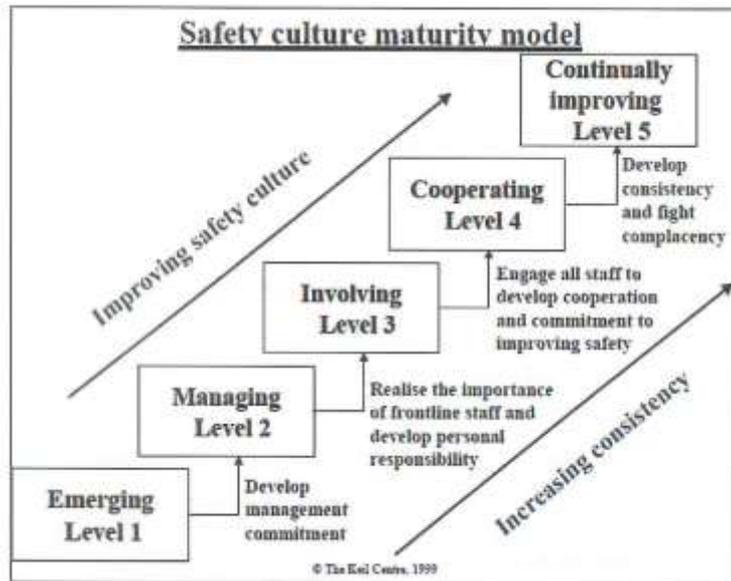


Figure 3.5 Safety Culture maturity model (Source: Keil Centre, 2001)

These five stages of safety culture that organisation's progress through are described as follow:

Level 1: Emerging

On Level 1 safety is viewed in terms of technical solutions and compliance with regulations. Safety is not considered to be a key business risk and the primary responsibility for safety is placed on the safety department. Accidents are seen as being part of the job and therefore unavoidable. Most employees are not interested in safety unless as the basis for swinging other arguments in their favour such as effecting changes in shifts.

Level 2: Managing

On Level 2 safety is viewed in terms of adherence to policies, procedures and engineering controls. Safety is considered to be a business risk and because accidents are seen as being preventable Management asserts their time and effort into accident prevention. Safety performance is measured by means of lagging indicators and incentives are based on reduced injury rates. Senior

managers are still reactive towards health and safety and use punishment when accident rates increase.

Level 3: Involving

On Level 3 the organisation views the involvement of all employees in health and safety as crucial to achieve future improvements. Management recognises that accidents are caused by a wide range of factors that often originate from management decisions. A significant portion of the workforce is willing to work with management to improve health and safety and to accept personal responsibility for their own health and safety. Safety performance data is actively gathered and applied effectively.

Level 4: Cooperating

On Level 4 health and safety is considered to be important both from a moral and economic point of view. The majority of the workforce accepts personal responsibility for their own and other's health and safety and the importance of all employees feeling valued and respected is recognised. Significant effort and resources is put into proactive measures to prevent accidents. Safety performance is actively monitored and a healthy lifestyle is promoted.

Level 5: Continuous improvement

On Level 5 the prevention of all injuries or harm to employees is a core company value. All employees share the belief that health and safety is a critical part of their job and that the prevention of accidents is important. The organisation has had a sustained period without reportable incidents but has not grown complacent because there is a feeling that the next accident can happen at any time. A range of indicators are utilised to monitor safety performance but it is not linked to incentives because everyone has confidence in the process. The organisation invests considerable effort and resources in promoting health and safety both at work and at home.

3.5. KEY ELEMENTS OF SAFETY CULTURE

From the discussion so far it is evident that safety culture consists of certain elements or key indicators and that an organisation's safety culture is distinguished by its maturity on each of the elements. If an organisation intends to develop its safety culture it is critical that the key elements of safety culture be identified. Several characteristics or key indicators of safety culture have been identified in the literature as summarised in Table 3.4 on the next page.

There seems to be considerable variations in the proposed elements of safety culture but some common factors can be identified, namely:

- Leadership and management commitment
- Communication and feedback
- Integrating production and safety
- Employee participation
- Safety systems and resources
- Training
- Learning organisation

3.6. IMPROVING SAFETY CULTURE

The safety culture model of Hudson (1999) and the SCMM developed by the Keil Centre (2000) purports that organisations can exhibit a type of safety culture on a continuum that ranges from poor to excellent. This implies that safety culture can change or improve over time as the organisation's performance on the different elements of safety culture develops and matures. It is suggested that organisations move incrementally through the stages or levels by building on the strengths and overcoming the weaknesses of the previous (Hudson, 1999; Keil Centre, 2000). The question is how can an organisation develop and mature on each element in order to achieve an optimal safety culture?

TABLE 3.4

Key Elements of Safety Culture

<p>Reason (1997)</p> <ul style="list-style-type: none"> - Informed culture - Reporting culture - Just culture – no blame but clear guidelines - Flexible culture - Learning culture – draw conclusions and learn from safety information 	<p>Hudson (1999)</p> <p><u>Communication</u></p> <ul style="list-style-type: none"> - Flow of safety information - Management informed - Workforce informed <p><u>Organisational attitudes</u></p> <ul style="list-style-type: none"> - Workforce attitude towards management - Management attitude towards workforce - Collective efficacy <p><u>Safety</u></p> <ul style="list-style-type: none"> - Status of Safety Department - Reward of safety performance - Procedures - Design aspects <p><u>Organisational behaviour</u></p> <ul style="list-style-type: none"> - Managerial style - Level of care - Dealing with change - Reaction to trouble <p><u>Working behaviour</u></p> <ul style="list-style-type: none"> - Production versus safety - Risk awareness - On-site behaviour - Environment seen as critical 	<p>Keil Centre (2000)</p> <ul style="list-style-type: none"> - Management commitment and visibility - Communication - Productivity versus safety - Learning organisation - Safety resources - Participation - Shared perceptions about safety - Trust - Industrial relations and job satisfaction - Training
<p>Cooper (2001)</p> <ul style="list-style-type: none"> - Quality of safety leadership - Quality of risk control systems - Quality of safety management information system - Safety management system audits - Quality of job and safety training - Good safety climate - Employee involvement in safety - Status of safety practitioners 	<p>Krause (2004)</p> <p><u>Organisational factors</u></p> <ul style="list-style-type: none"> - Procedural justice - Leader-member exchange - Management credibility - Perceived organisational support <p><u>Team factors</u></p> <ul style="list-style-type: none"> - Work group relations - Team work <p><u>Safety specific factors</u></p> <ul style="list-style-type: none"> - Organisation's value for safety performance improvement - Upward communication - Approaching others 	<p>Wiegmann, Von Thaden & Gibbons (2007)</p> <p><u>Organizational Commitment</u></p> <ul style="list-style-type: none"> - Safety values - Safety fundamentals – regulative compliance - Going beyond compliance <p><u>Operational Personnel Involvement</u></p> <ul style="list-style-type: none"> - Supervisors / Foremen - Maintenance supervision - Trainers <p><u>Formal Safety System</u></p> <ul style="list-style-type: none"> - Reporting system - Feedback and response - Effectiveness of safety personnel <p><u>Informal Safety System</u></p> <ul style="list-style-type: none"> - Accountability for unsafe behavior - Authority to make decisions - Employee professionalism

3.6.1. Safety Culture Change Models

According to Hudson (1999) a managed change process is needed for an organisation to develop along the continuum towards a “true” safety culture. The next culture in the line defines *where* the organisation wants to go and a change model determines *how* the organisation is going to get there.

Models for organisational change can certainly be applied to the safety culture change process (Hudson, 1999). However, models have been developed specifically for safety culture change.

3.6.1.1. *The safety enhancement process model*

The Civil Air Navigation Services Organisation (CANSO) developed a model for a systematic and closed-loop process for enhancing safety culture (CANSO, 2008). This process is illustrated in Figure 3.6 on the next page.

Firstly, the organisation must define its safety culture vision. Leadership and employees must have a clear picture of which stage or level of safety culture they aspire to achieve. Any one of the well-known models of safety culture can be utilised to define this vision.

Secondly, the drivers of the aspired safety culture must be identified. These drivers are basically the elements of safety culture as described by the safety culture model that was selected. It may include aspects such as management and safety systems, plans and procedures.

Thirdly, the current safety culture must be measured utilising any of the available measurement tools and depending on the elements of safety culture that the organisation wants to measure. Examples of safety culture measurement tools are questionnaires, interviews, observations and audits.

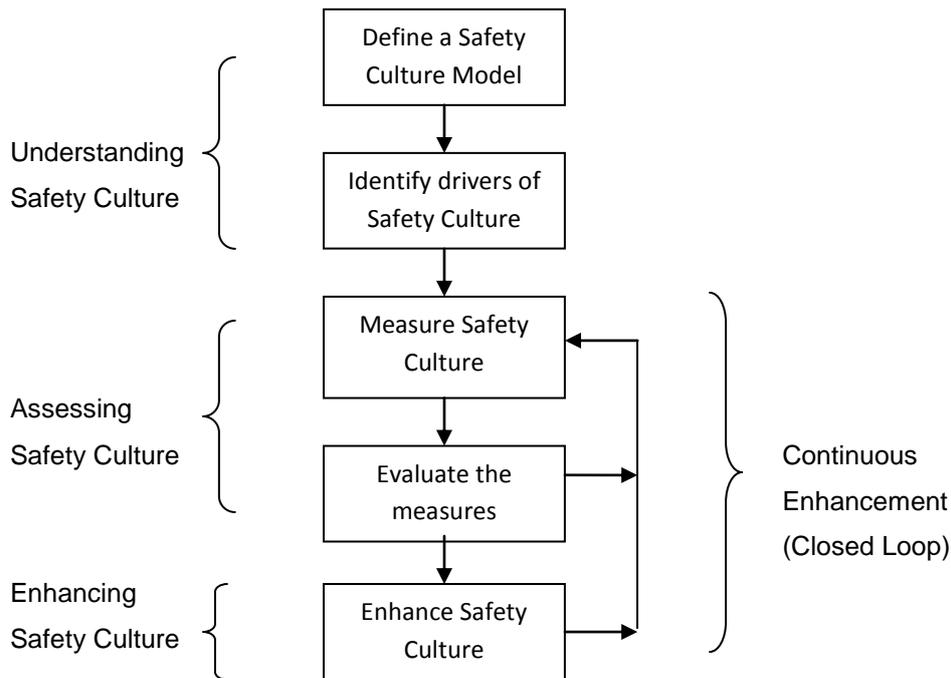


Figure 3.6 Safety culture enhancement process (Source: CANSO, 2008)

The fourth step involves the analysis, evaluation and presentation of the measurement results. In this step the strengths and weaknesses of the current safety culture are identified. The results may be presented by means of frequency charts, radar plots or in any other appropriate manner.

Finally, enhancement strategies and action plans must be developed to build on the strengths and address the weaknesses that were identified. Follow up on actions and feedback to employees is crucial to close the loop and ensure the effectiveness of the process. The measuring, evaluating and enhancing steps are repeated on an ongoing basis to ensure continuous enhancement.

3.6.1.2. The MHSC culture transformation implementation model

The Mine Health and Safety Council (MHSC) developed a culture transformation implementation model as part of their *Change Minds, Change Mines* project (MHSC, 2008). The purpose of the model is to assist mines in implementing the Culture Transformation Framework (CTF) that was developed to affect the cultural change needed towards attaining zero harm in the mining sector and is very specific to this sector.

The culture transformation implementation model consists of five ‘pillars’ or elements that need to be addressed namely, leadership, risk management, bonuses and performance incentives, leading practices and elimination of discrimination. The model provides a description in terms of the minimum standards required for each pillar as presented in Table 3.5 below.

TABLE 3.5

Pillars Of The Culture Transformation Implementation Model

PILLAR	DESCRIPTION (MINIMUM REQUIREMENTS)
1. Leadership	<p>A leadership programme for all leadership levels, which includes as a minimum:</p> <ul style="list-style-type: none"> a) An annual performance assessment. b) A development programme to include visible leadership. c) A visible leadership programme with measurable targets. d) A programme to effectively engage and empower workers.
2. Risk management	<p>Risk management should always focus on measures to prevent accidents and such measures should be based on objective risk assessments. Accident investigation system is a priority and must include as a minimum:</p> <ul style="list-style-type: none"> a) A distinction between different types of human error. b) An implicit consideration of organizational system issues. c) A regular evaluation carried out by a multi-functional internal stakeholder team to determine effectiveness.
3. Bonuses and Performance incentives	<p>Bonuses and performance incentives can send mixed messages that production is more important than ZERO HARM. Strive to have a ZERO HARM operations bonus system across ALL levels that:</p> <ul style="list-style-type: none"> a) Enhances safe and healthy production. b) Includes a combination of leading and lagging indicators. c) Includes a regular evaluation of whether those affected by the bonus system understand it and considers it fair.
3. Leading practices	<p>There will be a common approach to identifying and facilitating the adoption of leading OHS practices and research outcomes, which includes:</p> <ul style="list-style-type: none"> a) Involvements on all levels. b) Leadership support. c) Adequate training and technical support. d) Monitoring of progress.
4. Elimination of discrimination	<p>Racism, genderism and any other form of unfair discrimination are obstacles to the kind of workplace relationships that are conducive to achieve ZERO HARM and should be eliminated with diversity management programmes.</p>

The next part of the model consists of an action plan for addressing each pillar and outlines activities, responsibility and time frames. In general, the action plan consists of the following main activities for each pillar:

- Conduct a gap analysis against the set standard for each pillar;
- Adjust company policies and practices to address the gaps; and
- Continue with these activities until the standards are achieved.

3.7. BARRIERS TO SAFETY CULTURE

If there were no barriers to safety culture then the development of it would not pose a problem for organisations and organisations everywhere would exhibit a “culture of safety” without much effort (Hudson, 1999). Several aspects relating to the beliefs and practices of an organisation, its leaders and its members have been identified as posing a barrier to the development of an optimal safety culture and the most prominent are highlighted in the next sections.

3.7.1. Bureaucratic organisations

The number and formality of procedures and lines of authority may constrain the effort of empowering employees (Hudson, 1999; Flynn & Shaw, 2011). Obsolete rules and procedures for routine tasks may lead to employees finding ways to cut steps out of the process (Krause, 2005; Flynn & Shaw, 2011).

3.7.2. Regulators and the law

Health and safety legislation and regulators such as inspectors can actually pose a barrier to the development of safety culture (Hudson, 1999). This happens if inspectors tend to focus more on the letter of the law and regulations rather than the “spirit of safety”. Subsequently, organisations tend to focus more on complying with minimum legal requirements such as appointments and extensive documentation systems in order to satisfy inspectors and thus a proactive approach is discouraged.

3.7.3. Competing goals and resources

When functional areas of the organisation such as production receives higher priority and more financial and other resources than the safety function it poses a barrier to the development of safety culture (Flynn & Shaw, 2011; Williams, 2008). This happens when production is overemphasised at the expense of safety. Employees may also complain that safety is more work and more meetings and that it interferes with their “real” work (Hudson, 1999).

3.7.4. Incentive or reward programs

Some organisations implement as system whereby employees are rewarded with incentive or bonus schemes if they manage to work a certain period without incident or injury (Williams, 2008; Zisso, 2011). If incentives and rewards are not implemented cautiously it may discourage employees not to report incidents and to hide injuries or near misses (Williams, 2008; Zisso, 2011). Overemphasising the improvement of incident statistics at the expense of demonstrating real concern for safety poses a barrier to the development of safety culture (Williams, 2008).

3.7.5. Lack of communication and feedback

Employees should be kept up to date about safety issues as well as progress on solutions and improvement efforts (Williams, 2008). Management should give employees regular corrective feedback as well as praise for safety performance where deserved (Williams, 2008). Weaknesses in the communication interface may cause confusion and lack of involvement and different management styles between departments may create inconsistencies in the message sent (Flynn & Shaw, 2011).

3.7.6. A culture of blame and punishment

Placing direct blame or responsibility on employees and their actions for accidents without identifying the contributing system and process factors is a sure way to damage safety culture (Williams, 2008; Zisso, 2011). Although punishment is appropriate when employees keep on defying safety rules, it should not be implemented excessively or inconsistently because fear of these negative consequences may discourage employees from reporting incidents (Williams, 2008).

3.7.7. Safety Management Systems

A safety management system may go a long way in creating safety culture but a poorly designed, badly implemented and ineffective safety management system can also have a destructive influence on the overall safety culture (Perdue, 2009). Where the safety management system has failed the organisation may revert back to their old, outdated practices on the grounds that it worked before (Hudson, 1999). On the other hand, where the safety management system is very successful it may breed complacency (Hudson, 1999). Once a significant safety improvement is achieved, effective processes, tools and systems may be neglected or even stopped on the grounds that the problem was effectively addressed (Hudson, 1999).

3.7.8. Resistance to change

Organisational change is a planned process aimed at achieving a specific goal (Werner, 2007). Change usually requires people to move out of their comfort zones to think and behave differently than what they are used to. As a result, a change process at its best is uncomfortable and often resisted by employees as well as management (Werner, 2007). This is especially true when there is a belief that the current situation or system is satisfactory and then employees may feel that there is no real reason or urgency for change (Hudson, 1999).

The successful management of change is therefore a key factor in any change process, also when the goal is to change the safety culture (Werner, 2007). The most effective way to overcome resistance to change is to implement a managed change process (Hudson, 1999) and allow employees to participate in all aspects of the planning and implementation of the change process and subsequently have an influence on the safety improvement process (Cooper, 2001; Werner, 2007).

3.7.9. Management failure

It has been established that management commitment is a critical element of safety culture. If management fails to demonstrate that they embrace safety as a value instead of just viewing it as a goal to be achieved, it poses a barrier to the development of safety culture (Flynn & Shaw, 2011; Hudson, 1999). The most prominent leadership deficiency that poses a barrier to safety culture is that of not leading by example in terms of safety (Krause, 2005).

3.8. CHAPTER SUMMARY

In this chapter the term safety culture was conceptualised and defined. Different models that explain safety culture and describe the types of safety cultures that may exist in organisations were discussed. The key elements of safety culture were identified. Models for the improvement of safety culture were discussed. Finally, the factors that pose a barrier to the development and improvement of safety culture were identified and discussed.

In chapter 4, the concept of safety leadership and its role in safety culture will be discussed. A discussion of safety leadership models and methods to improve safety leadership will be included.

CHAPTER 4

SAFETY LEADERSHIP

In this chapter the term safety leadership is conceptualised. The elements of effective safety leadership is identified and discussed. Various theoretical models of safety leadership are described and an integrated model for safety leadership is presented. Various methods for improving safety leadership are discussed and a safety leadership development model is proposed.

4.1. INTRODUCTION

Research has established that an organisation's safety culture plays an important role in its safety performance (Guldenmund, 2006; Wiegmann, Von Thaden & Gibbons, 2007) and that leadership and management commitment to safety is one of the key elements of an optimal safety culture (Keil Centre, 2000; Krause, 2004). Research on the factors that distinguish organisations that are successful with their safety improvement initiatives from those that are less successful or that have failed has shown that *quality of leadership* is the most important distinguishing factor (Flynn & Shaw, 2009; Krause, 2004).

In addition, research has shown that safety is a valid leadership focus because it provides a starting point for engaging employees in meeting organisational goals and also correlates with strong business performance (Krause & Weekley, 2005). Thus, organisations that are interested in establishing a safety culture to improve safety as well as business performance would do well to develop the quality of their safety leadership (Boyd, 2008; Clark, 2002; Cooper, 2001; Dunlap, 2011; Flynn & Shaw, 2011; Krause, 2004; Krause, 2007; Krause & Weekley, 2005; Pater, 2012). Subsequently, the critical questions are: What is safety leadership and how can it be improved?

4.2. THE CONCEPT OF SAFETY LEADERSHIP

Research has established the pivotal role of leadership in safety (Boyd, 2008; Clark, 2002; Cooper, 2001; Dunlap, 2011; Flynn & Shaw, 2011; Krause, 2004; Krause, 2007; Krause & Weekley, 2005; Pater, 2012). Thus, it is important that organisations understand what the concept of safety leadership refers to.

4.2.1. Definition of safety leadership

The same factors that contribute to effective leadership in operational areas such as quality and production also contribute to effective safety leadership (Cooper, 2001). Therefore, an understanding of what safety leadership is could be derived from understanding the concept of leadership in general.

Leadership, at its most basic, can be defined as a “social process of influencing people to work voluntarily, enthusiastically and persistently towards a purposeful group or organisational goal” (Werner, 2007, p. 288). Leaders focus on developing long term strategies to achieve organisational goals; they create a vision and inspire people to achieve that vision (Werner, 2007). In short, a leader is someone who influences other people’s behaviour to achieve certain goals.

In terms of safety the goals that need to be achieved are the prevention of incidents and the reduction of injuries and this is commonly referred to as safety performance improvement (Jones, 2006; Petersen, 2004). Essentially, safety leadership is the interpersonal influence that a leader exercises in order to achieve the organisation’s safety performance goals (Petersen, 2004).

Safety leadership involves influencing the safety culture by creating norms and displaying consistent behaviours to shape the desired type of safety environment (Krause, 2004). Leaders look beyond the numbers and strive to create optimism for safety by increasing employees’ competence, personal control and participation in safety activities (Geller, 2000). Safety leaders hold

employees accountable for behaving proactively to prevent injuries and in doing so, develop a sense of personal responsibility for continued participation and improvement (Geller, 2000).

Research by DuPont identified the concept of *felt* leadership as a factor that is shared by organisations with truly sustainable safety cultures (Schweitzer, 2012). In the area of safety, *felt* leadership:

- Is easily observable.
- Clearly demonstrates belief in safety.
- Makes a positive impression on employees.
- Demonstrates a personal commitment.
- Pervades the organisation.
- Affects all levels of employees.
- Involves all levels of employees.

Cooper (2001, p. 30) offers a description of safety leadership that, for the purpose of study, is applied as a definition of the concept. He states that:

Effective safety leadership requires senior managers to develop and implement a strategic plan for safety that captures the hearts and minds of the organisation's employees and personally demonstrate excitement and enthusiasm for the changes. They must model the behaviours that others are expected to follow, while also maximizing the use of the organisation's resources to deliver a productive but safe working environment.

4.2.2. Who are the safety leaders?

If organisations are interested in improving safety leadership it is important to know on which people their efforts should be focused. As discussed, leadership is about influencing other people's behaviour to achieve certain goals. In this context, leadership is not necessarily restricted to a leading or managerial

position and anyone at any level of the organisation can exert influence on others (Werner, 2007).

Traditionally, the function of implementing and leading safety initiatives were relegated solely to safety professionals that, depending on the organisational structure, operated with or without organisational authority (Dunlap, 2011; Williams, 2002). The important role of middle management and supervisors in influencing safety behaviours especially on the lower levels and usually with organisational authority, have also been established (Clark, 2002; Drennan & Richey, 2012). However, only leaders and senior managers make decisions about resources and organisational direction and only leaders can instil safety as a value within the organisation (Boyd, 2008; Clark, 2002; Dunlap, 2011).

Leaders and managers set the vision and goals for safety while supervisors and safety professionals ensure that critical safety functions are performed in support of the vision and goals (Cooper, 2001; Drennan & Richey, 2012; Krause, 2004). This does not mean that safety professionals and lower levels should be excluded but merely that safety leadership development initiatives should start at the top i.e. with managers (Cooper, 2001; Flynn & Shaw, 2009; Krause, 2004; Pater, 2012).

4.3. THE ELEMENTS OF SAFETY LEADERSHIP

If organisations wish to develop and improve safety leadership to achieve an optimal safety culture, it is important to identify the elements that make up effective safety leadership. Researchers have identified several elements that contribute to effective safety leadership. For ease of reference these elements are grouped into five main categories namely personal attributes and values, knowledge and experience, safety management, leadership style and leadership behaviours.

4.3.1. Personal attributes and values

Earlier approaches to leadership namely the trait theories attempted to identify certain personality traits that distinguished leaders from followers (Werner, 2007). These theories implied that people with certain personal characteristics make better leaders than those without the specific characteristics. Current theories on leadership acknowledge that leadership is a complex issue that is not only influenced by the leader's characteristics but also situational factors such as the nature of the task and external factors such as the socio-economic environment (Werner, 2007). Nonetheless, leadership is in essence a personal activity and the leader's personality and values will have an influence on their safety leadership (Krause & Weekley, 2005; Landsberg, 2000).

4.3.2. Knowledge and experience

In recent literature, knowledge and experience of the business has been identified as one of the core competencies of leadership (Werner, 2007). Knowledge of the business, its technology and standard operating procedures is also important in safety leadership (Carrillo, 2002). Safety leaders must know the workplace, understand the hazards and risks associated with performing the job and be aware of the real safety conditions and issues in the workplace (Flynn & Shaw, 2009; Krause & Weekley, 2005).

Knowledge and experience of the business and the hazards associated with the work is also a legal requirement. Section 7 (d) and (e) of the Mine Health and Safety Act 29 of 1996 (MHSA) requires employers to ensure that work is performed under the general supervision of someone who understands the workplace hazards and has the authority to implement and enforce the necessary precautionary measures.

Effective safety leaders must also acquire a thorough understanding of the organisation's safety management system (Krause & Weekley, 2005). Safety leaders should also make an effort to know the requirements for compliance

with occupational health and safety legislation and regulations and not only depend on safety professionals for this information (Drennan & Richey, 2012).

4.3.3. Safety management

Research shows that effective safety leadership also involves certain management activities (Geller, 2000). Organisations must have an effective system in place for the management and coordination of safety activities. This system should be led by the most senior person in the organisation, with the support of managers and safety professionals (Flynn & Shaw, 2009; Krause & Weekly, 2005).

In the literature a distinction is usually made between safety management and safety leadership (Geller, 2000; Krause, 2004; Krause, 2007). Simply stated, safety management refers to “what gets done” on site-level and has an impact on safety improvement mechanisms and safety leadership refers to “how it gets done” and has an impact on overall safety culture (Krause, 2004; Krause, 2007).

Safety management activities include the implementation and monitoring that site-level safety mechanisms such as incident investigation, safety committees, hazard identification, risk assessment, safe procedures, checklists, and safety data reporting are in place and are implemented adequately and effectively (Krause, 2004). Managers are held accountable for safety outcomes and utilise injury numbers to motivate employees to improve safety (Geller, 2000).

Performing these tasks is also a legal requirement as per various Sections of the Mine Health and Safety Act 29 of 1996. For example: Hazard identification and incident investigation (Section 11), establishing safety committees (Section 34), safety data reporting (Section 2) and compiling safe procedures or codes of practices (Section 9).

In general, management and leadership functions are both concerned with determining goals and objectives, making decisions about what must be done and motivating employees to do what is needed (Cooper, 2001; Werner, 2007). Thus, it is often expected that leaders should be able to manage and that managers should also be able to lead (Werner, 2007). In a safety context, managers must know when to be safety leaders and vice versa because the achievement of an optimal safety culture requires both safety management and safety leadership (Geller, 2000).

4.3.4. Leadership Style

The quality of leadership is crucial to safety improvement and research has shown a direct relationship between leadership style and safety outcomes (Clarke, 2013; Jones, 2006; Krause, 2007; Zohar, 2002). Over the years several perspectives about leadership style have been developed that has resulted in a number of leadership theories and models (Werner, 2007). The question is which leadership style would be most appropriate for safety?

Two broad leadership styles have been determined namely transactional and transformational leadership (Werner, 2007). In transactional leadership the leader offers rewards for achieving goals and punishment for failing to achieve goals. In transformational leadership the leader creates a vision and communicates it in such a convincing manner that followers identify with the vision and start to pursue it as a personal goal.

Studies about the impact of transactional and transformational leadership styles on safety concluded that a combination of transactional and transformational leadership is the most effective (Clarke, 2013; Cooper, 2001; Krause & Weekley, 2005; Zohar, 2002). A transactional leadership style is necessary to ensure compliance with safety rules and regulations while a transformational leadership style is important in ensuring employee buy-in and participation in safety (Clarke, 2013; Cooper, 2001; Zohar, 2002). Transactional leadership closely relates to safety management activities such as goal setting and

allocation of resources thus developing a transformational style would be an effective way to complement safety performance (Jones, 2006). Leaders cannot create excellent safety performance on the merits of leadership style alone. Reducing workplace exposure and injuries requires a combined and rigorous attention to the combination of leadership, culture, equipment, and systems that affect how work is done (Jones, 2006).

4.3.5. Leadership Behaviours

Safety management is necessary but such activities are not enough to achieve safety culture (Geller, 2000). Safety leadership goes beyond talking about safety; it is about behaviour (Schweitzer, 2012). In safety leadership, behaviour is a combination of the leader's personal traits, skills and influencing style altered by the situational demands and constraints (Krause & Weekley, 2005; Petersen, 2004).

Several authors, for example Krause (2004), Carrillo (2002), Flynn & Shaw (2009) and Dunlap (2011), have identified safety leadership principles or key leadership practices that are likely to promote an optimal safety culture. These safety leadership behaviours include vision, credibility, collaboration, feedback and recognition, accountability, business integration, action orientation and learning orientation.

4.3.5.1. Vision

Safety leadership starts with a vision for safety (Krause, 2004). This means that the most senior executive must have a clear picture of what safety performance excellence looks like for the organisation. The safety leader must convey the vision in a compelling manner and this is most effectively done through actions and not only words (Carrillo, 2002).

4.3.5.2. *Credibility*

Safety leaders must be credible in other words when they say something others believe them because their decisions and actions consistently match what they say (Carrillo, 2002; Flynn & Shaw, 2009; Krause, 2004). This involves being willing to admit one's mistakes to others and representing and protecting the interests of the group. It also includes giving honest information about safety performance even if not well received and acting consistently in setting and applying safety standards (Krause, 2004). Senior management must set an example and challenge unsafe behaviours and not reinforce the notion that these behaviours are acceptable (Flynn & Shaw, 2009).

4.3.5.3. *Collaboration*

Collaboration means working well with other people and promoting communication and participation in safety (Krause, 2004). This includes asking input from people on issues that will affect them, helping people to resolve problems for themselves and encouraging others to implement ideas and solutions to improve safety (Krause, 2004). All employees should be involved by contributing ideas for improvement and encouraged to become aware what safety performance means in terms of their own jobs (Flynn & Shaw, 2009). Employees have the most vested in their personal safety and they know the job and what needs to be done to perform it safely (Dunlap, 2011). The relationship must be balanced so that employees can participate in safety while management provides the appropriate amount of leadership (Dunlap, 2011).

Effective communication from management to staff and frequent communication in all directions is vital for the success of safety leadership (Flynn & Shaw, 2009; Krause, 2004). Employees should be encouraged to give honest feedback about safety even if it is unfavourable and must feel comfortable to report safety issues without fear of discipline (Flynn & Shaw, 2009; Krause, 2004). This also means that management should be willing to listen to employees' grievances and ideas about safety (Geller, 2002).

4.3.5.4. Feedback and recognition

The effective safety leader is good at providing feedback and giving recognition for accomplishments (Krause, 2004). Effective safety leaders publicly recognise contributions of others, give recognition for good safety performance, praise more often than criticise and find ways to celebrate success (Drennan & Richey, 2012; Flynn & Shaw, 2009; Krause, 2004). Giving positive recognition in the form of verbal praise is a leadership skill and the frequency of verbal praise is a measure of leadership performance (Drennan & Richey, 2012).

4.3.5.5. Accountability

Leaders are accountable and must take responsibility and also hold others accountable for safety performance (Dunlap, 2011; Geller, 2000). This means clearly establishing and communicating employees' role in safety, what the expected safety behaviours are and establishing the consequences for poor safety performance or not complying with safety rules (Dunlap, 2011). Effective safety leaders create a sense that people are responsible for safety in their own organisational unit and level (Krause, 2004). Staff should be encouraged to take ownership of safety (Flynn & Shaw, 2009).

4.3.5.6. Business integration

A safety leader must value and support safety as an integral part of the business (Krause, 2004). In every business there are competing priorities e.g. cost and production and it is critical that senior management give safety a high status in the business objectives and it should be a priority in all situations (Carrillo, 2002; Flynn & Shaw, 2009). This means that all business activities must be managed with a constant focus on safety (Perdue, 2000). A safety leader visibly displays their commitment to safety through leading by example and clearly demonstrating to employees that safe behaviour in all operations is expected (Flynn & Shaw, 2009; Krause, 2004)

4.3.5.7. *Action orientation*

Safety management activities are mostly reactive and focus on correction but not on prevention (Geller, 2000). A safety leader is proactive rather than reactive in addressing safety issues and takes advantage of opportunities to improve safety when they arise (Geller, 2000; Krause, 2004). This means that management must understand the risk profile of the business in order to identify and address safety hazards proactively. A safety leader is performance driven and delivers results with speed and excellence (Krause, 2004).

4.3.5.8. *Learning orientation*

A learning culture or willingness to learn enables the organisation to identify, learn from and change unsafe conditions and behaviours (Flynn & Shaw, 2009). Leaders need to allocate sufficient resources and build their own and employee's competencies through training and communication (Carrillo, 2002). It is also important to provide a mechanism to review incidents and to give feedback about corrective actions taken. It is important that leaders respond to incidents in a positive, learning way (Flynn & Shaw, 2009). Successful safety leaders place a high value on the function and advice of health and safety practitioners and other critical role players such as safety managers and health and safety representatives (Cooper, 2001).

4.4. SAFETY LEADERSHIP MODELS

Various researchers have developed theoretical models of safety leadership. These models aim to explain and describe safety leadership and offer guidance for developing effective safety leaders.

4.4.1. Carrillo's Safety Leadership Model

According to Carrillo (2002) safety excellence is mostly about building relationships, communication and establishing a foundation of trust and credibility that motivates employees to follow and enforce safety procedures

because it is the right thing to do and not because it is mandated. Safety is 90% about people and that makes safety leadership both simple and complex (Carrillo, 2002). Thus, a leadership model with a set of concrete behaviours that guides safety leaders through the organisational and human factors that affect safety performance is needed.

Carrillo (2002) developed a three dimensional model for safety leadership as a result of research on the application of the safety leadership formula namely *trust + credibility x competence = results*. Leaders that applied the formula established both personal trust and credibility while developing the competencies for safety excellence in the organisation. The model is based on the concept that people move from vision to implementation via three dimensions that operate simultaneously as illustrated in Figure 4.1.

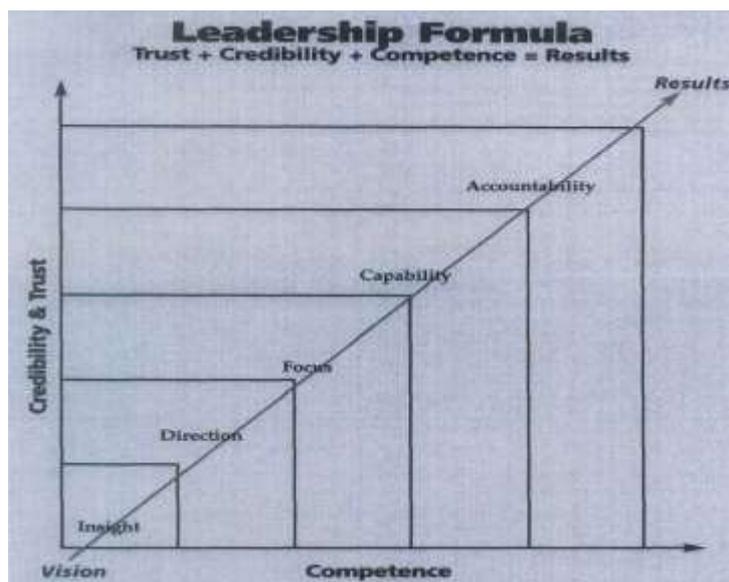


Figure 4.1 Carrillo’s Safety Leadership Model (Source: Carrillo, 2002)

The three dimensions are described in more detail below.

First Dimension: Trust & Credibility

The lack of trust between employees and management is a frequent obstacle to improving safety cultures. Therefore any safety improvement effort requires

trustworthy and credible leaders that display behaviours, values and traits that engender trust and commitment.

Second Dimension: Developing the Competencies for Safety Excellence

This dimension entails the development of people and creating the processes, structures and skills to support safety excellence. It also includes allocating the necessary resources.

Third Dimension: From Vision to Safety Excellence

The third dimension is a five-step leadership pathway to turn the vision into actions and reach safety excellence. The five leadership steps are insight, direction, capability, focus and accountability.

Step 1: Insight

Leaders must gain insight into the safety issues that need to be addressed. If leaders do not know what the issues are they cannot change their behaviour. This is achieved by assessing their personal as well as organisational strengths and weaknesses. An honest assessment from superiors, peers and employees can help a leader obtain a clear picture of the actual situation.

Step 2: Direction

Setting the direction and inspiring employees involve different activities such as creating a vision, developing strategy, setting goals and action planning. It is important that the vision and goals must be shared.

Step 3: Focus

This involves paying attention to safety issues and can vary from informal observations and feedback to formal measuring and reward systems. It includes identifying priorities and setting a personal example.

Step 4: Capability Development

Leaders must be willing to spend time on safety issues for example in meetings and be accessible to people in order for them to give their ideas and input. Leaders also need to allocate sufficient resources and build employee competencies through training and communication.

Step 5: Accountability

The first part of accountability is to hold oneself accountable and the second is to hold others accountable. A leader is responsible to make standards and expectations clear and maintain a performance management system where everyone understands when and how they will be held accountable.

The application of this model mainly involves the development of certain leadership competencies and behaviours such as trust, credibility and accountability. However, the other critical elements of safety leadership (as identified in point 4.3), namely personal attributes and values, knowledge and experience, safety management, and leadership style are not addressed.

4.4.2. Krause's Safety Leadership Model

Krause (2005) developed a model that aims to explain the elements of safety leadership as illustrated in Figure 4.2 on the next page.

The model comprises of four parts or rings that emanate from the centre outwards. The core ring represents the personality, values and commitment of

the leader. The second ring represents the leadership style. The third ring refers to the best practices or behaviours that safety leaders engage in namely vision, collaboration, feedback and recognition, communication, accountability, valuing safety and action orientation. The outer ring reflects the organisational culture that will be established as a result of the leader's influence. Krause (2005) contends that active and effective safety leaders combine leadership style and best practices to achieve the desired safety culture.

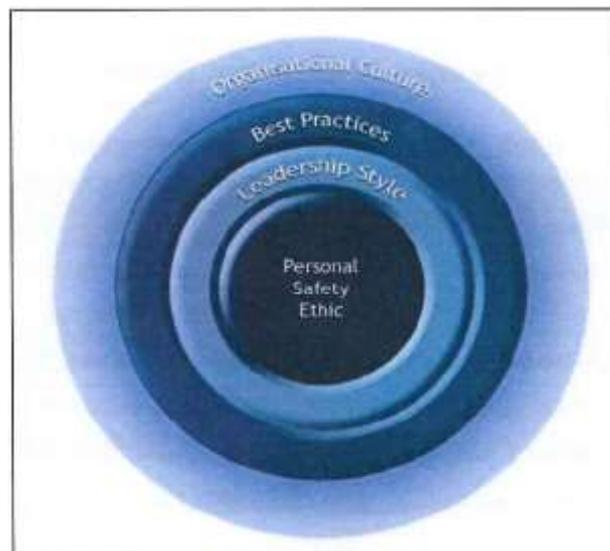


Figure 4.2 Krause's Safety leadership model (Source: Krause, 2005, p. 26)

Krause's model combines certain elements of safety leadership namely personal values, leadership style and leadership practices. Although he has noted the importance of knowledge, experience and safety management in safety leadership in some of his other research (Krause & Weekley, 2005), these elements are not addressed in this model.

4.4.3. Pater's Levels of Culture and Leadership Characteristics

Pater (2012) has identified four levels of safety culture namely forced culture, protective culture, involved culture, and leadership culture. Certain leadership characteristics are evident on each level as summarised in Table 4.1 on page 95.

Application of the model requires leaders to firstly assess their current culture level and leadership behaviours. Leaders must then adopt some of the characteristics of the next level and implement the necessary strategies in order to take the organisation to a higher level of safety culture and performance.

TABLE 4.1

Pater’s Levels of Culture and Leadership

	Safety Culture	Leadership Characteristics
Level 1	<u>Forced Culture</u> Where safety is done <i>to</i> workers	Leadership is invisible or disconnected. Leaders focus on production or meeting customer demands. Leaders do not attend safety events and rarely talk about safety issues.
Level 2	<u>Protective Culture</u> Where safety is done <i>for</i> workers	Leadership is directive. Leaders focus on compliance with safety regulations. Leaders do not involve employees in safety matters.
Level 3	<u>Involved Culture</u> Where safety is done <i>with</i> workers	Leadership understands that employee engagement is important. Best practices and recognition systems are implemented. Leaders think that safety has been “achieved” and this can stifle progress.
Level 4	<u>Leadership Culture</u> Where safety is done by workers for themselves	Executives and senior managers are typically active “safety champions”. Leaders are highly accessible and provide the necessary resources to reduce obstacles to safety. Leaders encourage active participation and self-monitoring.

This model only focuses on one element of safety leadership namely leadership behaviours and practices. The other elements of safety leadership such as personal attributes and values, knowledge and experience, safety management and leadership style are not addressed.

4.4.4. An integrated safety leadership model

Effective safety leadership consists of a number of elements namely personal attributes and values, knowledge and experience, safety management and

leadership style as discussed in point 4.3. However, the safety leadership models discussed so far mainly focus on the behaviours or practices that effective safety leaders engage in and little attention is given to elements such as knowledge and experience or safety management.

Research, as cited previously, has established each element as a critical component of safety leadership. Theoretically, the argument is that only the presence and interrelated working of all the elements would truly constitute safety leadership. Subsequently, the researcher developed a safety leadership model that is unique in the sense that it combines all the elements of effective safety leadership, as illustrated in Figure 4.3.



Figure 4.3 An integrated safety leadership model

Leaders’ personal attributes that form part of their personalities as well as if and how highly they value safety will influence their safety leadership. Sufficient technical and operational knowledge and experience of the workplace, the

safety systems that are in place and specific workplace hazards and risks will enable leaders to be more effective safety leaders. Similarly, knowledge of legal requirements and standards will not only ensure legal compliance but also contribute to effective safety leadership. Safety Management activities are part and parcel of legal compliance as well as effective safety leadership. Safety leaders must apply transactional leadership style to ensure achievement of safety management goals and also know when to apply a more transformational leadership style to ensure achievement of the safety leadership vision. Finally, leaders should engage in the leadership behaviours that are critical to effective safety leadership.

4.5. IMPROVING SAFETY LEADERSHIP

Since the beginning of studies about leadership there has been a debate about whether leaders are born or whether one can learn to be a leader (Werner, 2007). Drennan & Richey (2012) is of the opinion that leadership is not a rare, charismatic or inherent talent but that it can be learned, observed and measured. The models of Carrillo (2002) and Pater (2012) also suggest that safety leadership can be developed to take the organisation to a higher level of safety performance. The question is: *How* can safety leadership be developed and improved?

4.5.1. Leadership development strategies

There are many different approaches to leadership development that can be followed (Cacioppe, 1998; Locke & Tarantino, 2006; Werner, 2007). Although there is much debate over which approach is the most effective, certain activities and learning methods have proven to be successful (Cacioppe, 1998).

Werner (2007) suggests that leadership development strategies should meet the following four criteria:

- *Focus on the future*

Organisations should identify the future challenges and environments that their leaders will have to operate in. This will ensure that leadership development is focused on developing the competencies necessary to deal with those challenges.

- *Clearly identify leadership competencies*

Organisations must identify the required leadership competencies (i.e. knowledge, skills, attributes and attitudes) according to their needs. Based on the needs analysis, a leadership competency framework must be developed.

- *Identify future leaders*

Organisations must have succession and talent management procedures in place in order to identify individuals with potential and earmark them for development. In doing so, the organisation will determine the scope of their leadership pool.

- *Use multiple learning interventions*

Applying a variety of learning interventions will ensure that leaders are exposed to a wide range of leadership experiences. Interventions may include business assignments and projects, business school programs, coaching and mentoring and workshops.

By incorporating these four elements organisations will be able to establish world-class leadership development strategies (Werner, 2007). Meyer (2004) also supports the importance of these criteria and specifically aligning leadership development with the formal strategy and goals of the organisation and applying a blend of learning interventions.

Locke & Tarantino (2006) developed a model for leadership development that promotes sustained learning, focuses on the future needs of the organisation and on achieving long term results. The model consists of four components, namely assessment, alignment, application, and achievement as explained in the next section.

- *Assessment*

The essential first step in the development process of leadership programs is the needs assessment. The needs assessment identifies the leadership competencies in terms of organisational relevance and provides the overall direction for the development program.

- *Alignment*

It is important to align leadership competencies with organisational goals. A strategic approach is required to ensure that the leadership development initiative advances both the organisation and the individual.

- *Application*

During this phase action plans are developed and implemented. Participants are assigned to action learning groups and application of leadership skills are further supported through a number of coaching sessions.

- *Achievement*

The final important step in leadership development is to determine measures for tracking progress. Measures must capture the current level of leadership competence in the focus area as well as improvement as the program progresses. Four measurement periods are suggested: Baseline assessment, after six weeks, after three months and after six months.

This model complies with the four criteria put forward by Werner (2007). In addition, it also emphasises that learning is a continuous process (Meyer, 2004) and that progress must be measured to determine whether the required level of performance have been achieved.

Cacioppe (1998) developed an integrated model for leadership development that describes the key elements of a successful leadership development program. It also provides a framework that organisations can utilise to plan and build their leadership programs. The model consists of a seven stage leadership development plan that is described below.

1. Articulate strategic imperatives

The first step is to determine and define the strategic objectives that are vital to the survival, growth and success of the organisation in the next two to three years. Organisations must identify the internal and external factors that impact on the organisation, for example changes in market share or lack of skills in a certain area. This stage includes establishing a vision and strategy to deal with the key issues and challenges that face the organisation.

2. Set objectives for development

The next step is to identify the main purpose and set the objectives of the leadership development plan. The knowledge, skills, attitudes and attributes that should be developed by the end of the program must be specified.

3. Identify appropriate methods

Based on the objective and specific competencies required the content, method and timing of the program must be determined. The program should include various techniques such as case studies, team building, coaching, job assignments and projects.

4. Select providers and design specific learning program

The organisation must select appropriate training providers (internal or external) to conduct the leadership program. The specific content and other program details are worked out with the providers.

5. Evaluation of program delivery and effectiveness

Each of the previous stages must be evaluated to ensure that the promised outcomes are achieved. The program content and learning activities must be assessed to ensure that they actually lead to the development of the competencies they were designed for.

6. Integrate with management and human resources systems

The next step is to ensure that the skills and aspects covered in the program is aligned with human resources systems such as recruitment, selection and performance management. The competencies should be added to performance appraisal and promotion criteria. This is necessary to ensure that organisational systems support and reinforce the transfer of learning into the workplace.

7. Overall assessment of value of program, broad objectives and program philosophy

The final step involves looking at broader issues such as the end process, value to the business and changes in objectives. The overall program must be assessed to determine what is working well and where it can be improved in order to yield the most value to the business. However, the individual's development experience should also be considered. Effective leadership development programs should achieve three goals:

- Improve self-knowledge and worth.
- Improve abilities, skills and relationships.
- Contribute to improved business performance.

This model incorporates all the criteria and critical elements of a leadership development program as already discussed. The model further emphasises the importance of integrating leadership development with human resources and other organisational systems. Additionally assessing broader aspects of the overall program and individual experiences adds another factor to consider when determining the effectiveness of leadership development initiatives.

4.5.2. A model for safety leadership development

The strategies and activities that contribute to leadership development in other key performance areas could certainly be employed in the area of safety. The question central to this research is: How can leadership development practices be applied to improve safety leadership?

The researcher incorporated standard leadership development criteria and practices to compile a safety leadership development process model that provides a framework for designing a safety leadership development program. This model is illustrated in Figure 4.4 on the next page.

Increased pressure from government to improve safety in the South African mining industry (Shabangu, 2012) qualifies the development of safety leadership skills as a key issue and challenge that mining companies will need to address now and in the coming years. In the case of safety the strategic goal is already known namely to improve safety performance by reducing incidents and injuries.

The safety leadership competency profile has also already been identified. Competencies refer to the required level of skills, knowledge, attributes and attitudes in a particular area. From this point of view, the elements of safety leadership incorporated into the safety leadership model (refer to Figure 4.3) could be considered to constitute the required safety leadership competencies.

The safety leaders, as described in point 4.2.2., are the executives and managers of an organisation. Subsequently, the participants in a safety leadership program have also already been identified.

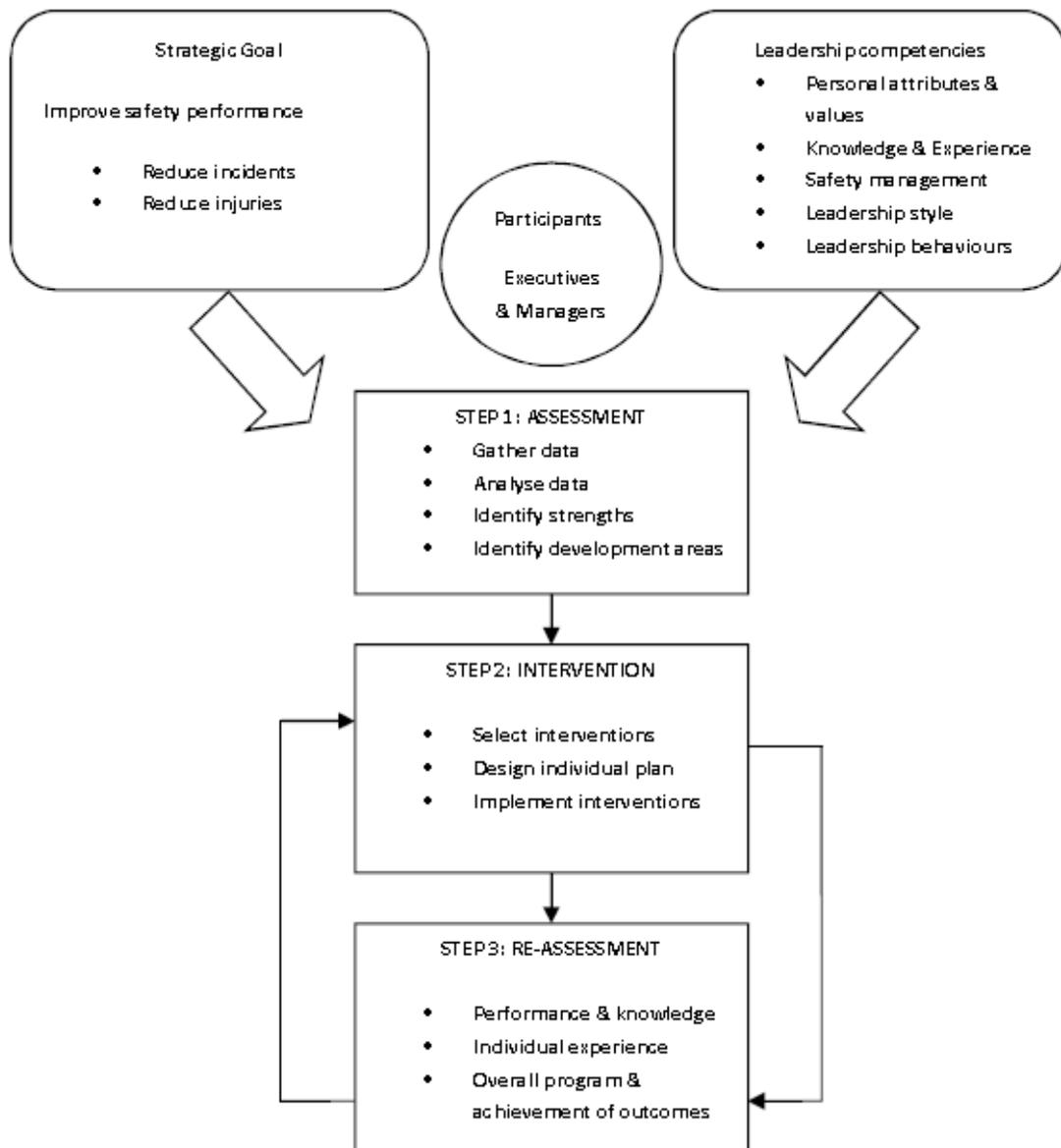


Figure 4.4 Safety leadership development model

The main part of the model consists of three steps namely assessment, intervention and re-assessment. These steps are discussed in the next sections.

Step 1: Assessment

The first step in developing safety leadership is to assess leaders on the different elements of safety leadership (Carrillo, 2002; Pater, 2012). The assessment methods will vary depending on which element is measured. Many different assessment instruments are available for assessing personal attributes and values, leadership style and certain leadership behaviours. Information on safety leadership behaviours are often collected by getting input from others in the form of a 360 degree evaluation (Carrillo, 2002). This information can also be obtained during the performance appraisal process (Cacioppe, 1998).

Knowledge, experience and safety management can be assessed by collecting biographical data such as training records and work experience and by conducting interviews. In many organisations this type of information is already collected during the recruitment and selection process.

Next the results of the assessment must be analysed in order to identify strengths and possible development areas. This step not only reveals leaders' current levels of performance and development needs but also guides the design of a development plan that is customised for each individual.

Step 2: Intervention

Suitable interventions to address the identified development areas must be selected and implemented. Whether an intervention is suitable depends on the element that needs to be addressed and the organisation's systems and resources.

The personal attributes of leaders i.e. their personality traits and values are not easily changed (Krause & Weekley, 2005). Although it is difficult to change personality and values it is possible to adjust behaviour to enhance overall influence and performance as a leader (Krause & Weekley, 2005). Thus,

leaders can gain an understanding of their personality and learn to perform the right behaviours (Carrillo, 2002; Krause & Weekley, 2005).

The knowledge and management elements of safety leadership are hard skills and lend itself to classroom training (Drennan & Richey, 2012). For example training courses on legal requirements and liabilities, the new safety system, new regulations, hazard identification and risk assessment, incident investigations and meeting management. Experience can be gained in the specific working environment.

There are many leadership training programs available but leadership style and leadership behaviours are soft skills that cannot easily be learned in a classroom (Drennan & Richey, 2012). It can only be acquired through frequent practice and application of skills and behaviours on the job. Like any other type of behaviour, safety leadership behaviour is also susceptible to immediate, accurate and positive feedback (Krause, 2004). When senior leaders have a clear understanding of what critical behaviours are important for them to perform, and how these are related to a given objective, the foundation is laid for the right behaviours to occur (Krause, 2004). Thus, some method of providing feedback on safety leadership behaviour is necessary.

The most successful organisations employ a combination of learning interventions such as classroom training and job assignments, often as part of an executive coaching program, to develop leadership (Drennan & Richey, 2012; Meyer, 2004; Werner, 2007). Given the different elements that constitute safety leadership this seems to be an appropriate approach that could be followed for the development of safety leadership.

Once the appropriate learning interventions for the development of each safety leadership element have been established the next step is to design a development program for each participant based on their assessment results. This means that except for general guidelines and standard interventions no two participants will follow the same program unless they have exactly the same

development needs. This approach allows for spending less time on competencies already achieved and more on those that need development. It also implies that some participants might complete the program in less time than others.

Step 3: Re-assessment

After the completion of the interventions, the success of the program must be measured in the form of re-assessment (Drennan & Richey, 2012). Behaviour and knowledge elements are reassessed and monitored to determine if any change has taken place. This step may include the overall evaluation of the program to achieve organisational goals as well as the assessment of participant's development and individual experiences.

Legislation, work procedures or technology may change over time and the safety leader must remain up to date. Learning is a continuous process and the re- assessment - intervention loop will ensure that competencies are continued to be developed and refreshed as required. Integrating safety leadership competencies into the organisation's overall recruitment, promotion and performance management systems will enhance the success of the development program.

4.6. CHAPTER SUMMARY

In this chapter the term safety leadership was conceptualised and defined. The elements of effective safety leadership were discussed. Theoretical models of safety leadership were described and an integrated model for safety leadership was presented. Methods for improving safety leadership were discussed according to a safety leadership development model.

Executive coaching was identified as a possible method of improving safety leadership and this concept is defined and described in the next chapter.

CHAPTER 5

EXECUTIVE COACHING

In this Chapter the term *executive coaching* is conceptualised and defined. The different types of and approaches to executive coaching are discussed. The elements or components of a successful executive coaching program are identified. Various models that aim to explain the executive coaching process are described. The application of executive coaching as a tool to develop safety leadership is discussed. A framework for developing and evaluating an executive coaching program to improve safety leadership is presented.

5.1. INTRODUCTION

The term *coach* is familiar to most people because of its application in the sport world (Geller, 1995). The role of the coach is to support the improvement of individual and team performance through a process of observation and feedback (Geller, 1995). In recent years, the notion of having a coach has become an increasingly popular means for personal as well as professional development (Nyman & Thach, 2009; Tach, 2002).

In the early 1990's the concept of executive coaching emerged as a means to address specific skills deficiencies and to enhance the performance of executives and managers (Bougae, 2005; Long, 2003, Zenger & Stinnett, 2006). Since then, research has shown that coaching has a positive impact on improving leadership effectiveness (Bougae, 2005; Krause & Weekley, 2005; Nyman & Tach, 2009). Subsequently, many organisations now employ coaching as part of their leadership development programs (Nyman & Tach, 2009).

The purpose of executive coaching is to improve professional performance, personal satisfaction and consequently improve organisational effectiveness (Killburg, 1996; Tach, 2002). According to Masciarelli (1999) there are some instances where executive coaching is most useful namely where the company

is growing rapidly, where a leader is promoted from within, where the leader must serve as a change agent or where the leader seeks professional development. Thus, if leaders and managers are interested in changing the safety culture and in developing their safety leadership skills then executive coaching could be an effective means to achieve this.

Coaching has also been employed to correct and improve safety related behaviours (Geller, 2004; Mathis, 2009; Richardson, 1996). Research about coaching for safety focuses on the benefits of when managers, supervisors and safety professionals coach employees on safety behaviours. However, no research is available on the benefit of executive coaching to improve the safety behaviours of safety leaders. Subsequently the question is how can an executive coaching program be developed to develop and improve safety leadership?

5.2. THE CONCEPT OF EXECUTIVE COACHING

If organisations are interested to employ executive coaching as a means to improve safety leadership, then it is critical to understand what the concept refers to. An understanding of executive coaching can be gained firstly by defining the concept and describing the different types of executive coaching programs and secondly by discussing theoretical models that explain the process.

5.2.1. The definition of executive coaching

Several definitions of executive coaching have been developed over the years. Before discussing the definitions of executive coaching it must be established what the term *executive* refers to. The term *executive* refers to people in the top and upper ranks of the organisation e.g. Chief Executive Officers and plant or business unit managers (Long, 2003).

According to Koonce (1994) executive coaching is “a behaviour modification program aimed to quickly identify and address behavioural issues that becomes part of the executive’s development plan”. Killburg (1996) defines executive coaching as “a helping relationship formed between a client who has managerial authority in an organisation and a consultant who uses a wide variety of behavioural techniques and methods to help the client achieve a mutually identified set of goals within a formally defined coaching agreement”. According to O’Neill (as cited in Bougae, 2005) it is the process of increasing a leader’s skill and effectiveness in the accomplishment of three leadership responsibilities namely communicating the purpose, vision and goals of the organisation, building relationships, and producing results and outcomes from the direct efforts of others. Phillips and Mitch (as cited in Bougae, 2005) offer the following definition: “Executive coaching is a facilitative one to one, mutually designed relationship between a professional coach and a key contributor who has a powerful position in the organization”.

5.2.2. Forms of coaching delivery

From the definitions of executive coaching it is evident that coaching is usually a one-to-one, face-to-face activity and this is the traditional form of coaching delivery (Fielden, 2005). However, this form of coaching delivery can be very impractical considering executives’ busy schedules and different locations. Telephone coaching is being used increasingly because it is more cost effective although it is believed to hamper communication because facial expressions and gestures cannot be seen (Fielden, 2005; Hakim, 2000). Online coaching i.e. via e-mail or the internet, is also gaining popularity because of cost and time savings as well as increased flexibility in scheduling time for learning (Fielden, 2005).

When developing an executive coaching plan the most suitable form of coaching delivery should be selected. It does not have to be restricted to one form of delivery as face-to-face sessions can be supported by telephone or e-mail communication (Fielden, 2005; Hakim, 2000).

5.2.3. Types of executive coaching

Three major types of executive coaching have been identified namely performance based, holistic and content coaching (Nyman & Tach, 2009; Tach & Heinselman, 1999; Tach, 2002).

5.2.3.1. Performance coaching

In performance based coaching the focus is on practical and specific business practices or behaviours that need development for example project management, goal setting or interpersonal skills (Tach, 2002). Berg & Karlsen (2007) refers to this type of coaching as skill coaching and it contributes to the development of new behaviour patterns and techniques or skills needed to cope with a situation. The coach works with the leader on a one-to-one basis to help identify strengths and specific improvement areas – usually based on some type of 360 degree survey feedback (Nyman & Tach, 2009). Together they develop a customised development plan and continue with ongoing interaction to assist in improving leadership abilities.

The role of the coach is to provide feedback, guidance, identify development opportunities, and identify possible additional training needs (Nyman & Tach, 2009; Tach & Heinselman, 1999). The process typically lasts three to six months and involves one to two meetings of one to two hours per month either face to face or via the telephone (Nyman & Tach, 2009; Tach, 2002).

Companies have reported that this type of coaching had far more impact on leadership effectiveness than any other program and the rate of improvement more than doubled when coaching was based on a 360 degree feedback process (Nyman & Tach, 2009). A study conducted by Tach (2002) where a 360 degree feedback process was included in the coaching program showed an average increase of 55% on leadership effectiveness as perceived by others and a slightly lower increase of 52% according to participant's self-ratings.

5.2.3.2. *Holistic coaching*

Holistic, also called in-depth, coaching is based on the principles of balance and of considering every aspect of a person's life such as career, finance and relationships (Nyman & Tach, 2009). This type of coaching is similar to personal coaching as described by Berg & Karlsen (2007) and it goes further than coaching behaviours or skills to include attitudes and feelings. It is more psychoanalytical in approach and often includes the exploration of personal values, motivations and even family issues that may hinder performance (Tach, 2002). For this type of coaching a high level of trust is required between coach and coachee (Berg & Karlsen, 2007).

The client evaluates the current situation and develops a vision of where they want to be and then decides where they want to begin to improve. The role of the coach is to listen, reflect and provide insights that help client deepen their learning and move towards accomplishing their goals (Nyman & Tach, 2009). Holistic coaches view themselves as being involved in the client's whole life and not just focusing on career and workplace aspects (O'Neill & Broadbent, 2003).

This type of coaching typically lasts longer usually a minimum of three months with regular visits or phone calls and often long term coaching relationships develop. It is not always practical due to time constraints and the fast paced results oriented nature of business (Tach, 2002).

5.2.3.3. *Content Coaching*

This type of coaching is appropriate when leaders need assistance on specific content areas such as marketing, finance or negotiations (Nyman & Tach, 2009; Tach, 2002). Content coaching is parallel to what Berg & Karlsen (2007) describe as knowledge coaching. The purpose is to provide knowledge and skills in specific areas. The coach needs expertise on the subject and coach and coachee must be comfortable with each other's style. Leaders still make the decisions and take the responsibility and the coach works in the background to offer advice and support.

The role of the coach is an expert in the specific area or discipline (Tach & Heinselman, 1999). The coach challenges the leader's thought processes and tests assumptions (Nyman & Tach, 2009).

This type of coaching typically involves a series of coaching sessions. The number of sessions and duration of the coaching program depends on the leader's skills level and knowledge (Nyman & Tach, 2009).

The type of coaching that would be appropriate depends on the situation and the specific needs of the coachee as well as the organisation (Berg & Karlsen, 2007, Nyman & Tach, 2009). In some cases it could be necessary to combine different methods of coaching in order to achieve the best results (Berg & Karlsen, 2007; Minter & Thomas, 2000).

In the field of safety, leadership development often focuses on developing certain leadership practices and behaviour or performance. However, safety leadership also has a knowledge or content element. Therefore, a combination of behavioural and content coaching may be needed in order to achieve the desired improvement in safety leadership effectiveness. **Thus, the researcher applied behavioural-content coaching as it is more appropriate in the safety environment than the other types of coaching discussed above (Berg & Karlsen, 2007; Minter & Thomas, 2000; Nyman & Tach, 2009).**

5.2.4. Approaches to coaching

A closely related aspect to the type of coaching is the theoretical approach that underlies the coaching process. Theoretical approaches to coaching are adopted from the different psychological perspectives i.e. existential, humanistic, cognitive, behavioural, psychodynamic, and systems approaches (Barner & Higgins; Berg & Karlsen, 2007; Geller, 2004). Sometimes two perspectives are combined for example cognitive-behavioural (Neenam & Palmer, 2001) or behavioural-systems (Visser, 2010) approaches. As a result several different theoretical approaches to coaching exist. Four main coaching

approaches or theoretical models that inform and shape the executive coaching process namely the clinical, behavioural, systems and social constructionist models are now discussed (Barner & Higgins (2007)).

5.2.4.1. The clinical model

The clinical model, as described by Barner & Higgins (2007), aims to assist the client to gain insight into themselves as a leader and individual and subsequently affect constructive changes in performance based on this learning. The coach works “from the inside out” to encourage honest self-disclosure and examination (Berglas, 2002). The coach must gain an understanding of the client’s personal history and investigate factors such as interpersonal relationships, causes and management of daily stresses, and personality characteristics in order to determine the influence of these factors on the performance of the client (Barner & Higgins, 2007; Berglas, 2002). In applying the clinical model coaches rely heavily on psychometric testing. Coaches employ psychometric instruments to reveal and understand the client’s overall personality, underlying thought patterns and beliefs that guide the client’s actions.

In the clinical approach the coach often takes on the role of counsellor and therapist (Barner & Higgins, 2007; Joo, 2005; Visser, 2010). Thus, this type of approach should only be followed when coaches have the formal psychological background to deal with any deep-seated emotional or personality problems that may present during coaching (Barner & Higgins, 2007; Berg & Karlsen, 2007; Joo, 2005).

5.2.4.2. The behavioural model

The behavioural model aims to assist clients to understand the impact of their behaviour on themselves and others and to identify ways to constructively adapt their behaviour to the demands of the organisation (Barner & Higgins, 2007; Berg & Karlsen, 2007; Geller, 2005, Neenam & Palmer, 2001). The coach acts as guide or trainer to assist clients to change problematic behaviours or develop

new job competencies. Behaviourally-oriented coaches employ assessment techniques such as questionnaires, 360 degree evaluations and interviews to obtain information on which areas should be targeted for change.

The behavioural approach to coaching may at times be considered too directive as it often focuses on a narrow range of targeted behaviours as defined by the organisation (Barner & Higgins, 2007; Geller, 2005, O'Neill, 2000). The coach must be able to balance the clients' personal goals and concerns with the organisation's expectations.

5.2.4.3. The systems model

The systems model views the leader as an integrate part of the organisational system and working environment (Barner & Higgins, 2007; Berg & Karlsen, 2007; O'Neill, 2000; Visser, 2010). The coach must gain an understanding of the organisational context in which the client's behaviour is embedded. The coach takes on the role of systems modeller and assists the client to identify effective and ineffective patterns and feedback loops that characterise the client's interactions with other organisational members and systems (Barner & Higgins, 2007; Visser, 2010). Systems-oriented coaches employ assessment techniques that include a broader view of the organisation such as departmental reports and graphic representations of the organisational structure and systems.

The challenge of the systems-oriented coach is to gain the co-operation of all stakeholders that influence the client's performance such as the client's manager, peers and team members. The coach must also balance the emphasis on the impact of external elements in the organisational system and the client's own role as leader and change agent of the system (Barner & Higgins, 2007). This will ensure that the client does not blame their performance issues on organisational inadequacies but accepts their own role in changing the organisational aspects that poses a performance barrier (Barner & Higgins, 2007; Berg & Karlsen, 2007; O'Neill, 2000).

5.2.4.4. *The social constructionist model*

The social constructionist model is embedded in the social constructionist perspective that contends that our social identities are constructed through our social interactions and the symbolic frameworks in which we interact (Barner & Higgins, 2007; Terre Blanche & Durrheim, 1999). Another key concept according to the social constructionist perspective is the use of language and the manifestation of that language in the form of a “story” or narrative (Ford, 1999; Terre Blanche & Durrheim, 1999). Thus, the assessment process consists entirely of gathering narrative material from the client and stakeholders. The coach interviews clients and stakeholders and asks probing questions in order to obtain information on how the client interprets past and present events and future possibilities.

A coach employing this approach must be cautious not to overlay their own interpretations above those of the client and it is important to honour the client’s story and work within that framework (Barner & Higgins, 2007). Coaches must remember that the goal of coaching is to meet organisational goals. Therefore, the focus must remain on blending the elements of the client’s story with the pragmatics of the organisation’s desired performance outcomes (Barner & Higgins, 2007; Ford, 1999).

As discussed, the different coaching models have their own specific purpose and advantages as well as challenges. Unlike the coaching type that is selected based on the needs of stakeholders such as the coachees and the organisation, the coaching approach is informed by the personal beliefs, knowledge, experience and preferences of the coach (Barner & Higgins, 2007, Berg & Karlsen, 2007; Visser, 2010). In other words, coaches adopt an approach based on their own underlying beliefs of how individuals change, their personal knowledge and experience and level of comfort with the assessment and intervention techniques that form part of each approach. Barner & Higgins (2007) points out the importance for coaches to identify and acknowledge which approach shapes their practice in order to address the shortcomings and constraints that accompany the application of a specific model.

Thus, for the purpose of this study the researcher will fulfil the role of the coach. The researcher acknowledges her personal preference for the behavioural approach to affect individual and subsequently organisational change. This is because of the researcher's underlying personal belief that although one might not be able to change the situation one can decide how to react to it. In addition, the researcher has more knowledge and experience with behavioural assessment and intervention techniques than with clinical or social constructionist methods. The researcher also acknowledges that safety leadership requires co-operation from all levels and ultimately forms part of the organisational systems. Therefore, it would be beneficial to consider aspects of the systems approach as well.

5.2.5. Components of an executive coaching program

The literature review revealed several aspects that must be included as critical components of a successful executive coaching program. These aspects include linking the coaching program to business objectives, gaining support for the coaching program, selecting coaches, matching of coaches and coaches, and evaluating the coaching program.

5.2.5.1. Linking the coaching program to business objectives

The coaching process must have a direct impact on the achievement of business objectives (Ennis, 2002; Long, 2003). For example if the business is interested in improving their safety performance then the executive coaching program might focus on developing the executive's safety leadership skills. Linking the executive coaching program with business strategy and objectives early on in the planning process is important for the overall effectiveness of the program (Ennis, 2002; Long, 2003).

5.2.5.2. Gaining support for the coaching program

As with all performance development initiatives it is important that senior management acknowledges and embraces coaching as the most suitable

method of improving performance and achieving the specific goal (Long, 2003). Executives often do not perceive a personal need for coaching especially if the focus of the program is not included as one of their key performance areas (Geller, 1995). In order to be effective an executive coaching program requires full organisational support and methodical integration (Long, 2003).

5.2.5.3. *Selecting coaches*

Organisations first identify the executives targeted to participate in the coaching program and then select coaches to conduct the coaching (Bougae, 2005). The suitability of a coach for a specific program depends on certain characteristics of the person such as their training, work and personal strengths and weaknesses, adaptability, knowledge of a specific business field and skills to facilitate learning (Ennis, 2002).

A thorough process of selecting coaches to ensure a fit with the organisation's goals and culture will contribute to the success of the coaching program (Ennis, 2002). Coaches should also be oriented in the type of business, its goals and the desired leadership competencies (Ennis, 2002; Koortzen & Oosthuizen, 2010). Organisations must also decide whether internal or external coaches will be employed for the specific coaching program (Fielden, 2005; Jarvis, 2004; Tach, 2002).

Internal coaches usually cost less and they already know the business and the organisational culture (Carter, 2005; Fielden, 2005; Frisch, 2001; Tach, 2002). Filipezak (1998) notes that business knowledge and experience is a vital prerequisite for executive coaches. Carter (2005) notes that internal coaches can work more quickly to implement development plans because they know what resources are available. Moreover, internal coaches are more easily available and are in a better position to observe the coachee in their day to day activities.

One of the disadvantages of employing internal coaches is that they can be perceived as a confidentiality risk by participants (Fielden, 2005; Tach, 2002). In

addition, issues such as conflict of interest and formal reporting lines may also hamper the effectiveness of internal coaches (Frisch, 2001; Tach, 2002). Although internal coaches are part of the same organisation, they should be disassociated from the everyday management of their coachees in order to separate the process from job coaching that line managers automatically do (Carter, 2005).

The following potential pitfalls should be considered and addressed when employing internal coaches (Carter, 2005; Frisch, 2001):

- **Balancing multiple roles:** Internal coaches usually have their own jobs within the company and they must balance their time between coaching and their other responsibilities.
- **Handling conflict of interest:** The coach's multiple roles may be perceived as a conflict of interest for example an HR practitioner that is also a coach may know information e.g. about upcoming promotions or restructuring that may impact the client but cannot make this information available.
- **Managing multiple relationships:** In addition to multiple roles, internal coaches also have multiple relationships within the organisation. These relationships may provide useful information to the coach but also raise questions of objectivity.
- **Confidentiality:** Internal coaches must manage multiple relationships carefully to guard confidentiality. For example a colleague may ask how the coachee is doing and it is important that the coach handle this situation with sensitivity and maintain confidentiality.
- **Listening objectively:** Knowledge of the organisation can also be a disadvantage because the coach may already have a preconceived impression of the coachee that may prevent them from being open minded and listening objectively.

- Abstaining from certain decisions: Coaches should not be involved in certain decisions pertaining to the coachee such as salaries or promotion.
- Manage relationship boundaries: It may be difficult to set the boundaries for the coaching relationship for example a former coachee keeps on seeking out the coach after the program has been completed. Another issue can be coachees that miss or arrive late for appointments and the procedures for changing appointments must be clarified from the start.

The role of the external coach is often more defined, i.e. restricted to coaching, whereas an internal coach usually has additional roles and responsibilities (Carter, 2005). External coaches often have a broader skills base because of their experience in many businesses in different industries and are perceived by executives as being more credible and objective (Carter, 2005; Fielden, 2005; Sperry, 2007; Tach, 2002). However, external coaches are usually more costly to employ and they do not necessarily understand the specific business and its culture (Fielden, 2005; Tach, 2002).

Research has shown that the decision to employ external or internal coaches depends on the situation and the goals of the program (Carter, 2005; Fielden, 2005; Jarvis, 2004). Jarvis (2004) have highlighted the situations in which external and internal coaches are preferable as summarised in Table 5.1 on the next page.

External coaches should be employed when sensitive feedback needs to be provided and when issues such as conflict of interest and confidentiality are a concern. External coaches also allow for the contribution of a broader range of expertise and ideas. External coaches are more likely to be perceived as less judgemental and more objective.

Internal coaches should be employed if knowledge of the business and culture is crucial to achieving the desired results. Internal coaches are more easily

available and in a position to build a trust relationship over time. Employing internal coaches will keep costs down as they are usually less expensive.

TABLE 5.1

External versus Internal Coaches

External coaches are preferable:	Internal coaches are preferable:
For providing sensitive feedback to senior business leaders. For political reasons, this can be difficult for an internal coach	When knowing the company culture, history and politics is critical
For bringing specialised expertise from a wide variety of organisational and industry situations	When easy availability is desired
When individuals are concerned about “conflict of interest” and whether confidentiality will be observed	For being able to build up a high level of personal trust over a period of time
For providing a wider range of ideas and experience	For not being seen to be “selling” consulting time
For being less likely to judge and being perceived as more objective	For keeping costs under control – may be less expensive

Safety is an integral part of the organisational culture and systems. Further, knowledge of the specific workplace hazards and risks is an essential component of improving safety performance (Paige, 2002). It can be concluded that executive coaching for safety is an activity that could be effectively conducted by internal coaches that already understand the business, its safety culture and systems (Geller, 1995; Mathis, 2009; Richardson, 1996). A positive for internal safety coaches, especially if the coach is a safety professional, is that a good working relationship might already exist, where the safety professional is already providing executives with guidance and assistance in terms of their safety responsibilities and management tasks.

When selecting internal coaches to coach executives for safety, organisations should make sure that the potential pitfalls, as discussed, are addressed. Additionally, organisations must ensure that the internal coaches have the necessary business as well as content knowledge and experience to ensure their credibility (Fielden, 2005; Sperry, 2007; Tach, 2002).

5.2.5.4. *Matching coaches and coachees*

A good match between the coach and the coachee contributes to the success of an executive coaching program (Ennis, 2002; Long, 2003; Tach, 2002). Matching coaches and coachees requires the consideration of two aspects namely the characteristics of the coach and the characteristics of the coachee (Ennis, 2002; Joo, 2005; Long, 2003). Effective coaching matches are based on factors such as gender, socioeconomic background and life experiences (Joo, 2005). Ennis (2002) also suggests that if possible, the executive should be included in the process of selecting a coach.

Although the matching of coaches and coachees have shown to contribute to the success of a coaching program, a comprehensive matching process is not always practical or possible. The reason is because training providers, including external coaching providers, are often decided on by the organisation during the design process of the leadership development program (Cacioppe, 1998). Similarly, if internal coaches are going to be employed, the organisation usually identifies employees that would be suitable coaches to conduct the program beforehand.

In this case it would be even more critical than usual for coaches to establish rapport and create a trusting relationship with the coachee (Frisch, 2001). Coaches must explain their coaching approach and methods as well as explain their role and their credentials i.e. what qualifies them to be the coach (Barner & Higgins, 2007; Carter, 2005; Frisch, 2001).

5.2.5.5. *Evaluating the coaching program*

Measuring and evaluating the results of the coaching program is the final component of a successful executive coaching program, (Ennis, 2002; Long 2003). As with other performance improvement initiatives it can be difficult to measure the success of coaching programs. According to Potter (1999) the following forms of evaluation are commonly included in the overall design to evaluate programs:

Needs assessment: This is usually done by means of surveys that include the use of questionnaires, interviews or observations to determine the particular need.

Programme planning: This usually involves examining the program's aims and purpose to determine whether the intervention, as planned, is feasible.

Formative evaluation: Formative assessment aims to identify aspects of the programme that are working well, the aspects that are problematic, and the aspects of the programme that could be improved.

Summative evaluation: This form of evaluation attempts to determine the outcomes, effects or impact of the programme by means of observation or measurement.

Long (2003) suggests that the impact of the coaching program should be measured on three aspects, namely:

1. The intent (goal) of the coaching program;
2. The growth of the individual that participated; and
3. The impact on business results.

Ennis (2002) concludes that if the executive feels that the coaching program made an impact on their performance then the program can be considered as having been worthwhile although this is a very subjective means of evaluation. It is possible to evaluate the coaching program by objective means and to do that it is necessary to establish clear goals and objectives as well as appropriate measures of achievement early on in the process (Ennis, 2002; Tach, 2002). A coaching program can also be evaluated through "before coaching" and "after coaching" 360 degree assessments (Ennis, 2002).

A few studies have utilised 360 degree surveys to evaluate the impact of a coaching program (Bowles, Cunningham, De la Rosa & Picano, 2007; Crethar,

Phillips & Brown, 2011; Tach, 2002; Weller & Weller, 2004). In these studies the pre-test and post-test scores of the 360 degree assessments were compared in a quantitative manner.

Other studies followed a qualitative approach in evaluating the coaching program (Bougae, 2005; Guskey, 2002; Niemes, 2002; Paige, 2002). Guskey (2002) devised a model for evaluating leadership development interventions that has been applied to evaluate a coaching program based on qualitative data. This model consists of the following five critical levels:

Level One – Participants’ reaction to executive coaching

This refers to the participants’ specific reactions to the coaching process and their view of whether or not the coaching experience was worthwhile.

Level Two – The participant’s learning

This level involves determining if learning took place and also to specify what kind of learning, for example personal or professional skills, has occurred.

Level Three – Organisational support and change

This level refers to the organisational support participants received during their coaching experience and if any changes were noted.

Level Four – Participant’s use of the new knowledge and skills

On this level it is critical to determine and evaluate whether participants are applying their newly gained knowledge and skills.

Level Five – Participants’ learning outcomes

The final level involves evaluating the achievement of learning outcomes. This refers to determining whether the goals of the program were achieved as a result of the coaching.

5.3. THE EXECUTIVE COACHING PROCESS

The coaching philosophy or approach establishes the coaching method and determines the phases of the coaching process (Koonce, 1994). Several authors have developed models to describe the process of executive coaching. Most authors have identified certain phases or stages that form part of the executive coaching process as summarised in Table 5.2.

TABLE 5.2

Summary of Executive Coaching Models

<p>Koonce, 1994:</p> <ol style="list-style-type: none"> 1. Pre-coaching phase 2. Data gathering 3. Coaching 4. Follow-up 	<p>O’Neill, 2000:</p> <ol style="list-style-type: none"> 1. Contracting 2. Action planning 3. Live action coaching 4. Debriefing
<p>Dembkowski & Eldridge, 2004: ACHIEVE Coaching Model</p> <ul style="list-style-type: none"> • Assess current situation • Creative brainstorming • Hone goals • Initiate option generation • Evaluate options • Valid action plan design • Encourage momentum 	<p>Koortzen & Oosthuizen, 2010: Competence Executive Coaching Model</p> <ul style="list-style-type: none"> • Contracting / re-contracting • Assessment / re-assessment • Development plan • Public dialogue • Implementation / Follow-up

5.3.1. Koonce's phases of executive coaching

According to Koonce (1994) the executive coaching process consists of four phases, namely:

- Pre-coaching;
- Data gathering;
- Coaching; and
- Follow-up.

The pre-coaching phase consists of discussions between the coach and coachee regarding the program, methods, frequency of sessions, location and costs. During the data gathering phase assessments are conducted, in the form of 360 degree surveys or interviews, to define problems and identify development needs. The coaching phase is where actual coaching takes place in the form of meetings during which goals and objectives are identified and a development plan to achieve the desired outcomes is compiled. During the follow-up phase behavioural changes are monitored and assessed to measure if the goals were achieved.

5.3.2. O'Neill's phases of executive coaching

O'Neill (as cited in Bougae, 2005) also identified four phases although he describes them differently, namely:

- Contracting;
- Action planning;
- Live action coaching; and
- Debriefing.

In the contracting phase goals are set and action plans are developed. In the action planning phase the specific steps required for the action plan and to achieve the goals are identified. The live action coaching phase involves the

direct observation of the executive on the job and offering suggestions. This phase is sometimes omitted if not practical in the specific working environment. The debriefing phase involves giving feedback and evaluating the achievement of goals. At this point the coaching relationship can be concluded or it can continue by means of re-contracting for further coaching.

5.3.3. The ACHIEVE Executive Coaching Model

Dembkowski and Eldridge (2006) developed the seven-step ACHIEVE Coaching Model that has been applied successfully in various organisations worldwide. They identified seven essentials steps in the executive coaching process and also offer insights into the skills and techniques required by effective coaches in each stage. The seven steps are: assess the current situation, creative brainstorming, hone goals, initiate option generation, evaluate options, valid action plan design and encourage momentum. This model is illustrated in Figure 5.1 below.

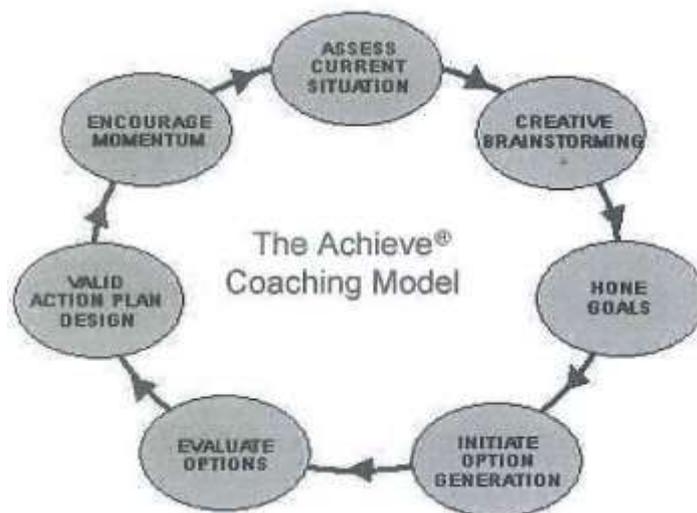


Figure 5.1 The ACHIEVE Coaching Model (Source: Dembkowski & Eldridge, 2006)

The seven steps of this model are briefly described as follow:

Step 1: Assess the current situation

In this step the executive is encouraged to reflect deeply on his or her current situation in order to enhance self-awareness and identify areas to address in the sessions ahead. The coach makes informed use of assessment instruments to gain an understanding of the client's situation and also takes time to understand the situation from the client's perspective.

Step 2: Creative brainstorming

In this phase the executive's perspective is broadened by brainstorming a variety of alternatives to the client's current situation. The coach asks creative, unexpected questions to interrupt the client's habitual thinking patterns in order to become "unstuck".

Step 3: Hone goals

In this step the executive must translate the alternatives and possibilities into specific goals. The coach assists the executive to clearly define the desired results and to develop a set of specific measurements that will provide clear evidence of goal achievement.

Step 4: Initiate option generation

Now that the executive has decided upon specific goals the next step is to develop a wide variety of methods for achieving the goals. The coach uses a variety of techniques and questioning to assist the client in generating an array of alternative options.

Step 5: Evaluate options

The next step is to evaluate and prioritise the comprehensive list of options that the executive has generated. The coach probes and encourages the client to evaluate each option and identify the most suitable options.

Step 6: Valid action plan design

At this stage the executive must design a concrete action plan and commit to it. The coach works with the client to create a detailed action plan in writing and ensures that the client is committed to the plan.

Step 7: Encourage momentum

The final step in a coaching relationship is usually to facilitate the client's execution of the action plan but the role of the coach in encouraging momentum between coaching sessions is equally important. In this phase the coach must continue to demonstrate interest in the development of the client through regular check-in or follow up sessions but must also avoid dependency and know when to end the coaching relationship.

This model aims to provide insight into coaching methodology as well as a means for coaches to structure their coaching programs and sessions. It provides for flexibility and individuality and coaches can adapt it to the specific environment.

5.3.4. The Competence Executive Coaching Model

Koortzen & Oosthuizen (2010) developed the Competence Executive Coaching Model based on research in a South African environment. They identified five competences namely contracting/re-contracting, assessment/re-assessment, development plan, public dialogue and implementation/follow-up as illustrated in Figure 5.2 on the next page.

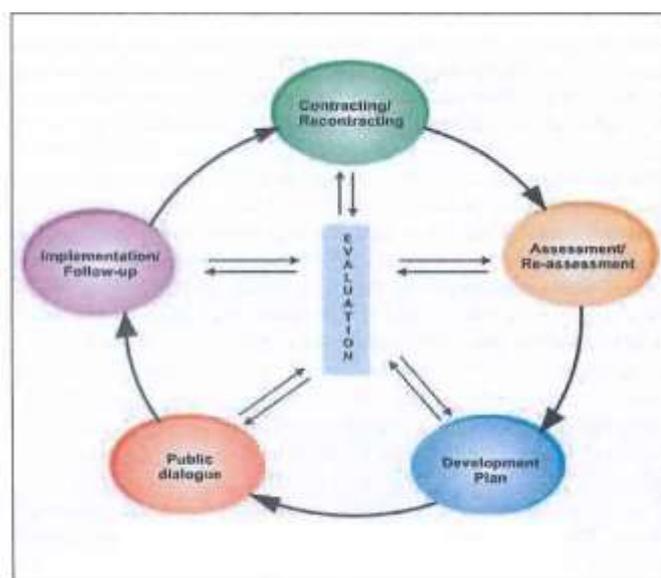


Figure 5.2 Competence Executive Coaching Model (Source: Koortzen & Oosthuizen, 2010)

The five competences are briefly described as follow:

Competence 1: Contracting / Re-contracting

This competence involves contracting with the business, relevant parties and the candidate. It is crucial for the coach to understand the context and goals of the business and what type of leadership competencies are desired to achieve these goals. The coach obtains the support and cooperation of the decision makers and executives and starts engaging with the coachee. At the end of the program a second contract can be negotiated and a similar process will be involved in re-contracting.

Competence 2: Assessment / Re-assessment

This competence involves a comprehensive assessment of the executive’s competencies based on the leadership profile or competency framework of the business. 360 degree evaluations and a number of psychometric assessments

can be used for this purpose. It is important to ensure the validity and reliability of the assessment results.

Competence 3: Development Plan

This competence firstly involves presenting feedback of the assessment to the coachee and facilitating a discovery and internalisation process and secondly constructing a development plan for the coachee. Various actions and learning strategies are incorporated into the plan in order to address the development areas.

Competence 4: Public dialogue

This competence involves peers who have been trained during the contracting phase in giving feedback on the coachees' progress during structured sessions. Public dialogue takes place at specified times during one of the coaching sessions and two or three participants give feedback to the coachee on what they have observed in the work context. Some critique regarding the public dialogue phase was noted with participants feeling that it creates anxiety and exposes the executive unnecessarily.

Competence 5: Implementation / Follow-up

The final phase is to implement the executive coaching program development plan by exposing the coachee to all the learning interventions and the actual conducting of the coaching and public dialogue sessions. It also involves assessment to determine the effectiveness of the interventions and adapting of the plan and process as needed.

This model provides a basic structure for the executive coaching process. In addition it describes the required competences and assessment criteria that could prove useful in the training of coaches.

All of the models discussed, although they may differ in terms of the number, names and description of the phases, essentially cover the same activities that constitute the coaching process. These activities, at its basic, include agreeing about the details of the program, assessing of competencies, conducting the coaching and related interventions, measuring the results and determining the way forward. As such, the researcher concludes that these basic activities should be included in a safety coaching program.

5.3.5. A framework for executive coaching programs

From the discussion of the concept and process of coaching it is clear that there are many components that constitute a successful executive coaching program. Joo (2005) developed a conceptual framework of executive coaching based on an integrative review of practice and research as illustrated in Figure 5.3.

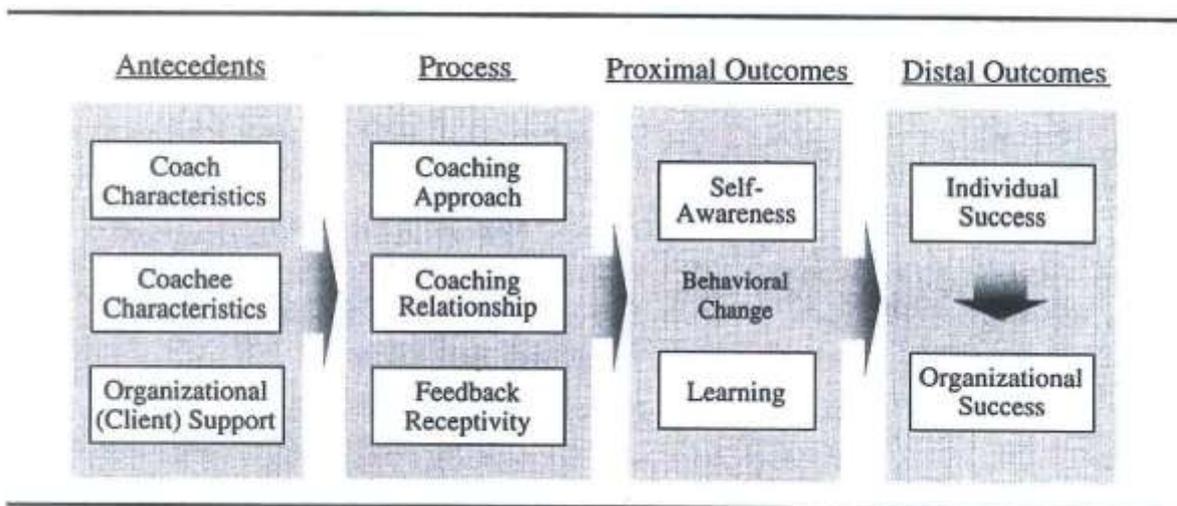


Figure 5.3 A conceptual framework for successful executive coaching (Source: Joo, 2005)

The framework consists of three key elements namely antecedents, process and outcomes. These elements are discussed in the next section.

Antecedents

The antecedents of positive outcomes in executive coaching are the characteristics of the coach and coachee and organisational support. Important coach characteristics include the coach's integrity, confidence, experience, training, and high developmental orientation. Important coachee characteristics include pro-activity, learning orientation and openness to feedback. Organisational support i.e. from top management and Human Resources is important to ensure integration and alignment of the program to business objectives.

Process

The coaching process is central to the framework and the important components are the coaching approach, the coaching relationship and feedback receptivity. The coaching approach must support the achievement of both organisational and personal goals and the appropriate approach should be selected based on organisational and personal needs. A good relationship between the coach and coachee enhances the process of self-awareness, learning and subsequent behavioural change and therefore the effective matching of coaches and coachees is critical. The receptivity of the coachee to assessment and feedback has an impact on learning and eventually on individual and organisational success and it is important to enhance feedback receptivity by ensuring that the assessment results are accurate and valid and accepted by the coachee and also coach to provide honest and challenging feedback and helpful suggestions.

Outcomes

The outcome element of the framework consists of two types namely proximal and distal outcomes.

Proximal outcomes include self-awareness and learning. Coachees gain self-awareness during the coaching process through deep reflection and by considering the effect of their behaviours on themselves and others. However, increased self-awareness is not enough and there should also be learning. Learning consists of two aspects namely cognitive and affective learning. Cognitive learning refers to enhancements in declarative, procedural, strategic and tangible knowledge while affective learning refers to less tangible aspects such as improved tolerance for diversity, work-life balance, self-efficacy or goal setting. Some coaches focus more on self-awareness and others more on learning but the purpose is the same namely behavioural change.

Distal outcomes are divided into individual success and organisational success. Individual success may entail increased compensation, promotion, job satisfaction and psychological wellness. Individual benefits may also include aspects such as improved problem solving and interpersonal skills. Organisational success may entail increased organisational performance, talent retention and transformation. Benefits for the organisation may be as diverse as improved productivity, quality and customer service.

In the researcher's opinion this framework provides a clear and comprehensive description of the components that constitute a successful executive coaching program. The antecedents include the importance of considering coach and coachee characteristics (Ennis, 2002; Joo, 2005; Long, 2003) as well as gaining organisational support for the program (Geller, 1995; Long, 2003). It highlights the importance of selecting the appropriate type of and coaching approach and the impact of matching coaches and coachees on the coaching relationship (Barner & Higgings, 2007; Berg & Karlsen, 2007; Long, 2003). Additionally, it emphasises the goals of leadership development through coaching namely self-awareness and learning (Cacioppe, 1998; Long, 2003). It also supports argument that the evaluation of executive coaching, as part of a leadership development program, should measure individual as well as organisational success (Cacioppe, 1998; Ennis, 2002; Long, 2003).

5.4. DEVELOPING A COACHING PROGRAM TO IMPROVE SAFETY LEADERSHIP

Executive coaching is a well-defined process with time frames designed to be focused and goal oriented (Koonce, 1994). To develop and implement a successful executive coaching program requires careful planning and the inclusion of specific activities (Ennis, 2002; Koonce, 1994; Long, 2003). The researcher applied the same principles as discussed in the previous sections to develop and evaluate a safety leadership coaching program.

Based on the literature review and the discussion of the principles of executive coaching in this chapter, the researcher developed a framework to serve as a guideline in developing and evaluating an executive coaching program to improve safety leadership. This framework is illustrated in Figure 5.4 on the next page. **The researcher developed the coaching program by applying the framework and the specific steps followed in conducting the program are described in the next chapter. Application of the framework in order to develop a coaching program is discussed in the next section.**

First of all, the framework could be applied as a general guideline for developing any executive coaching program, as part of a leadership development program. The overall goal of the coaching program must be identified. This will be based on the organisational goals and the executives' personal training and development needs. The goal of the coaching program determines what type of coaching would be most appropriate to achieve the goal. For example if the goal is to improve leadership performance then performance coaching would probably be the suitable type of coaching. The type of coaching required establishes the coaching approach to be followed. For example in the case of performance coaching a behavioural or systems approach would probably be suitable to achieve the overall goal. The type of coaching and coaching approach selected has an influence on certain components of the program such as the selection criteria for coaches, whether to employ internal or external coaches and how coaches and coachees would be effectively matched.

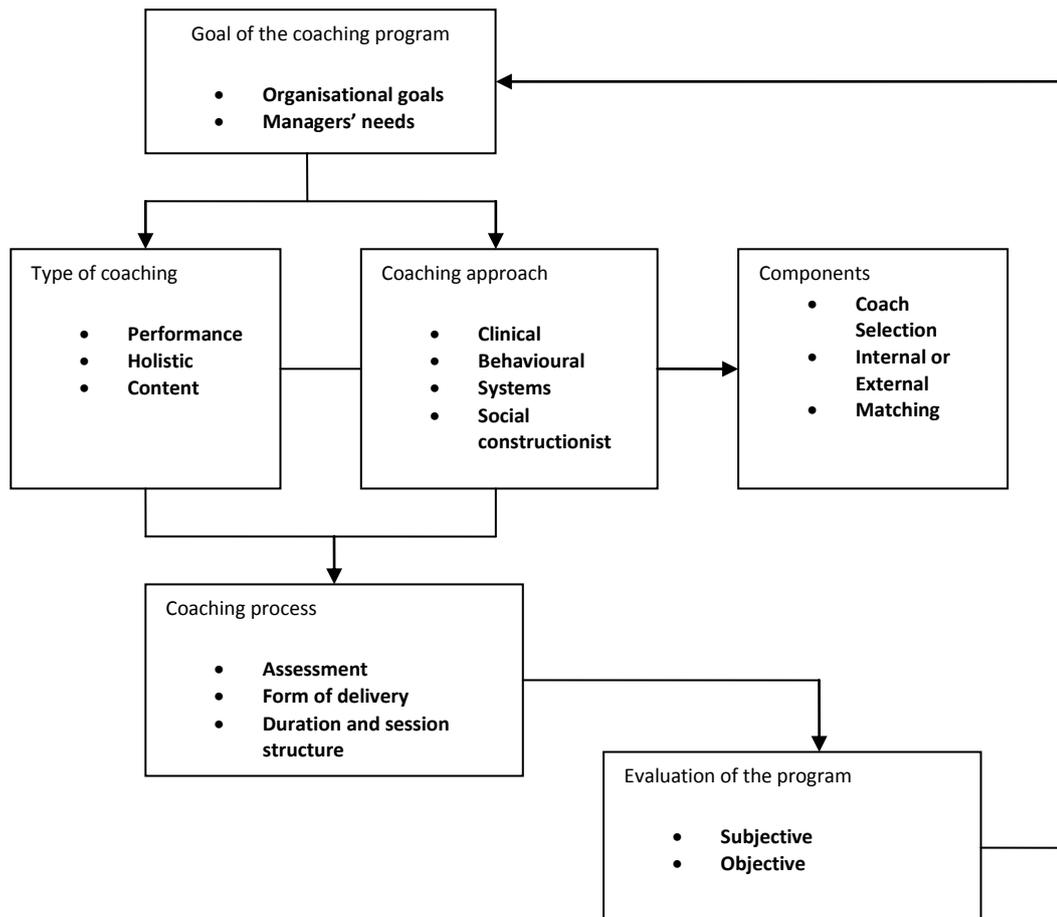


Figure 5.4 Framework for developing a safety leadership coaching program

The coaching type and approach determines certain aspects in the phases of the coaching process. For example what type of assessment techniques to employ during the data collection phase and what form of coaching delivery will be most suitable and practical during the actual coaching phase. The type of coaching and approach will also influence the duration of the program and how each coaching session is structured.

All of these aspects will determine what measures will be employed to evaluate the results and success of the coaching program. For example if holistic coaching with a clinical approach was conducted then evaluation of the program by subjective means i.e. as reported by the executive may be considered sufficient or, in case of performance coaching, the organisation may require an objective evaluation such as before and after coaching performance

assessments. Another option is to employ subjective as well as objective evaluations in order to form a comprehensive analysis of the impact of the coaching program. Ultimately the evaluation must be linked back to whether the overall goal of the program was achieved and thus whether organisational and individual needs were met.

Applied to safety leadership, certain factors are predetermined. The organisational goal of the program is to improve safety leadership. The executives' goal is to improve their safety leadership and specific individual goals will be established once the analysis of the assessment data has been conducted.

Safety leadership is about developing certain behaviours or practices and it also requires knowledge about safety legislation, workplace hazards, safety management tasks and organisational safety systems. Thus, in this case the type of coaching needed to achieve the goal of improving safety leadership would be performance-content.

A behavioural approach will allow for executives to understand the impact of their behaviour on themselves and others and to identify ways in which to adapt their behaviour to be effective safety leaders. However, safety is also part of the organisational systems and it is necessary to consider executive's interactions with other organisational members and systems that influence their performance. Thus, based on the personal beliefs, knowledge and experience of the researcher it is suggested that a behavioural-systems approach would be most appropriate to follow.

Safety is such an integral part of the organisational culture and systems and therefore it requires knowledge that is very specific to a workplace and industry (Paige, 2002). Thus, it is suggested that appropriate internal coaches be selected. Organisations must ensure that the internal coaches have the necessary business, leadership, coaching as well as content knowledge and experience to effectively assist executives with their development in this field.

The researcher is of the opinion that safety professionals with the appropriate knowledge and skills are best suited for the task as they usually operate separately from the line functions and may have already established relationships and be in a position of providing guidance in terms of safety.

The actual coaching process will focus more on behavioural aspects and behavioural assessment methods that are also compatible with the systems approach. For example, 360 degree feedback could be employed to determine executives' development needs. It is advisable to include an assessment of the executives' performance on the other elements of safety leadership namely knowledge, experience and safety management tasks. Whether formal measurement is included or not, a general examination and awareness of the executive's personal attributes, values and leadership style that influence their safety leadership should be encouraged. This will ensure that a comprehensive assessment is conducted and allow the coach to make recommendations for other interventions to be implemented parallel with the coaching program, if required.

The actual coaching sessions will mainly consist of on-on-one sessions but it can be supported by telephonic or electronic means if necessary. Because of the busy schedules of executives, sessions should not be longer than an hour at a time and scheduled a few weeks apart to give them enough time to complete the activities generated from each session. The number of sessions and overall duration of the program will depend on the type and number of development needs of each individual.

Finally, individual development progress as well as the overall program must be evaluated to determine its success in achieving organisational and individual goals. This includes subjective methods such as executives' self-reports about their development experience and perceived improvement as well as objective measures such as repeating the original assessments.

5.5. CHAPTER SUMMARY

In this chapter the concept of executive coaching was explained and defined and its application in a safety environment discussed. The different types of coaching namely performance, holistic and content coaching was described and the best possible type of coaching for safety leadership was proposed. Different theoretical approaches to executive coaching such as the clinical, behavioural, systems and social constructionist models were discussed and the best possible approach to follow for safety leadership coaching was proposed.

The components of a successful executive coaching program were discussed including the various methods and a model for the evaluation of a professional development program. The various theoretical models that aim to explain the executive coaching process were described. The application of the principles and components of executive coaching to develop safety leadership was discussed. A framework for developing and evaluating an executive coaching program to improve safety leadership was presented.

This chapter concludes the first phase of the study namely the literature review. The empirical study will be introduced in chapter 6. Aspects pertinent to the data collection and analysis methods employed in the empirical study will be discussed.

CHAPTER 6

DATA COLLECTION AND ANALYSIS METHODS: EMPIRICAL STUDY

In chapter 6, the second and third phase of the research, namely the empirical study, is introduced. The second phase consists of the quantitative study and the third phase is the qualitative study. The aims of the study, the population and sample, the measuring instruments, the data collection methods, and the methods employed to analyse the data is presented. The intervention that was conducted is also discussed.

6.1. INTRODUCTION

The empirical study focused on improving safety leadership. Safety leadership refers to the competencies (skills, knowledge, attributes and attitudes) that leaders require in order to improve the organisation's safety performance. These competencies include personal attributes and values, knowledge and experience, safety management, leadership style and leadership behaviours as discussed in chapter 4.

The study was conducted in a private organisation in the mining industry. The organisation consisted of two mining sites and adjacent works situated in close geographical proximity. The case organisation has implemented a safety management system and complies with the legal mine health and safety requirements as far as practically possible.

6.2. THE AIM OF THE STUDY

The general aim of the research was two-fold namely 1) to develop a safety leadership coaching program and 2) to evaluate the impact of a coaching program on safety leadership. A safety leadership coaching program was developed during the literature review phase of the research and then implemented. The impact of the safety leadership coaching program was evaluated by means of conducting a mixed methods study.

6.3. MIXED METHODS RESEARCH

A mixed methods research design was followed for this study. The definition of, rationale for utilising this method, and aspects pertaining to the selection of an appropriate mixed methods design is described before continuing with the discussion of the empirical study.

6.3.1. Defining mixed methods research

According to Greene, Caracelli and Graham (1989) mixed methods research designs include at least one quantitative method and one qualitative method. Johnson and Onuwuegbuzie (2004) indicate that mixed methods research mixes or combines quantitative and qualitative research approaches, techniques and methods in a single study. For the purpose of this study the definition of Creswell and Creswell (2005, p. 317) was applied, namely “mixed methods research is a research design or methodology for collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies in order to better understand research problems”.

This definition highlights three aspects that require discussion namely different types of data collection and analysis methods and the mixing of the different types of data.

The first aspect involves the intentional collection of both quantitative and qualitative data. This entails two distinctly different methods of collecting data and also collecting two distinctly different types of data (Klassen, Creswell, Plano Clark, Smith & Meissner, 2012). Quantitative research collects data in numerical format such as by means of a survey with structured responses numbered from one to five while qualitative research collects data in a less structured manner through interviews or observations in the form of written (text) or spoken (recordings) language (Creswell & Creswell, 2005; Durrheim, 1999a; Molina-Azorin & Cameron, 2010).

The second aspect is that both quantitative and qualitative data must be analysed and each type of data involves its own distinct analysis approaches. Qualitative approaches utilise statistical methods for data analysis while qualitative researchers analyse the data by identifying themes (Creswell & Creswell, 2005; Durrheim, 1999a; Molina-Azorin & Cameron, 2010).

The third aspect involves the procedure followed for the mixing of the quantitative and qualitative data. Firstly, researchers can *integrate* the two types of data by collecting both forms and then combining or comparing the two data sets (Creswell & Creswell, 2005, Greene et al., 1989). This procedure entails the merging of numeric and text data for example by first stating a statistical finding and then presenting a qualitative quote to illustrate the finding or *vice versa*. Secondly, researchers can *connect* the quantitative and qualitative data for example collect qualitative data in order to follow up and expand on the results of the quantitative data (Creswell & Creswell, 2005; Greene et al., 1989). Thirdly, researchers can apply a theoretical framework or program to combine the data sets. When mixing within a program-objective framework the researcher mixes quantitative and qualitative results within an overall program objective that guide the joining of multiphase studies. The point where mixing occurs will depend on the specific mixed methods design that is followed (Klassen et al., 2012). Subsequently, the mixing of data can occur during data collection, during data analysis and/or during the data interpretation stage.

The decision of at which stage the mixing is conducted depends on the level of interaction between the qualitative and quantitative studies (Greene, 2007). An *independent level of interaction* means that the quantitative and qualitative studies are implemented independently and the researcher keeps the research questions, data collection, and data analyses separate and only mixes the data at the end of the study when drawing overall conclusions and interpretations. An *interactive level of interaction* occurs when a direct interaction between the two studies exists for example when the design and implementation of one study depends on the results of the other study. This study was conducted with an independent level of interaction in that the research questions, data collection

and analyses were kept separately and the data was only mixed in the final interpretation at the end of the study.

6.3.2. Rationale for employing mixed methods

In the literature, discussions about mixing quantitative and qualitative research methods often make reference to the perceived incompatibility of the ontology, epistemology and methodology that is traditionally associated with each method (Azorin & Cameron, 2010; Creswell & Creswell, 2005; Hanson, Creswell, Plano Clark, Petska & Creswell, 2005). In essence, quantitative and qualitative research methods have different strengths and weaknesses (Durrheim, 1999a). Qualitative methods involve the study of selected issues in depth and detail in an attempt to identify and understand the themes that emerge from the data (Durrheim, 1999a). Qualitative research is less concerned with statistical accuracy and more concerned with detailed and in-depth analyses, typically does not draw large or random samples and findings are often not generalisable (Durrheim, 1999a; Ellinger, Watkins and Marsick, 2005). Quantitative methods begin with predetermined categories embodied in standardised quantitative measures (Durrheim, 1999a). Quantitative methods allow researchers to make broad and generalisable comparisons (Durrheim, 1999a).

What the standardised quantitative measure lacks in depth and detail of understanding, it gains in facilitating comparisons between different groups (Durrheim, 1999a). What quantitative methods lack in generalisability, it gains in depth and detail of understanding (Durrheim, 1999a; Ellinger et al., 2005). Thus, and perhaps contrary to traditional views, quantitative and qualitative methods constitute *alternative* and not necessarily *opposing* research strategies (Durrheim, 1999a; Cook & Reichardt, as cited by Creswell & Creswell, 2005). Mixed methods research is appropriate when the researcher wants to examine outcomes along with processes or experiences and is becoming an increasingly popular method for conducting research in organisations (Creswell & Creswell, 2005; Plano Clark, 2010).

Greene et al. (1989) identified several reasons for mixing methods namely triangulation, complementarity, development, initiation and expansion. Triangulation aims to converge, corroborate and match results from the different methods. Complementarity seeks to elaborate, enhance, illustrate and clarify the results of one method with the results of the other method. Development utilises the results of one method to inform the sampling, implementation, and measurement decisions of the other method. The goal of initiation is to discover paradox and contradiction, new perspectives on frameworks, and modifying of the questions and results from one method with questions and results from the other method. Expansion aims to extend the breadth and range of inquiry by applying different methods to address different components (or research questions) of the inquiry. These reasons provide a general framework that researchers can consider to justify their decision to mix methods (Greene et al., 1989). In this study the reason for employing mixed methods was expansion. The research questions pertaining to managers' changes in attitude and experience of the coaching program could not be answered by quantitative methods alone and therefore the decision to conduct mixed methods research was made.

Conducting mixed methods research has benefits as well as challenges (Azorin & Cameron, 2010; Creswell & Creswell, 2005; Hanson, Creswell, Plano Clark, Petska & Creswell, 2005). The benefit of employing a mixed methods design is that quantitative data provided generalisable trends while qualitative data provides in-depth information on individual's experiences (Greene et al., 1989). Thus, combining the two types of data could enhance the utility of the research (Azorin & Cameron, 2010; Creswell & Creswell, 2005). It is also argued that there is value in combining different methodological approaches when conducting research with the practical aim of evaluating a program, as is the case in this study (Mouton & Marais, 1996; Potter, 1999).

However, this research method also poses certain challenges, especially to the lone researcher in that at least basic skills in both quantitative and qualitative data collection and analysis methods is required (Creswell & Creswell, 2005;

Hanson et al., 2005; Molina-Azorin & Cameron, 2010). The collection and analysis of both quantitative and qualitative data places high demands on researchers' skills and also on their resources in terms of the time it takes to implement the aspects of both types of research (Hanson et al., 2005; Molina-Azorin & Cameron, 2010). These challenges are more easily overcome with a team of researchers that could divide activities and draw on each other's experience and thus lone researchers must ensure that they would be able to deal with the demands of mixed methods research (Creswell & Creswell, 2005; Hanson et al., 2005; Molina-Azorin & Cameron, 2010).

During the course of her work and academic life the researcher has conducted both quantitative and qualitative research but never combined in the same study. In this case, the researcher believed that a mixed methods design would greatly enhance the achievement of the aims of the study. Therefore, the researcher fully committed to the process and to dealing with the challenges concerned by means of effective planning and additional reading where necessary.

6.3.3. Mixed methods designs

Authors have identified different types of mixed methods designs (Creswell & Creswell, 2005; Greene et al., 1989; Johnson and Onuwuegbuzie, 2004; Klassen et al., 2012; Morse, 1991). Three broad types of mixed methods research designs are identified (Johnson & Onuwuegbuzie, 2004; Creswell & Creswell, 2005; Klassen et al., 2012), as follow:

- Concurrent (parallel or concurrent) designs are employed to merge quantitative and qualitative data that were collected concurrently and to compare the two sets of data.
- Sequential or two-phase designs enable one set of data to build on the results of the other. The sequence of the methods i.e. whether quantitative is followed by qualitative or *vice versa*, depends on the aim of the study.

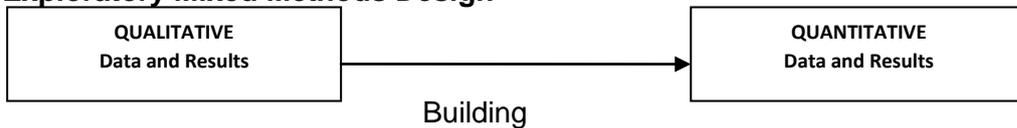
- Embedded or nested designs embed quantitative and qualitative approaches into each other in order to provide new insights or more refined thinking.

Based on the above, Creswell & Creswell (2005) have identified four basic research designs. Figure 6.1 below, illustrates these four basic designs.

Explanatory Mixed Methods Design



Exploratory Mixed Methods Design



Triangulation Mixed Methods Design



Nested Mixed Methods Design

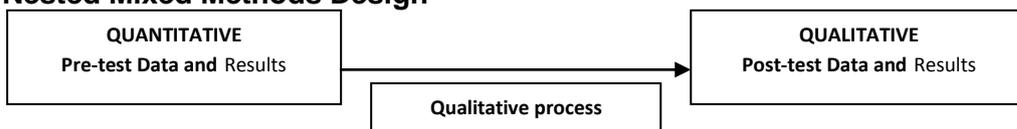


Figure 6.1 Basic Mixed methods designs (Source: Creswell & Creswell, 2005, p. 320)

The *explanatory mixed methods design* entails a quantitative data collection phase followed by a qualitative data collection phase. This design is utilised to follow up on quantitative results from experiments or surveys by more in-depth probing through qualitative methods such as focus groups, interviews or observations.

The *exploratory mixed methods design* is similar in that it also involves a quantitative collection phase followed by a second qualitative phase. This design is mainly employed to develop quantitative instruments when the variables are unknown or to explore preliminary quantitative results.

The *triangulation mixed methods design* collects quantitative and qualitative data concurrently so that the researcher can integrate the two types of data to make comparisons. This design is typically utilised to compare the particular with the general or to validate quantitative results.

The *nested mixed methods design* is similar to the triangulation design in that both quantitative and qualitative data are collected more or less at the same time but more emphasis is placed on the one set of data than on the other. In this case the quantitative research question addresses different constructs than the qualitative study. This design is mainly followed when the researcher's overall goal is to understand the impact of an intervention on outcomes while at the same time seeking to understand participant's experiences of the process (Creswell & Creswell, 2005).

In this study the nested mixed methods design was followed. The nested design was considered appropriate because the main aim of the study was to evaluate the impact of an intervention on outcomes while seeking to understand participant's experiences of the process (Creswell & Creswell, 2005). In addition, the nested design aligns with the reason selected for mixing methods namely expansion and an independent level of interaction in that the researcher can report on the two sets of data separately (Greene, 2007). The quantitative research question addressed the evaluation of safety leadership skills whereas the qualitative research question addressed participants' evaluation of the process and the intervention *per se*. The pre-test quantitative data was collected and after the intervention the post-test quantitative and qualitative data were collected more or less at the same time. For the evaluation of the intervention more emphasis was placed on the qualitative findings. The point of mixing the quantitative and qualitative results occurred during the data

interpretation stage. However, it can be difficult to integrate the results when the reason for employing the two methods is expansion i.e. to answer different research questions (Greene et al., 1989).

Authors suggest that mixed methods research designs should not be applied too rigidly (Hanson et al., 2005; Klassen et al., 2012; Molina-Azorin & Cameron, 2010). Although the study may initially have a predetermined mixed methods design, new components or aspects of other designs may develop as the data is collected and analysed. The aim of the study plays an important role and the quest to answer the research question should not be limited by the existing design (Hanson et al., 2005; Klassen et al., 2012; Molina-Azorin & Cameron, 2010). In this sense, the study incorporated some aspects of the triangulation mixed methods design in that the qualitative findings and quantitative results were compared where applicable, and in doing so the challenge of integrating data sets that answer different research questions were addressed.

6.4. THE QUANTITATIVE STUDY

The aims, population and sample, measuring instrument, data collection methods, and the methods employed to analyse the data for the quantitative study are described in the next sections.

6.4.1. Aims of the quantitative study

The specific empirical aims for the quantitative study were:

Research aim 1: To assess and describe the safety leadership of the mine before the coaching program.

Research aim 2: To compare the different biographical groups' assessment of the safety leadership to determine if there are any significant differences.

Research aim 3: To assess the safety leadership after completion of the coaching program to determine the impact thereof on safety leadership.

6.4.2. Research method and design

The survey method was employed for the study. The survey is one of the most common methods utilised to conduct research in organisations and it is the most frequently used method in organisational research to assess phenomena that are not directly observable (Bartlett, 2005). A survey is “a method used to gather self-report descriptive information about the attitudes, behaviours, or other characteristics of some population” (Rosenfeld, Edwards & Thomas, 1995, p. 548). The purpose of survey research is to collect information from various people on a certain set of constructs that are relevant to the organisation (Bartlett, 2005). The advantage of the survey method is that it is usually cheap and quick to administer and can cover a broad spectrum (Bennet, 1991).

For the quantitative study a 360 degree survey was utilised. The 360 degree survey method broadens the base of information about a person’s behaviour at work by including input from superiors, subordinates, peers, customers and other role players (Cascio, 1998). This method of collecting feedback is focused on increasing managers’ self-awareness and to encourage them to change certain behaviours (Becton & Schraeder, 2004; Cacioppe & Albrecht, 2000; Maurer, Mitchell and Barbeite, 2002). Studies have shown that 360 degree feedback plays a key role in improving safety leadership and that coaching is often more effective when it includes this type of feedback (Carrillo, 2002; Nyman & Tach, 2009; Tach, 2002).

A one-group pre-test – post-test design was followed for the quantitative part of the study. This design involves the collection of data before and after an intervention in order to determine the impact of the intervention on the variables being studied (Bartlett, 2005). The aim of this study was to determine the impact of a coaching program on safety leadership and therefore a pre-test – post-test design was considered appropriate.

6.4.3. Population and sample

A population is “any collection of objects or entities that have at least one common characteristic” (Jaeger, 1990, p. 138), such as employees at the same organisation. Limited resources generally do not allow researchers to obtain data about an entire population. Instead, researchers select samples of the population in order to draw inferences about the larger group (Holton & Burnett, 2005).

The case organisation is a small mining operation with approximately 480 employees. The organisation consists of two mining sites and adjacent works that are situated in close geographical proximity. The purposive sample (N=54) consisted of senior management and other managers, their superiors and some subordinates as well as the organisation’s health and safety representatives. These groups rated themselves and each other in their various capacities as peers, subordinates and superiors and a total of 215 questionnaires were completed. Although the sample seems relatively small, it is considered adequate in terms of the focus of the study (safety leaders) and the 360 degree survey method that was employed (Cascio, 1998; Terre Blanche & Durrheim, 1999).

6.4.4. The measuring instrument

The 360 degree Leadership Assessment Tool developed by the Mine Health and Safety Council (MHSC) in 2011 was utilised as the measuring instrument in the quantitative study.

6.4.4.1. Rationale for and background of the instrument

This assessment tool was developed by the MHSC based on the internationally recognised work of Behavior Safety Technologies (BST) and the International Council for Minerals and Metals (ICMM.) The rationale for utilising this instrument is that it measures safety leadership whereas other available instruments measure organisational safety culture. It is also compulsory for

mines to utilise this tool as part of their Mining Charter commitments and is therefore considered appropriate to be used in this study.

6.4.4.2. Objective of utilising the instrument

This questionnaire was employed to gather data on the safety leadership behaviours of managers in the case organisation. The information gathered firstly provided baseline data about the organisation's safety leadership and secondly the post test data that was applied to evaluate the impact of the coaching program on safety leadership. The pre-test results also provided the performance information on which the individual objectives of the coaching program were based.

6.4.4.3. The content of the questionnaire

The first part of the original questionnaire provides guidance on how the tool should be employed, who should participate and confidentiality arrangements. The second part asks for participant's responses to statements about safety leadership performance. Participants must indicate their responses along a 5-point Likert type scale ranging from strongly disagree (1) to strongly agree (5).

The original questionnaire consisted of nine main statements or headings that describe the required safety leadership behaviours. Seven of the main statements each have between one and five sub statements numbered a) to e). Two of the main statements do not have any sub statements. After each set of statements a space to record comments is provided.

The nine main statements and examples of sub-statements, where applicable, of the original questionnaire are presented in Table 6.1 on the next page.

TABLE 6.1***Content of the Original Questionnaire***

Main Statement	Examples of sub-statements
1) Have a clear vision for safety and health improvement and articulates it every day with passion, respect and transparency.	Demonstrates personal concern for employee well-being. Challenges and inspires people around vision and values.
2) Comply with Occupational Health and Safety (OHS) rules at and outside of work, walk the talk.	Follows through on commitments made. Acts consistently in setting and applying standards.
3) Require participation of all employees.	Helps others resolve problems for themselves. Asks for and encourages input from people on issues that will affect them.
4) Values the advice of OHS professionals.	No sub statements.
5) Integrate OHS in all business decisions.	Is willing to make unpopular decisions for the sake of excellence. Focuses efforts on the most important priorities.
6) Provide positive feedback when you see progress.	Publicly recognises the contributions of others that impact performance. Finds ways to celebrate accomplishments.
7) Hold our organisation accountable for improving safety and health performance.	Holds people accountable for meeting their commitments. Sets clear responsibilities for subordinates.
8) Show eagerness to learn.	Admits mistakes that could impact performance to self and others. Takes advantage of improvement opportunities when they arise.
9) Fully commits to improving health and safety culture.	No sub statements.

In order to utilise this questionnaire for the purpose of this study, some shortcomings in the original questionnaire were identified and addressed. Firstly, the original questionnaire does not include the recording of any demographic data to be able to make comparisons between the responses of

different groups. Secondly, the name of the person that is being assessed is not recorded which makes it impossible to collect the individual performance data required for the coaching program. Thirdly, some of the statements are compound questions in the sense that it asks for one response but includes two aspects, for example in the following statement:

Challenges *and* inspires people around vision and values.

In order to achieve the aims of this study the questionnaire was adapted to consist of three sections, as follow:

Section A: Demographic Data

Section A provides for the recording of respondents demographic data and it is explained that this will only be used for statistical analysis purposes. The following demographic information of respondents was collected:

- Gender
- Race
- Position / level in company
- Age group

Section B: Questionnaire Instructions

Section B describes how respondents should complete the questionnaire. Respondents must choose and tick the answering option that best describes their response to the statement on a five-point scale as illustrated below.

1	2	3	4	5
Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree

Section C: Statements

In the statement section the person that must be assessed was indicated for the respondent. Respondents also have to indicate in what capacity they are completing the questionnaire, that is, as self, peer, subordinate, superior or health and safety representative.

The statements were reviewed, all compound questions were split into two separate questions and the pre-test questionnaire consisted of 44 statements. No headings were included but the statements were kept in the same order and grouping according to the main statements in the original questionnaire. The post-test questionnaire consisted of 43 statements that were regrouped and renumbered according to the factors identified in the factor analysis. No previous information on the reliability or validity of the Leadership Assessment Tool was available. However, the validity was established as described in the next section and reliability testing was performed on both the pre-test and post-test questionnaire and the results are presented in Chapter 7.

6.4.5. Validity

Measurement validity can be defined as “the degree to which a measure does what it is intended to do” (Durrheim, 1999b, p. 83). Thus, in order for the measuring instrument to be valid, it should be suited to the purpose for which it will be used. In this study, the measuring instrument was designed to measure safety leadership behaviour and it was applied for that purpose.

Content validity is established by the degree to which a measure reflects the content of the domain under study (Durrheim, 1999b). The measure will be content valid if the items on the instrument are representative of what is being measured. The content validity of the statements in the questionnaire was established in a logical manner by comparing it with the descriptions of safety leadership behaviours as established in the subject literature. It was confirmed that the statements reflect the content of the domain that is being studied.

Factor analysis is a useful statistical tool in developing and validating measurement instruments (Yang, 2005). Factor analysis explains “correlations among a large number of observable variables by identifying or confirming underlying factors that explain these correlations” (Yang, 2005, p. 183). It is a method to reduce or summarise data into a smaller set of variables or factors with minimal loss of information (Hair, Black, Babin & Anderson, 2010; Tredoux & Pretorius, 1999). Data summarisation provides a structure for individual variables to be grouped together in terms of a concept that they represent collectively (Hair et al., 2010). Each of the statements in the questionnaire represented safety leadership behaviours or variables and the data was summarised to determine a smaller number of meaningful dimensions that adequately represented the original number of variables (Hair et al., 2010; Tredoux & Pretorius, 1999).

Factor analysis involves the making of a number of decisions, thus, the factor analysis was performed according to stage 4 and stage 5 in the factor analysis decision model proposed by Hair et al. (2010) as depicted in Figure 6.2 on page 156. Stage 4 involves selecting a factor method for example component analysis or common factor analysis and specifying the factor matrix by determining the number of factors to be retained. Stage 5 firstly entails the selection of a rotational method based on whether the factors should be correlated or uncorrelated. Secondly, the rotated matrix is interpreted by determining whether significant loadings exist, whether the factors can be named and if communalities are sufficient. Thirdly, the factor model is re-specified by identifying the variables that were deleted and accepting or rejecting the number of factors and type of rotation method applied.

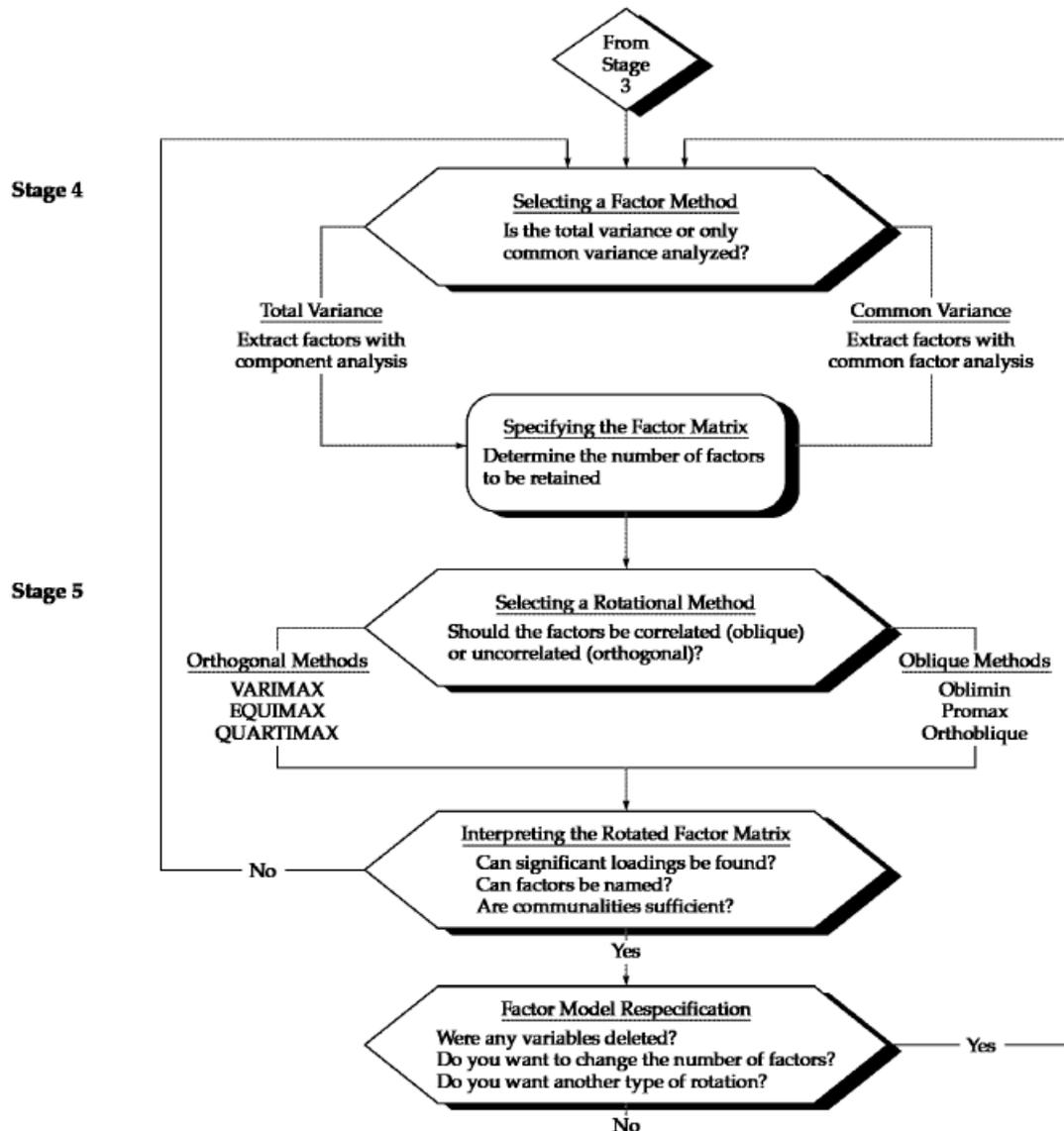


Figure 6.2 Stages 4 and 5 in the Factor Analysis Decision Diagram
(Source: Hair et al., 2010)

6.4.6. Reliability

The reliability of a measure refers to its dependability and specifically to “the extent to which the instrument yields the same results on repeated trials” (Durrheim, 1999b, p. 88). Thus, the measure is reliable if it provides consistent results.

There are different ways in which the reliability of a measure can be tested and internal consistency is one of the most common measures of reliability employed in research (Durrheim, 1999b). Internal consistency is established “by the degree to which each item in a scale correlates with each other item” (Durrheim, 1999b, p. 90). In this study the internal consistency of the questionnaire was determined by performing an item analysis using Cronbach’s coefficient alpha.

6.4.7. Data collection method

It came to the researcher’s attention that none of the employees in the selected sample have ever participated in a 360 degree survey process before. Also, due to the nature of the mining environment the majority of the participants would not have anywhere appropriate to sit and complete the questionnaires. In addition, the questionnaire was compiled in English and this was the second language of all of the participants. Therefore, the researcher decided to arrange for “research” sessions to be conducted at a suitable time and venue at both sites.

A session for each level of participants was conducted separately. During the sessions the purpose and aims of the research project was explained. The 360 degree survey process was explained and participants were given basic training on the pitfalls to avoid when rating. Confidentiality arrangements were explained, namely that the questionnaires were to be completed anonymously and that any feedback of the results will only be given in group context.

Hard copies of the questionnaire were printed and handed out to participants. Pens were provided where required. The names of the senior managers the respondents had to rate were pre-recorded on the questionnaires. The researcher explained the different sections of the questionnaire and also read through each statement and dealt with any questions regarding the meaning of words. Thereafter, the participants were given the opportunity to complete the

questionnaire and put their completed surveys in a slotted box. A total of 215 questionnaires were completed.

For the post-test survey, the process was repeated. All information was repeated for refresher purposes and the same procedure was followed. Exactly the same group of people participated in the post survey and thus a total of 215 questionnaires were completed again.

6.4.8. Data analysis and statistical methods

The pre-test and post-test survey data was analysed in a quantitative manner by means of the statistical computer software package SPSS (Statistics Package for Social Scientists). The various statistical methods employed in this study are discussed in the next sections.

6.4.8.1. Descriptive Analysis

The purpose of descriptive analysis is to describe and summarise the data by determining the distribution of scores obtained on each variable (Durrheim, 1999c). This gives the researcher a general 'picture' of the data collected. Descriptive analysis includes calculating frequency distributions, measures of central tendency such as the mean and measures of variability such as the standard deviation.

a) Frequency distributions

Frequency distributions are graphic representations of the number of participants who obtained a certain score on a variable (Durrheim, 1999c). This gives an indication of the distribution of scores. Graphic representations of frequency distributions were applied to depict the demographic composition of the sample.

b) The mean

The mean is a measure of central tendency. Measures of central tendency are calculations of the most central score in a distribution (Durrheim, 1999c). These measures are used to best represent the data collected for a specific variable.

The mean as a measure of central tendency is “the arithmetic average of all the values in the data set” (Durrheim, 1999c, p. 105). Adding all the values in the data set and then dividing that total by the total number of values in the set calculates the mean (Durrheim, 1999c).

Mean scores were calculated for participant’s responses to the dimensions of safety leadership in order to determine overall perceptions. Mean scores were also calculated for each independent variable, namely race group, gender, age group, job level and site respectively, in order to make comparisons between the groups. Finally, the mean scores of the different groups on each dimension were calculated in order to compare the pre-test and post-test results.

c) The standard deviation

The standard deviation is a measure of variability and “estimates the degree to which the observations for a variable are dissimilar to each other” (Durrheim, 1999c, p. 106). The standard deviation as a measure of variability indicates “how widely the responses vary around the mean” (Holton & Burnett, 2005, p. 39). The mean and standard deviation are the basis of inferential statistical analysis.

6.4.8.2. Inferential analysis

The purpose of most research is to determine whether relationships exist between variables (Durrheim, 1999c). Once the means are known, researchers usually want to make comparisons between groups (Holton & Burnett, 2005). Thus, data analysis must go beyond description.

Inferential analysis enables the researcher to draw inferences or conclusions about populations from the sample data (Durrheim, 1999c). Using samples to draw conclusions about populations is open to error and inferential statistics provide a reliable way of making interpretations of data in this context (Durrheim, 1999c).

Researchers make use of t-tests and analysis of variance (ANOVA) techniques to compare and determine the differences between the means of groups. The purpose is not only to determine the difference between the means but also to establish either whether there is no difference or if there is a difference, and if there is a difference whether that difference is a “real” or statistically significant difference between the groups (Holton & Burnett, 2005).

Researchers examine these differences by means of reading p-values (Holton & Burnett, 2005). By convention, a p-value equal to or less than .05 ($p \leq .05$) is the level at which a result is considered to be significant (Holton & Burnett, 2005; Tredoux & Smith, 1999). This level indicates that the researcher can be 95% confident that the difference is “real” and did not occur by chance. Analysis of variance techniques indicate whether there are significant differences between the means of groups but do not explain how they are different from each other. To further examine how the means of groups are different, post hoc tests are performed (Bates, 2005). The statistical tests applied in this study are discussed in the next sections.

a) One way analysis of variance (ANOVA)

When researchers want to compare the means of more than two groups, analysis of variance (ANOVA) techniques are applied (Holton & Burnett, 2005; Tredoux & Smith, 1999). One-way or simple ANOVA tests are used to compare the means of more than two groups on a dependent variable (Tredoux & Smith, 1999). One-way analyses of variance were performed on the pre-test data in this study in order to determine whether ratings of the safety leadership

dimensions (dependent variables) differed according to gender, race, age, job level and site (independent variables).

b) T-test for equality of means

Researchers employ t-tests to compare the means between two groups (Holton & Burnett, 2005). In the interest of confidentiality and for ethical reasons, no identifying information was recorded on the surveys and therefore the pre-test and post-test results of individuals could not be paired. Subsequently, the pre-test and post-test data sets were treated as independent samples. Thus, independent samples t-tests were performed to compare the pre-test and post-test results (Tredoux & Smith, 1999).

When analysing differences between groups the equivalence or invariance across groups must first be established or it could lead to inaccurate conclusions (Barnette & Williams, 2005). Thus, cross-group comparisons should begin by testing the assumptions of invariant measurement operations across the groups being compared (Barnette & Williams, 2005). For this purpose Levene's test for equality of variances was performed. If the result of the Levene's test is significant (i.e. $p \leq 0.05$) then equal variances cannot be assumed and the corresponding t-test result is appropriate to report on. If its result is insignificant then the t-test result for equal variances assumed is appropriate.

c) Post-hoc tests

T-tests and ANOVA tests reveal that there are differences between the means of groups but not where these differences lie (Bates, 2005). To further analyse the differences between the means of more than one group post hoc tests are performed (Bates, 2005). Post-hoc Scheffe and Games-Howell tests were performed for age group and job level to determine how these groups differed on the dependent variables.

6.5. THE COACHING INTERVENTION

The coaching program was developed in the literature review phase (Chapter 5) of the study and consisted of five parts as set out below. A participant manual and a coach's manual were compiled to facilitate the coaching program. Based on the pre-test 360 degree survey results, the executive coaching program was implemented to assist leaders to develop their safety leadership behaviours. Although the coaching program focused mainly on improving safety leadership behaviours, the other elements of safety leadership were also included to ensure a comprehensive development experience (Meyer, 2004; Werner, 2007). **The steps followed in the coaching program were based on research regarding the phases of coaching as discussed in chapter 5 (Dembkowski & Eldridge, 2004; Koonce, 1994; Koortzen & Oosthuizen, 2010; O'Neill, 2000). The steps are outlined below.**

PART 1 PLANNING

The coaching program, its objectives and the process was introduced. The coach and coachee determined the coaching session arrangements and signed a formal coaching agreement outlining their roles and responsibilities.

PART 2 ASSESSMENT OF SAFETY LEADERSHIP

The coachees' current safety leadership performance was assessed by means of informal self-reports as well as the 360 degree survey. The results of the assessments were analysed and discussed to identify the coachees' strengths and possible development areas.

PART 3 INDIVIDUAL DEVELOPMENT PLAN (IDP)

The coach and coachee compiled an individual development plan based on the assessment results. The plan outlined what aspects needed to be developed and included specific activities that must be completed within a determined time frame.

PART 4 IMPLEMENTATION

The coachee participated in the actual coaching sessions and implemented the actions as identified in the IDP. The format followed in each session consisted of identifying goals and actions and also feedback on progress with previous goals.

PART 5 EVALUATION

The participant's progress and achievement of goals were evaluated. This part also included the evaluation of the coaching program itself. This was achieved by means of the post-test 360 degree survey as well as conducting a semi-structured interview.

6.6. THE QUALITATIVE STUDY

The qualitative part of the study was conducted shortly after the coaching intervention was completed.

6.6.1. Aims of the qualitative study

The specific empirical aims for the qualitative study were to:

Research aim 4: To determine the impact of the safety coaching program on managers' attitudes with regard to safety.

Research aim 5: To determine the managers' personal experiences of the coaching program.

6.6.2. Research method

The qualitative research method employed is informed by the goals or objectives of the research (Braun & Clarke, 2006; Durrheim, 1999a). As indicated in Chapter 1, the quantitative study was a descriptive study with the

aim to accurately describe the impact of the coaching program on managers' attitude towards safety as well as their personal experiences of the coaching process.

To this end a group or collective case study method was utilised. This method entails the description of a number of cases, showing how individuals are both similar and different and how these differences are distributed, in order to present the concepts and themes identified across the entire set of data (Braun & Clarke, 2006; Ellinger, Watkins & Marsick, 2005; Ryan, 2005). Case study research can be utilised to examine various phenomena for example decisions, programs, an organisation, an implementation process, organisational change and policy (Ellinger et al., 2005). Case study research is most appropriate when the research is interested in answering *how*, *what* and *why* questions (Ellinger et al., 2005, p. 328).

6.6.3. Sampling

Qualitative research is less concerned with statistical accuracy and more concerned with detailed and in-depth analysis and typically does not draw large or random samples (Durrheim, 1999a; Ellinger et al., 2005). The participants in the qualitative study was a purposive sample consisting of the managers (n=4) who completed the coaching program (Passmore & Baker, 2005; Terre Blanche & Durrheim, 1999a).

6.6.4. Data collection method

There are various ways in which qualitative data can be collected (Braun & Clarke, 2006; Kelly, 2005a; Ryan, 2005). According to Ryan (2005) data collection can be divided into four main categories based on the degree to which the researcher interacts with the participants of the study. The four categories are: Techniques for indirect observation, techniques for direct observation, techniques for elicitation and mixed methods. Elicitation techniques are further divided into four basic types of interviews namely unstructured, semi-

structured, structured and mixed. This taxonomy of qualitative data collection techniques is illustrated in Figure 6.3.

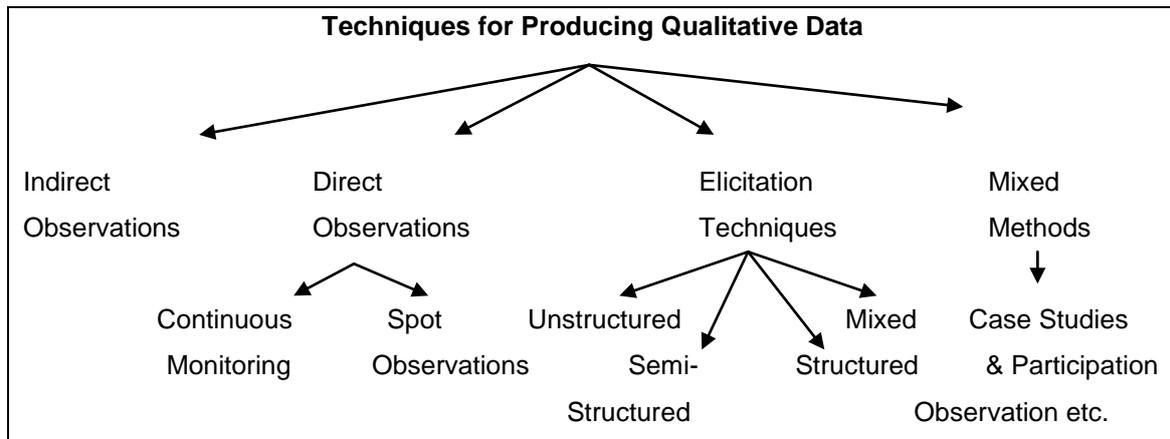


Figure 6.3 Taxonomy of qualitative data collection techniques (Source: Ryan, 2005)

Terre Blanche and Kelly (1999) contend that conducting interviews is one of the most popular methods of collecting qualitative data. As noted before, there are different types of interviews namely unstructured, semi-structured, structured and mixed (King, 2004; Ryan, 2005). Terre Blanche and Kelly (1999) conclude that the semi structured interview, where an ‘interview schedule’ is compiled, is most often used as qualitative data collection techniques. Semi-structured interviews are used in qualitative research to discover the meaning participants give to a process and to understand how and why they have come to that particular perspective (King, 2004; Terre Blanche & Durrheim, 1999). This type of interview is designed so that each participant is asked a similar set of questions and is useful when the researcher wants to make comparisons and derive themes across individuals or groups (King, 2004; Ryan, 2005).

The advantages of employing semi-structured interviews in qualitative research have been identified in the literature and include the following (King, 2004):

- It allows the researcher to be part of the process and establish a relationship to create the trust needed to elicit information on sensitive issues.

- It can address focused questions about specific aspects of organisational life.
- It can also be utilised to examine broader issues such as organisational culture.
- It assists participants to interpret questions correctly because the interviewer is there to clarify meanings.
- It is flexible in determining the wording and sequence of questions asked and allows opportunities for follow up and to clarifying participants' responses.
- The interview is a method that most participants feel comfortable with partly because of familiarity in general with interviews as well as because most people enjoy talking about their work, whether to share their accomplishments or air their complaints.

Following from the above, a semi-structured interview was selected as the main source of data collection for this phase of the study. The interview guide consisted of eight open ended questions to elicit information about the participant's experience of the coaching program, the impact on their attitudes, skills, and knowledge of safety leadership as well as suggestions for the improvement of the program.

Examples of questions included in the semi-structured interview:

- What is your opinion of safety at the moment?
- Has your attitude/beliefs about safety changed? Please elaborate e.g. how has it changed?
- On what aspects of safety leadership do you feel you have improved?
- What aspects do you feel still present a challenge to you in terms of safety leadership?
- What was your experience of the coaching process?
- Do you have any other input or comments about the coaching program?

The data was collected by means of recording the semi-structured interviews with a voice recording device. The researcher also made notes of additional aspects that may not be evident from the recordings during the interviews (Ruona, 2005; Terre Blanche & Kelly, 1999). In the interest of ethics, the participant's verbal consent that the interview could be recorded and that the information gathered could be utilised for the study was obtained at the beginning of the session (King, 2004).

It is important to note that there are also disadvantages or challenges that need to be addressed when utilising semi-structured interviews in qualitative research (King, 2004). The disadvantages and ways to address them that was considered by the researcher, as described further in chapter 8, include the following:

- It is highly time consuming to develop the interview guide, conduct the interview and perform the data analyses. It is essential that sufficient time is scheduled for each of the aspects and specifically the allocation of time to conduct the interview (King, 2004; Terre Blanche & Kelly, 1999).
- It requires concentration and skills on the interviewer's part. The interviewer must be well prepared, practice the interviews beforehand (Terre Blanche & Kelly, 1999) and not conduct too many interviews on one day (King, 2004).
- The interviewer can become too immersed in the interaction and start engaging in ordinary conversation instead of focussing on specific topics. A well designed interview guide can be helpful in keeping the interview on track (Terre Blanche & Kelly, 1999).
- The researcher is part of the process and as such may have biases that can influence the process and the knowledge produced through it. It is difficult to completely eliminate the researcher's bias and own subjectivity but at the least the researcher must identify and acknowledge any presuppositions, monitor it and reflect on how it may affect the data collection and interpretation (Ruona, 2005).

6.6.5. Data analysis

The theoretical framework along which the qualitative data was analysed as well as the steps followed in the data analyses process are discussed in the following sections.

6.6.5.1. *Theoretical Framework*

The method of data analysis employed is driven by various aspects of the research project that need to be considered. These aspects include the research question(s), the type of data collected (i.e. audio, objects, text, video), the data collection method (i.e. unstructured, semi-structured, structured or mixed), the analytical purpose (i.e. exploratory and descriptive or confirmatory) as well as the broader theoretical assumptions (i.e. interpretative or positivist) of the researcher (Braun & Clarke, 2006; Guest, MacQueen & Namey, 2012; Ryan, 2005).

There are many different analytical traditions within qualitative analysis such as phenomenology, grounded theory and thematic content analysis (Braun & Clarke, 2006; Guest, et al., 2012; Terre Blanche & Kelly, 1999). Although all of these are interpretative traditions that deal with the analysis of qualitative data, that is data that does not indicate ordinal values, there are some differences in the approach to how the data is analysed (Guest et al., 2012).

According to Guest et al. (2012) each style has its own strengths and limitations and these are now briefly discussed.

Phenomenology is a purely interpretive method where subjective meaning is interpreted and extrapolated from discourse. Analysis is typically thematic in nature, has the latitude to explore data more deeply and extrapolate beyond the text. It focuses only on individual human experience, may interpret too far beyond what is in the text and analysis is not necessarily systematic.

Grounded theory uses systematic techniques to find themes and create codes to build theories or models that are “grounded” in the data. It is interpretative in that quantification is not included and positivist in that analysis is systematic and assertions must be supported with evidence in the text. It can be used to study topics other than individual experience such as processes or cultural norms. It is very time consuming. It involves inductive analysis that is not based on existing theory or hypotheses.

Thematic content analysis identifies key themes in the text and these are transformed into codes. It uses techniques in addition to theme identification including word searches and other data reduction techniques. It is positivist because assertions are required to be supported with evidence, processes are systematic and quantification can be applied. Inclusion of quantification adds analytical breadth. It can be used to study topics other than only individual human experience. Thematic analysis may omit some of the finer details or nuances but an overall rich description is maintained (Braun & Clarke, 2006).

According to Guest et al. (2012) thematic analysis is the most useful and most commonly applied method of analysis in qualitative research. Braun & Clarke (2006) points out that the ability to “thematise meanings” is one of the few generic skills shared across qualitative analyses techniques. Thematic analysis is not a new approach to qualitative analysis and is usually viewed as a process performed within one of the major analytical theories (Braun & Clarke, 2006; Ryan & Bernard, 2003). However, Braun and Clarke (2006) as well as Guest et al. (2012) advocate thematic analysis as a theoretical approach to qualitative analysis in its own right.

“Thematic analyses move beyond counting explicit words or phrases and focus on identifying and describing both implicit and explicit ideas within the data, that is, themes” (Guest et al., 2012, p. 10). Applied thematic analysis is a rigorous, yet inductive, set of procedures designed to derive and examine themes from text in a manner that is transparent and credible (Guest et al., 2012). In applied research the output may or may not be a theoretical model but it is still

concerned with ensuring that the interpretations are supported by actual data in the text (Guest et al., 2012). The credibility of the findings is facilitated by systematic and visible analysis methods and procedures (Guest et al., 2012). Considering the above, thematic analysis was applied as data analysis method in this study.

6.6.5.2. *Data analysis process*

Data can be analysed manually or with the assistance of computer software packages. In this day and age most researchers conduct data analysis with the assistance of a computer (Braun & Clarke, 2006; Ryan, 2005). Several steps or phases in the qualitative data analysis process have been identified in the literature as summarised in Table 6.2.

TABLE 6.2
Summary of Elements of Data Analysis Process

<p>Ruona (2005, p. 240)</p> <ol style="list-style-type: none"> 1. Data preparation 2. Familiarization 3. Coding 4. Generating meaning 	<p>Terre Blanche and Kelly (1999, p. 140)</p> <ol style="list-style-type: none"> 1. Familiarisation and immersion 2. Inducing themes 3. Coding 4. Elaboration 5. Interpretation and checking
<p>Braun and Clarke (2006)</p> <ol style="list-style-type: none"> 1. Familiarising yourself with the data 2. Generating initial codes 3. Searching for themes 4. Reviewing themes 5. Defining and naming themes 6. Producing the report 	<p>Ryan (2003)</p> <ol style="list-style-type: none"> 1. Identify themes and subthemes 2. Build and apply code books 3. Describe phenomenon 4. Make comparisons 5. Build, display, test and validate models

The different guidelines for analysis of qualitative data cover more or less the same aspects and steps required for analysing qualitative data. However, in this study the data was analysed following the six phases of thematic analysis put forward by Braun and Clarke (2006) as it is specifically designed to be applied to thematic analysis. Braun and Clarke's (2006) six phases of thematic data analysis, which were applied, are discussed in the next section.

Phase 1: Familiarising yourself with the data

If the data was collected through interactive means the researcher comes to the analysis with some prior knowledge and possibly initial analytical interests or ideas (Braun & Clarke, 2006). Nonetheless, it is still a vital step in analysis to immerse oneself in and become familiar with the data (Braun & Clarke, 2006, Kelly, 1999b; Ruona, 2005). Familiarising yourself with the data involves the repeated reading of the data in an *active* way (Braun & Clarke, 2006). This means searching for meanings and patterns and making notes while reading through the data. It is ideal to read through the data at least once or twice before starting the coding process (Braun & Clarke, 2006; Ryan & Bernard, 2003).

If the data collected is not already in text format then it is necessary to first prepare the data for analysis (Ruona, 2005; Terre Blanche & Kelly, 1999). Audio data such as from interviews need to be transcribed before thematic analysis can be conducted. The process of transcribing, although time consuming, is an excellent way to start familiarising yourself with the data (Braun & Clarke, 2006).

Several guidelines or systems for transcription have been established (Terre Blanche & Kelly, 1999; Ruona, 2005). However, transcription for thematic analysis does not require the same level of detail in the transcript as for example discourse or narrative analysis and there are no specific, all inclusive guidelines established (Braun & Clarke, 2006). Braun & Clarke (2006) suggests that, at a minimum, a verbatim account of all verbal and non-verbal utterances that retains the information needed in a manner that is true to its original nature is required. The transcripts should be checked back against the recordings for accuracy (Braun & Clarke, 2006; Terre Blanche & Kelly, 2005).

Phase 2: Generating initial codes

This phase involves the creation of initial codes from the data. Coding is the process of grouping data into segments and labelling the segments with a term (Ruona, 2005). In this phase the researcher identifies the codes and then matches up the codes with the actual data extracts or segments that demonstrate that code (Braun & Clarke, 2006). This involves copying extracts of data from individual transcripts and collating each code together in a separate file. It is important to work systematically through the entire data set, give attention to each data extract, ensure that all data is coded, and not to leave out contradictions or inconsistencies that may prove important to present the full story and reduce biasedness (Braun & Clarke, 2006).

The process of initial coding depends to an extent on whether the analysis is data-driven or theory driven (Braun & Clarke, 2006). If the analysis is data-driven then an inductive approach is followed and the initial codes will be derived from the data (Braun & Clarke, 2006). In this sense, coding is a way of identifying patterns or themes that naturally underlie the data (Terre Blanche & Kelly, 1999). If the analysis is theory-driven the data is approached in a deductive manner with specific questions in mind that the researcher wants to code around (Braun & Clarke, 2006).

The theory-driven approach works for data collected by means of structured or semi-structured interviews or focus groups where questions and probes are repeated across cases (Namey, Guest, Thairu & Johnson, 2008). Ryan & Bernard (2003) concurs that the first attempt at generating codes often comes from the questions in an interview guide. The theory-driven approach is more structured and considered more reliable (Namey, et al., 2008). However, the two approaches are not mutually exclusive as theory-driven analysis does not preclude the researcher from uncovering data-driven themes and vice versa (Namey et al., 2008).

Phase 3: Searching for themes

Phase 3 starts when all data have been initially coded and collated and there is a long list of codes identified across the data set (Braun & Clarke, 2006). The researcher now starts to consider how different codes may be combined to form an overarching theme. The researcher may make use of visual representations such as tables, mind maps and writing down codes to organise them into theme-piles (Braun & Clarke, 2006).

In order to identify themes, it is necessary to understand what constitutes a theme. “A theme captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set” (Braun & Clarke, 2006). Themes come in all shapes and sizes and can be described as “the conceptual linking of expressions” (Ryan & Bernard, 2003). Themes differ from the coded segments in that they are broader, that is, several segments collated to form a theme (Braun & Clarke, 2006). Themes can come from the data (inductive approach) or from the prior theoretical understanding of the researcher (deductive approach) or both (Braun & Clarke, 2006; Ruona, 2005; Ryan & Bernard, 2003). However, themes are mostly induced from empirical data (text) because even with a fixed set of open-ended questions one cannot anticipate all of the themes that will arise before analysing the data (Ryan & Bernard, 2003). According to Ryan and Bernard (2003) a theme has been identified when the researcher can answer the following question: What is this expression an example of?

Suggestions and techniques to derive themes are widely discussed in the literature on qualitative analysis (Braun & Clarke, 2006; Namey et al., 2008; Ruona, 2005; Ryan & Bernard, 2003; Terre Blanche & Kelly, 1999). A summary of the most common techniques employed in theme identification is presented in Table 6.3 on the next page.

TABLE 6.3
Summary of Theme Identification Techniques

Technique	Description
Repetitions	The easiest and most obvious way to identify themes in a set of data is to identify the topics that occur and reoccur.
Indigenous Typologies	Identify local terms that may sound unfamiliar or terms that are used in unfamiliar ways.
Metaphors and analogies	Identify how people's thoughts, behaviours and experiences are expressed with analogies and metaphors.
Transitions	Naturally occurring shifts in content may mark themes for example in speech, pauses or changes in voice tone may indicate transitions. In semi-structured interviews investigators steer the conversation from one topic to another creating transitions (and basically a theme) with each question.
Similarities and differences	Search for similarities and differences by making systematic comparisons across units of data.
Linguistic connectors	Look at words and phrases such as "because" and "since" that indicate causal relations. Words such as "if", "then", "rather than" and "instead of" indicate conditional relations. Time oriented relationships are expressed with words such as "before", "after", "then", and "now".
Missing data	Instead of asking what is present in the data, ask what is it not present i.e. what is missing and identify topics that participants seemed to avoid.
Theory related material	Making the connection between the data and important research questions and/or theory.
Cutting and sorting	Identify quotes or expressions that seem important, arrange it into piles of aspects that go together and then name the piles.
Word lists and Key Words In Context (KWIC)	Generate word lists by identifying all the unique words in a text and then count the number of times they appear. Context may be lost unless it is traced back to the data and the context is also considered.
Word co-occurrence or collocation	This is the application of two or more codes to a segment of text from one respondent. If reference is made to several separate aspects that require separate codes in the same segment of text, the paragraph will be coded with all the codes and that means these aspects co-occur in the segment.
Meta-coding	This technique examines the relationship between deductive theoretical themes to discover new themes and overarching meta-themes. This requires a fixed set of data units and a fixed set of pre-defined themes. The data is recorded in a unit-by-theme matrix and can be analysed statistically.
Frequency or prevalence	Determine the frequency of words as well as themes to establish their prevalence by counting the total number of times the code was applied across individual cases and/or the entire data set.

Ryan and Bernard (2003) conclude that all the techniques, except meta-coding, can be applied to narrative texts. Selecting the appropriate theme-identification techniques depends, among other aspects such as labour and motivation, on the kind of data and the expertise required to perform the technique (Ryan & Bernard, 2003). For example fluency in the language is required to apply techniques that rely on metaphors and indigenous typologies as well as identifying missing data. To apply word co-occurrence or meta-coding the researcher needs to know how to manipulate matrices and understand methods such as cluster analysis, factor analysis and correspondence analysis. Those without these skills should use scrutiny techniques such as looking for repetitions, similarities and differences, transitions, linguistic connectors and the process techniques such as cutting and sorting, word lists and key words in context (KWIC) that do not require skills in matrix analysis (Ryan & Bernard, 2003). Ryan & Bernard's (2003) outline of the most common theme-identification techniques and guidelines for their application is reflected in Figure 6.4 on the next page

Ellinger, Watkins and Marsick (2005) purports that although it is helpful to know how many times a particular theme appears, numbers alone do not tell the story of most case studies given that their purpose is insight and not coverage and that insights and perceptions may be theoretically important even if they are small in number. However, counts and conversions of qualitative data into other descriptive statistics, e.g. frequencies, often help tell the story of the case more effectively than words alone (Ellinger et al., 2005).

Namey, Guest, Thairu and Johnson (2008) suggests the analysis of words or phrases as an initial method to filter and reduce the data set and to undertake theoretical coding of the entire data set before proceeding with further analysis. Thereafter, the researcher can make use of code frequencies and a combination of other methods as required.

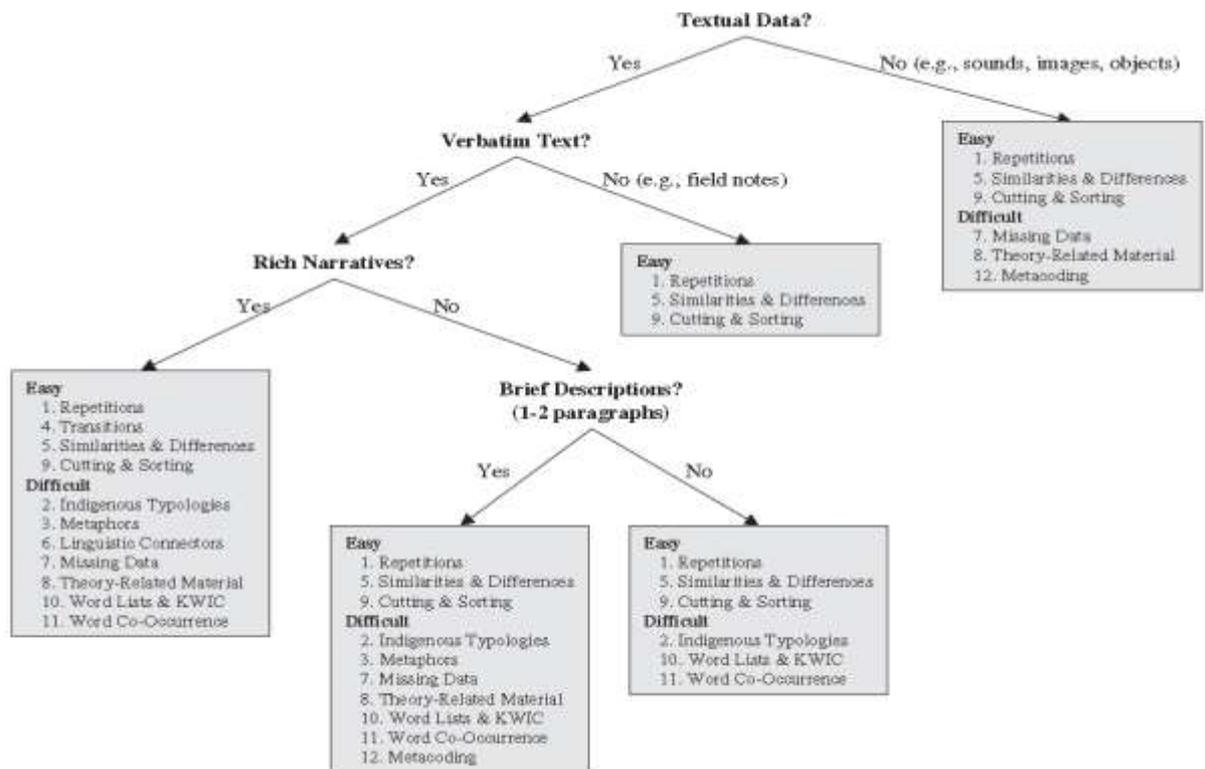


Figure 6.4 Selecting among Theme-Identification Techniques (Source: Ryan & Bernard, 2003)

In essence, researchers agree that it is necessary to apply several techniques in order to identify themes (Braun & Clarke, 2006; Namey, et al., 2008; Ryan & Bernard, 2003). Hence, the researcher made use of a combination of theme identification techniques in this study that included identifying repetitions, transitions, similarities and differences, theory related material, and linguistic connectors, applying cutting and sorting, and calculating frequencies.

Phase 4: Reviewing themes

This phase involves the refinement of the set of candidate themes devised in the previous phases. The researcher needs to reflect on each theme and also how themes link together (Braun & Clarke, 2006; Ruona, 2005). It will become evident that some preliminary themes are not really themes because there is not enough data to support it or the data is too diverse. Other themes might collapse into each other and two separate themes might form one theme. Other

themes might need to be broken down into sub-themes as was the case in this study.

Phase 5: Defining and naming themes

Phase 5 begins when you have a satisfactory thematic map of your data (Braun & Clarke, 2006). At this point the researcher needs to define and further refine the themes that will be presented and analyse the data within them. Define and refine means to identify the essence of what each theme is about and what aspect of the data each theme captures (Braun & Clarke, 2006). Themes must be organised into a coherent and internally consistent and conceptually congruent account with accompanying narrative as evidence in the text of the theme (Ruona, 2005). Themes should reflect the purpose of the research and provide answers to the research questions (Ruona, 2005)

For each theme you need to conduct and write a detailed analysis and to consider how it fits into the broader overall analysis in relation to your research questions (Braun & Clarke, 2005). Titles of the themes should be finalised and the names that will be presented in the final analysis should be determined. The name or title of the theme should be concise and immediately give a sense of what the theme is about (Braun & Clarke, 2006; Ruona, 2005).

Phase 6: Producing the report

Phase six starts when the researcher has a set of fully worked out themes and involves the final analysis and write up of the report. The report must provide a concise, coherent, logical, non-repetitive and interesting account of the story the data tells within and across themes (Braun & Clarke, 2006). It must provide sufficient evidence of the themes in the data i.e. enough data extracts to demonstrate the prevalence of the theme. It is important to go beyond mere description or paraphrasing of the data and to make arguments in relation to your research questions as well as links to theory and quantitative results if applicable (Braun & Clarke, 2006).

6.6.6. Reporting

The findings of the qualitative study were presented in a descriptive style under the theme headings. The findings were utilised to evaluate participants' experience of the process as well as the coaching program *per se*. In addition, theory related to safety leadership and coaching as well as the quantitative results was incorporated where applicable.

6.6.7. Strategies employed to ensure quality data

The trustworthiness of qualitative data is often questioned because the concepts of validity and reliability cannot be addressed in the same manner as with quantitative data (Golafshani, 2003; Shenton, 2004; Trochim, 2006). Nevertheless, authors have identified several measures that qualitative researchers can incorporate to address these issues (Shenton, 2004). The alternative criteria developed for evaluating qualitative research results include credibility, transferability, dependability, and confirmability (Beck, Gregory & Carr, 2009; Golafshani, 2003; Shenton, 2004; Trochim, 2006).

6.6.7.1. Credibility

Credibility refers to the believability of the findings from the perspective of the participants in the research (Beck et al., 2009; Shenton, 2004; Trochim, 2006). In order to establish credibility the researcher must promote confidence that the results have been recorded accurately. The purpose of qualitative research is to describe or understand phenomena from the participant's point of view and therefore the participants are really the only ones who can legitimately evaluate the credibility of the results (Shenton, 2004; Trochim, 2006).

In order to achieve this, the researcher incorporated participant or member checks in the process. Firstly, clarifying questions and summarising statements were employed during the interview to check that the researcher understood participants' responses correctly. Secondly, participants were given feedback

once the data was analysed to confirm whether it accurately reflected the meaning they intended to convey.

6.6.7.2. Transferability

Transferability entails the extent to which the results can be generalised to other contexts (Beck et al., 2009; Golafshani, 2003; Trochim, 2006). The findings of qualitative research are generally specific to a small number of individuals in a particular environment therefore it is difficult to demonstrate that the findings are applicable to other situations (Shenton, 2004). The researcher can enhance transferability by describing the research context and methods thoroughly in order to enable other researchers to make a judgement about the transferability of the findings to their specific research setting (Trochim, 2006).

To enable transferability judgements the researcher provided a thorough description of the research context and participants. This included information on the organisation taking part in the study, the number and type of participants, and the data collection and analysis methods employed.

6.6.7.3. Dependability

The dependability criterion involves the reliability of the data if the study is replicated and repeated in the same context and utilising the same methods (Beck et al., 2009; Golafshani, 2003; Shenton, 2004; Trochim, 2006). In order to address this issue, the process within the study should be reported in detail and the researcher must describe the changes that occur in the setting and how these changes affected the study (Trochim, 2006). In this study dependability was addressed by providing the details of the context and the research methods utilised as well as including reflective commentary on the analysis process.

6.6.7.4. Confirmability

Confirmability refers to objectivity. The researcher must make every effort to ensure that the findings are the result of the participants' experiences and ideas

and not that of the researcher (Shenton, 2004). In qualitative research it is difficult to ensure absolute objectivity as the instrument is the researcher and each researcher brings a unique perspective to the study (Shenton, 2004; Trochim, 2006). Strategies to enhance confirmability include documenting the procedures for checking and re-checking the data throughout the study, reporting negative instances that contradict certain findings, and conducting a data audit after the study (Trochim, 2006).

In this study the process of checking and re-checking the data was documented. Contradicting responses, where applicable, were highlighted. In addition, the data was evaluated by another researcher in order to establish if the same conclusions would have been reached by another researcher.

6.7. CHAPTER SUMMARY

In this chapter the data collection and analysis methods employed in the empirical study was described. The study followed a nested mixed methods research design, i.e. combining quantitative and qualitative methods in one study, and the background to and rationale for adopting this design was provided.

In the quantitative study the survey method that was utilised and the one-group pre-test – post-test design that was followed were explained. The sample, population, measuring instrument and data collection method was described.

The statistical tests employed to analyse the data and report the results were also discussed. A discussion of the measures employed to establish the validity and reliability of the quantitative data was included.

Information on the implementation of the intervention, i.e. the executive coaching program, was provided. The coaching program was implemented in five parts that corresponded with the phases of coaching as identified in the literature.

The data collection method for the qualitative study namely a semi-structured interview was discussed. The six phases of thematic analysis followed to analyse the qualitative data and the theme identification techniques applied were described. The strategies followed by the researcher to ensure the quality of the data were identified.

In the next chapter the results of the first part of the empirical study, namely the quantitative results, will be presented.

CHAPTER 7

REPORTING AND INTERPRETATION OF QUANTITATIVE RESULTS

In this chapter the results of the second phase of the research namely the quantitative study is presented. The demographic composition of the sample is graphically presented. Aspects concerning the validity and reliability of the study are discussed. The pre-test and post-test results are reported and comparisons between the sets of data are made.

7.1. INTRODUCTION

This study attempted to answer several research questions and to this end the research was conducted in three phases namely the literature review, the quantitative study and the qualitative study. The general aim of the research was to develop and evaluate the impact of a safety coaching program on the safety leadership of the organisation. The specific aims for the quantitative study were:

Specific aims for the quantitative study:

Research aim 1: To assess and describe the safety leadership of the mine before the coaching program.

Research aim 2: To compare the different biographical groups' assessment of the safety leadership to determine if there are any significant differences.

Research aim 3: To assess the safety leadership after completion of the coaching program to determine the impact thereof on safety leadership.

Research aim 6: To formulate recommendations for the organisation to improve safety leadership.

Research aim 7: To formulate recommendations in terms of the utilisation of a coaching program as a tool to improve safety leadership.

The results of the assessments are reported and comparisons of the pre-test and post-test data to evaluate the impact of the coaching program on safety

leadership behaviours are presented. Recommendations for the organisation to improve safety leadership and the utilisation of a coaching program as a tool to improve safety leadership will be formulated based on the results and will be discussed in Chapter 9.

7.2. DEMOGRAPHIC PROFILE OF THE SAMPLE

The study was conducted at a small mining company that consists of two mining sites and adjacent works that are situated in close geographical proximity. The employees who participated in the study included senior management, management, supervisors, foremen, employees and health and safety representatives. The same group of participants took part in the pre and post- test therefore the demographic composition was the same for both studies with the exception of the age category as explained in point 7.2.4.

7.2.1. Gender composition

The majority of the questionnaires (n=215) were completed by males (82%) and 18% by females, as reflected in Figure 7.1 below.

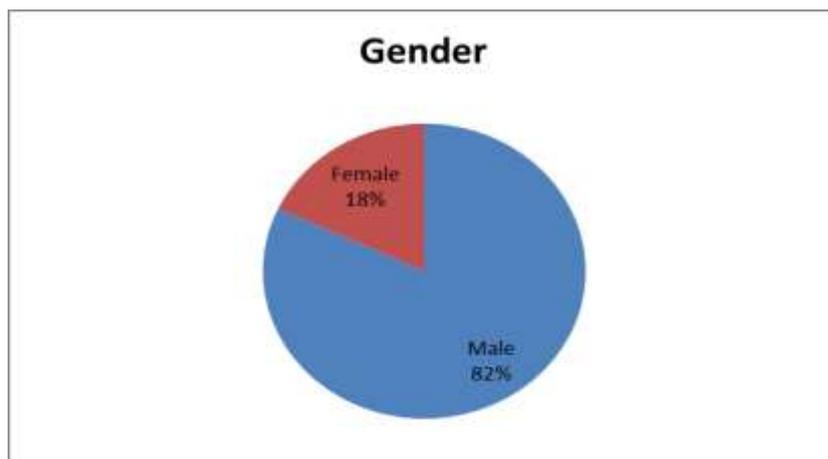


Figure 7.1 Gender composition (n = 215)

7.2.2. Racial Distribution

Figure 7.2 depicts the racial representation. The majority of the sample consisted of Africans (79%) and Whites constituted 21%.

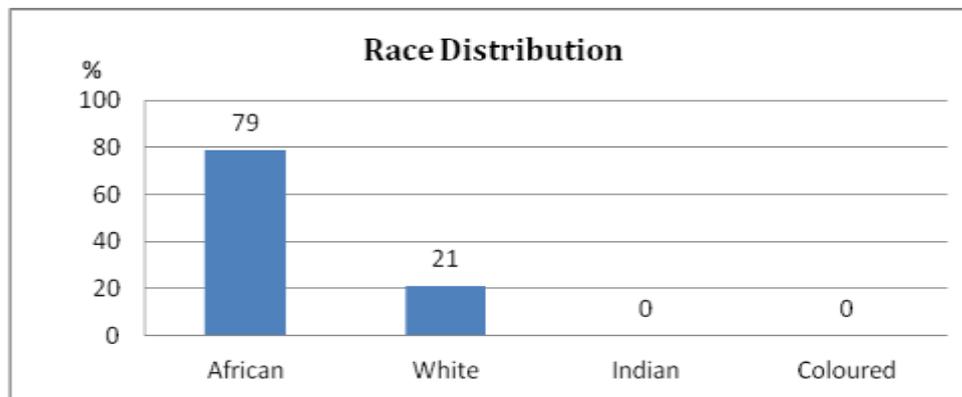


Figure 7.2 Race distribution (n = 215)

Indians and Coloureds are not represented in the sample as they are not represented in the population either.

7.2.3. Job level distribution

Participants were grouped into six main job categories or levels namely senior management, management, supervisor, foreman, employee and health and safety (H&S) representatives. The job level distribution is shown in Figure 7.3 on the next page.

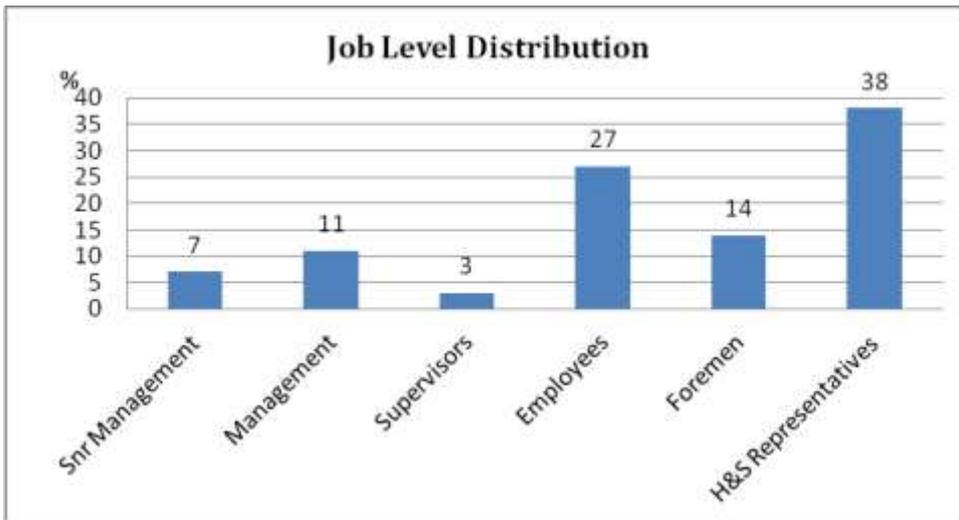


Figure 7.3 Job level distribution (n = 215)

Most of the questionnaires were completed by H&S Representatives (38%) and employees (27%) followed by Foremen (14%), management (11%), senior management (7%), and supervisors (3%).

7.2.4. Age distribution

The age distribution varied across five categories as reflected in Figure 7.4. The majority of participant's were between the ages of 31 and 40 years (61%). 17 % were between 41 and 50 years, 14% were between 21 to 30 years and 8% between 51 and 60 years.

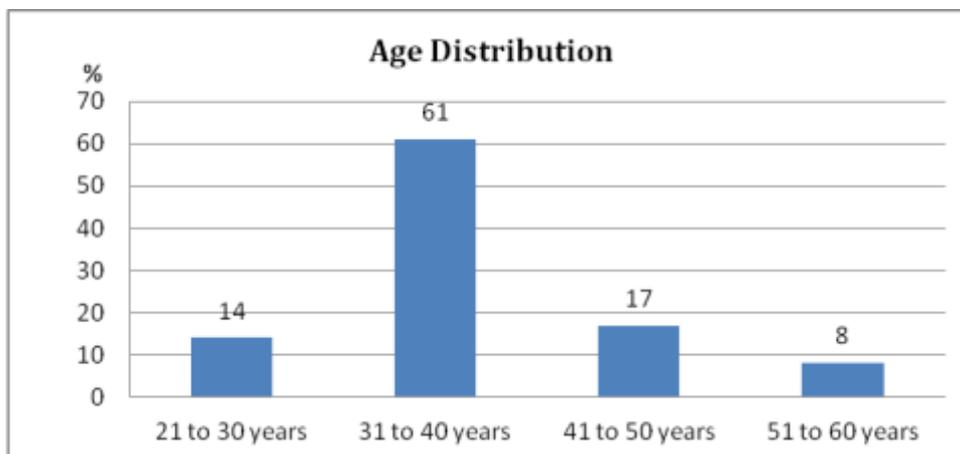


Figure 7.4 Age distribution (n = 215)

The age category was the only demographic aspect where the post-test distribution differed from the pre-test distribution. This can be explained by means of natural aging in other words some respondents had their birthdays during the approximate 8 months that lapsed between the assessments and that placed them in the next age category during the post-test. These differences were reflected as a 10% decrease in the 31 to 40 years category (51%) and a subsequent 10% increase in the 41 to 50 years category (27%).

7.2.5. Site Representation

The respondents were more or less evenly distributed between the two sites as reflected in Figure 7.5.

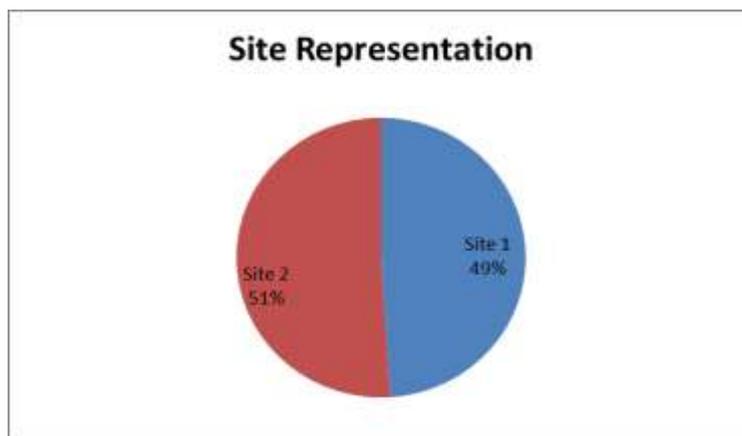


Figure 7.5 Site Representation

Questionnaires completed by respondents employed at Site 1 comprised 49% and Site 2 comprised 51%.

7.3. VALIDITY AND RELIABILITY OF THE QUANTITATIVE STUDY

The validity and reliability of the study was established and is discussed in the following sections.

7.3.1. Validity

Aspects relating to the different types of validity established for this study are discussed in the next sections.

7.3.1.1. Measurement Validity

Measurement validity is ensured when the measuring instrument is suited to the purpose for which it is applied (Durrheim, 1999b). In this study, measurement validity was established because the measuring instrument was designed to measure safety leadership behaviour and it was applied for that purpose.

7.3.1.2. Content Validity

Content validity is established if the items on the instrument are representative of what is being measured (Durrheim, 1999b). The content validity of the statements in the questionnaire was established in a logical manner by subject matter experts by means of comparing it with the descriptions of safety leadership behaviours as described in the literature.

7.3.1.3. Factor Analysis

Factor analysis is a useful statistical tool to establish the validity of measuring instruments (Yang, 2005). In this study, factor analysis was performed by means of the principal component analysis (Hair, Black, Babin & Anderson, 2010; Tredoux & Pretorius, 1999), as discussed in chapter 6. As displayed in Table 7.1, the Kaiser-Myer-Olkin value was .9252, therefore exceeding the recommended value of 0.6 (SPSS Version 20). Bartlett's test of sphericity reached statistical significance ($p = 0.000$) supporting the factorability of the correlation matrix. All items displayed communality values of .50 or higher as specified by the researcher and in line with the cut-off value proposed by Hair et al. (2010). The communalities of each item are attached as Appendix C.

TABLE 7.1***Kaiser-Meyer-Olkin and Bartlett's Test***

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.925
Bartlett's Test of Sphericity	Approx. Chi-Square	7970.286
	df	946
	Sig.	.000

Eight factors were specified according to Kaiser's criterion and extracted by means of principal component analysis, all with eigenvalues greater than one and explaining 70.2% of the variance (Hair et al., 2010; Tredoux & Pretorius, 1999, See Appendix D). This percentage is above the criterion stipulated by Hair et al. (2010) that a solution in the social sciences should account for 60% (or even less) of the variance. The factor matrix obtained was rotated to a simple structure by means of Varimax rotation (Hair et al., 2010), as reflected in Table 7.2 on page 189.

Subsequently, items with a high loading on a specific factor were grouped together (Hair et al., 2010). Some items loaded onto more than one factor and in each case the item was included in the factor for which it obtained the highest result. One of the items (Q11) did not load onto any of the factors and this item was rejected from the post-test questionnaire (Hair et al., 2010). Factors with fewer than three items are generally considered weak and unstable and should be eliminated (Costello & Osborne, 2005). However, all the factors had three or more items (Refer to Table 7.2). Thus, the eight factors were considered to be the meaningful dimensions that represented the variables measured (Hair et al., 2010; Tredoux & Pretorius, 1999; Yang, 2005).

TABLE 7.2

Rotated Component Matrix

Item	Component							
	1	2	3	4	5	6	7	8
Q14	.713		.427					
Q1	.684							
Q12	.657							
Q3	.640							
Q13	.593	.437						
Q2	.538					.512		
Q4	.537	.522						
Q9	.468			.407				
Q10	.456				.402			
Q40		.688						
Q25		.666						
Q31		.594			.405			
Q34		.558						
Q30		.557						
Q29	.401	.470						.439
Q43		.446						
Q41			.729					
Q42			.727					
Q22			.622					
Q44			.514			.419		
Q33			.421					
Q19				.697				
Q21				.625				
Q20				.600				
Q17				.548				.439
Q18				.511				
Q36			.430	.507				
Q5					.715			
Q6					.664			.404
Q24					.575			
Q32					.509			
Q39						.683		
Q16						.558		
Q38						.546	.401	
Q37						.481		
Q23						.436		.415
Q11								

Q15							.695	
Q7							.631	
Q8							.550	
Q35		.437					.454	
Q28								.634
Q27								.600
Q26					.409			.574

7.3.1.4. *Internal validity*

If a study has internal validity it means that the findings follow in a direct way from its methods, the design can sustain its findings or conclusions and cannot be explained by alternative means (Terre Blanche & Durrheim, 1999). It is important to discuss the aspects that influence internal validity in a study such as this one where time elapses between the two phases of the study. In this case approximately 8 months elapsed between the pre and post-test.

Campbell and Stanley (as cited in Swanson & Holton, 2005) as well as Terre Blanche and Durrheim (1999), describe several variables that could pose a threat to internal validity. These aspects are described and the measures that could be implemented to eliminate or control their impact are discussed.

- Co-varying events or “history”

This factor refers to the possibility that the results of the study could have been affected by other events that occurred at the same time but independently from the data collection for example organisational re-structuring or changes in policies and procedures. Including a ‘no intervention’ or control group could control for the impact of a co-varying event. In other words if there was such an event the group that was not part of the intervention would also show unexpected change over the time interval.

This study did not include a control group but as far as is known to the researcher no events of this nature occurred during the duration of the study.

- Independent natural change or “maturity”

Changes in attitudes or behaviour could occur simply because of the passage of time for example having greater confidence because of being in the job for a longer period of time. Previous research (Bowles, Cunningham, De la Rosa & Picano, 2007) showed that managers who were coached demonstrated higher levels of performance than those who simply learned from experience in the job over time. For the purpose of this study, if the results indicated statistically significant changes it could prove that the intervention had an impact and not only maturity.

- Reactive effects to participating in a study or “testing”

This refers to the effects of a data collection process on a later data collection process such as reacting to being studied rather than to the intervention or learning from repeated tests. In this study one cannot completely eliminate the effect of reacting to be studied but the two assessments is considered to have been too far apart (+- 8 months) for participants to have learned from it. This was also evident from the fact that participants requested refresher training on how to complete the questionnaire during the post-test sessions.

- Measurement unreliability or “instrument decay”

Changes in the data collection instrument or the observers can affect the internal validity of the study or if the measuring instrument does not have satisfactory measurement validity and reliability it can lead to erroneous conclusions. The measurement validity of the instrument was established and discussed in Chapter 6. The reliability of both the pre-test and post-test measuring instrument was satisfactory as indicated in point 7.3.2.

- Statistical regression of extreme subjects or “selection”

Statistical regression to the mean has to do with differences in selection criteria of participants for different groups. For example if only those who score the lowest on a criterion are selected to participate in the intervention then they are very likely to show positive improvement on the next measurement. This variable is best controlled for by not sampling from the extremes and applying random sampling and assignment instead. The participants for the intervention in this study were not selected based on their performance on certain criteria but all managers were invited to participate irrespective of the results of the safety leadership survey.

- Loss of sample members or “mortality”

Human research participants often tend to withdraw from research studies. This could be because of time constraints or it could be because the participants have resigned from the organisation or were transferred or promoted. The organisational structure and group of participants, except for the age category, remained the same for the duration of the study as described in point 7.2. There was a change in the distribution according to the age categories and the 31 to 40 years age group had a loss of members to the next category because of natural aging.

7.3.1.5. External validity

External validity refers to the degree to which the findings and conclusions of a study can be generalised beyond its confines and context (Terre Blanche & Durrheim, 1999). For example a study can be conducted in one section of an organisation and then the results can be applied to other sections in the same organisation (Swanson & Holton, 2005). It is important to establish external validity in research of a descriptive nature, such as this study (Terre Blanche & Durrheim, 1999).

One method of establishing external validity is to ensure that the sample is representative of the population (Swanson & Holton, 2005). In order to determine if the sample is representative of the case organisation the demographic distributions described in point 7.2.1 were compared to that of the organisation's employee profile. This comparison is presented in Table 7.3.

TABLE 7.3

Comparisons of Population And Sample Category

Category	% Representation in population (n=480)	% Representation in sample (n=215)
JOB LEVEL		
Senior Management	0.42	7
Management	0.83	11
Supervisors	0.63	3
Foreman	2.1	14
Employees	92	27
H&S Representatives	4	38
GENDER		
Males	65	82
Females	35	18
RACE		
African	94	79
White	6	21
AGE GROUP		
21 to 30 years	50	15
31 to 40 years	33	51
41 to 50 years	12	27
51 to 60 years	5	7

According to van Vuuren and Maree (1999) a general rule of thumb is that small populations (+- 1000) require a 30% sampling ratio. Some categories were less represented in the sample than in the population namely employees, females, Africans and 21 to 30 years. The reason for this was mainly because the focus of the research was on safety leadership and these demographic groups do not feature prominently in the organisation's management profile. This must be considered when interpreting the results.

7.3.2. Reliability

Reliability refers to the consistency with which an instrument yields results (Swanson & Holton, 2005; Terre Blanche & Durrheim, 1999). In this study the reliability of the measuring instrument was determined by calculating Cronbach's coefficient alpha for the various factors or dimensions.

According to Nunnally and Bernstein (1994), scores above 0.70 are sufficient to establish reliability. All of the dimensions obtained results of more than 0.70 in both the pre-test and post-test, as indicated in Table 7.4. Thus, the results were considered to be reliable.

TABLE 7.4
Cronbach's Coefficient Alpha per Dimension

Dimension	Nr of Items	Cronbach's Alpha Pre-test	Cronbach's Alpha Post-test
Dimension 1 – Credibility	9	.912	.922
Dimension 2 – Accountability	6	.882	.893
Dimension 3 – Collaboration	6	.852	.848
Dimension 4 – Learning orientation	5	.898	.868
Dimension 5 – Business integration	4	.808	.797
Dimension 6 – Action orientation	5	.848	.850
Dimension 7 – Feedback and recognition	4	.834	.771
Dimension 8 – Vision and values	4	.852	.811

7.4. SAFETY LEADERSHIP DIMENSIONS

Eight factors were identified from the factor analysis. The statements that loaded onto the eight factors were analysed and based on the safety leadership behaviours as identified in the literature, were labelled and operationalised as follow:

7.4.1. Credibility

Credibility refers to whether people believe in the integrity of the safety leaders because their decisions and actions consistently match what they say. It also involves being consistent in setting and applying safety standards. In other words, the same rules should apply to everyone under the same circumstances. Another important aspect of credibility is that senior management must lead by example to show that they genuinely care about safety.

7.4.2. Accountability

The dimension of accountability refers to the fact that safety leaders must accept responsibility but also hold others accountable for safety performance. This means that leaders must clearly establish and communicate what employees' role in safety is, what the expected safety behaviours are and what the consequences are for poor safety performance and not complying with safety rules. Effective safety leaders must instil the sense that people are responsible for safety in their own organisational unit and level.

7.4.3. Collaboration

Collaboration means working well with other people and promoting participation in safety. This includes engaging in and leading discussions (communication) about potential safety risks, asking input from people on issues that will affect them, treating all people with respect and encouraging others to implement ideas and solutions to improve safety. All employees should be involved by contributing ideas for improvement and being encouraged to become aware of what safety performance means in terms of their own jobs.

7.4.4. Learning orientation

A learning orientation refers to the willingness of safety leaders to identify, learn from and change unsafe conditions and behaviours. Leaders need to allocate

sufficient resources and build employee competencies through training and communication. It is also important to provide a mechanism to review incidents and to give feedback about corrective actions taken. Another aspect of learning orientation is the value that is placed on the function and contribution of safety role players in the organisation such as the safety manager and health and safety representatives.

7.4.5. Business integration

In every business there are competing priorities such as production versus safety and it is critical that senior management integrate safety into all business decisions and objectives also on a strategic level. Management must be fully committed to improving health and safety and focus their efforts on the most important priorities that includes safety issues.

7.4.6. Action orientation

An effective safety leader is proactive rather than reactive in addressing safety issues. This means that management must know the risk profile of the business and identify and address hazards and risks before it causes an incident or accident. A safety leader is performance driven and takes advantage of opportunities to improve safety and consistently delivers results in solving safety related problems.

7.4.7. Feedback and recognition

The effective safety leader is good at providing feedback and giving recognition for accomplishments in terms of improving safety. This translates to publicly recognising the contributions of others, giving recognition for good safety performance, praising employees more often than criticising them, and finding way to celebrate success. Safety leaders should not only give feedback but also be prepared to receive feedback about employees' grievances and ideas about

safety. Employees should feel comfortable to report safety issues without fear of discipline or victimisation.

7.4.8. Vision and values

The dimension of vision and values refers to the 'picture' or ideal that the most senior executives have of what safety performance excellence looks like for the organisation. The safety leader must convey this vision in a compelling manner so that everyone in the organisation understands what is expected. Management must inspire employees to uphold the safety vision and values and also challenge behaviours that are not in accordance with the vision and values.

7.5. DETERMINING THE CUTOFF SCORE

Researchers generally apply a cut-off point when reporting and interpreting the results of a Likert scale type questionnaire (Barua, 2013). A cut-off point allows researchers to distinguish between positive and negative perceptions or to determine whether overall practices are satisfactory or unsatisfactory (Barua, 2013; Cascio, Alexander & Barret, 1988; Odendaal & Roodt, 1998).

Research conducted by the Human Sciences Research Council purports that an average of 3.2 can be considered a reasonable cut-off point (Odendaal & Roodt, 1998). However, Barua (2013) suggests that cut-off points may be adjusted to incorporate aspects of the population variation and this may allow for the application of higher cut-off points. For example the Deloitte Best Company to Work for Survey applies a cut-off point of 3.7 (Melck, Van der Merwe, Pretorius, Lazenby, Mouton & Nell, 2012).

No research for a cut-off point in a survey to measure safety leadership could be found. The researcher proposes that a cut-off point of 3.2 is too low to be applied to a safety environment that is essentially concerned with the protection of people's lives. Especially if one considers that the description of the rating of

3 on the measuring instrument is *indifference* which means being uncaring and uninterested (Oxford Mini-dictionary, 1999). In light of the importance of safety leadership in improving safety performance, that is reducing injuries, organisations can clearly not afford indifference to the matter (Boyd, 2008; Clark, 2002; Cooper, 2001; Dunlap, 2011; Flynn & Shaw, 2011; Krause, 2004; Krause, 2007; Krause & Weekley, 2005; Pater, 2012). Subsequently, for a mean to be interpreted as reflecting positive or satisfactory perceptions it would have to be closer to 4 (agree) than to 3 (indifferent).

There are many ways in which cut-off points may be determined and the process may include theoretical or statistical methods (Cascio, 1988). Three aspects seem to be pertinent when attempting to derive appropriate cut-off points. Firstly, it is important that the content validity of the individual items on each scale be established by content experts (Barua, 2013; Cascio, 1988). Secondly, it is important that the scales show acceptable reliability results (Barua, 2013). Finally, it is essential that the motivation for and method employed to determine the cut-off point is explained (Cascio, 1988).

In this study, the pre-test results represented the baseline for perceptions of the overall safety leadership profile. The post-test results were generally higher than the pre-test indicating overall more positive perceptions. Thus, it seemed logical that a sensible cut-off point would be at some point between the two data sets. Thus, the average means of the overall safety leadership of the two assessments were calculated. The average mean of the two data sets computed to 3.77 and was applied as the cut-off point to differentiate between positive and negative perceptions in this study. This cut-off point corresponds with the cut-off point applied in the Deloitte Best Company to Work for Survey (Melck, et al., 2012).

7.6. PRE-TEST OVERALL SAFETY LEADERSHIP PROFILE

The means of each safety leadership dimension was calculated to obtain an overall profile of the organisation's safety leadership. The overall pre-test safety

leadership results of the organisation on these eight dimensions is summarised in Table 7.5.

TABLE 7.5
Pre-Test Overall Safety Leadership Profile

	N	Mean	Std. Deviation	Std. Error Mean
Dimension_1 Credibility	215	3.77	.77349	.05275
Dimension_2 Accountability	215	3.72	.74089	.05053
Dimension_3 Collaboration	215	3.73	.74961	.05112
Dimension_4 Learning orientation	215	3.74	.85422	.05826
Dimension_5 Business integration	215	3.68	.74520	.05082
Dimension_6 Action orientation	215	3.69	.78864	.05378
Dimension_7 Feedback and recognition	215	3.60	.86541	.05902
Dimension_8 Vision and values	215	3.64	.83138	.05670

On the overall pre-test safety leadership profile of the organisation the highest rating was for credibility (3.77). All the other dimensions obtained means lower than 3.77 indicating negative perceptions or dissatisfaction with the overall safety leadership practices. Particularly for the dimensions of feedback and recognition (3.60) and vision and values (3.64) that received the lowest overall scores.

7.7. PRE-TEST MEAN SCORES COMPARISONS

In the next section the pre-test mean scores of the different demographic groups are compared. Further analysis was performed to determine any significant differences in responses between the groups.

7.7.1. Gender

To compare the differences between males' and females' ratings of safety leadership in the organisation, their respective means on each dimension were calculated. The pre-test calculations are illustrated graphically in Figure 7.6.

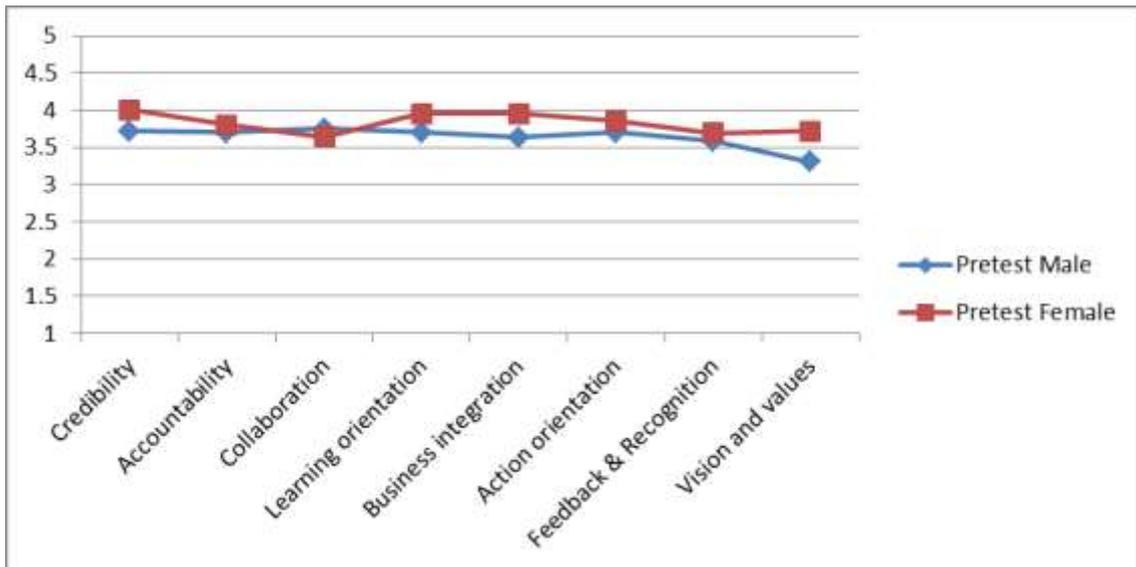


Figure 7.6 Pre-test mean scores of males and females

The pre-test results revealed that males as well as females were overall positive about safety leadership, with females slightly more positive than males on all dimensions except collaboration (3.67). Males were most positive about collaboration (3.74) and credibility (3.72), followed by accountability (3.70) and learning orientation (3.70). Females were most positive about credibility (4.00), learning orientation (3.95) and business integration (3.95), followed by action orientation (3.85) and accountability (3.80). Males rated feedback and recognition the lowest (3.58), followed by vision and values (3.63) and business integration (3.63). Females rated collaboration the lowest (3.67) followed by feedback and recognition (3.69).

7.7.1.1. Pre-test Analysis of variance: Gender

A t-test was conducted to determine whether the above differences were statistically significant. The results of the t-test indicated that there were significant differences at the <0.05 level between the groups on two of the dimensions, as reflected in Table 7.6. Females rated credibility and business integration significantly higher than males.

TABLE 7.6

Pre-Test T-Test Between Males and Females

		Sum of Squares	df	Mean Square	F	Sig.
Dimension_1 Credibility	Between Groups	2.478	1	2.478	4.203	.042*
Dimension_2 Accountability	Between Groups	.348	1	.348	.633	.427
Dimension_3 Collaboration	Between Groups	.276	1	.276	.668	.415
Dimension_4 Learning orientation	Between Groups	1.854	1	1.854	2.559	.111
Dimension_5 Business integration	Between Groups	3.180	1	3.180	5.857	.016*
Dimension_6 Action orientation	Between Groups	1.190	1	1.190	1.921	.167
Dimension_7 Feedback and recognition	Between Groups	.397	1	.397	.529	.468
Dimension_8 Vision and values	Between Groups	.300	1	.300	.433	.511

p ≤ .05

7.7.2. Race groups

Based on the race distribution a comparison was made between the applicable race categories, namely Africans and Whites, by calculating the respective mean scores on each dimension. The results are reflected in Figure 7.7.

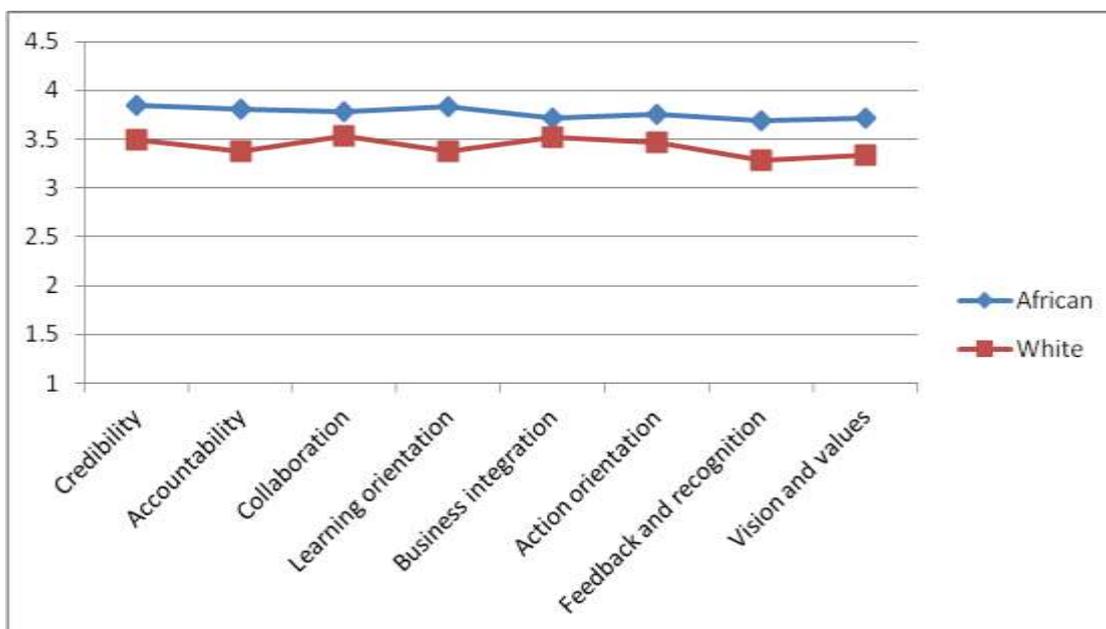


Figure 7.7 Pre-test mean scores of Africans and Whites

Overall, the pre-test ratings of Africans' were higher than Whites' on all eight dimensions. Africans were the most positive about credibility (3.85) and learning orientation (3.84). While Whites were most positive about collaboration (3.53) and business integration (3.52), the results still implied dissatisfaction because the means for these dimensions were lower than 3.77. Both race groups were the least positive about feedback and recognition with Africans rating it 3.69 and Whites rating it 3.33.

7.7.2.1. Pre-test analysis of variance: Race

A t-test was conducted to determine if there are any significant differences between the pre-test responses according to race groups. The t-test on the pre-test data revealed that there were significant differences according to race group on certain dimensions as indicated in Table 7.7. Africans were significantly more positive than Whites about credibility, accountability, learning orientation, action orientation, feedback and recognition, and vision and values.

TABLE 7.7

Pre-Test T-Test for Race Group

		Sum of Squares	df	Mean Square	F	Sig.
Dimension_1 Credibility	Between Groups	4.634	1	4.634	7.999	.005**
Dimension_2 Accountability	Between Groups	6.469	1	6.469	12.413	.001**
Dimension_3 Collaboration	Between Groups	1.127	1	1.127	2.750	.099
Dimension_4 Learning orientation	Between Groups	7.769	1	7.769	11.153	.001**
Dimension_5 Business integration	Between Groups	1.456	1	1.456	2.641	.106
Dimension_6 Action orientation	Between Groups	2.676	1	2.676	4.370	.038*
Dimension_7 Feedback and recognition	Between Groups	5.866	1	5.866	8.092	.005**
Dimension_8 Vision and values	Between Groups	5.678	1	5.678	8.504	.004**

* p = ≤ .05

** p = ≤ .01

7.7.3. Job level

In order to compare the differences between the various job levels in the organisation their respective pre-test means on each dimension were calculated

as presented in Table 7.8. To make interpretation of the results more meaningful the small supervisor group (n=6) was combined with the foreman (n=31) category as both levels represented junior management.

TABLE 7.8
Mean Scores for Job Level

Dimension	Job level	Pre-test	
		N	Mean
Dimension 1 – Credibility	Snr Management	16	3.05
	Management	24	3.40
	Supervisor/Foreman	37	3.94
	Employee	59	3.90
	H&S Representative	79	3.85
Dimension 2 – Accountability	Snr Management	16	2.92
	Management	24	3.34
	Supervisor/Foreman	37	3.81
	Employee	59	3.88
	H&S Representative	79	3.82
Dimension 3 – Collaboration	Snr Management	16	3.09
	Management	24	3.51
	Supervisor/Foreman	37	3.83
	Employee	59	3.79
	H&S Representative	79	3.78
Dimension 4 – Learning orientation	Snr Management	16	3.06
	Management	24	3.23
	Supervisor/Foreman	37	3.91
	Employee	59	3.90
	H&S Representative	79	3.84
Dimension 5 – Business integration	Snr Management	16	3.03
	Management	24	3.54
	Supervisor/Foreman	37	3.72
	Employee	59	3.81
	H&S Representative	79	3.74
Dimension 6 – Action orientation	Snr Management	16	3.01
	Management	24	3.45
	Supervisor/Foreman	37	3.83
	Employee	59	3.78
	H&S Representative	79	3.76
Dimension 7 – Feedback and recognition	Snr Management	16	2.64
	Management	24	3.29
	Supervisor/Foreman	37	3.62
	Employee	59	3.80
	H&S Representative	79	3.73
Dimension 8 – Vision and values	Snr Management	16	2.85
	Management	24	3.23

	Supervisor/Foreman	37	3.85
	Employee	59	3.75
	H&S Representative	79	3.74

The pre-test results indicated that senior management seemed to be the most dissatisfied with safety leadership as they recorded the lowest ratings on all dimensions of all the job level categories and their means for all dimensions were lower than 3.77. They rated collaboration (3.09) the highest and feedback and recognition (2.64) the lowest.

The management level also indicated dissatisfaction with safety leadership as their means for all dimensions were lower than 3.77. Management seemed to be the most negative about learning orientation (3.23) and vision and values (3.23) and most positive about business integration (3.54).

The results of the senior management and management levels represent the self-rating category according in the 360 degree survey method implemented. In other words, these scores reflect management's ratings of their own safety leadership.

The supervisor/foreman level overall gave the highest ratings on all dimensions. They were most positive about credibility (3.94) and learning orientation (3.91). However, this group was dissatisfied with business integration (3.72) and feedback and recognition (3.62) as these dimensions obtained averages below 3.77.

The employees and H&S representatives gave very similar ratings on collaboration, action orientation and vision and values with employees rating credibility (3.90), accountability (3.88), business integration (3.81), learning orientation (3.90) and feedback and recognition (3.80) slightly higher than the H&S representatives with 3.85, 3.82, 3.74, 3.84 and 3.73 respectively on these dimensions. Employees recorded their lowest ratings for vision and values (3.75) and this implies that employees do not feel that management has a clear vision and does not value safety. H&S representatives were negative about

business integration (3.74), action orientation (3.76), feedback and recognition (3.73) as well as vision and values (3.74).

7.7.3.1. Pre-test analysis of variance: Job level

A one-way analysis of variance (ANOVA) was conducted to determine if there are any significant differences between the pre-test responses according to job level. The ANOVA revealed that there are significant differences according to job level on all dimensions on the 0.01 level, as reflected in Table 7.9. To determine how the means are different a post hoc test was performed and the differences are discussed in conjunction with the post hoc Scheffe Test in Appendix E.

The supervisor/foreman, employee and H&S representative levels were significantly more positive than senior management on all dimensions. Employees rated accountability significantly higher than management. Supervisor/foreman, employees, and H&S representatives rated learning orientation significantly higher than management.

TABLE 7.9
Pre-Test Anova for Job Level

		Sum of Squares	df	Mean Square	F	Sig.
Dimension_1 Credibility	Between Groups	14.100	4	3.525	6.497	.000**
Dimension_2 Accountability	Between Groups	16.207	4	4.052	8.403	.000**
Dimension_3 Collaboration	Between Groups	7.214	4	1.804	4.666	.001**
Dimension_4 Learning orientation	Between Groups	17.097	4	4.274	6.455	.000**
Dimension_5 Business Integration	Between Groups	8.689	4	2.172	4.141	.003**
Dimension_6 Action orientation	Between Groups	10.488	4	2.622	4.491	.002**
Dimension_7 Feedback and recognition	Between Groups	20.992	4	5.248	7.913	.000**
Dimension_8 Vision and values	Between Groups	16.919	4	4.230	6.781	.000**

** p = ≤ .01

7.7.4. Age

The means of the respective age categories were calculated in order to make comparisons between the groups. The results are listed in Table 7.10 on the next page.

TABLE 7.10

Mean Scores for Age

Dimension	Age category	Pre-test	
		N	Mean
Dimension 1 – Credibility	21 – 30 years	31	3.57
	31 – 40 years	131	3.77
	41 – 50 years	37	4.02
	51 – 60 years	16	3.56
Dimension 2 – Accountability	21 – 30 years	31	3.76
	31 – 40 years	131	3.75
	41 – 50 years	37	3.69
	51 – 60 years	16	3.43
Dimension 3 – Collaboration	21 – 30 years	31	3.72
	31 – 40 years	131	3.74
	41 – 50 years	37	3.79
	51 – 60 years	16	3.44
Dimension 4 – Learning orientation	21 – 30 years	31	3.51
	31 – 40 years	131	3.80
	41 – 50 years	37	3.92
	51 – 60 years	16	3.35
Dimension 5 – Business integration	21 – 30 years	31	3.69
	31 – 40 years	131	3.69
	41 – 50 years	37	3.74
	51 – 60 years	16	3.48
Dimension 6 – Action orientation	21 – 30 years	31	3.52
	31 – 40 years	131	3.75
	41 – 50 years	37	3.72
	51 – 60 years	16	3.48
Dimension 7 – Feedback and recognition	21 – 30 years	31	3.37
	31 – 40 years	131	3.71
	41 – 50 years	37	3.55
	51 – 60 years	16	3.33
Dimension 8 – Vision and values	21 – 30 years	31	3.41
	31 – 40 years	131	3.68
	41 – 50 years	37	3.85
	51 – 60 years	16	3.29

The pre-test data reflected that the age group 21 to 30 years rated accountability the highest (3.76) and gave their lowest ratings for feedback and recognition (3.37) and vision and values (3.41). None of the dimensions obtained an average of 3.77 or higher and this indicates the dissatisfaction of this group with safety leadership practices.

The 31 to 40 years category was positive about learning orientation (3.80) and credibility (3.77). None of the other dimensions obtained an average above 3.77 and this group's lowest ratings were for vision and values (3.68).

The 41 to 50 years age group rated credibility the highest (4.02) and they were also positive about learning orientation (3.91), vision and values (3.85) and collaboration (3.79). This group's results indicated dissatisfaction with the other dimensions of safety leadership (means below 3.77) and gave their lowest score for feedback and recognition (3.55).

Overall, the 51 to 60 years category gave the lowest ratings on all dimensions and none of the dimensions obtained an average above 3.77. This group rated business integration (3.48) and learning orientation (3.48) the highest and vision and values (3.29) the most negative.

7.7.4.1. Pre-test analysis of variance: Age

A one-way analysis of variance (ANOVA) was conducted to determine if there are any significant differences between the pre-test responses according to age and the results are presented in Table 7.11. The results revealed a significant difference at the 0.05 level in the ratings for learning orientation and vision and values according to age.

TABLE 7.11***Pre-Test Anova for Age Group***

		Sum of Squares	df	Mean Square	F	Sig.
Dimension_1 Credibility	Between Groups	4.175	3	1.392	2.371	.072
Dimension_2 Accountability	Between Groups	1.476	3	.492	.895	.445
Dimension_3 Collaboration	Between Groups	.811	3	.270	.651	.583
Dimension_4 Learning orientation	Between Groups	5.821	3	1.940	2.723	.045*
Dimension_5 Business integration	Between Groups	.754	3	.251	.449	.718
Dimension_6 Action orientation	Between Groups	2.128	3	.709	1.143	.333
Dimension_7 Feedback and recognition	Between Groups	4.411	3	1.470	1.990	.116
Dimension_8 Vision and values	Between Groups	5.380	3	1.793	2.655	.050*

* $p = \leq .05$

The post hoc Games-Howell test (Appendix E) revealed that the 41 to 50 years category were significantly more positive than the 51 to 60 years category about learning orientation and vision and values. The 31 to 40 years category was also significantly more positive about learning orientation than the 51 to 60 years age group.

7.7.5. Site

In order to compare the differences between the two sites their respective pre-test means on each dimension were calculated. The mean pre-test scores according to site are summarised in Table 7.12.

TABLE 7.12***Mean Scores for Site***

Dimension	Pre-test	
	Site 1	Site 2
	Mean	Mean
Dimension 1 – Credibility	3.74	3.80
Dimension 2 – Accountability	3.58	3.85
Dimension 3 – Collaboration	3.72	3.74
Dimension 4 – Learning orientation	3.75	3.73
Dimension 5 – Business integration	3.57	3.79
Dimension 6 – Action orientation	3.66	3.71
Dimension 7 – Feedback and recognition	3.52	3.69
Dimension 8 – Vision and values	3.66	3.62

On the pre-test results Site 1 recorder means below 3.77 on all dimensions. Site 1 was the most negative about feedback and recognition (3.52) and the most positive about learning orientation (3.75) and credibility (3.74).

Site 2 was positive about accountability (3.85), credibility (3.80), and business integration (3.79). Site 2 was negative about the other dimensions (means below 3.77) and rated vision and values (3.62) the lowest.

7.7.5.1. *Pre-test analysis of variance: Site*

A t-test was performed to establish if any of the differences noted between the two sites on the pre-test scores were significant. The results are shown in Table 7.13.

TABLE 7.13

Pre-Test T-Test for Site

		Sum of Squares	df	Mean Square	F	Sig.
Dimension 1 – Credibility	Between Groups	.174	1	.174	.290	.590
Dimension 2 – Accountability	Between Groups	3.825	1	3.825	7.168	.008**
Dimension 3 – Collaboration	Between Groups	.020	1	.020	.049	.826
Dimension 4 – Learning orientation	Between Groups	.028	1	.028	.038	.846
Dimension 5 – Business integration	Between Groups	2.723	1	2.723	4.996	.026*
Dimension 6 – Action orientation	Between Groups	.122	1	.122	.196	.659
Dimension 7 – Feedback and recognition	Between Groups	1.539	1	1.539	2.065	.152
Dimension 8 – Vision and values	Between Groups	.102	1	.102	.147	.702

* p = ≤ .05

** p = ≤ .01

The results indicated a significant difference at the 0.01 level for accountability and at the 0.05 level for business integration. Site 2 reported significantly higher ratings than Site 1 for these dimensions.

7.7.6. Discussion

In the previous sections the safety leadership of the mine before the coaching program was conducted, was described. On the overall pre-test safety leadership profile of the organisation all the dimensions except credibility obtained mean scores below 3.77. Thus, improvement is desirable particularly on the dimensions of feedback and recognition and vision and values that received the lowest ratings overall.

The different biographical groups' assessment of the safety leadership was compared to determine if there were any significant differences according to gender, race, job level, age or site. The results revealed that significant differences existed and these are summarised according to the various demographic groups and integrated with the literature where applicable.

Gender:

- Females generally recorded higher ratings than males. One other study also found that 360 degree ratings varied according to gender with a strong relationship between more favourable ratings and the female gender (Manning & Robertson, 2010).
- Males rated collaboration the highest and feedback and recognition the lowest.
- Females rated credibility the highest and collaboration the lowest.
- Females were significantly more positive about credibility and business integration than males.

Race:

- Africans' ratings were generally higher than the ratings given by Whites. In the literature reviewed, no other studies investigated or reported on differences in 360 degree ratings according to race.

- Africans rated credibility the highest and feedback and recognition the lowest.
- Whites reported their highest ratings for collaboration and the lowest also for feedback and recognition.
- Africans were significantly more positive than Whites about credibility, accountability, learning orientation, action orientation and vision and values.

Job level

- Senior management and management represented the self-rating category according to the 360 degree survey method.
- Overall, senior management recorded the lowest scores of all the job levels on all dimensions. Manning & Robertson (2010) found that seniority has an impact on 360 degree ratings with a relationship between senior management and more negative ratings.
- Senior management and H&S representatives gave their highest ratings for collaboration.
- The supervisor/foreman and employee levels gave their highest ratings for credibility.
- The highest rating from the management level was given for business integration.
- The senior management and supervisor/foreman levels gave their lowest ratings for feedback and recognition.
- The management and employee levels gave their lowest ratings for vision and values.
- H&S representatives gave business integration their lowest rating.

- The supervisor/foreman, employee and H&S representative levels were significantly more positive about all of the dimensions than senior management and management.

Age

- Overall, the 51 to 60 years group gave lower ratings than the other age categories on all dimensions. In the literature reviewed, no other studies investigated or reported on differences according to age in the 360 degree safety leadership assessment.
- The 21 to 30 years and 41 to 50 years groups gave their lowest scores for the same dimension namely feedback and recognition.
- The 21 to 30 years category gave their highest ratings for accountability.
- The 41 to 50 years group reported their highest ratings for credibility.
- Both the 31 to 40 years and 51 to 60 years categories gave their lowest scores for vision and values and their highest scores for learning orientation.
- The 41 to 50 years group was significantly more positive about learning orientation and vision and values than the 51 to 60 years age group. While the 31 to 40 years category was also significantly more positive about learning orientation than the 51 to 60 years category.

Site

- Site 2 recorded higher ratings than Site 1 on most of the dimensions. According to Krause (2004) geographical separation or departmental designations can lead to the development of safety subcultures or so called 'site-level cultures'. This means that different sites can have identical safety policies and procedures, similar work activities and workforces and yet have very different scores on safety performance because of different work settings and managers.

- Site 1 gave their highest ratings for learning orientation and the lowest for feedback and recognition.
- Site 2 reported their highest scores for accountability and the lowest for vision and values.
- There were significant differences between the scores of the sites with Site 2 being more positive than Site 1 about accountability and business integration.

This concludes the reporting of results and the description of the safety leadership profile and differences between demographic groups before the intervention as per the first two aims of the quantitative study. The next sections focus on the pre-test and post-test comparisons as per the third objective.

7.8. PRE-TEST AND POST-TEST COMPARISONS

One of the aims of the quantitative study was to determine the impact of the intervention (coaching program) on safety leadership. The method employed to achieve this was to follow a pre-test post-test design and then to compare the results of the two sets of data. Firstly, the results are reported and interpreted and secondly, the results are discussed and integrated with the available literature.

In the interest of confidentiality and for ethical reasons no identifying information was recorded on the surveys and therefore the pre-test and post-test results of individuals could not be paired. Subsequently, the data sets were compared as independent samples.

7.8.1. Overall safety leadership profile

The post-test results revealed higher overall ratings than the pre-test on all dimensions of safety leadership. The results indicate overall satisfaction with

the safety leadership practices as the means of all dimensions are equal to or above 3.77.

The highest post-test scores were for the dimensions of collaboration (3.89) and credibility (3.88) and the lowest for business integration (3.78), feedback and recognition (3.78), and vision and values (3.77). The pre-test post-test comparison of the overall safety leadership profile of the organisation is illustrated in Figure 7.8.

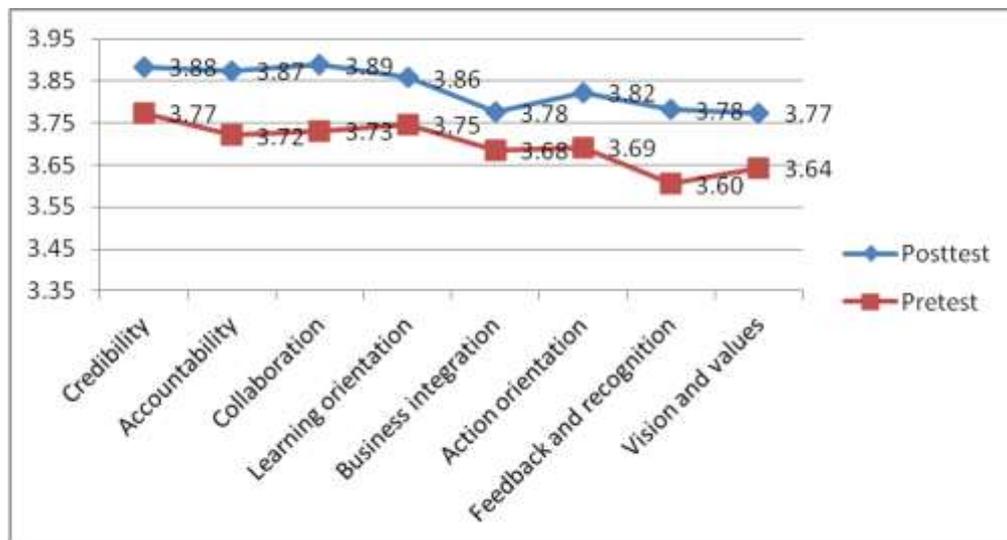


Figure 7.8 Pre-test post-test means comparisons: Overall profile

The independent samples t-test was performed to establish whether the differences observed in the pre-test and post-test ratings were significant. The results are reflected in Table 7.14 on the next page.

Three of the dimensions, namely accountability, collaboration and feedback and recognition, obtained a significance score at the <0.05 level. This means that there was a significant difference between the pre-test and post-test ratings on these three dimensions. Post-test ratings were significantly higher on these dimensions.

TABLE 7.14

Overall Pre-Test Post-Test Comparisons

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-Test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimension_1 Credibility	Equal variances assumed	3.825	.051	-1.517	428	.130	-.10853	.07154	-24915	.03210
	Equal variances not assumed			-1.517	424.762	.130	-.10853	.07154	-24915	.03210
Dimension_2 Accountability	Equal variances assumed	.156	.693	-2.152	428	.032*	-.15349	.07131	-.29365	-.01333
	Equal variances not assumed			-2.152	427.992	.032	-.15349	.07131	-.29365	-.01333
Dimension_3 Collaboration	Equal variances assumed	5.554	.019	-2.298	428	.022*	-.15736	.06848	-.29197	-.02276
	Equal variances not assumed			-2.298	422.463	.022*	-.15736	.06848	-.29198	-.02275
Dimension_4 Learning orientation	Equal variances assumed	13.883	.000	-1.494	428	.136	-.11070	.07408	-.25630	.03490
	Equal variances not assumed			-1.494	405.243	.136	-.11070	.07408	-.25632	.03493
Dimension_5 Business integration	Equal variances assumed	.365	.546	-1.294	428	.196	-.09070	.07008	-.22844	.04704
	Equal variances not assumed			-1.294	426.850	.196	-.09070	.07008	-.22844	.04704
Dimension_6 Action orientation	Equal variances assumed	3.081	.080	-1.612	428	.071	-.13116	.07238	-.27342	.01110
	Equal variances not assumed			-1.612	423.382	.071	-.13116	.07238	-.27343	.01110
Dimension_7 Feedback & recognition	Equal variances assumed	12.011	.001	-2.355	428	.019	-.17674	.07506	-.32428	-.02920
	Equal variances not assumed			-2.355	405.341	.019*	-.17674	.07506	-.32431	-.02918
Dimension_8 Vision & Values	Equal variances assumed	9.908	.002	-1.761	428	.079	-.13023	.07394	-.27556	.01510
	Equal variances not assumed			-1.761	415.136	.079	-.13023	.07394	-.27558	.01511

* p ≤ .05

7.8.2. Gender

The pre-test and post-test mean scores of males and females were compared respectively in order to determine any significant changes.

7.8.2.1. Mean scores comparisons: Males

Pre-test and post-test means of males are depicted in Figure 7.9 on the next page. The post-test scores of males were generally higher than the ratings given on the pre-test. On the post-test, males were positive about collaboration (3.86), learning orientation (3.82), credibility (3.84), accountability (3.81), and

action orientation (3.78). Males were still negative about business integration (3.70), feedback and recognition (3.76), and vision and values (3.72).

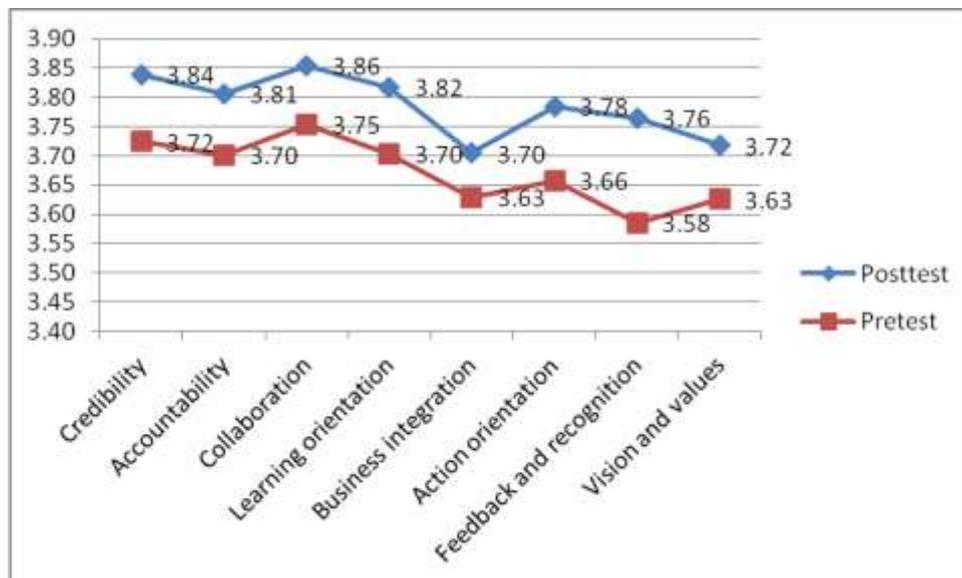


Figure 7.9 Pre-test Post-test means comparisons: Males

7.8.2.2. T-test Analysis of variance: Males

Independent samples t-test for equality of means was conducted to determine if there were any significant differences between the pre-test and post-test means of males. The results are listed in Table 7.15 on the next page.

The t-test revealed significant differences between the pre-test and post-test scores of males on the 0.05 level for one of the dimensions. This means that males rated feedback and recognition significantly higher on the post-test, i.e. after the intervention.

TABLE 7.15

Pre-Test Post-Test Comparisons of Males

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-Test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimension_1 Credibility	Equal variances assumed	1.397	.238	-1.427	352	.154	-.11425	.06005	-.27169	.04319
	Equal variances not assumed			-1.427	350.849	.154	-.11425	.06005	-.27169	.04319
Dimension_2 Accountability	Equal variances assumed	.381	.537	-1.294	352	.196	-.10452	.06075	-.26334	.05430
	Equal variances not assumed			-1.294	351.821	.196	-.10452	.06075	-.26334	.05430
Dimension_3 Collaboration	Equal variances assumed	2.582	.109	-1.327	352	.185	-.10189	.07664	-.25243	.04904
	Equal variances not assumed			-1.327	350.610	.185	-.10189	.07664	-.25244	.04905
Dimension_4 Learning orientation	Equal variances assumed	12.959	.000	-1.338	352	.182	-.11299	.06446	-.27911	.05312
	Equal variances not assumed			-1.338	331.421	.182	-.11299	.06446	-.27914	.05316
Dimension_5 Business integration	Equal variances assumed	1.158	.283	-.970	352	.333	-.07627	.07864	-.23093	.07839
	Equal variances not assumed			-.970	350.435	.333	-.07627	.07864	-.23094	.07839
Dimension_6 Action orientation	Equal variances assumed	1.938	.165	-1.537	352	.125	-.12655	.06233	-.26948	.03537
	Equal variances not assumed			-1.537	348.228	.125	-.12655	.06233	-.26948	.03538
Dimension_7 Feedback & Recognition	Equal variances assumed	7.199	.008	-2.116	352	.035	-.17938	.06479	-.34613	-.01263
	Equal variances not assumed			-2.116	337.442	.035*	-.17938	.06479	-.34616	-.01260
Dimension_8 Vision & Values	Equal variances assumed	9.567	.002	-1.097	352	.273	-.09181	.06368	-.25639	.07277
	Equal variances not assumed			-1.097	339.046	.273	-.09181	.06368	-.25641	.07279

a. gender = Male

* p ≤ .05

7.8.2.3. Mean scores comparisons: Females

Female’s post-test ratings were generally higher than their pre-test ratings and especially for accountability (4.19) and business integration (4.11). Females returned the lowest ratings on feedback and recognition (3.86). Overall females are satisfied with the safety leadership practices as all dimensions scored an average above 3.7. These pre-test and post-test ratings are illustrated in Figure 7.10 on the next page.

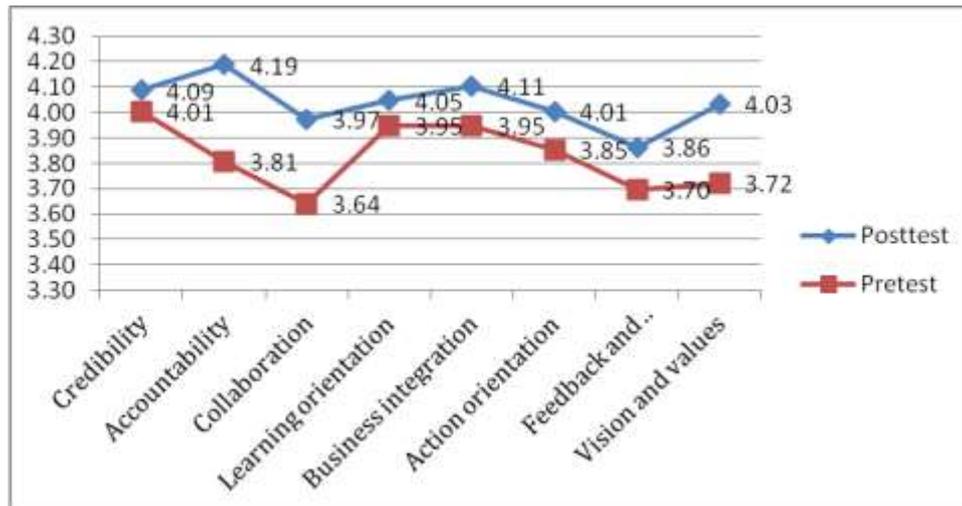


Figure 7.10 Pre-test Post-test means comparisons: Females

7.8.2.4. T-test Analysis of variance: Females

The independent samples t-test was performed to determine whether significant differences existed between female's pre-test and post-test mean scores. The results are presented in Table 7.16 on page 218. The results indicated a significant difference on the 0.05 level between female's pre-test and post-test scores for accountability, collaboration, and vision and values. In other words, females rated credibility, collaboration, and feedback and recognition significantly higher on the post-test, that is, after the intervention.

7.8.3. Race

The pre-test and post-test mean scores of Africans and Whites were compared respectively in order to determine any changes.

TABLE 7.16

Pre-Test Post-Test Comparisons of Females

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-Test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimension_1 Credibility	Equal variances assumed	7.976	.006	-.547	74	.586	-.08187	.14958	-.37992	.21618
	Equal variances not assumed			-.547	68.869	.586	-.08187	.14958	-.38029	.21655
Dimension_2 Accountability	Equal variances assumed	.172	.679	-2.813	74	.006*	-.38158	.13665	-.65187	-.11129
	Equal variances not assumed			-2.813	73.956	.006	-.38158	.13665	-.65187	-.11129
Dimension_3 Collaboration	Equal variances assumed	16.714	.000	-2.205	74	.031	-.33158	.15036	-.63117	-.03198
	Equal variances not assumed			-2.205	64.008	.031*	-.33158	.15036	-.63195	-.03120
Dimension_4 Learning orientation	Equal variances assumed	2.134	.148	-.725	74	.471	-1.0000	.13788	-.37473	.17473
	Equal variances not assumed			-.725	72.167	.471	-1.0000	.13788	-.37485	.17485
Dimension_5 Business integration	Equal variances assumed	.029	.865	-1.182	74	.241	-1.5789	.13361	-.42411	.10833
	Equal variances not assumed			-1.182	73.944	.241	-1.5789	.13361	-.42412	.10833
Dimension_6 Action orientation	Equal variances assumed	5.704	.019	-1.099	74	.275	-1.5263	.13892	-.42943	.12417
	Equal variances not assumed			-1.099	72.764	.276	-1.5263	.13892	-.42951	.12425
Dimension_7 Feedback & Recognition	Equal variances assumed	6.020	.017	-1.048	74	.298	-1.6447	.15689	-.47708	.14813
	Equal variances not assumed			-1.048	62.712	.298	-1.6447	.15689	-.47802	.14907
Dimension_8 Vision & Values	Equal variances assumed	1.967	.165	-2.117	74	.038*	-.30821	.14606	-.60024	-.01818
	Equal variances not assumed			-2.117	72.405	.038	-.30821	.14606	-.60035	-.01807

a. gender = Female

* p ≤ .05

7.8.3.1. Mean scores comparisons: Africans

African’s pre-test and post-test scores were very similar as shown in Figure 7.11. The post-test ratings were slightly higher than the pre-test ratings and indicated that Africans are satisfied with the safety leadership practices (all means above 3.77). Africans rated credibility (3.98) the highest and business integration (3.82) received the lowest post-test ratings from Africans.

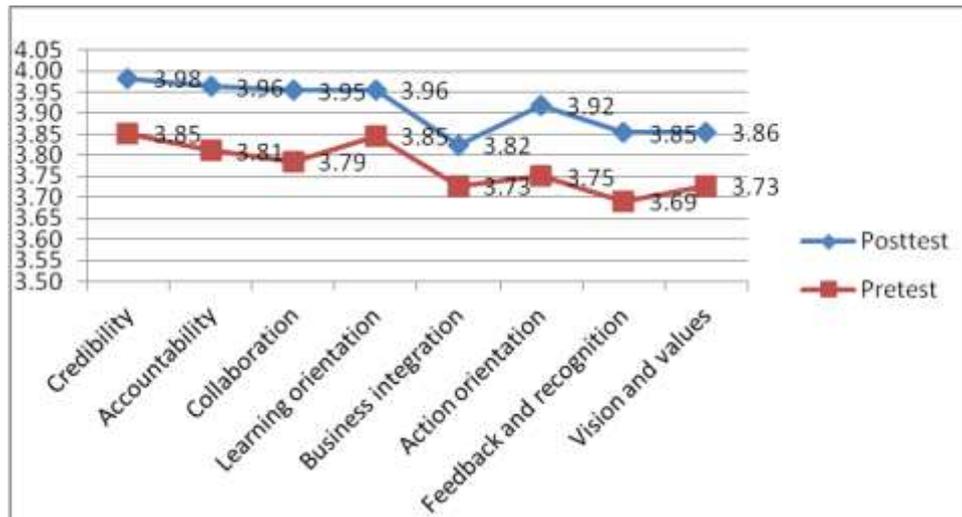


Figure 7.11 Pre-test Post-test means comparisons: Africans

7.8.3.2. T-test analysis: Africans

Independent samples t-test was performed to determine if the differences noted between African’s pre-test and post-test mean scores were significant. The results are summarised in Table 7.17 on the next page.

There were significant differences on the 0.05 level between African’s pre-test and post-test scores accountability, collaboration, action orientation and feedback and recognition level. This means that Africans rated four out of the eight dimensions significantly higher on the post-test than on the pre-test, i.e. after the intervention.

TABLE 7.17

Pre-Test Post-Test Comparisons of Africans

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimension_1 Credibility	Equal variances assumed	4.768	.030	-1.772	336	.077	-1.3083	.07384	-2.7608	.14441
	Equal variances not assumed			-1.772	328.852	.077	-1.3083	.07384	-2.7610	.14443
Dimension_2 Accountability	Equal variances assumed	.689	.407	-2.080	336	.038*	-1.5187	.07300	-2.9547	-.00627
	Equal variances not assumed			-2.080	334.841	.038	-1.5187	.07300	-2.9548	-.00627
Dimension_3 Collaboration	Equal variances assumed	9.725	.002	-2.296	336	.022	-1.6805	.07318	-3.1200	-.24110
	Equal variances not assumed			-2.296	328.632	.022*	-1.6805	.07318	-3.1201	-.24109
Dimension_4 Learning orientation	Equal variances assumed	16.572	.000	-1.406	336	.161	-1.0688	.07741	-.26115	.04340
	Equal variances not assumed			-1.406	301.866	.161	-1.0688	.07741	-.26121	.04346
Dimension_5 Business integration	Equal variances assumed	.721	.396	-1.285	336	.200	-.09615	.07485	-.24338	.05107
	Equal variances not assumed			-1.285	330.819	.200	-.09615	.07485	-.24339	.05108
Dimension_6 Action orientation	Equal variances assumed	9.868	.002	-2.254	336	.025	-1.6805	.07456	-3.1472	-.22138
	Equal variances not assumed			-2.254	311.747	.025*	-1.6805	.07456	-3.1476	-.22133
Dimension_7 Feedback & Recognition	Equal variances assumed	11.029	.001	-2.053	336	.041	-1.6272	.07926	-3.1862	-.00682
	Equal variances not assumed			-2.053	308.051	.041*	-1.6272	.07926	-3.1867	-.00677
Dimension_8 Vision & Values	Equal variances assumed	6.524	.011	-1.632	336	.104	-1.2722	.07796	-.28057	.02613
	Equal variances not assumed			-1.632	324.382	.104	-1.2722	.07796	-.28059	.02615

a. race = African

* $p \leq .05$

7.8.3.3. Mean scores comparisons: Whites

Whites' ratings on the pre-test and post-test were very similar with slightly higher post-test ratings on accountability and feedback and recognition. However, Whites seemed to remain dissatisfied about safety leadership practices in general because none of the dimensions obtained means above 3.77. Whites were most positive about business integration (3.59) and collaboration (3.57) and rated action orientation (3.47) and vision and values (3.47) the lowest. The pre-test and post-test means comparisons of Whites are reflected in Figure 7.12.

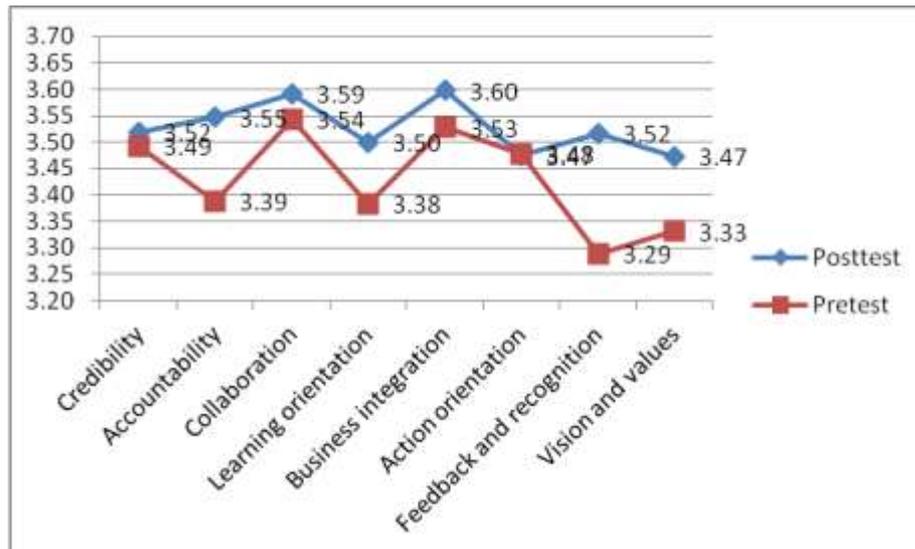


Figure 7.12 Pre-test Post-test means comparisons: Whites

7.8.3.4. *T-test analysis: Whites*

The independent samples t-test did not identify any significant differences between the pre-test and post-test data of Whites, as shown in Table 7.18 on page 222. This means that Whites' ratings of the safety leadership dimensions did not significantly increase or decrease after the coaching intervention.

7.8.4. Job level

Six job level categories were identified namely senior management, management, supervisor, foreman, employee and Health and safety (H&S) representative. The pre-test post-test means comparisons according to job level are presented in the next sections.

TABLE 7.18

Pre-Test Post-Test Comparisons of Whites

		Independent Samples Test ^a										
		Levene's Test for Equality of Variances		t-test for Equality of Means							95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper		
Dimension_1 Credibility	Equal variances assumed	.007	.933	-.146	90	.884	-.02657	.18170	-.38754	.33440		
	Equal variances not assumed			-.146	89.987	.884	-.02657	.18170	-.38754	.33440		
Dimension_2 Accountability	Equal variances assumed	.983	.322	-.667	90	.388	-.15942	.18380	-.52457	.20573		
	Equal variances not assumed			-.667	88.795	.388	-.15942	.18380	-.52464	.20580		
Dimension_3 Collaboration	Equal variances assumed	.630	.429	-.269	90	.773	-.04783	.16549	-.37660	.26084		
	Equal variances not assumed			-.269	89.577	.773	-.04783	.16549	-.37662	.26087		
Dimension_4 Learning orientation	Equal variances assumed	.065	.800	-.662	90	.516	-.11739	.18002	-.47504	.24026		
	Equal variances not assumed			-.662	89.882	.516	-.11739	.18002	-.47505	.24026		
Dimension_5 Business integration	Equal variances assumed	.619	.434	-.403	90	.688	-.07065	.17527	-.41885	.27755		
	Equal variances not assumed			-.403	88.672	.688	-.07065	.17527	-.41892	.27762		
Dimension_6 Action orientation	Equal variances assumed	.711	.401	.023	90	.982	.00435	.18624	-.36962	.37831		
	Equal variances not assumed			.023	86.664	.982	.00435	.18624	-.36981	.37851		
Dimension_7 Feedback & Recognition	Equal variances assumed	.327	.569	-1.233	90	.221	-.22826	.18510	-.59599	.13947		
	Equal variances not assumed			-1.233	89.398	.221	-.22826	.18510	-.59603	.13950		
Dimension_8 Vision & Values	Equal variances assumed	2.284	.134	-.779	90	.438	-.14130	.18129	-.50148	.21887		
	Equal variances not assumed			-.779	87.614	.438	-.14130	.18129	-.50161	.21900		

a. race = White

7.8.4.1. Mean scores comparisons: Senior management

The pre-test and post-test results of senior management were very similar on most of the dimensions, as shown in Figure 7.13. However, they gave slightly lower ratings for business integration and action orientation and slightly higher scores for feedback and recognition on the post-test. This group remained dissatisfied with safety leadership practices as none of the dimensions obtained a means above 3.77 on the post assessment.

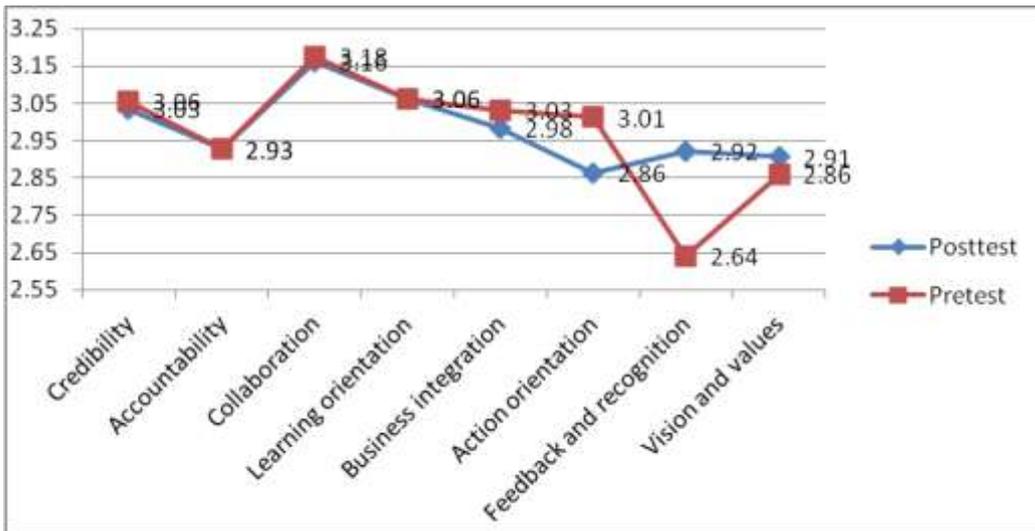


Figure 7.13 Pre-test Post-test means comparisons: Senior management

7.8.4.2. T-test analysis: Senior management

The independent samples t-test did not indicate any significant differences in the pre-test and post-test results of senior management as per Table 7.19 on page 224. This means that senior management's ratings of safety leadership remained more or less the same after the intervention as it was before the intervention.

TABLE 7.19

Pre-Test Post-Test Comparisons of Senior Management

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Dimension_1 Credibility	Equal variances assumed	.184	.671	.071	30	.944	.02083	.29270	-.57693	.61860
	Equal variances not assumed			.071	29.760	.944	.02083	.29270	-.57713	.61860
Dimension_2 Accountability	Equal variances assumed	.536	.470	.000	30	1.000	.00000	.30350	-.61964	.61964
	Equal variances not assumed			.000	29.729	1.000	.00000	.30350	-.62008	.62008
Dimension_3 Collaboration	Equal variances assumed	.002	.966	.046	30	.963	.01250	.27024	-.53941	.56441
	Equal variances not assumed			.046	29.625	.963	.01250	.27024	-.53970	.56470
Dimension_4 Learning orientation	Equal variances assumed	.157	.694	.000	30	1.000	.00000	.30574	-.62441	.62441
	Equal variances not assumed			.000	29.936	1.000	.00000	.30574	-.62447	.62447
Dimension_5 Business integration	Equal variances assumed	.465	.500	.179	30	.859	.04688	.26155	-.48728	.58103
	Equal variances not assumed			.179	29.682	.859	.04688	.26155	-.48752	.58127
Dimension_6 Action orientation	Equal variances assumed	1.955	.172	.475	30	.638	.15000	.31580	-.49495	.79495
	Equal variances not assumed			.475	27.698	.639	.15000	.31580	-.49720	.79720
Dimension_7 Feedback & recognition	Equal variances assumed	.041	.841	-1.188	30	.244	-.28125	.23683	-.76492	.20242
	Equal variances not assumed			-1.188	29.987	.244	-.28125	.23683	-.76493	.20243
Dimension_8 Vision & Values	Equal variances assumed	1.889	.180	-.174	30	.863	-.04688	.26891	-.59607	.50232
	Equal variances not assumed			-.174	28.387	.863	-.04688	.26891	-.59738	.50363

a. LEVEL = Senior management

7.8.4.3. Mean scores comparisons: Management

The management level's post-test scores were notably higher than the pre-test on all dimensions as illustrated in Figure 7.14. Management's post-test ratings were on average 0.43 points higher than their pre-test ratings. This represents an average increase of 13% between pre-test and post-test results. However, this group remained negative about business integration (3.71), action orientation (3.74), and vision and values (3.71) with means below 3.77 on these dimensions.

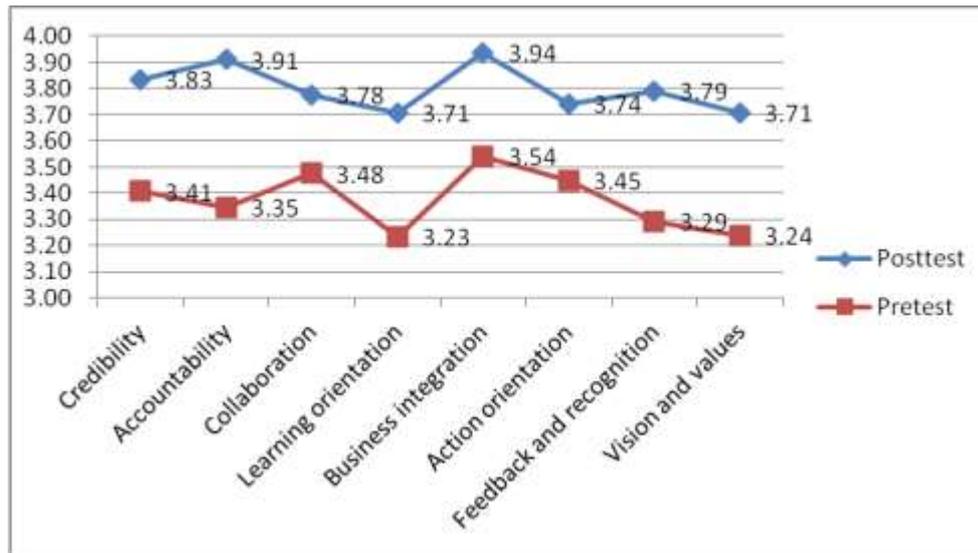


Figure 7.14 Pre-test Post-test means comparisons: Management

7.8.4.4. T-test analysis: Management

As presented in Table 7.20 on the next page, the independent samples t-test highlighted significant differences on the 0.05 level between the pre-test and post-test results of management for credibility, accountability, learning orientation, business integration, feedback and recognition and vision and values. Management rated six of the eight dimensions significantly higher on the post-test (i.e. after the intervention) than on the pre-test.

TABLE 7.20

Pre-Test Post-Test Comparisons of Management

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Dimension 1 Credibility	Equal variances assumed	.054	.817	-2.381	46	.021*	-4.2593	1.7892	-7.8607	-.06576
	Equal variances not assumed			-2.381	45.868	.021	-4.2593	1.7892	-7.8610	-.06575
Dimension 2 Accountability	Equal variances assumed	1.375	.247	-3.471	46	.001*	-5.6250	1.6204	-8.8867	-.23633
	Equal variances not assumed			-3.471	42.823	.001	-5.6250	1.6204	-8.8933	-.23667
Dimension 3 Collaboration	Equal variances assumed	.892	.350	-1.748	46	.087	-3.0000	1.7158	-.64537	0.4537
	Equal variances not assumed			-1.748	45.826	.087	-3.0000	1.7158	-.64540	0.4540
Dimension 4 Learning orientation	Equal variances assumed	.214	.646	-2.814	46	.007*	-4.7500	1.6882	-.81481	-.13519
	Equal variances not assumed			-2.814	45.991	.007	-4.7500	1.6882	-.81481	-.13519
Dimension 5 Business integration	Equal variances assumed	.205	.653	-2.326	46	.024*	-3.9583	1.7020	-.73842	-.05325
	Equal variances not assumed			-2.326	44.839	.025	-3.9583	1.7020	-.73866	-.05301
Dimension 6 Action orientation	Equal variances assumed	.940	.337	-1.609	46	.114	-2.9167	1.8127	-.66855	0.7321
	Equal variances not assumed			-1.609	41.973	.115	-2.9167	1.8127	-.66749	0.7416
Dimension 7 Feedback & Recognition	Equal variances assumed	.528	.471	-2.756	46	.008*	-5.0000	1.8141	-.86517	-.13483
	Equal variances not assumed			-2.756	44.120	.008	-5.0000	1.8141	-.86559	-.13441
Dimension 8 Vision & Values	Equal variances assumed	.516	.476	-2.689	46	.010*	-4.6875	1.7429	-.81958	-.11792
	Equal variances not assumed			-2.689	45.584	.010	-4.6875	1.7429	-.81967	-.11783

a. LEVEL = Management

* p ≤ .05

7.8.4.5. Mean scores comparisons: Supervisor / Foreman

The Supervisor / Foreman level generally gave higher scores on the post-test than on the pre-test with averages above 3.77 on all dimensions. Notably higher ratings for accountability (4.0), learning orientation (4.05), feedback and recognition (3.95), and vision and values (4.04) were recorded on the post-test. This is depicted in Figure 7.15.

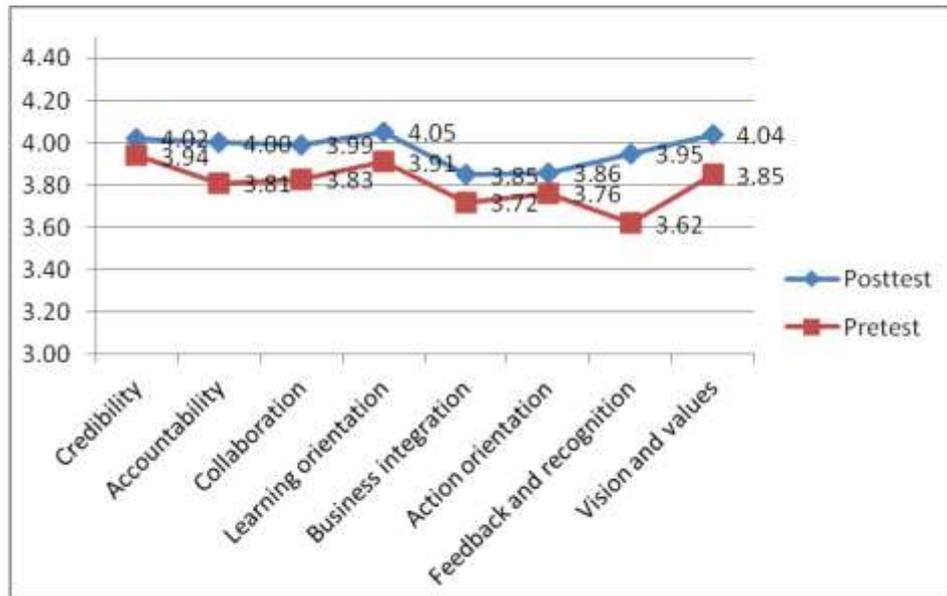


Figure 7.15 Pre-test Post-test means comparisons: Supervisor/Foreman

7.8.4.6. T-test analysis: Supervisor/Foreman

In order to determine any significance in the differences noted in the Supervisor / Foreman level's pre-test and post-test scores, the independent samples t-test was conducted. The results revealed statistically significant differences between pre-test and post-test ratings on the 0.05 level only on one dimension, namely action orientation. The results for this group are set out in Table 7.21 on page 228.

7.8.4.7. Mean scores comparisons: Employees

Employee's pre-test and post-test ratings were very similar. However, they recorded higher post-test scores on all dimensions particularly for collaboration and action orientation as can be seen in Figure 7.16 on the next page. Employees seemed to be satisfied with safety leadership as all dimensions obtained means above 3.77.

TABLE 7.21

Pre-Test Post-Test Comparisons of Supervisor / Foreman

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Dimension_1 Credibility	Equal variances assumed	.069	.797	.365	10	.722	.06566	.15203	-28319	.39430
	Equal variances not assumed			.365	9.960	.722	.06566	.15203	-28328	.39440
Dimension_2 Accountability	Equal variances assumed	.012	.914	-1.423	10	.185	-.38889	.27330	-.99783	.22006
	Equal variances not assumed			-1.423	9.708	.186	-.38889	.27330	-1.00033	.22255
Dimension_3 Collaboration	Equal variances assumed	5.198	.046	.964	10	.358	.33333	.34577	-.43709	1.10375
	Equal variances not assumed			.964	8.059	.363	.33333	.34577	-.46299	1.12985
Dimension_4 Learning orientation	Equal variances assumed	5.248	.045	-1.820	10	.099	-.46667	.25647	-1.03812	.10479
	Equal variances not assumed			-1.820	6.195	.117	-.46667	.25647	-1.08948	.15615
Dimension_5 Business integration	Equal variances assumed	12.500	.005	.652	10	.529	.16667	.25550	-.40261	.73595
	Equal variances not assumed			.652	5.679	.540	.16667	.25550	-.46718	.80062
Dimension_6 Action orientation	Equal variances assumed	1.488	.250	-2.219	10	.050*	-.53333	.24037	-1.06891	.00224
	Equal variances not assumed			-2.219	8.887	.054	-.53333	.24037	-1.07814	.01147
Dimension_7 Feedback & Recognition	Equal variances assumed	1.558	.240	-1.481	10	.169	-.54167	.36562	-1.36633	.27289
	Equal variances not assumed			-1.481	8.255	.176	-.54167	.36562	-1.38028	.29695
Dimension_8 Vision & Values	Equal variances assumed	.385	.549	-1.326	10	.214	-.33333	.25139	-.89345	.22679
	Equal variances not assumed			-1.326	9.995	.214	-.33333	.25139	-.89349	.22682

a. LEVEL = Supervisor / Foreman

* p ≤ .05

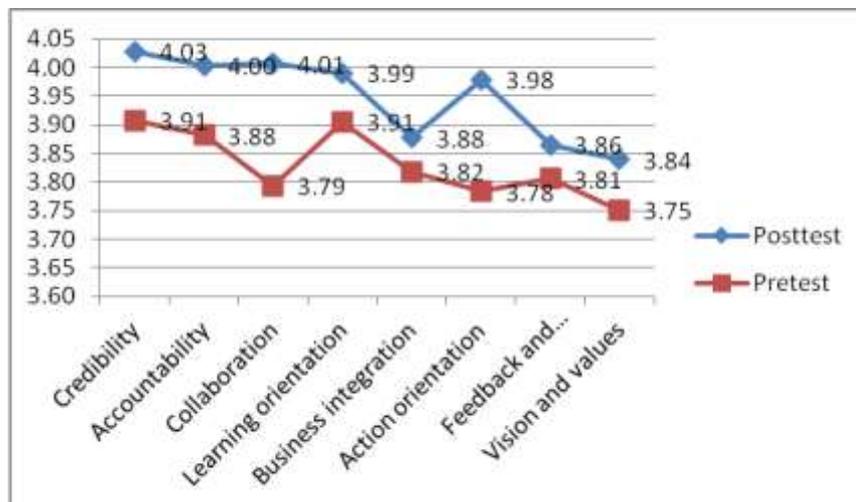


Figure 7.16 Pre-test Post-test means comparisons: Employees

7.8.4.8. T-test analysis: Employees

Table 7.22 reflects the results of the independent samples t-test for equality of means that was performed to identify any significant differences between employee's pre-test and post-test ratings. No significant differences on any of the dimensions were revealed. Thus, employees' ratings did not significantly change between the pre-test and the post-test assessment.

TABLE 7.22

Pre-Test Post-Test Comparisons of Employees

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimension_1 Credibility	Equal variances assumed	2.980	.087	-.934	116	.352	-.12053	.12901	-.37605	.13500
	Equal variances not assumed			-.934	113.278	.352	-.12053	.12901	-.37612	.13506
Dimension_2 Accountability	Equal variances assumed	.016	.900	-.962	116	.338	-.12147	.12623	-.37149	.12855
	Equal variances not assumed			-.962	115.978	.338	-.12147	.12623	-.37149	.12856
Dimension_3 Collaboration	Equal variances assumed	4.697	.032	-1.774	116	.079	-.21356	.12039	-.45200	.02488
	Equal variances not assumed			-1.774	113.708	.079	-.21356	.12039	-.45205	.02493
Dimension_4 Learning orientation	Equal variances assumed	4.251	.041	-.606	116	.546	-.08475	.13995	-.36193	.19244
	Equal variances not assumed			-.606	106.028	.546	-.08475	.13995	-.36221	.19272
Dimension_5 Business integration	Equal variances assumed	.798	.374	-.444	116	.658	-.06932	.13354	-.32382	.20517
	Equal variances not assumed			-.444	113.432	.658	-.06932	.13354	-.32388	.20524
Dimension_6 Action orientation	Equal variances assumed	5.685	.019	-1.453	116	.149	-.19661	.13529	-.46458	.07136
	Equal variances not assumed			-1.453	105.144	.149	-.19661	.13529	-.46487	.07165
Dimension_7 Feedback & Recognition	Equal variances assumed	3.824	.053	-.420	116	.675	-.06932	.14115	-.33888	.22024
	Equal variances not assumed			-.420	107.969	.675	-.06932	.14115	-.33910	.22045
Dimension_8 Vision & Values	Equal variances assumed	2.504	.116	-.609	116	.544	-.08898	.14615	-.37846	.20049
	Equal variances not assumed			-.609	110.598	.544	-.08898	.14615	-.37860	.20064

a. LEVEL = Employee

7.8.4.9. Mean scores comparisons: H&S representatives

Figure 7.17 depicts the pre-test and post-test means scores of Health and Safety (H&S) representatives. H&S representatives gave slightly higher ratings on the post-test especially for collaboration, action orientation and feedback and recognition. This group was satisfied with safety leadership as the post-test means of all dimensions were higher than 3.77.

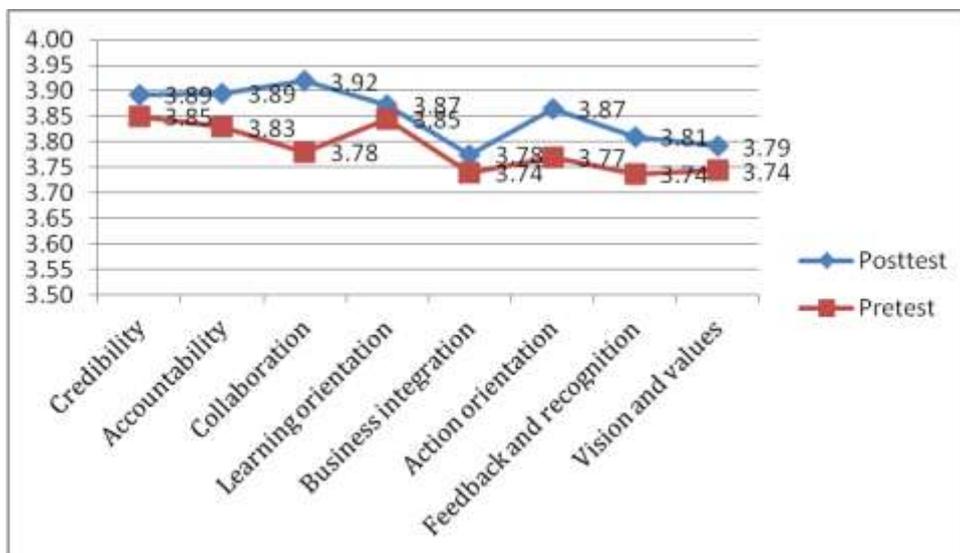


Figure 7.17 Pre-test Post-test means comparisons: H&S representatives

7.8.4.10. T-test analysis: H&S representatives

According to the results of the independent samples t-test, as presented in Table 7.23 on the next page, no significant differences were identified. This means that the ratings of the H&S representatives on the safety leadership dimensions did not significantly change between the pre-test and post-test assessments.

TABLE 7.23

Pre-Test Post-Test Means Comparisons of H&S Representatives

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimension_1 Credibility	Equal variances assumed	1.618	.205	-.377	156	.707	-.04219	.11196	-.26339	.17900
	Equal variances not assumed			-.377	153.681	.707	-.04219	.11196	-.26341	.17902
Dimension_2 Accountability	Equal variances assumed	.047	.829	-.602	156	.548	-.06640	.10872	-.28016	.14936
	Equal variances not assumed			-.602	155.766	.548	-.06640	.10872	-.28017	.14936
Dimension_3 Collaboration	Equal variances assumed	6.914	.009	-1.316	156	.190	-.13824	.10580	-.34822	.06974
	Equal variances not assumed			-1.316	149.821	.190	-.13824	.10580	-.34828	.06980
Dimension_4 Learning orientation	Equal variances assumed	6.309	.013	-.240	156	.811	-.02785	.11615	-.25728	.20158
	Equal variances not assumed			-.240	141.805	.811	-.02785	.11615	-.25746	.20176
Dimension_5 Business integration	Equal variances assumed	.575	.449	-.312	156	.755	-.03481	.11152	-.25509	.18547
	Equal variances not assumed			-.312	152.861	.755	-.03481	.11152	-.25512	.18550
Dimension_6 Action orientation	Equal variances assumed	3.555	.061	-.862	156	.390	-.09620	.11157	-.31659	.12418
	Equal variances not assumed			-.862	145.667	.390	-.09620	.11157	-.31671	.12430
Dimension_7 Feedback & recognition	Equal variances assumed	5.965	.016	-.620	156	.536	-.07278	.11737	-.30463	.15906
	Equal variances not assumed			-.620	139.862	.536	-.07278	.11737	-.30484	.15927
Dimension_8 Vision & Values	Equal variances assumed	5.207	.024	-.415	156	.679	-.04747	.11451	-.27366	.17872
	Equal variances not assumed			-.415	146.398	.679	-.04747	.11451	-.27378	.17884

a. LEVEL = H&S Representative

7.8.5. Age groups

Respondents' ages were divided into four categories namely 21 to 30, 31 to 40, 41 to 50 and 5 to 60 years. The results are discussed in the sections below.

7.8.5.1. Mean scores comparisons for age group: 21-30 years

In this age group, higher post-test than pre-test scores were recorded. Most noticeably on learning orientation, action orientation, feedback and recognition and vision and values as reflected in Figure 7.18. This group was positive about

most dimensions, except credibility, accountability, and action orientation, with means above 3.77.

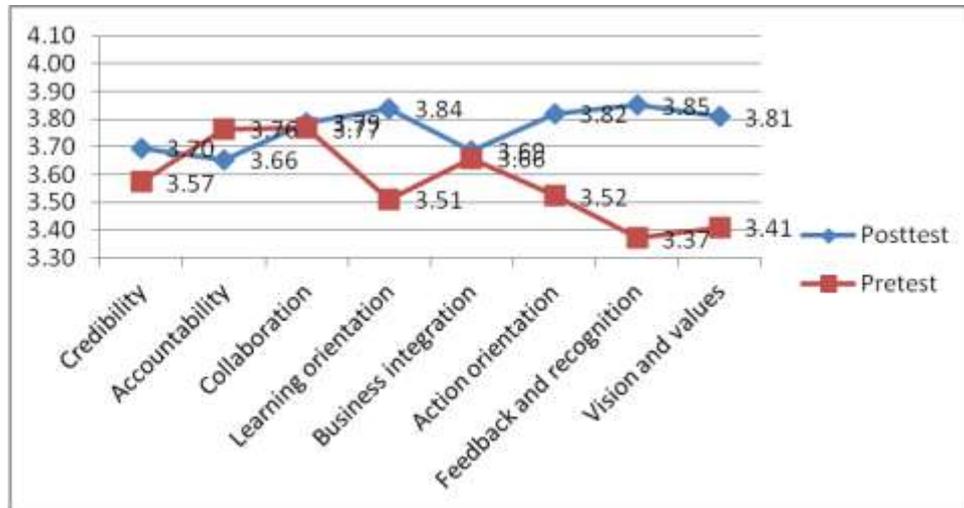


Figure 7.18 Pre-test Post-test means comparisons for age: 21-30 years

7.8.5.2. T-test analysis for age group: 21-30 years

The T-test analysis indicated significant differences between pre-test and post-test scores for this age group. A significant difference in means was recorded on the 0.05 level for feedback and recognition, as reflected in Table 7.24.

TABLE 7.24

Pre-Test Post-Test Comparisons of 21-30 Years

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimension_1 Credibility	Equal variances assumed	1.517	.223	-.571	59	.570	-.12282	.21500	-.55304	.30740
	Equal variances not assumed			-.573	57.694	.569	-.12282	.21435	-.55193	.30629
Dimension_2 Accountability	Equal variances assumed	.225	.637	.588	59	.559	.10789	.18369	-.25947	.47524
	Equal variances not assumed			.588	58.900	.559	.10789	.18336	-.25903	.47480
Dimension_3 Collaboration	Equal variances assumed	1.543	.219	-.096	59	.924	-.01892	.19570	-.41252	.37467
	Equal variances not assumed			-.096	58.360	.924	-.01892	.19525	-.41171	.37386
Dimension_4 Learning orientation	Equal variances assumed	14.095	.000	-1.236	59	.221	-.33032	.26728	-.86515	.20450
	Equal variances not assumed			-1.246	48.361	.219	-.33032	.26507	-.86317	.20253
Dimension_5 Business integration	Equal variances assumed	2.251	.139	.120	59	.905	.02715	.22720	-.42747	.48177
	Equal variances not assumed			.120	55.534	.905	.02715	.22613	-.42593	.48023
Dimension_6 Action orientation	Equal variances assumed	4.653	.035	-1.172	59	.246	-.29742	.25376	-.80519	.21035
	Equal variances not assumed			-1.180	51.463	.243	-.29742	.25202	-.80325	.20841
Dimension_7 Feedback & Recognition	Equal variances assumed	10.470	.002	-2.083	59	.042	-.47903	.22994	-.93914	-.01892
	Equal variances not assumed			-2.101	48.071	.041*	-.47903	.22801	-.93746	-.02061
Dimension_8 Vision & Values	Equal variances assumed	10.143	.002	-1.709	59	.093	-.39704	.23227	-.86162	.06773
	Equal variances not assumed			-1.727	43.637	.091	-.39704	.22988	-.86045	.06636

a. age = 21-30 years

* p = ≤ .05

7.8.5.3. Mean scores comparisons for age group: 31-40 years

In general, the 31 to 40 years category gave higher post-test than pre-test scores as per Figure 7.19 on page 234. All dimensions, except feedback and recognition and vision and values, were rated positively with averages of more than 3.77.

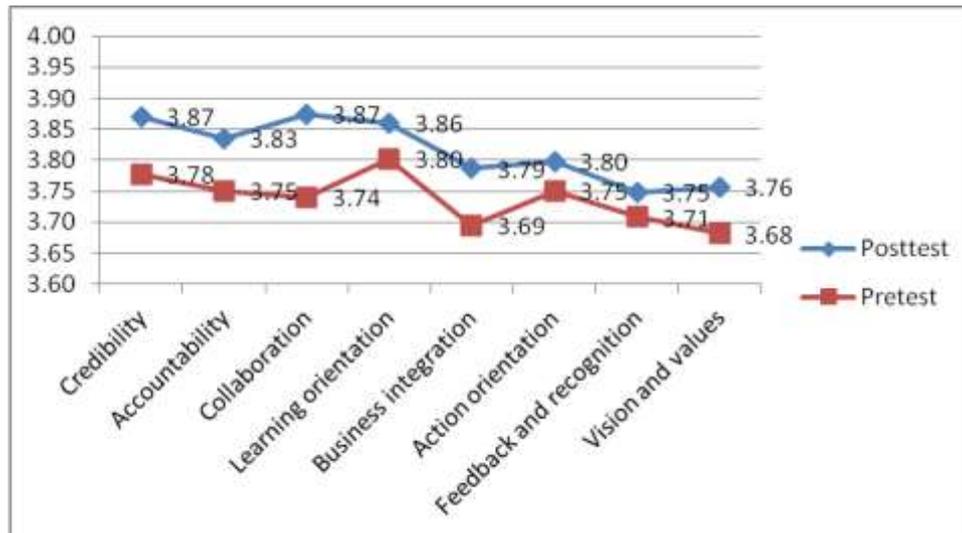


Figure 7.19 Pre-test Post-test means comparisons for age: 31-40 years

7.8.5.4. T-test analysis for age group: 31-40 years

The independent samples t-test was performed to determine any significant differences between the pre-test and post-test results. No significant differences were revealed for this age group as evident from Table 7.25 on page 235.

7.8.5.5. Mean scores comparisons for age group: 41-50 years

Overall, the 41 to 50 years group recorded higher ratings on the post-test than the pre-test, specifically on accountability, collaboration, action orientation and feedback and recognition. However, they gave slightly lower scores on the post-test for vision and values as per Figure 7.20 on page 235.

Except for vision and values, all dimensions were rated positively (means above 3.77). This category did not consist of exactly the same group as the pre-test because of natural aging that placed some participants in the next age category at the time of the post-test.

TABLE 7.25

Pre-Test Post-Test Comparisons of 31-40 Years

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Dimension_1 Credibility	Equal variances assumed	5.231	.023	-1.035	239	.302	-.09378	.09061	-.27228	.08472
	Equal variances not assumed			-1.050	238.955	.295	-.09378	.08835	-.26879	.08224
Dimension_2 Accountability	Equal variances assumed	1.963	.162	-.898	239	.370	-.08421	.09381	-.26902	.10060
	Equal variances not assumed			-.907	238.344	.365	-.08421	.09281	-.26705	.09663
Dimension_3 Collaboration	Equal variances assumed	6.733	.010	-1.536	239	.126	-.13408	.08731	-.30607	.03790
	Equal variances not assumed			-1.555	238.757	.121	-.13408	.08622	-.30394	.03577
Dimension_4 Learning orientation	Equal variances assumed	9.188	.003	-.650	239	.516	-.05847	.08994	-.23565	.11871
	Equal variances not assumed			-.664	237.836	.507	-.05847	.08806	-.23195	.11501
Dimension_5 Business integration	Equal variances assumed	.348	.556	-.995	239	.321	-.09171	.09221	-.27336	.08995
	Equal variances not assumed			-1.000	236.259	.318	-.09171	.09167	-.27230	.08888
Dimension_6 Action orientation	Equal variances assumed	4.261	.040	-.538	239	.591	-.04704	.08747	-.21934	.12527
	Equal variances not assumed			-.544	238.407	.587	-.04704	.08652	-.21747	.12340
Dimension_7 Feedback & Recognition	Equal variances assumed	5.422	.021	-.413	239	.680	-.03971	.09614	-.22910	.14968
	Equal variances not assumed			-.420	238.787	.675	-.03971	.09445	-.22577	.14635
Dimension_8 Vision & Values	Equal variances assumed	1.399	.238	-.784	239	.434	-.07552	.09627	-.26516	.11412
	Equal variances not assumed			-.787	234.533	.432	-.07552	.09595	-.26456	.11352

a. age = 31-40 years

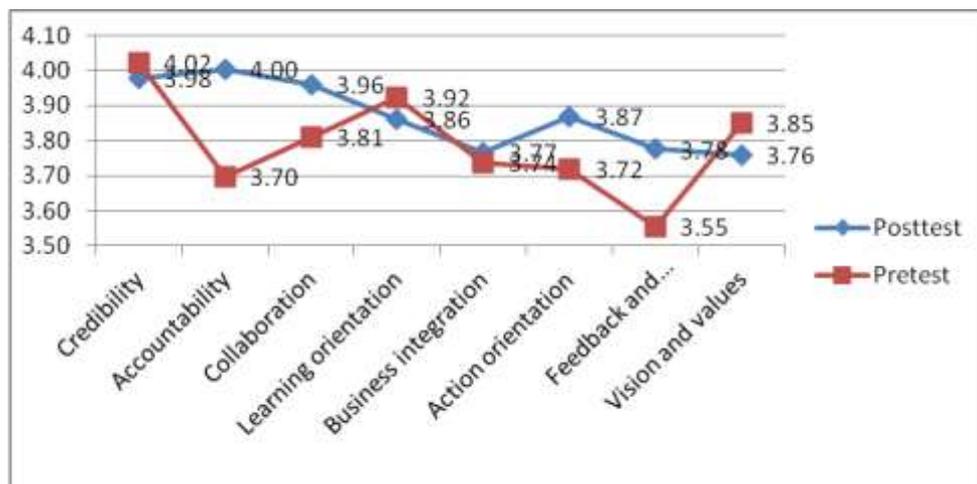


Figure 7.20 Pre-test Post-test means comparisons for age: 41-50 years

7.8.5.6. T-test analysis for age 41-50 years

In order to determine if any of the differences noted above were significant, an independent samples t-test was performed. This age group did not consist of exactly the same members as the pre-test group because natural aging placed some participants that were in the previous category during the pre-test in this age category at the time of the post-test.

The results did not indicate any significant differences between pre-test and post-test scores for this age group as set out in Table 7.26 on the next page. This means that this group's ratings of safety leadership remained more or less the same between the two assessments.

7.8.5.7. Mean scores comparisons for age group: 51-60 years

The 51 to 60 years category gave markedly higher ratings for all dimensions on the post-test as illustrated in Figure 7.21 on page 237. Except for collaboration (3.75), all of the dimensions were rated positively with means above 3.77.

TABLE 7.26

Pre-Test Post-Test Comparisons of 41-50 Years

		Independent Samples Test ^a									
		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
Dimension_1 Credibility	Equal variances assumed	.620	.367	.258	94	.797	.04362	.16924	-.29242	.37966	
	Equal variances not assumed			.263	81.787	.793	.04362	.16573	-.28609	.37333	
Dimension_2 Accountability	Equal variances assumed	.498	.482	-1.731	94	.087	-.30463	.17596	-.65401	.04475	
	Equal variances not assumed			-1.798	85.691	.076	-.30463	.16944	-.64149	.03223	
Dimension_3 Collaboration	Equal variances assumed	.250	.618	-.901	94	.370	-.14851	.16481	-.47574	.17872	
	Equal variances not assumed			-.880	70.704	.382	-.14851	.16877	-.48505	.18802	
Dimension_4 Learning orientation	Equal variances assumed	.063	.818	.361	94	.704	.06331	.16615	-.26659	.39320	
	Equal variances not assumed			.364	78.640	.702	.06331	.16481	-.26475	.39137	
Dimension_5 Business integration	Equal variances assumed	3.449	.066	-.204	94	.839	-.03046	.14943	-.32715	.26622	
	Equal variances not assumed			-.214	88.031	.831	-.03046	.14230	-.31325	.25232	
Dimension_6 Action orientation	Equal variances assumed	.265	.608	-.862	94	.391	-.14888	.17272	-.49181	.19406	
	Equal variances not assumed			-.891	84.601	.376	-.14888	.16713	-.48119	.18344	
Dimension_7 Feedback & recognition	Equal variances assumed	1.186	.279	-1.303	94	.196	-.22137	.16994	-.55878	.11604	
	Equal variances not assumed			-1.247	65.931	.217	-.22137	.17753	-.57582	.13308	
Dimension_8 Vision & Values	Equal variances assumed	.035	.852	.577	94	.565	.08288	.16085	-.22649	.41225	
	Equal variances not assumed			.571	73.863	.570	.08288	.16262	-.23117	.41682	

a. age = 41-50 years

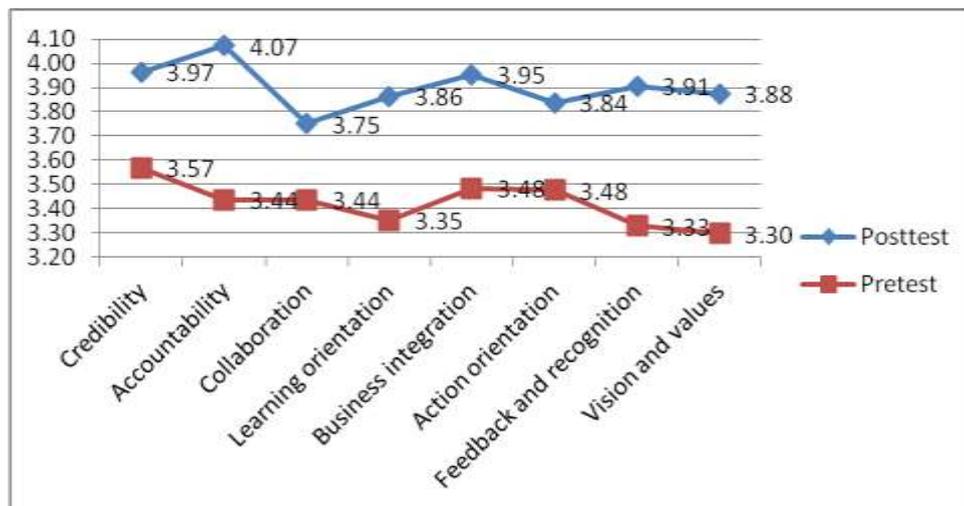


Figure 7.21 Pre-test Post-test means comparisons for age: 51-60 years

7.8.5.8. T-test analysis for age group: 51-60 years

The independent samples t-test was conducted to determine any significant differences between pre-test and post-test data for this age group. The post-test ratings were observed to be notably higher than the pre-test ratings and significant differences were revealed by the t-test as per Table 7.27 below.

TABLE 7.27
Pre-Test Post-Test Comparisons of 51-60 Years

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Dimension_1 Credibility	Equal variances assumed	.002	.967	-1.990	30	.056	-.39583	.19892	-.80207	.01041
	Equal variances not assumed			-1.990	29.909	.056	-.39583	.19892	-.80212	.01046
Dimension_2 Accountability	Equal variances assumed	.106	.747	-3.723	30	.001*	-.63542	.17068	-.98398	-.28685
	Equal variances not assumed			-3.723	29.517	.001	-.63542	.17068	-.98422	-.28661
Dimension_3 Collaboration	Equal variances assumed	.493	.485	-1.443	30	.159	-.31250	.21668	-.75481	.12981
	Equal variances not assumed			-1.443	29.793	.159	-.31250	.21668	-.75494	.12984
Dimension_4 Learning orientation	Equal variances assumed	.180	.674	-2.847	30	.008*	-.51250	.18002	-.88014	-.14486
	Equal variances not assumed			-2.847	29.944	.008	-.51250	.18002	-.88017	-.14483
Dimension_5 Business integration	Equal variances assumed	.000	.967	-2.478	30	.019*	-.46875	.18914	-.85503	-.08247
	Equal variances not assumed			-2.478	29.911	.019	-.46875	.18914	-.85508	-.08242
Dimension_6 Action orientation	Equal variances assumed	.632	.433	-2.025	30	.050*	-.36250	.17897	-.72801	.00301
	Equal variances not assumed			-2.025	29.157	.050	-.36250	.17897	-.72846	.00346
Dimension_7 Feedback & Recognition	Equal variances assumed	.076	.785	-2.489	30	.019*	-.57813	.23228	-1.05251	-.10374
	Equal variances not assumed			-2.489	29.288	.019	-.57813	.23228	-1.05299	-.10326
Dimension_8 Vision & Values	Equal variances assumed	1.507	.229	-2.883	30	.007*	-.57813	.20064	-.98769	-.16866
	Equal variances not assumed			-2.883	28.250	.007	-.57813	.20064	-.98876	-.16749

* p ≤ .05

Ratings of this age group were significantly higher on the 0.05 level for six of the eight dimension namely accountability, learning orientation, business integration, action orientation, feedback & recognition and vision and values.

This means that respondents in this category rated these six dimensions significantly higher on the post-test than on the pre-test assessment.

7.8.6. Site

Participants were from two different sites and statistical analysis was performed to compare the pre-test and post-test results respectively. The results of the analysis are discussed in the following sections.

7.8.6.1. Mean scores comparisons: Site 1

The mean scores of Site 1 were lower on the post-test for credibility, learning orientation, business integration, action orientation and vision and values as per Figure 7.22.

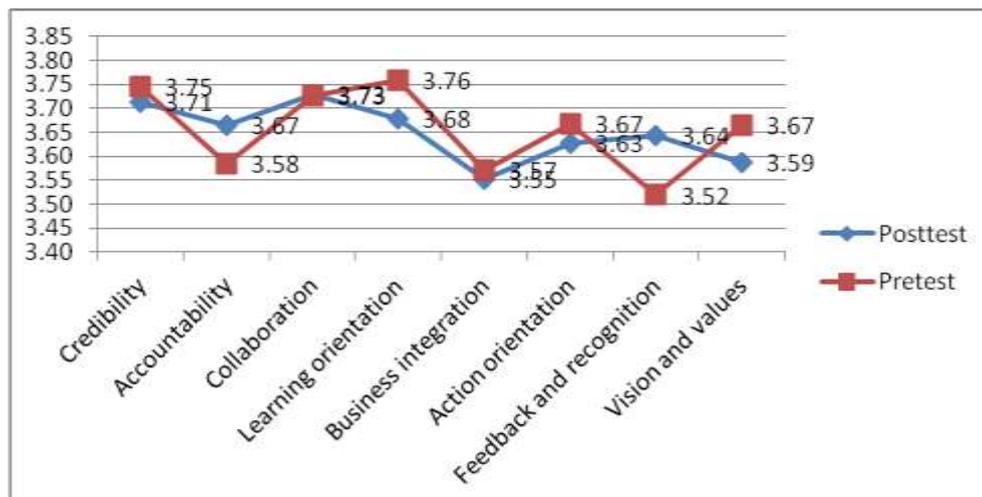


Figure 7.22 Pre-test Post-test means comparisons: Site 1

Post-test scores were higher than the pre-test for accountability and feedback and recognition. However, Site 1 remained negative about safety leadership with post-test means below 3.77 on all dimensions.

7.8.6.2. T-test analysis: Site 1

The T-test analysis was performed in order to determine if there were any significant differences between the pre-test and post-test scores of Site 1. According to the results no significant differences were detected as reflected in Table 7.28.

TABLE 7.28
Pre-Test Post-Test Comparisons of Site 1

		Independent Samples Test ^a								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Dimension_1 Credibility	Equal variances assumed	3.324	.070	.293	210	.770	.03145	.10721	-.17990	.24279
	Equal variances not assumed			.293	208.039	.770	.03145	.10721	-.17991	.24280
Dimension_2 Accountability	Equal variances assumed	.468	.495	-.750	210	.454	-.09019	.10688	-.29089	.13052
	Equal variances not assumed			-.750	209.633	.454	-.09019	.10688	-.29089	.13052
Dimension_3 Collaboration	Equal variances assumed	3.155	.077	-.039	210	.969	-.00377	.09578	-.19259	.18504
	Equal variances not assumed			-.039	205.892	.969	-.00377	.09578	-.19261	.18507
Dimension_4 Learning orientation	Equal variances assumed	6.166	.014	.756	210	.451	.07925	.10488	-.12751	.28600
	Equal variances not assumed			.756	203.885	.451	.07925	.10488	-.12755	.28604
Dimension_5 Business integration	Equal variances assumed	4.972	.027	.206	210	.837	.01887	.09150	-.16151	.19924
	Equal variances not assumed			.206	203.612	.837	.01887	.09150	-.16154	.19928
Dimension_6 Action orientation	Equal variances assumed	5.579	.019	.400	210	.689	.03962	.09803	-.15559	.23484
	Equal variances not assumed			.400	206.507	.689	.03962	.09803	-.15561	.23486
Dimension_7 Feedback & Recognition	Equal variances assumed	6.918	.009	-1.246	210	.214	-.12500	.10029	-.32271	.07271
	Equal variances not assumed			-1.246	194.849	.214	-.12500	.10029	-.32280	.07280
Dimension_8 Vision & Values	Equal variances assumed	26.701	.000	.810	210	.419	.07783	.09608	-.11157	.26723
	Equal variances not assumed			.810	185.625	.419	.07783	.09608	-.11172	.26738

a. site = Site 1

7.8.6.3. Mean scores comparisons: Site 2

The pre-test and post-test mean scores of Site 2 were compared as shown in Figure 7.23. Site 2 recorded higher scores on the post-test than on the pre-test for all dimensions. All dimensions were rated positively with means above 3.77.

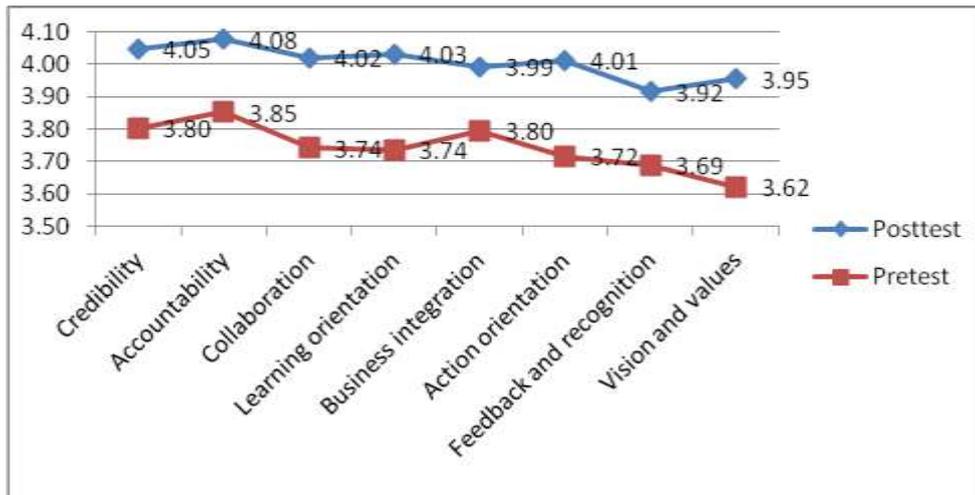


Figure 7.23 Pre-test Post-test means comparisons: Site 2

7.8.6.4. T-test analysis: Site 2

The T-test analysis revealed significant differences on the 0.05 level in the pre-test and post-test scores of respondents from Site 2. Significant differences were indicated for the dimensions of credibility, accountability, collaboration, learning orientation, action orientation, feedback and recognition, and vision and values as reflected in Table 7.29 on page 242.

Respondents from Site 2 rated seven of the eight safety leadership dimensions significantly higher on the post-test than on the pre-test. Business integration was the only dimension that was not rated significantly higher by this group.

TABLE 7.29

Pre-Test Post-Test Comparisons of Site 2

Independent Samples Test ^a										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimension_1 Credibility	Equal variances assumed	3.783	.053	-2.635	216	.009*	-.24465	.09283	-.42762	-.06168
	Equal variances not assumed			-2.635	212.004	.009	-.24465	.09283	-.42764	-.06166
Dimension_2 Accountability	Equal variances assumed	.257	.613	-2.517	216	.013*	-.22477	.08930	-.40079	-.04875
	Equal variances not assumed			-2.517	215.979	.013	-.22477	.08930	-.40079	-.04875
Dimension_3 Collaboration	Equal variances assumed	8.825	.003	-2.879	216	.004	-.27706	.09624	-.46675	-.08738
	Equal variances not assumed			-2.879	212.466	.004*	-.27706	.09624	-.46677	-.08736
Dimension_4 Learning orientation	Equal variances assumed	12.163	.001	-2.886	216	.004	-.29541	.10237	-.49718	-.09364
	Equal variances not assumed			-2.886	190.379	.004*	-.29541	.10237	-.49734	-.09349
Dimension_5 Business integration	Equal variances assumed	.366	.546	-1.957	216	.052	-.19725	.10079	-.39580	.00140
	Equal variances not assumed			-1.957	215.867	.052	-.19725	.10079	-.39580	.00140
Dimension_6 Action orientation	Equal variances assumed	3.046	.082	-2.889	216	.004*	-.29725	.10255	-.49938	-.09512
	Equal variances not assumed			-2.889	211.131	.004	-.29725	.10255	-.49941	-.09509
Dimension_7 Feedback & Recognition	Equal variances assumed	5.591	.019	-2.069	216	.040	-.22706	.10975	-.44338	-.01074
	Equal variances not assumed			-2.069	205.224	.040*	-.22706	.10975	-.44345	-.01068
Dimension_8 Vision & Values	Equal variances assumed	1.230	.269	-3.034	216	.003*	-.33257	.10963	-.54864	-.11650
	Equal variances not assumed			-3.034	213.851	.003	-.33257	.10963	-.54865	-.11648

a. site = Site 2

* p ≤ .05

7.9. DISCUSSION OF RESULTS

The following research hypothesis was presented in terms of the quantitative study:

Hypothesis 1: A coaching program will positively impact on the safety leadership of the organisation.

If the results were to support the hypothesis it would be evident in higher post-test than pre-test ratings. In terms of the overall safety leadership profile, the post-test results revealed higher overall ratings than the pre-test on all dimensions. Three out of the eight dimensions indicated a significant increase overall. The dimensions that received the highest ratings in the pre-test still remained high and collaboration was rated significantly higher on the post assessment. The significant increase in ratings for collaboration is consistent with studies that showed improvement because of coaching particularly in interpersonal and communication skills that link to collaborative or participative management skills (Crethar et al., 2011; De Haan & Niess, 2011; Weller & Weller, 2004).

One of the dimensions that were rated the lowest on the pre-test assessment, namely feedback and recognition, increased significantly on the post-test thus further confirming the hypothesis that the coaching program would have a positive impact on the organisation's safety leadership. Other studies have also found that executive coaching has a positive impact on leadership behaviour as indicated by increases in post assessment 360 degree ratings (Bowles, Cunningham, De la Rosa & Picano, 2007; Crethar, Phillips & Brown, 2011; Tach, 2002; Weller & Weller, 2004).

The results are now further discussed according to the various demographic groups.

Gender

The results indicated that both males and females gave higher post-test than pre-test ratings on all dimensions and significant differences were noted on certain dimensions. In addition, females' post-test ratings were overall higher than males'. However, there were differences in the dimensions that were rated significantly higher by the two genders respectively. Feedback and recognition was the only dimension rated significantly more positive by males on the post-test while females rated three dimensions significantly higher on the post assessment namely accountability, collaboration, and vision and values.

In the literature, only a few studies could be identified where 360 degree surveys were utilised to evaluate the impact of executive coaching on leadership behaviour. Most of these studies did not investigate or report on gender differences (Bowles et al., 2007; Crethar et al., 2011; Tach, 2002; Weller & Weller, 2004). In essence, these studies assumed that gender makes no difference. One study found that 360 degree ratings varied according to gender with a strong relationship between more favourable ratings and the female gender (Manning & Robertson, 2010). According to Manning & Robertson (2010) this trend could be attributed to gender stereotypes. However, they also purport that the differences may not be because of gender but rather because of differences in the jobs that males and females perform. Thus, gender differences in 360 degree assessments may be because males predominate senior and management positions overall as is also the case in this study.

Race

None of the limited number of studies where 360 degree surveys was conducted in order to evaluate the impact of executive coaching reported on race differences (Bowles et al., 2007; Crethar et al., 2011; Tach, 2002; Weller & Weller, 2004). This means that these studies did not examine the effects of race on 360 degree ratings.

In this study both race groups presented higher post-test than pre-test ratings and the post-test scores of Africans were generally higher than Whites on all dimensions. No significant differences were indicated for Whites.

Africans reported a significant difference on post-test ratings for accountability, collaboration, action orientation, and feedback and recognition. This could possibly be because coaching is likely to influence the subordinates of those who were coached (Bowles et al., 2007; De Haan & Niess, 2011) and in this study most Africans completed the questionnaires in their capacity as subordinates of the managers that participated in the coaching program. In addition, the significant increase in ratings for collaboration is consistent with studies that showed improvement because of coaching, particularly in interpersonal and communication skills that link to collaborative or

participative management skills (Crethar et al., 2011; De Haan & Niess, 2011; Weller & Weller, 2004).

Job level

Senior Management gave the lowest ratings of all the job levels. There was a slight increase in the post-test ratings for feedback and recognition while lower post-test than pre-test scores for business integration and action orientation was recorded. None of the increases or decreases between pre-test and post-test scores was found to be significant.

Previous research has shown that seniority has an impact on 360 degree ratings with more negative ratings associated with the senior management level (Manning & Robertson, 2010). Studies also purport that although coaching is not completely without benefit it is often less beneficial for executive managers as opposed to middle managers (Bowles et al. 2007; Manning & Robertson, 2010). In this study, only one participant in the coaching intervention was from senior management level and that could explain why there were no significant changes in pre-test and post-test ratings.

Management showed the most increase between pre-test and post-test ratings. Post-test ratings were between 9% and 17% higher on all dimensions. Seven out of the eight dimensions were rated significantly higher on the post assessment by this level. Despite a higher post-test means, the dimension of action orientation was the only dimension that did not reflect a significant difference between post-test and pre-test ratings of management.

All of the managers that participated in the survey completed the executive coaching program and that could explain the significantly higher ratings on the post assessment. This result is also consistent with other studies that have recorded increases of between 3% and 50% in manager's ratings after they participated in a coaching intervention (Crethar et al., 2011; Tach, 2002; Weller & Weller, 2004). The results of this study also support the notion that coaching has the strongest effect on middle

managers, as opposed to senior management, possibly because they are more involved in day to day interactions and have a higher need to influence others (Bowles et al., 2007; Manning & Robertson, 2010).

The results indicated a significant difference between the *Supervisor / Foreman* level's pre-test and post-test scores on one dimension only namely action orientation. Nonetheless, this level still recorded higher post-test than pre-test scores on all dimensions. It is interesting that there was only one instance of significant differences because research has shown that coaching is most likely to influence the direct reports of those that were coached (Bowles et al., 2007; De Haan & Niess, 2011).

Overall, *employees* gave higher post-test than pre-test ratings for all dimensions although no instances of significant differences were identified. Studies have shown that behavioural changes after coaching are observable to others and that coaching is likely to influence the individuals under the direction of those being coached (Bowles et al., 2007; De Haan & Niess, 2011; Weller & Weller, 2004). However, in this study there were two other levels (supervisor and foreman) between the employees and management and it could explain the lesser impact on this level.

Health and Safety representatives recorded higher overall post-test than pre-test scores on all dimensions. However, no significant increases in ratings were identified.

Age

None of the limited number of studies where 360 degree surveys was conducted in order to evaluate the impact of executive coaching reported on differences according to the age of participants (Bowles et al., 2007; Crethar et al., 2011; Tach, 2002; Weller & Weller, 2004). In this study, the 21 to 30 years group recorded significant pre-test and post-test differences for feedback and recognition. The 31 to 40 years and 41 to 50 years categories did not report any significantly different results between the pre and post assessments. The 51 to 60 years group reported significant differences between pre-test and post-test results on six of the eight dimensions namely

accountability, learning orientation, business integration, action orientation, feedback and recognition, and vision and values.

It should be noted that 31 to 40 years group lost 10% of its members to the 41 to 50 years category because of natural aging between the pre-test and post-test. It is unknown what effect, if any, this had on the ratings.

Site

In general, Site 2 recorded higher ratings than Site 1 in both the pre and post assessment. Respondents from Site 1 gave very similar ratings on the pre and post assessments and no significantly different results were identified. On the other hand, respondents of Site 2 gave higher post-test ratings on all dimensions with significantly more positive post-test scores for seven of the eight dimensions namely credibility, accountability, collaboration, learning orientation, action orientation, feedback and recognition, and vision and values.

The studies reviewed where 360 degree surveys were implemented to evaluate the impact of executive coaching did not report on differences according to the geographic locations of participants although it included participants from different locations and departments (Bowles et al., 2007; Crethar et al., 2011; Tach, 2002; Weller & Weller, 2004). However, literature on organisational culture purports that geographical separation or departmental designations for example different managers can result in safety subcultures or 'site-level cultures' (Krause, 2004). In this study, the two sites were geologically separated and under the command of different managers with Senior Management residing at Site 1. Thus, these results indicated the possibility that safety subcultures have developed.

In summary, the safety leadership dimensions that improved the most (based on the number of times significant increases in post-test ratings were recorded) after the coaching program were feedback and recognition and accountability. These dimensions were closely followed by action orientation, vision and values, and learning

orientation. The dimensions that improved the least were credibility and business integration.

In conclusion, the results of this study support the hypothesis that a coaching program would have a positive impact on the organisation's safety leadership. The results contribute to the existing body of research that has found the following:

- Coaching is likely to influence the individuals under the direction of those being coached.
- Performance or behavioural changes after coaching are observable to others;
- The impact of coaching is the strongest for middle managers (as opposed to senior management) that have been coached;
- Coaching has the greatest impact on interpersonal and communication aspects that link to collaborative or participative behaviours.

This study is unique in that it investigated executive coaching as a leadership development tool specifically in the area of safety leadership. In essence, it confirms that an executive coaching program is an effective leadership development tool to improve safety leadership. What stands out from this study is that the dimension of accountability was the second most improved behaviour after the coaching intervention. This implies that the coaching program contributed to increasing participants' awareness of their responsibility for safety and the consequences of not complying with safety rules and procedures.

In addition, it is the only study where the impact of coaching on 360 degree ratings according to different participant characteristics such as race, age, and location were investigated and reported on. The results of this study showed that there is a difference in 360 degree ratings of safety leadership according to these participant characteristics, although the reasons therefore cannot be established for certain without further research.

7.10. CHAPTER SUMMARY

In this chapter the results of the quantitative study was reported and interpreted. The demographic distribution of the sample was described and graphically presented. Aspects with regard to establishing the validity and reliability of the study were discussed. The pre-test results were reported and then comparisons were made between the pre-test and post-test data according to the different independent variables. The impact of the coaching intervention on the organisation's safety leadership was discussed and the results were integrated with the literature.

In the next chapter the findings of the second phase of the empirical research, namely the qualitative study, will be presented and discussed.

CHAPTER 8

REPORTING AND INTERPRETATION OF QUALITATIVE FINDINGS

Chapter 8 contains the findings of the third phase of the research namely the qualitative study. The sample is described and the strategies followed to improve the quality of the research are discussed. The findings of the study are presented according to the themes and sub-themes that were identified. The findings are discussed and integrated with the literature as well as the results of the quantitative study. Lastly, the coaching program is evaluated according to a theoretical model.

8.1. INTRODUCTION

The general aim of this research was to develop and evaluate the impact of a coaching program on safety leadership. The specific aims for the qualitative study were:

Research aim 4: To determine the impact of the safety coaching program on managers' attitudes with regard to safety.

Research aim 5: To determine the managers' personal experiences of the coaching process.

Research aim 6: To formulate recommendations for the organisation to improve safety leadership.

Research aim 7: To formulate recommendations in terms of the utilisation of a coaching program as a tool to improve safety leadership.

The qualitative part of the study was conducted shortly after the coaching intervention was completed. A case study method was utilised. Multiple (n=4) cases consisting of the managers that completed the coaching intervention, were analysed to explore and describe the impact that coaching had on the manager's attitudes with regards to safety, as well as their overall experiences of the coaching program. Recommendations for the organisation to improve safety leadership and the utilisation

of a coaching program as a tool to improve safety leadership will be formulated based on the results and will be discussed in chapter 9.

Information for the qualitative study was collected by means of a semi-structured interview. Conducting semi-structured interviews is one of the most popular methods of collecting qualitative data (King, 2004; Terre Blanche and Kelly, 1999). There are several advantages for utilising semi-structured interviews to collect data for qualitative research (King, 2004). It allows the researcher to establish a relationship in order to create the trust needed to elicit information on sensitive issues. It can address focused questions about specific aspects of organisational life or examine broader issues such as organisational culture. It provides an opportunity for participants to clarify the meaning of questions and for the researcher to follow up and clarify participants' responses. Most participants feel comfortable with interviews partly because of familiarity in general with interviews as well as because most people enjoy talking about their work whether to share their accomplishments or air their complaints.

The researcher created an interview guide (King, 2004; Ryan & Bernard, 2005; Terre Blanche & Kelly, 1999). The questions were selected to elicit responses in answer to the research questions (Question 1, 2, 3, 4 and 6), to achieve the overall aim of the research (Question 5 and 7), as well as about a theory related aspect of safety leadership (Question 8). The participants were asked to respond to the following eight open-ended questions:

- 1) How do you feel about safety at the moment?
- 2) Do you feel differently about safety now than you did before?
If yes, please elaborate on how and why you feel differently.
- 3) In terms of the elements of safety leadership or in general, what would you say is the biggest challenge of safety leadership?
- 4) On which aspects of safety leadership do you feel you have improved the most?
- 5) Do you think that you have achieved the goals of the coaching program?
- 6) What was your experience of the coaching process?

- 7) Do you have any inputs on how the coaching program, the material, the content or structure of sessions, or process can be improved?
- 8) What is your vision for safety?

In order to address the main challenges of the interview process identified in Chapter 6, namely time demands, concentration and interview skills, venturing off the topic and managing bias and subjectivity, the researcher implemented the following measures:

- The researcher ensured that sufficient time was allocated to the interview by making appointments with participants well in advance (King, 2004; Terre Blanche and Kelly, 1999).
- The researcher prepared well for the interviews by reviewing information on interviewing skills and running through the interview format and questions several times beforehand (Terre Blanche and Kelly, 1999).
- Only one interview was scheduled on a day to ensure that the researcher could concentrate fully on each interview (King, 2004). The interview guide was utilised as a guideline to ensure that all topics were covered (Terre Blanche and Kelly, 1999).
- The researcher attempted to curb bias and subjectivity by making a conscious decision beforehand to respect and accept participants' responses as the way they perceived it (Swanson & Holton, 2005; Terre Blanche & Durrheim, 1999). The researcher also reflected on how her presuppositions influenced the interview process and the information generated (Ruona, 2005). In this instance, the researcher considered it beneficial being an insider because it meant that sometimes when participants said something she immediately knew what they were talking about, and what they were referring to. However, this sometimes prevented the researcher to explore further or ask for elaboration on certain issues. In other words, the researcher did not ask follow up questions on aspects that another researcher who didn't know the company and people would have asked about. At the time the researcher was satisfied that sufficient information to answer the research questions and achieve the overall aims of the research was elicited and selected not to conduct follow up interviews.

Thus, in analysing the data extra care was taken to just reflect what actually was said and not what the researcher already knew. .

The interviews were conducted face-to-face in the participants' offices and lasted on average between 20 and 25 minutes. The researcher started the interview and explained that the purpose was to gather information about their development during and experiences of the coaching program. The interviews were recorded with a laptop. Participants' consent to be recorded and that the information could be utilised in the research were obtained at the start of the interview. At the end of the interview participants were asked if they had any other inputs to share and thanked for their participation.

8.2. DESCRIPTION OF THE PARTICIPANTS

The participants in the qualitative study was a purposive sample consisting of the managers (n=4) who completed the coaching program (Terre Blanche & Durrheim, 1999). The participants were all white males. One of the participants was a senior manager while the other three participants were on the management level. One participant was in the 31 to 40 age group, one in the 41 to 50 age group and two were in the 51 to 60 years category. The sample was distributed evenly between the two sites of the company and included two managers from each site. All participants reported at least ten years of experience in the business and in a managerial capacity. Participants were not familiar with the elements that constitute effective safety leadership and none of the participants have participated in an executive coaching program before.

8.3. STRATEGIES TO ENHANCE THE QUALITY OF THE RESEARCH

The trustworthiness of qualitative data is often questioned because the concepts of validity and reliability cannot be addressed in the same manner as with quantitative data (Shenton, 2004; Trochim, 2006). Nevertheless, authors have identified several measures that qualitative researchers can incorporate to address these issues

(Shenton, 2004). The alternative criteria developed for evaluating qualitative research results include credibility, transferability, dependability, and confirmability as discussed in more detail in Chapter 6. The specific strategies employed in this study to address these issues are presented in the next sections.

8.3.1. Credibility

In order to establish credibility the researcher must promote confidence that the results have been recorded and interpreted accurately. The purpose of qualitative research is to describe or understand phenomena from the participant's point of view and therefore the participants are really the only ones who can evaluate the credibility of the results.

In this study, the researcher incorporated participant or member checks into the process. Firstly, the researcher made a conscious decision even before starting the data analysis process, while preparing to conduct the interviews, to attempt to remain as objective as possible and to look at what the information is really saying as opposed to what the researcher wanted it to say (Ryan & Bernard, 2003). Secondly, clarifying questions and summarising statements were employed during the interview to check that the researcher understood participants' responses correctly (Kelly, 1999a; King, 2004). Thirdly, participants were given feedback once the data was analysed to confirm whether it accurately reflected the meaning they intended to convey (Shenton, 2004; Trochim, 2006). Participants confirmed that the results were recorded and interpreted accurately.

8.3.2. Transferability

The findings of qualitative research are generally specific to a small number of individuals in a particular environment, as was also the case in this study. Therefore, it is often difficult to demonstrate that the findings are transferable to other situations. In this study, transferability was enhanced by providing a detailed description of the research context, methods and participants in order to enable other researchers to

judge if the findings are applicable to their own specific research setting (Beck et al., 2009; Trochim, 2006).

8.3.3. Dependability

Dependability basically refers to the reliability or repeatability of the findings. In other words, the findings and conclusions reached would be consistent when the study is replicated in the same context and with the same methods. In this study dependability was addressed by providing the details of the context and the research methods utilised as well as including commentary on the analysis process in the form of a reflective statement, refer to point 8.4 (Beck et al., 2009; Shenton, 2004; Trochim, 2006).

8.3.4. Confirmability

Confirmability relates to the question of objectivity. The researcher must make every effort to ensure that the findings are the result of the participants' experiences and ideas and not that of the researcher (Shenton, 2004). In this study, the process of checking and re-checking the data was documented as described in chapter 6. Contradicting responses or responses that did not correspond with other responses were highlighted during the reporting of the findings. In addition, the data was checked and evaluated by a colleague in order to establish if the same conclusions would have been reached by another researcher (Trochim, 2006).

8.3.5. The role of the researcher

In qualitative studies the researcher is the instrument and the "positionality" of the researcher can have an impact on the research (Shenton, 2004; Trochim, 2006; Walt, Shiffman, Schneider, Murray, Brugha & Gilson, 2008). *Positionality* refers to how researchers are viewed, situated, their institutional base and perceived legitimacy (Walt et al., 2008). It includes aspects such as the researcher's race, gender, class,

profession, and whether they are insiders or outsiders (Kelly, 1999b; Walt, et al. 2008). In interpretive research it is the researcher that is primarily responsible for the collection as well as analysis of the data and thus it is important to be aware of their *positionality* and how it affects participants' agenda and the generation of knowledge (Kelly, 1999b; Walt et al., 2008).

In this study the researcher is a middle-class, white, female, in the 41 to 50 years age group, and in the organisational position of Safety, Health and Environmental Advisor. The age and gender differences between the researcher and the participants did not seem to have any observable affect in this study. Further, because of the researcher's organisational position she was regarded as knowledgeable on the subject of safety leadership. The researcher has no line authority i.e. input in salaries, performance reviews or promotion of the participants and they trusted her and felt comfortable to share their experiences. In addition, as an insider the researcher was also familiar with organisational structures, processes, procedures and challenges and also in a position to observe participants in the workplace.

In this study, the researcher fulfilled various roles (Shenton, 2004; Trochim, 2006; Walt, et al., 2008): The researcher developed the coaching program, was the coach and also conducted the semi-structured interviews in order to evaluate the coaching program. Initially, this was merely a practical arrangement in order to complete the research and the researcher was confident that she would be able to fulfil these roles. In retrospect, the researcher realised that it was quite ambitious to attempt to do everything particularly in terms of the time pressures it created.

On the one hand, being involved in the coaching as well as the qualitative data collection seemed to have some effect on the participants' ability to give honest and objective feedback about the coaching program. For example one of the managers said that it was difficult to give feedback about the program because "now I must criticise you". On the other hand, this unique position of the researcher enabled her to verify the information given during the interview with what was observed during the coaching process as well as in the workplace (Kelly, 1999b; Walt, et al. 2008). In the

end all the participants gave suggestions for improvement and the fact that they gave examples to explain their statements during the interviews convinced the researcher that responses were honest and not just given to please the researcher or to avoid conflict.

8.4. REFLECTIVE STATEMENT ON THE DATA ANALYSIS PROCESS

The data was analysed by means of thematic content analysis. The six phases of thematic analysis proposed by Braun and Clarke (2006) was followed in the data analysis process.

Phase 1: Familiarisation with the data

The researcher first transcribed the recordings *verbatim* into a written format and additional interview notes were added where applicable (Braun & Clarke, 2006). This written account included all verbal utterances and references where applicable to non-verbal aspects such as laughs or smiles. Thereafter, the researcher typed up the written transcriptions onto a computerised word processing program namely Microsoft Word. The line numbers feature of the word processing program was activated to allow for tracking of the data during the later stages of the analysis (Ruona, 2005). Finally, the accuracy of the transcriptions was checked by reading through the text while listening to the recordings and corrections and additions were made where necessary (Braun & Clarke, 2006; Terre Blanche & Kelly, 1999a).

After the interviews were transcribed and the interview notes were processed, the researcher already had a preliminary understanding of the data (Braun & Clarke, 2006; Ruona, 2005; Terre Blanche & Durrheim, 1999). The researcher then read all the material (transcribed text) again until a sufficient level of familiarisation was achieved and the researcher had a good understanding of the data (Braun & Clarke, 2006). At this stage the researcher already started noting patterns and writing down ideas and possible coding schemas (Braun & Clarke, 2006).

Phase 2: Generating initial codes

The researcher initially followed a theoretical or deductive approach in identifying patterns and thus started noting how the data related to the theory on safety leadership as well as the research questions (Braun & Clarke, 2006; Ruona, 2005). The theory-driven approach works for data collected by means of structured or semi-structured interviews or focus groups where questions and probes are repeated across cases (Namey et al., 2008; Ryan & Bernard, 2003). The researcher compiled a preliminary coding table or system based on the questions asked during the data collection process and the understanding gained during the familiarisation process (Ryan & Bernard, 2003). This initial coding framework is presented in Table 8.1.

TABLE 8.1

Initial Coding Framework

Main Category	Sub-categories
101 Safety Perceptions	1011 Current perceptions
	1012 Previous perceptions
	1013 Reasons for changes
	1014 Has it changed
201 Challenges in safety leadership	2011 Management tasks
	2012 Behavioural
	2013 Priorities
301 Areas of improvement	3011 Knowledge
	3012 Behavioural
401 Experience of the process	4011 Receiving feedback
	4012 Receiving guidance
	4013 Management Commitment
501 Program goal achievement	5011 Personal awareness
	5012 Skills and knowledge
	5013 Organisational goals
601 Program evaluation	6011 Content and format
	6012 Duration
	6013 Applicability to other levels
701 Vision for safety	No sub categories

The coding system consisted of a main numerical code for each question and a sub-code was created by adding a number to the main code for aspects related to the question that presented in the text (Ruona, 2005). For example the main code for attitudes about safety was 101 and the sub-code for current attitude 1011, previous attitude 1012 and whether attitudes have changed 1013. In the interest of confidentiality, an identification code for each participant was also created.

The original transcripts were saved in separate electronic files and the researcher opened another document for each participant in order to begin organising and coding the data (Ruona, 2005). The researcher created a table with columns for organising the transcribed data (Ruona, 2005) as illustrated in Table 8.2. Demographic information of the participant such as gender, race, job level, age category and site was also recorded in this document.

TABLE 8.2
Format for Organising and Coding Interview Data

Code	Sub Code	ID	Q nr	Line	Interview data	Notes
<i>Example</i>						
101	1011	M1	1	3	Safety is a very serious issue for me because we are dealing with people's lives.	Realises his responsibility

The identification (ID) code of the participant and the number of the question asked in the interview was recorded in the applicable columns. The researcher employed the copy and paste function of the word processing program to transfer the corresponding responses of the participant to the interview data column (Ruona, 2005). The line column provided for the recording of the line number where the data occurred in the original transcript in case the researcher needed to refer back to it.

The researcher started to identify meaningful segments of data i.e. sentences or paragraphs, by separating statements that are different from each other (Ruona, 2005; Ryan & Bernard, 2003). The researcher added rows into the table and moved each segment into a new row with the cut and paste option (Ruona, 2005; Ryan & Bernard, 2003). The participant ID and relevant question number was also copied into each new row and the line number column was updated accordingly. Where relevant, the researcher kept some of the surrounding data to ensure that the context is not lost (Braun & Clarke, 2006). In the last column the additional notes and comments were recorded where applicable. The researcher continued with this process until the data was sufficiently divided into segments.

The researcher worked through the whole document and applied the codes and sub-codes identified to the interview data and recorded it in the first two columns (Braun & Clarke, 2006). The researcher then started to apply an inductive or data-driven approach and new codes were created and added to the initial coding table when segments of information formed a pattern that did not seem to fit into any of the initial coding categories (Braun & Clarke, 2006, Ryan & Bernard, 2003; Ruona, 2005). This process was followed with each interview transcript separately.

Phase 3: Searching for themes

At this point the researcher had a long list of codes identified across individual data sets (Braun & Clarke, 2006). In order to view the data as a whole, all the interviews were merged into one master document (Ruona, 2005). With the sorting function of the word processing program the data was sorted according to the codes (Braun & Clarke, 2006). The researcher started to reflect on how the data contributed to answering the research questions. Data that connected to the quantitative results was also noted. The researcher started to reflect on how the codes may be combined to form themes (Braun & Clarke, 2006). The researcher wrote down the working names of the themes and sub-themes in a framework to determine if they work and flow logically (Braun & Clarke, 2006).

Although the phases of qualitative data analysis usually lists coding and deriving themes as two separate steps, in practice these two actions are intertwined (Braun & Clarke, 2006; Ryan & Bernard, 2003; Ruona, 2005). In other words with the process of generating codes and coding the data, themes are already being identified. To identify themes the researcher applied a combination of different techniques as suggested in the literature (Braun & Clarke, 2006; Namey et al., 2008; Ryan & Bernard, 2003).

Firstly, *transitions* were identified during the initial coding phase, based on the natural shifts in content marked by each of the questions posed in the semi-structured interview (Ryan & Bernard, 2003). Secondly, *repetitions*, that is reoccurring words and phrases, were identified and the initial codes were applied to the data segments accordingly (Ryan & Bernard, 2003). Thirdly, the *cutting and sorting* technique was applied to group together similar responses and responses about the same topics (Ryan & Bernard, 2003; Ruona, 2005). The fourth technique employed was to consider *linguistic connectors* to identify causal such as the reason why attitude towards safety has changed (“because”) and time oriented relationships such as current (“now”) and previous (“before”) attitudes toward safety (Ryan & Bernard, 2003). Finally, *theory related material*, that is, the technique of making the connection between the data, the research questions and the theory on safety leadership was applied (Braun & Clarke, 2006; Ryan & Bernard, 2003).

After identifying the initial themes, *frequencies* were calculated to determine the prevalence of codes across the data set and in relation to each preliminary theme (Ellinger, Watkins and Marsick, 2005; Namey et al., 2008). Frequencies are only an indication of how themes are distributed and to show a “picture” of the data and the final selection of themes depends on the researcher’s interpretation of how to best answer the research questions and aims (Namey et al., 2008). The frequency distributions of codes across the data set and in relation to the themes are presented in Table 8.3 on the next page. The frequency of the number of participants that mentioned a code is also indicated.

TABLE 8.3

Frequency Distributions of Codes

Theme description	Sub-code and description	N of responses	% in data	% in theme	N of participants that mentioned it	% of participants (N=4)
101 Attitude towards safety	1011 current attitude is positive	19	10.7	51.4	4	100
	1012 previous attitude	12	6.8	32.4	4	100
	1013 attitude has changed	6	3.4	16.2	4	100
	Sub-totals	37	21	100		100
102 Reasons for changes	1021 training / increased legal knowledge	6	3.4	31.6	3	75
	1022 experience with previous accidents	2	1.1	10.5	2	50
	1023 awareness of legal consequences	7	4	36.8	4	100
	1024 improved housekeeping	4	2.3	21.1	2	50
	Sub-totals	19	11	100		68.8
201 Challenges	2011 management tasks	10	5.7	25.6	3	75
	2012 change employees mind-set	25	14.1	64.1	3	75
	2013 competing priorities	4	2.3	10.3	2	50
	Sub-totals	39	22.1	100		66.7
301 Impact	3011 increased knowledge	3	1.7	7	2	50
	3012 increased pro-activeness	10	5.7	23.2	4	100
	3013 increased self-awareness	22	12.4	51.2	4	100
	3014 improved interaction	2	1.1	4.6	2	50
	1015 less incidents	6	3.4	14	4	100
	Sub-totals	43	24.3	100		80
401 Manager's experiences	4011 positive experience	8	3.4	44.5	4	100
	4012 want feedback	2	1.1	11.1	2	50
	4013 design of program	4	2.3	22.2	3	75
	4014 recommend to other levels	4	2.3	22.2	4	100
	Sub-totals	18	9.1	100		81.3
501 Goal achievement	5011 achieved goals	5	2.8	100	4	100
	Sub-totals	5	2.8	100		100
601 Suggestions	6011 more sessions	4	2.3	66.7	3	75
	6012 include technical aspects	2	1.1	33.3	2	50
	Sub-totals	6	4.1	100		62.5
701 Vision for safety	7011 has a vision for safety	6	3.4	100	4	100
	Sub-totals	6	3.4	100		100
801 Lead by example	8011 must set an example	2	1.1	50	1	25
	8012 not setting an example	2	1.1	50	2	50
	Sub-totals	4	2.2	100		37.5
Totals		177	100			

Phase 4: Reviewing themes

This phase involves the refinement of the set of candidate themes devised in the previous phases. The researcher reflected on each theme and also how the themes could link together (Braun & Clarke, 2006; Ruona, 2005). Initially the researcher focused only on the aspects where all of the managers responded in more or less the same manner or where they were all in agreement (Namey et al., 2008). However, the researcher realised that if someone said something repeatedly it must be very important to them. It was a small sample and each participant could make a valuable contribution in their own right and thus certain issues were reported although it was only mentioned by two or three of the participants (Ellinger et al., 2005). Nonetheless, throughout the process, an indication was given of whether the researcher was referring to the views of all of the participants or only a certain number of them.

The researcher was satisfied with the composition of some of the themes, namely attitude towards safety, reasons for changes, challenges, and manager's experiences (Braun & Clarke, 2006). Participants' increased self-awareness and subsequent improvement in their interaction with employees seemed to represent a large part of the theme about the impact of the coaching and it was decided to break down this theme into two separate themes namely impact on personal development and impact on professional development (Braun & Clarke, 2006).

It became evident from the frequency distributions (See Table 8.3) that some preliminary themes are not really themes because there was not enough data to support it or the data was too diverse (Braun & Clarke, 2006), for example the statements about leading (or not leading) by example. For similar reasons, it was decided not to present the responses on goal achievement as a theme but to present it as evidence in the final evaluation of the coaching program. In addition, the researcher also decided that the suggestions for improvement does not really constitute a theme and should just be reported as such. The theme about vision for safety was retained as a theme although the responses were small in number because the question was

asked based on its theoretical significance to effective safety leadership (Ellinger, et al., 2005).

Phase 5: Defining and naming themes

Phase 5 begins when the researcher has a satisfactory thematic map of the data (Braun & Clarke, 2006). At this point the researcher further defined and refined the themes that will be presented and analysed the data within them. This means the researcher identified the essence of what each theme is about and what aspect of the data each theme captures (Braun & Clarke, 2006). The themes were organised into a coherent and internally consistent and conceptually congruent account with accompanying narrative (text) as evidence of the theme (Ruona, 2005). Themes were organised to reflect the purpose of the research and provide answers to the research questions (Ruona, 2005). The final thematic map of the data, showing how the final seven themes and related sub-themes identified by the researcher were organised, is reflected in Figure 8.1 on the next page.

For each theme a detailed analysis was conducted and written and the researcher considered how it fitted into the broader overall analysis in relation to the research questions and theory on safety leadership and coaching programs (Braun & Clarke, 2006). The titles or names of the themes were finalised. The names of the themes were concise, consisted of words that respondents actually used (as opposed to technical terms) and indicated a sense of what the theme was about (Braun & Clarke, 2006; Ruona, 2005).

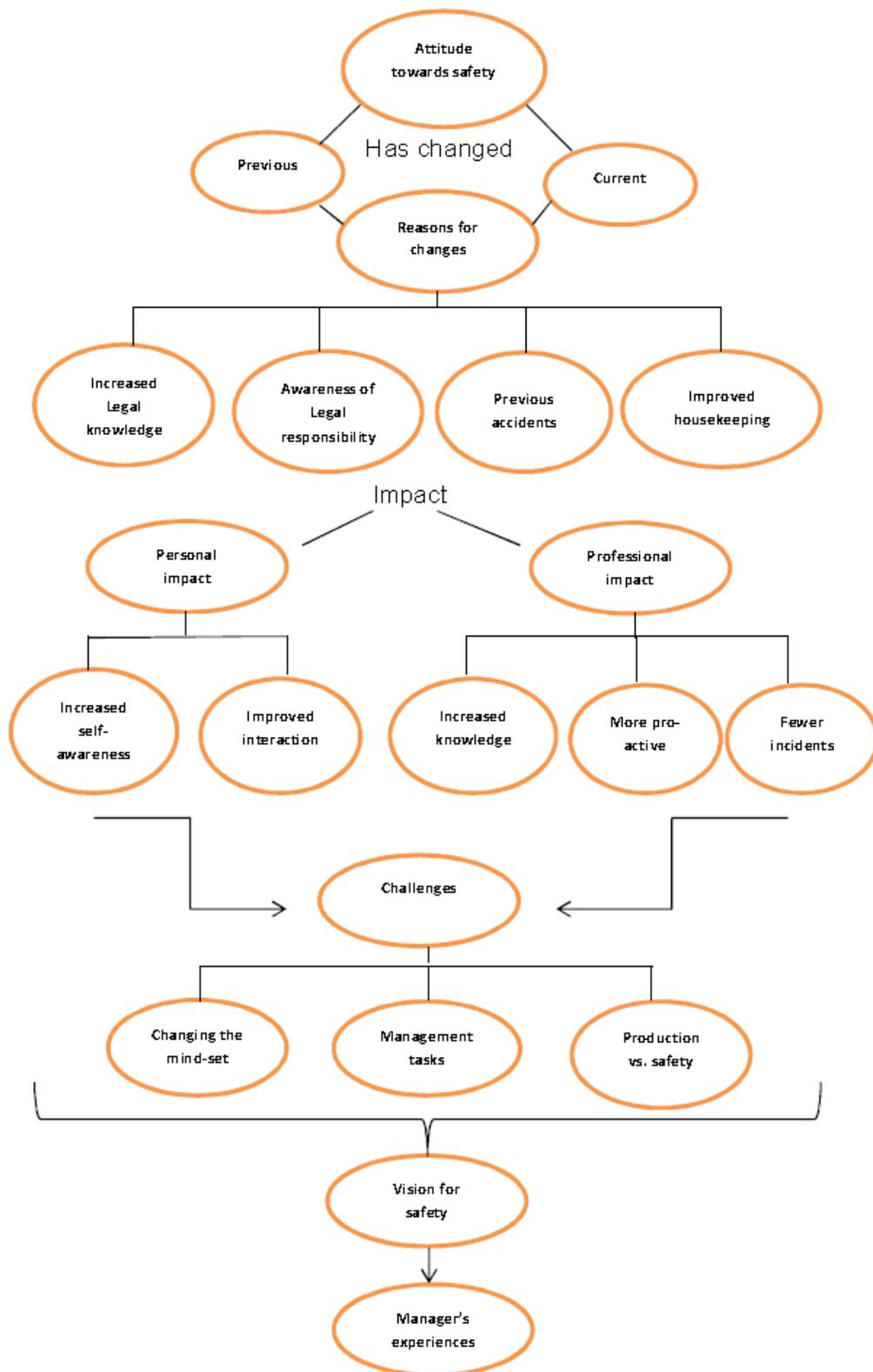


Figure 8.1 Thematic map of the data

Phase 6: Producing the report

In Phase six, the researcher had a set of fully worked out themes and the final analysis and write up of the report was conducted. The report was compiled to provide a concise, coherent, logical, non-repetitive and interesting account of the story the data tells within and across the themes (Braun & Clarke, 2006). Sufficient evidence of the themes in the data was included in the form of quoted text to demonstrate the prevalence of the theme (Braun & Clarke, 2006). Arguments in relation to the research questions as well as links to the applicable theory and quantitative results, where applicable, were made (Braun & Clarke, 2006).

8.5. REPORTING OF THE FINDINGS

The findings are presented according to the themes and sub-themes that were identified by means of thematic content analysis following the theme identification techniques and process as described in the previous section. Seven main themes and several sub-themes were identified as set out in Table 8.4 on page 268.

The actual words and responses of the participants were presented in support of the findings and these are indicated with quotation marks. There were only four participants and they all knew each other and worked closely together and in the interest of confidentiality the agreement from the start was that findings would only be reported on in group context. Thus, no identifying information was included that show which statements were made by which participant. Nonetheless, the researcher attempted to provide a balanced view that represented references to the responses of all the participants.

TABLE 8.4***Themes and Sub-Themes Identified***

THEME	SUB-THEME
1) Changes in attitude towards safety	Sub-theme 1.1: Previous attitude towards safety
	Sub-theme 1.2: Current attitude towards safety
2) Reasons for changes in attitude	Sub-theme 2.1: Increased legal knowledge
	Sub-theme 2.2: Awareness of legal responsibilities
	Sub-theme 2.3: Experience with previous accidents
	Sub-theme 2.4: Improved housekeeping
	Sub-theme 2.4: Improved housekeeping
3) Impact on personal development	Sub-theme 3.1: Increased self-knowledge and awareness
	Sub-theme 3.2: More positive interactions with employees
4) Impact on professional development	Sub-theme 4.1: Increased legal knowledge
	Sub-theme 4.2: Increased pro-activeness
	Sub-theme 4.3: Improved safety performance
5) Challenges for safety leadership	Sub-theme 5.1: Ensuring compliance with safety procedures
	Sub-theme 5.2: Changing the mind-set of employees
	Sub-theme 5.3: Production versus safety
6) The vision for safety	No sub-themes
7) Managers' experiences of the coaching program	No sub-themes

8.5.1. Theme 1: Changes in attitude towards safety

All the participants indicated that the way they viewed safety has changed and that it has changed for the better. They felt “better” and “positive” about safety and thought it was “necessary”, a “good thing” and very “serious”. One of the managers indicated that there are some aspects about safety that is “unnecessary” and that still bothered him, such as the wearing of hard hats in certain areas, but that he definitely feels “more positive than negative” about it. In order to describe how Managers’ attitude towards safety has changed two sub-themes emerged namely their previous attitude towards safety and their current attitude towards safety.

8.5.1.1. Sub-theme 1.1: Previous attitude towards safety

The managers' accounts of how they previously felt about safety indicated that there seemed to be a general lack of focus on and knowledge about safety. This was evident from responses such as "Before there wasn't really any safety" and "...there were safety rules but it was not really enforced". The following statement from one of the managers summed up this situation:

"Before, knowledge of safety was not shared, the consultant was trusted to do it and we didn't know what it entailed and especially how safety procedures should be applied to our working environment".

Other responses about how some of the participants previously felt about safety also implied a general disregard for safety. In the past they did not "really worry about safety", safety was "not important" and it was more important "to do the work than to focus on safety". Injuries were also not investigated in order to determine the cause and implement corrective or measures.

8.5.1.2. Sub-theme 1.2: Current attitude towards safety

It is evident from the Managers' responses that their attitude towards safety at the moment was very different than before. It is clear that they care about the lives of the employees because they do not want "to see that people get hurt at the workplace" and a fatal accident "is something that you don't want". They are talking about employees and accidents in a manner that show that they genuinely care, for example: "I don't want to lose anyone; I don't want anything to happen to anyone's life and to take away his ability to work and to provide for himself and his children".

It seems that Managers now understand the full extent of their responsibility in terms of safety and the consequences of not focusing on safety. The following statements served to support this:

“I realise it is not just about the work, you are actually responsible for everyone’s safety. It is actually a scary thought”.

“The big thing for me is that it can cost someone’s life”

8.5.2. Theme 2: Reasons for changes in attitude

Participants were asked to reflect on the reasons why they felt differently about safety now than they did before. It should be noted that in an attempt not to lead the participants the question was not asked specifically in relation to the coaching but participants could interpret the term “than before” how they saw fit. This approach was followed in order to elicit all possible reasons for the change in attitude and to establish whether participation in the coaching program would be mentioned as one of the reasons. Four sub-themes emerged pertaining to the aspects that contributed to the change in attitude towards safety namely increased legal knowledge, awareness of legal consequences, experience with previous accidents and observable workplace improvements.

8.5.2.1. Sub-theme 2.1: Increased legal knowledge

Participants attended a workshop that explained the legal requirements in terms of the Mine Health and Safety Act no 29 of 1996 and how it relates to the organisation’s safety system as part of their coaching activities. All of the participants indicated that increased knowledge about the law contributed to the change in their attitude toward safety. The reason for this was that now they knew more about safety and what was expected of them. This finding was supported by the following statements:

“You only realise after the training how serious it really is”

“I learnt a lot like with the training, I know now about the law and my responsibilities”

“I guess I understand it better now and know what the legal things are and that you put other people’s lives in danger”

“I know what my responsibility is as manager according to the law”

8.5.2.2. *Sub-theme 2.2: Awareness of legal responsibilities*

Participants indicated their concern for employees' lives as discussed in sub-theme 1.2, however, it seemed as if their sense of urgency around safety was also because they were very aware of the consequences for themselves. In other words, they had to focus on safety because it has personal consequences for them in terms of the responsibility that is placed on them by the law. This may have followed from their increased knowledge of the legal requirements and responsibilities as discussed in sub-theme 2.1. All of the participants made a reference at some point or another to the responsibility and negative consequences for themselves, for example:

"I must, I don't have a choice, I must continue, it is part of my job. I can't just leave it and if something happens what do I say then?"

"I must discipline myself and apply safety. If I don't do it I am going to get into trouble"

"I think that is the reason why we [management] are more aware of it because we know we are the guys that run the risk when there is an accident"

8.5.2.3. *Sub-theme 2.3: Experience with previous accidents*

Two of the managers mentioned that the previous fatal accidents that occurred approximately two years ago also contributed to changing their view about safety. The managers "learnt some lessons" from the inspectors from the Department of Mineral Resources (DMR). The DMR inspectors "focused more on certain issues", such as documentation and "furnishing the proof" that the necessary measures to prevent the accidents were in place. This finding corresponds with the literature that many companies are not proactive in terms of safety until after a serious accident occurred (Geller, 2000; Hudson, 1999).

It was interesting that the two participants that mentioned their experience with previous accidents were from the same site. The researcher confirmed with the company's Safety Department that both sites had had a fatal accident in the same year but participants from the other site did not mention it at all. Although this does not

necessarily mean that it did not affect them, it does seem as if this experience had a bigger and longer lasting impact on the Managers of the one site than of the other site.

8.5.2.4. Sub-theme 2.4: Improved housekeeping

Two of the managers also mentioned that other aspects improved in the workplace as a result of having safety systems in place and that is why they feel more positive about safety. These aspects relate to housekeeping in that the workplace is neater and more organised. Improved housekeeping is also a reflection of the safety culture (Hudson, 1999). This finding links to the notion that implementing safety procedures contributes to the overall improvement of the workplace and business performance (Krause & Weekley, 2005). The following statements highlighted this theme:

“What is better because of safety, is that the workplace is neater”

“With it [safety], other things such as housekeeping also improves”

“...many things improve with safety, like housekeeping”

“There is more order with the safety aspects and that is what I like”

8.5.3. Theme 3: Impact on personal development

The goal of the coaching program was to improve and change Managers’ performance and behaviour in terms of safety leadership. Participants’ were asked to reflect on the aspects that they felt they have most improved on. On a personal level the impact of the coaching program manifested as increased self-knowledge and subsequent more positive interactions with employees.

8.5.3.1. Sub-theme 3.1: Increased self-knowledge and awareness

One of the participants said that he felt “mostly the same” about himself but the other participants all felt that they had learnt something about themselves during the coaching process. All the participants agreed that the 360 degree feedback that they received gave “insight into your behaviour and actions”. Even if sometimes they “don’t

want to hear it”, it definitely made them more aware of their weak as well as their strong points. The feedback made them “want to improve” even if they did not “jump up and start working on it immediately”.

It was evident that most of the participants did not realise how others see them and they described it as “interesting” to find out how others viewed them. They also realised that different people such as management, health and safety representatives and subordinates had different opinions of what their strong and weak points were. Most of the participants were not aware of some of their shortcomings; they did not realise certain things that they were doing; and realised that they were “not always doing everything right”. Examples of the responses relating to this theme were:

“You see other’s picture of you and you don’t realise how they see you”

“Everyone sees you in a different light”

Participants’ reports of increased self-awareness are consistent with research that indicates increased self-awareness as one of the areas of impact on participants of an executive coaching program (Bougae, 2005; Crethar, Phillips & Brown, 2011; Ennis, 2002; Paige, 2002). Increased self-awareness is also indicated as an outcome in cases where a 360 degree survey forms part of the feedback process (Ennis, 2002; Tach, 2002; Niemes, 2002; Weller & Weller, 2004).

Knowledge of personal attributes and values and how these may affect safety leadership is one of the elements of effective safety leadership as identified in Chapter 4. According to Carrillo (2002) insight and an understanding of the actual safety situation and behaviours is required for safety leadership to improve. Pater (2012) also agrees that the starting point for improving safety leadership is for leaders to assess and become aware of their current strengths and weaknesses and then to adapt their behaviour accordingly.

8.5.3.2. *Sub-theme 3.2: More positive interactions with employees*

Following from the increase in self-awareness a specific realisation was in terms of how their communication and interaction with employees were viewed. Participants were not aware that they were perceived as giving negative feedback and not praising employees enough. This newfound insight changed the way that some of the managers communicated and interacted with the employees as reflected in the following statements:

“Where I have done better is in teaching others and giving training and showing them what to do, not just to yell and swear at them”

“Now, I am cautious to be too negative, to say something good also and not just jump on someone and reprimand them”

This concurs with other studies that recorded improvement in areas of communication, interaction and collaborative working as a result of executive coaching (Crethar et al., 2011; De Haan & Niess, 2011). The increased self-awareness resulted in improved safety leadership behaviours and this was also evident from the quantitative analysis. In the pre-test results of the 360 degree survey the dimension of feedback and recognition received the lowest overall ratings of all the dimensions. However, this dimension showed a significant improvement in the overall post-test results.

8.5.4. Theme 4: Impact on professional development

The data indicated that the coaching program also had an impact on the participants on a professional level. An impact on professional level refers to the development of knowledge and skills as well as the contribution made to the organisational goals (Ennis, 2002; Meyer, 2004; Niemes, 2002).

8.5.4.1. Sub-theme 4.1: Increased legal knowledge

Knowledge and experience of the business, organisational safety systems and legal requirements is one of the elements of safety leadership as discussed in chapter 4. In the assessment phase of the coaching program, participants rated their knowledge of safety systems and the legal requirements mostly as “poor” or “average” and subsequently they attended a legal workshop as part of their individual development plan activities.

All the participants agreed that the coaching program contributed to developing their knowledge and in particular their knowledge of the legal requirements and responsibilities. This links to sub-theme 2.1 were increased legal knowledge was reported as one of the reasons for the changes in Managers’ attitude towards safety. Statements in addition to those already presented in sub-theme 2.1 are provided below:

“I think to know more about safety and what the legal aspects are, especially after the training”

“...and as I said the workshop about the legal requirements was very good. I learnt a lot and I can apply it now”

The willingness to learn or having a learning orientation is essential to safety leadership behaviour (Carrillo, 2002; Cooper, 2001) as discussed in chapter 4. This aspect refers to building safety competencies through training and also valuing the advice and assistance of safety professionals. The quantitative results also indicated the learning orientation of managers as it was rated significantly higher on the post-test assessment by Management, respondents in the 51 to 60 year age group and respondents from site 2.

8.5.4.2. Sub-theme 4.2: Increased pro-activeness

All of the managers indicated that they are more proactive about identifying hazards and risks and to implement corrective measures before an incident occurs. This means that they understand the risk profile of the organisation and they are constantly looking for “new risks” that could emerge. Opportunities to improve safety are identified and resources are made available to “fix things” before accidents happen. In addition, accidents are investigated to determine “what caused it and how it can be prevented to happen again”. The participants’ development in terms of their action orientation was demonstrated with the following statements:

“I take more notice and I am more proactive to see hazards and risks and address them instead of waiting to see if something is going to happen”

“But what I think I am good with now, or better at, is to identify risks and be more aware, to see things that I didn’t see before that pose a risk”

“So, you walk around the whole time looking for risks and how they can be fixed”

“If I see a forklift being fixed I also look at other things that need to be done for safety while it is standing there”

Action orientation or to be proactive in addressing safety issues is one of the critical behaviours required for effective safety leadership as discussed in chapter 4. The finding that Managers were behaving in a more pro-active manner to address safety issues was sustained by the results of the quantitative study. The dimension of action orientation was rated significantly higher on the post-test assessment by a number of groups namely Africans, Management, respondents in the 51 to 60 years category as well as respondents from site 2.

8.5.4.3. Sub-theme 4.3: Improved safety performance

At first the participants seemed unsure whether their increased knowledge and skills have contributed to the achievement of the organisation’s safety goals. However, when

they were reminded that the number of incidents reported was a measure of safety performance they all responded rather confidently in the following manner:

“Yes, definitely there are fewer incidents”

“No, for sure there are fewer incidents”

“We haven’t had a fatal not even a near fatal, so I think it definitely improved”

Managers acknowledged that although there were still minor incidents that these were becoming less and less. They seemed to feel satisfied that even if accidents were to happen, for example because of new risks that could emerge, that the necessary “processes and safety procedures are in place” to deal with it effectively.

According to the literature the purpose of developing safety culture and safety leadership is to improve the organisation’s safety performance, i.e. reduce incidents and injuries (Guldenmund, 2006; Hudson, 1999; Wiegmann, Von Thaden & Gibbons, 2007). The claim of improvement in the company’s safety performance was verified against the incident statistics obtained from the Safety Department.

Two years before the research was conducted, five incidents were reported. Two of these were minor damage incidents or so called near misses where no one was injured, one accident resulted in a lost work day injury and two were fatal accidents. In the year preceding the research, 10 accidents were reported. Of these, five were damage incidents or so called near misses where no one was injured. The other five accidents were safety incidents that involved injuries of which four resulted in lost work days and one required medical treatment but without loss of a work day. In the year in which the research (and the coaching) was conducted there were only two minor damage incidents reported. Thus, the number of incidents decreased as well as the severity of the incidents.

8.5.5. Theme 5: Challenges for safety leadership

Managers reported improvement in their skills and knowledge however some challenges in terms of safety leadership were also experienced. All participants mentioned that the biggest challenge for managers in terms of safety leadership was “the people”. The challenge in terms of “the people” are twofold namely to ensure that employees comply with safety procedures and also to change employees’ mind set about safety. The classic debate of production versus safety also remained a challenge for participants.

8.5.5.1. Sub-theme 5.1: Ensuring compliance with safety procedures

The managers reported that the most difficult thing is “... to get the people to apply the safety rules and procedures” and “... to get the guys to do safety things for example to complete checklists”. This means that they “... have to check them up all the time” and walk around “checking and asking why aren’t your checklists filled in?” and if they don’t “check up on them the whole time they leave it”. The managers would like everyone to know what the safety procedures are and to comply with it without them having to check up and control it all the time. One manager explained it with the following statement:

“They must know what is right and do it, not wait to be told and to be checked up on the whole time or only do it when they see me”

Performing safety management activities is one of the elements of effective safety leadership as identified in chapter 4. These activities include the monitoring of site-level safety mechanisms such as the following of safe work procedures and completion of checklists (Krause, 2004). It was noted that the three participants on the management level felt more strongly about this aspect than the participant on senior management level. This could be because of the fact that the management level is more involved in the checking and controlling of day-to-day activities (Bowles, Cunningham, De la Rosa & Picano, 2007; Manning & Robertson, 2010).

This finding also links to the leadership style element of safety leadership. Effective safety leaders need to be able to apply a transactional leadership style to ensure that people follow the safety rules and procedures (Clarke, 2013; Cooper, 2001; Zohar, 2002).

8.5.5.2. *Sub-theme 5.2: Changing the mind-set of employees*

Participants were of the opinion that the employees' mind set about safety is not yet "right". In other words, employees do not understand or take seriously their own responsibility and accountability in terms of safety. Participant responses that described this particular challenge of safety leadership were as follow:

"The biggest challenge I would say is to get people's mind-set right"

"... making the guys understand that ultimately you are responsible for your own safety. It is a kind of mind-set and a challenge for me to get people into that mind-set"

"We stress more about the visual things such as hard hats at certain places than about the mind-set to know what is important in terms of safety"

Participants offered various reasons why employees' did not have the right mind-set about safety. The main reasons contemplated were that employees 1) were not aware of the dangers and consequences of neglecting safety aspects and 2) believed that management is responsible for their safety. Some statements in support of this are presented below.

"To make them realise what is the consequence if they don't do the safety things"

"On ground level they are not so aware of safety, if they can get away with it they don't do it, they don't realise what dangers there are"

"Employees think it is management and the owners' responsibility to take care of safety"

“Sometimes I get the feeling that people think we put things [safety equipment] in place and it will protect them automatically, we can put things in place but you also need to be aware and know how to use it and why it is there”

Establishing accountability or creating a sense of responsibility for safety is another one of the behaviours required for effective safety leadership as explained in chapter 4. Taking accountability means that employees know their role and accept their responsibility in terms of safety and also realise what the consequences are for not complying with safety rules (Dunlap, 2011; Krause, 2004). The participant on the senior management level was particularly concerned, more so than those on the management level, about this challenge. This could be because as a senior manager and also an owner, the law places the ultimate accountability on the employer.

Accountability consists of two parts namely to hold oneself accountable and the second is to hold others accountable (Carrillo, 2002). From Themes 1 and 2 it is evident that managers hold themselves accountable but they are still struggling to establish a sense of responsibility and accountability in others. In addition, this is linked to the leadership style element of safety leadership. A transformational leadership style is required to encourage employee buy-in and participation in safety (Clarke, 2013; Zohar, 2002).

However, it seems the manager’s efforts in displaying and cultivating a sense of accountability and responsibility did not go unnoticed. The quantitative results revealed that the dimension of accountability was one of the three safety leadership behaviours that were rated significantly higher on the overall post assessment results. It was also the dimension that was rated significantly higher by the most number of groups.

8.5.5.3. Sub-theme 5.3: Production versus safety

The classic debate of production versus safety refers to the priority given to safety and the integration of safety into all aspects of the business to achieve a balance between the competing priorities and demands on the company’s resources (Carrillo, 2002;

Flynn & Shaw, 2009; Krause, 2004). One of the managers described this dilemma in terms of the issuing of personal protective equipment. He stated that if it is not controlled carefully it “buggers up the budget completely but on the other hand the employees are happy because they see that the company is looking after their safety”.

Participants’ acknowledged that they also focused more on production than safety in the past as described in sub-theme 1.1. However, they were of the opinion that it was also the case amongst the employees and that “everyone is still more production oriented”. Many of the employees are remunerated based on production rates and must achieve daily production targets. They view safety as “extra work” that takes up time they could have spent on their actual work. This creates a situation where employees “don’t care [about safety] because they just want their money at the end of the month”.

Business integration or managing all business activities with a constant focus on safety is one of the behaviours required for effective safety leadership as discussed in chapter 4 (Carrillo, 2002; Flynn & Shaw, 2009; Krause, 2004). The overemphasis on production at the expense of safety clearly remains a challenge. This finding was reinforced by the quantitative results as the dimension of business integration was one of the two least improved dimensions on the post assessment.

8.5.6. Theme 6: The vision for safety

Safety leadership starts with a vision for safety (Krause, 2004) and is a critical behavioural aspect in safety leadership as described in more detail in chapter 4. This means that leaders and managers must have a clear picture of what safety performance excellence looks like for the organisation and they must convey this vision in a compelling manner that is observable to others (Carrillo, 2002). The dimension of vision and values received one of the lowest ratings on the pre-test 360 degree survey. This indicated that if the leaders had a vision for safety, this vision was not clearly communicated or visible to employees.

However, at the time of the qualitative study all managers had a very clear expectation of how the ideal safety situation should look like at the company. Managers' vision for safety at the organisation included that everyone had "the same sense of responsibility for safety as management" and also that "everybody knows what they must do and that they do it". Participants envisioned a safe workplace, where everyone knew and did what was expected of them in terms of safety and that this would reduce incidents and injuries and create a safety culture. The following statement was a good description of the managers' vision for safety:

"I just want to see that the workplace is safe and it must be nice for everyone to know there is a whole health and safety culture in this company and everyone is part of it"

The notion that managers had a vision for safety and that they were conveying it clearly, in an observable manner, to others in the organisation was also substantiated by the results of the quantitative study. The dimension of vision and values was one of the dimensions that received significantly higher ratings on the post assessment from females, management, respondents in the 51 to 60 years age category and respondents from site 2.

8.5.7. Theme 7: Managers' experiences of the coaching program

Since it was the first time that any of the participants received coaching in the workplace they were asked to reflect on what the experience of being coached was like for them. Overall, the participants were satisfied with the program and would not want to change anything because "it was set out and explained very well". Other comments confirmed that "it worked" and that "it went well" and also that "the whole thing and the way you did it were good". The main aspect that seemed to be appreciated was that it was customised to individual development needs. As one manager put it:

“It was set up in a way that if you wanted to focus more on one aspect you could do that, you could decide where you wanted to give more attention, so I think it was good”.

All of the participants viewed the coaching process as having been a positive experience. They described the experience with words such as that it was “helpful”, “easier”, and “quite nice” to receive guidance. Thus, they experienced it as a helping relationship in accordance with the definitions of coaching as discussed in chapter 5. Statements made were as follow:

“It is easier if someone tells you and teaches you than if you have to look it up yourself”

“I think that it is quite nice when someone explains it to you”

“It was very helpful”

The experience of receiving feedback such as from the 360 degree survey during the coaching process was described as “good”, “interesting” and “appreciated”. Most of the managers indicated that they were interested in repeating the survey to see whether others’ perceptions have changed and if they have improved.

All participants agreed that receiving the coaching would be applicable and beneficial to employees on other levels in the organisation to help give them a deeper insight and more knowledge as it did for them. They were of the opinion that if other levels also received the coaching it would help to overcome the challenges that still remained.

The findings presented in this theme confer with other research where participants in a coaching program stated that the experience was positive and that they would recommend the coaching to others (Bougae, 2005; Ennis, 2002; Tach, 2002). It also corresponds with research that advocate that, unlike other forms of leadership development, executive coaching should be customised for a leader’s individual needs and goals (Cacioppe, 1998; Paige, 2002; Zenger & Stinnett, 2006).

8.6. SUGGESTIONS FOR IMPROVEMENT

In terms of the content covered in the program, there were suggestions that technical aspects and regulations more specific to their own job could have been addressed more comprehensively. They would also have liked to receive guidance on how to deal with everyday safety issues in the workplace.

In terms of the duration of the program, participants suggested that more sessions could have been scheduled and that the sessions could have been conducted more regularly than once every two weeks. This was actually a surprising suggestion because there were times when the sessions had to be rescheduled because of work load and other commitments. One of the managers also scheduled sessions outside of normal working hours.

8.7. DISCUSSION

The following hypothesis was presented in terms of the qualitative study:

Hypothesis 2: The coaching program will have a positive impact on managers' attitude towards safety.

The findings, as per Theme 1, indicated that Managers' attitude towards safety has changed and in a positive manner. Increased legal knowledge (sub-theme 2.1) and the subsequent awareness of their responsibilities (sub-theme 2.2) for safety gained as part of the coaching program, was presented as part of the reason (Theme 2) for this change in attitude. Thus, the coaching program had a positive impact on manager's attitude towards safety and the hypothesis was sustained. This is consistent with research purporting that the executive coaching process is intended to help leaders to, among other outcomes, make attitude adjustments and change habits (Kaye, 2006; Zenger & Stinnett, 2006). It is, however, acknowledged that the coaching program was not the sole reason for the change in attitude and that the previous accidents (sub-

theme 2.3) and observed workplace improvements (sub-theme 2.4) also were contributing factors.

The coaching program had an impact both on a personal and organisational level. On a personal level (Theme 3), the program provided the insight for increased self-awareness (sub-theme 3.1) and this led to more positive interactions with employees (sub-theme 3.2). On a professional level (Theme 4), the program resulted in increased legal knowledge (sub-theme 4.1) and the ability to be more pro-active (sub-theme 4.2) in addressing safety risks. It also contributed to improving the organisation's safety performance in that fewer incidents were reported (sub-theme 4.3). These findings support the research that states that the executive coaching process is intended to help leaders to make attitude adjustments, change habits and develop skills (Ennis, 2002; Kaye, 2006; Paige, 2002; Zenger & Stinnett, 2006).

Increased legal knowledge was a recurring theme and it was presented as one of the reasons why attitudes towards safety has changed (sub-theme 2.1) and also mentioned as one of the aspects that improved the most because of the program. It also supports the theory that leadership development programs are more effective when a blend of learning interventions, for example coaching and workshops, are applied (Meyer, 2004; Werner, 2007). Although legal knowledge is an important element of safety leadership, a word of caution to the organisation is needed because focussing too much on the legal requirements and consequences, could actually pose a barrier to safety culture (Hudson, 1999).

At the organisational level, there was an improvement observed in the safety performance (sub-theme 4.3) of the company. There was a reduction in the number of incidents as well as the severity of the incidents that were reported between the period before and during the coaching program. Again, a word of caution is needed because a significant reduction in accidents can breed complacency (Hudson, 1999) and cause managers to think that the policies and procedures are in place and effective. Thus, it is important for the organisation not to lose focus now and to remain diligent with their safety efforts.

Three main challenges (Theme 5) were experienced by the participants namely to ensure that safety procedures are followed (sub-theme 5.1), to change the mind-set of employees to accept their own responsibility in terms of safety (sub-theme 5.2) and to integrate safety into all aspects of the business (sub-theme 5.3). These challenges highlight the importance for Managers to be able to combine transactional and transformational leadership styles. A transactional leadership style is necessary to ensure compliance with safety rules and regulations while a transformational leadership style is required to encourage employee buy-in and participation in safety (Clarke, 2013; Cooper, 2001; Zohar, 2002).

The findings revealed that Managers have a clear vision for safety at the organisation (Theme 6). Three aspects are of importance in terms of the vision for safety, as have emerged throughout the themes and sub-themes, namely for everyone 1) to know what they must do; 2) do it; and 3) understand and accept their responsibility. Participants were of the opinion that if these three aspects were achieved then it would reduce incidents and result in a positive safety culture at the organisation.

Managers reported positive experiences of the coaching process (Theme 7) and that it helped them to improve their safety leadership skills. It was worthwhile and they thought that if it was rolled out to other levels of employees it would contribute to overcoming the challenges that remained. Overall, the participants were satisfied with the process and structure of the program, especially because it was designed to focus on their individual development needs.

Suggestions to make the program even more effective and helpful were provided. These included aspects such as including workplace specifics and conducting more regular sessions on a more regular basis.

Ultimately, the purpose of improving safety leadership is to develop the safety culture of the organisation. According to the literature, safety culture develops along a continuum of stages (Hudson, 1999; Keil Centre, 2000; Westrum, 1993). The safety culture model of Hudson (1999) was applied in this research and based on the findings

of the qualitative study the development of the organisation's safety culture could be described.

The "before" responses corresponded with the pathological stage of safety culture (Hudson, 1999) where there was no safety knowledge or communication, health and safety issues were ignored, the focus was on production and basically management did not KNOW and did not CARE about workforce safety. There was also some evidence of the reactive stage where safety became a hot issue after the fatal accidents and the calculative stage where the focus is to comply with legal requirements.

The responses that described their current safety attitude indicated that managers now CARE about workforce safety and their increased knowledge means that they now also KNOW about safety. Managers have started to believe that safety is a worthwhile endeavour and are actively seeking to improve safety and implement preventative measures. Managers are now very proactive, they know the safety risks and time and resources are available for improvements before accidents happen. This reflects aspects of the proactive stage of safety culture. However, some aspects such as workforce participation and accountability remain a challenge and present an obstacle for the company to be able to progress to the final and ideal generative stage.

In conclusion, the findings of the qualitative study concurred with other research in that improving safety leadership has a positive impact on the safety performance as well as the development of safety culture in an organisation (Boyd, 2008; Clark, 2002; Cooper, 2001; Dunlap, 2011; Flynn & Shaw, 2011; Krause, 2004; Krause, 2007; Krause & Weekley, 2005; Pater, 2012). The findings, specifically Themes 2, 3, 4, 5, and 6, also highlighted the interrelated working of the elements of safety leadership namely personal attributes and values, knowledge and experience, leadership style, management tasks and leadership behaviours.

This confirms that all five of the elements play a role and are important for effective safety leadership as purported by the integrated model of safety leadership that was

developed by the researcher. A summary of the findings and how it links to the elements of safety leadership is presented in Table 8.5 below.

TABLE 8.5

Linking Of Findings to Safety Leadership Elements

THEME	SUB-THEME	SAFETY LEADERSHIP ELEMENT
Reasons for changes in attitude (Theme 2)	Increased legal knowledge	Knowledge and experience
	Awareness of legal consequences	Knowledge and experience
	Experience with previous accidents	Knowledge and experience
	Improved housekeeping	Not applicable
Impact of the coaching program (Themes 3 and 4)	Increased self-knowledge and awareness	Personal attributes and values
	More positive interactions with employees	Leadership behaviours (Collaboration, feedback and recognition)
	Increased legal knowledge	Knowledge and experience (Learning orientation)
	Increased pro-activeness	Leadership behaviours (Action orientation)
	Improved safety performance	Management tasks
Challenges for safety Leadership (Theme 5)	Ensuring compliance with safety procedures	Management tasks Leadership style (transactional)
	Changing the mind-set of employees	Leadership behaviours (Accountability) Leadership style (transformational)
	Production vs safety	Leadership behaviours (Business integration)
The vision for safety (Theme 6)	No sub-themes	Leadership behaviours (Vision and values)

8.8. EVALUATION OF THE COACHING PROGRAM

The general aim of the research was to develop and evaluate a coaching program to improve safety leadership. The outline of the coaching program is attached as Appendix F. The discussion of the findings already indicated that the coaching program had an impact on improving the safety leadership and the final step to confirm this is to evaluate the program according to a theoretical model. Guskey (2002) developed a model that consists of five critical evaluation levels that can be applied to evaluate the effectiveness of professional development interventions such as executive coaching programs. The executive coaching program conducted as part of this research was evaluated against these five levels and the results are presented in the next sections.

8.8.1. Level One – Participants’ reaction to executive coaching

This refers to the participants’ specific reactions to the coaching process and their opinion of whether or not the coaching experience was worthwhile. Participants viewed the coaching process as a positive and worthwhile experience as discussed in Theme 6. They were satisfied with the experience to the extent that the program was recommended to others.

8.8.2. Level Two – The participant’s learning

This level involves determining if learning took place and also to specify what kind of learning has occurred. In this case learning took place both in terms of personal and professional development. This is evident from the findings presented in Theme 3. It includes aspects such as increased self-awareness, increased legal knowledge and behavioural changes.

8.8.3. Level Three – Organisational support and change

This level refers to the organisational support participants received during their coaching experience and if any changes in the performance and/or behaviour of participants were noted. Organisational support for the program, or the lack thereof, was not mentioned specifically. However, changes in the performance and behaviours of participants were noted by others as also indicated by the quantitative results.

8.8.4. Level Four – Participant’s use of the new knowledge and skills

On this level it is critical to determine and evaluate whether participants are applying their newly gained knowledge and skills. Throughout the coaching program as well as in the interview, participants provided examples of how they were applying their newfound knowledge and skills.

8.8.5. Level Five – Participants’ learning outcomes

The final level involves evaluating the achievement of learning outcomes. In other words what goals were achieved as a result of the coaching? Three overall goals were set for the coaching program namely to increase self-awareness, to improve knowledge and skills and to contribute to the organisational goals. The participants agreed that all three goals were achieved as was also evident from both the quantitative results and the qualitative findings.

8.9. CHAPTER SUMMARY

In this chapter the findings of the third phase of the research namely the qualitative study was presented. The findings were presented according to the 7 main themes that emerged namely changes in attitudes, reason for changes, the impact on personal development, the impact on professional development, the challenges of safety leadership, the vision for safety, and managers' experiences of the coaching program. Suggestions given by the participants for the improvement of the coaching program were discussed. The findings were discussed and integrated with the literature as well as the quantitative results. The coaching program was evaluated according to a theoretical model.

In the next chapter the conclusions, recommendations and limitations of the study as well as suggestions for future research will be presented.

CHAPTER 9

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

The focus of this chapter is on step 9 of the research project as described in chapter 1. It contains the conclusions, limitations and recommendations of the research based on the results of the study. The purpose is to determine the level of achievement of research aims and the answering of the research questions. The conclusions are formulated firstly in terms of the specific aims of the literature review and secondly in terms of the empirical study for both the quantitative and qualitative study. The limitations of the literature review and the empirical study are discussed and suggestions for further research are made. Recommendations for the case organisation as well as practitioners in the field of industrial psychology are made.

9.1. CONCLUSIONS

The general aim of the research was to develop a safety leadership coaching program and to evaluate the impact of a coaching program on safety leadership. The significance of improving safety leadership is highlighted by its role in influencing the safety culture of an organisation and ultimately in improving safety performance. With increased pressure from legislative bodies to transform the safety culture of mines it is important for the field of industrial and organisational psychology to investigate safety leadership by means of empirical research. In order to achieve the general aim of the research specific research aims and sub-aims were formulated as described in chapter 1. A mixed methods research design was followed and the research was conducted in three phases namely the literature review, the quantitative study and the qualitative study.

Firstly, the achievement of the research aims and the conclusions that were drawn about the literature review and the empirical study are addressed respectively. Thereafter, conclusions about the research hypotheses are presented. Lastly, the achievement and conclusions of the overall aim is discussed.

9.1.1. Conclusions: Literature review

Conclusions were drawn about each of the specific research aims and sub-aims in terms of the literature review as set out in chapter 1.

9.1.1.1. Research aim 1: To describe the background of occupational health and safety in the South African mining industry.

Chapter 2 provided a broad overview of the background to occupational health and safety in the South African mining industry. The requirements of the Mine Health and Safety Act no 29 of 1996 (MHSA), the MHSA Regulations as well as the Regulations of the Minerals Act no 50 of 1991(MA) that are still in force were discussed and the state of occupational health and safety in the South African mining industry was reviewed. The most obvious conclusions that could be drawn from the discussion of the background to occupational health and safety in the South African mining industry were:

- Occupational health and safety in the South African mining industry is mainly governed by the Mine Health and Safety Act no 29 of 1996 (MHSA) and its Regulations and the Regulations of the Minerals Act no 50 of 1991 (MA) that are still in force according to Schedule 4.4 of the MHSA.
- The MHSA prescribes the duties of the various role-players such as employers, employees, inspectors and the Minister to ensure a safe and healthy environment for employees as well as non-employees, for example the immediate community, that may be affected by the mine's activities.
- The MHSA and MA Regulations sets out the more technical and practical guidelines in terms of the safety precautions that must be implemented at mines.
- The MHSA also sets out the duties of employees and their rights to a healthy and safe workplace. This implies that the responsibility for health and safety at work is promoted as being a shared responsibility between employers and employees.

- However, the ultimate responsibility for compliance with the requirements of the MHSA and the various regulations remains with the employer. Non-compliance could result in temporary closure of the mine or sections of the mine (Section 54), substantial financial penalties and even periods of imprisonment (Schedule 8).
- Despite marginal improvements in statistics over the past few years, the South African mining industry is still considered to have unacceptably high rates of injuries, fatalities and diseases. This indicates that the safety performance of mining companies in South Africa is not satisfactory.
- The continued, and even stricter, enforcement of compliance to legislative requirements by the Department of Mineral Resources means that mining companies in South Africa must renew their efforts and focus on improving occupational health and safety.

9.1.1.2. Research aim 2: To conceptualise safety culture.

The term safety culture was conceptualised and defined in chapter 3. Research sub-aim 2.1 namely to discuss different models and types of safety culture was also addressed in Chapter 3.

a) Conclusions about safety culture

The main conclusions drawn from the literature review regarding safety culture were:

- Safety culture is a sub component of organisational culture and refers to the attitudes, beliefs and level of concern that members across all levels of the organisation have about safety. The safety culture manifests in the manner that safety policies and procedures are implemented and managed in the organisation.
- The elements of safety culture include group values, personal commitment, learning orientation and the involvement of all levels of the organisation.

- Safety culture plays a key role in improving the safety performance of an organisation.
- A number of barriers could prevent organisations to develop their safety culture including bureaucracy, regulators and the law, competing goals and resources, incentive programs, lack of communication, a culture of blame and punishment, safety management systems, resistance to change, and management failure.

b) Conclusions about safety culture models

Several researchers have developed theoretical frameworks or models in order to describe and explain safety culture. From the review of these models the following conclusions were drawn:

- Safety culture is established and developed through the dynamic relationship between management, employees and the working environment.
- Every organisation has a safety culture and it is a question of determining the type and level of safety culture that exists in a specific company.
- Models that describe the types and levels of safety culture suggest that organisations can exhibit a type of safety culture on a continuum that ranges from negative or poor to positive or excellent.
- These models highlight the theory that organisations could develop and improve their safety culture by implementing a managed change process.

9.1.1.3. Research aim 3: To conceptualise safety leadership and its role in safety culture.

Safety leadership was conceptualised and defined in chapter 4. The safety leaders were identified as the senior and other managers in the organisation that make decisions about the application of resources and the overall direction of the organisation. Research sub-aim 3.1 to discuss different models of safety leadership and safety leadership development was also addressed in this chapter.

a) Conclusions about safety leadership and its role in safety culture

The role of safety leadership in developing safety culture was established. The following conclusions pertaining to this aspect were drawn:

- The factor that distinguishes organisations that are successful with their safety improvement initiatives from those that are less successful or that have failed is the “quality of leadership”.
- Just as leadership shapes the overall organisational culture, safety leadership is instrumental in shaping the organisation’s safety culture.
- Safety leadership refers to the interpersonal influence that a leader exercises in order to achieve the organisation’s safety performance goals. It involves establishing safety standards and displaying consistent behaviours to create the desired type of safety environment.
- The elements that constitute effective safety leadership include personal attributes and values, knowledge and experience, safety management tasks, leadership style, and specific leadership behaviours.
- The importance of improving safety leadership is highlighted by its role in developing safety culture and thus in improving mining companies’ safety performance.
- The proposed increased enforcement of compliance to legislative requirements and the focus on improving safety performance means that effective safety leadership will become increasingly important for mining companies.

b) Conclusions about safety leadership models

The various models of safety leadership as described in the literature were reviewed. Based on this review, the following conclusions were drawn:

- Safety leadership models identify a set of concrete behaviours and competencies that is required for effective safety leadership.

- The safety leadership models discussed all implied that safety leadership, like any other leadership aspect, can be developed.
- Safety leadership can be developed by assessing the current leadership behaviours and culture level and then adopting the characteristics and implementing the strategies necessary to achieve the next level.
- The safety leadership models reviewed mainly focused on the behaviours or practices that effective safety leaders needed to engage in and little attention is given to the other elements such as knowledge and experience or safety management tasks.
- None of the models that were reviewed included all of the elements of safety leadership as identified in the literature review.
- A comprehensive model that included all the critical elements of effective safety leadership was lacking.

Based on the above conclusions, the researcher developed an integrated model of safety leadership that incorporated all the elements of safety leadership as identified in the literature. This model described and explained the interrelated working of five elements of safety leadership namely personal attributes and values, knowledge and experience, leadership style, management tasks and leadership behaviours. This model was illustrated in Figure 4.3.

c) Conclusions about leadership development

The conclusion that safety leadership could be developed raised the question of how safety leaders could achieve this. Thus, literature concerning leadership development was also reviewed. The conclusions drawn about this aspect were:

- There is a debate about what the most effective strategies for leadership development are.
- However, most researchers agree that leadership development interventions should include basic elements such as identifying the competencies that need to be developed, aligning the program with personal and company goals,

incorporating multiple learning interventions, and including assessment and feedback activities.

- General leadership development strategies could also be applied to developing safety leadership.
- Certain elements of safety leaderships such as personal attributes and values, leadership style, and leadership behaviours are so called soft skills and more difficult to change and develop than other elements such as knowledge and management tasks.
- A combination of learning interventions such as classroom training, job assignments and coaching could be a suitable leadership development strategy to improve safety leadership.

Based on the above conclusions, the researcher compiled a leadership development model that provides a guideline for the development of safety leadership specifically. This model was illustrated in Figure 4.4.

9.1.1.4. Research aim 4: To define and describe coaching.

Coaching was identified as a possible strategy for safety leadership development and the concept of coaching was defined and described in chapter 5. Research sub-aim 4.1 to discuss different coaching models was also addressed in this chapter. The main conclusions regarding coaching and coaching models are presented in the next sections.

a) Conclusions about coaching

The main conclusions drawn from the literature review about coaching were:

- Coaching has become an increasingly popular means for leadership development.

- Coaching that has been employed to improve safety related behaviours in organisations focused mainly on coaching other levels of employees but not on developing safety leadership as such.
- Executive coaching is identified as coaching aimed at employees in the upper ranks of the organisation as is the case with the safety leaders that were the focus of this research.
- The purpose of executive coaching is to improve professional performance, personal satisfaction and consequently improve organisational effectiveness.
- The executive coaching process is intended to help leaders to make attitude adjustments, change habits, and develop and enhance leadership skills.
- Executive coaching traditionally involves one-to-one sessions. However, other forms of delivery such as via the telephone and e-mail can support the process and address time or logistical constraints.
- There are different types of coaching that can be conducted depending on personal and organisational needs, namely performance, holistic and content coaching. The type of coaching employed depends on individual and organisational needs.
- Different approaches to coaching can be followed namely clinical, behavioural, systems, and social constructionist models. The coaching approach is informed by the personal beliefs, knowledge, experience and preferences of the coach.
- The elements that constitute an effective coaching program include linking the program to organisational objectives, gaining support for the program, selecting coaches, matching coaches to coachees, and evaluating the program.
- The evaluation of the coaching program, that is to determine whether the program achieved its goals, is a critical though sometimes difficult component to address.
- Coaching programs are often evaluated by subjective means based on qualitative data such as participants' reports that the program was worthwhile and that they learnt from it. However, objective means of evaluation is possible for example by comparing pre-test and post-test scores of a 360 degree survey in a quantitative manner.

b) Conclusions about coaching models

Several authors have developed models to describe and explain the process of executive coaching. The main conclusions based on the review of these models were:

- Most authors identify certain phases or stages that form part of the executive coaching process.
- The phases involve activities pertaining to contracting, assessment, developing goals, actual coaching, re-evaluation and follow up.
- According to an integrated framework a successful executive coaching program consists of *the antecedents* i.e. the characteristics of the coach, coachee and organisational support, *the process* includes the coaching approach, the coaching relationship and receptivity to feedback, and *the outcomes* namely self-awareness and learning that leads to behavioural change and subsequently individual and organisational success.
- The principles contained in the models for executive coaching could be applied to develop a coaching program to improve safety leadership.

Based on the conclusions from the literature review on coaching and coaching models, the researcher developed a framework as guideline for the development of a coaching program to improve safety leadership that is focused on the executive level. This framework was illustrated in Figure 5.4.

9.1.1.5. Research aim 5: To develop a safety coaching program.

In order to develop a safety coaching program, the researcher considered all of the information regarding safety leadership, leadership development and coaching that was investigated during the literature review phase of the study. The following conclusions were drawn:

- The objectives of a safety coaching program were already defined. The personal goal is to improve safety leadership and the organisational goal is to improve safety performance.
- The safety leadership competencies that needed to be developed consist of the elements of safety leadership namely personal attributes and values, knowledge and experience, leadership style, management tasks and leadership behaviours.
- Safety leadership is about developing certain behaviours or practices and it also requires knowledge about safety legislation, workplace hazards, safety management tasks and organisational safety systems. Thus, the type of coaching most appropriate to achieve the goal of improving safety leadership would be a combination of performance and content coaching.
- Executives need to consider the impact of their behaviour on themselves and others and safety is also part of the organisational systems, hence it is necessary to also consider executive's interactions with other organisational members and systems that influence their performance. Thus, based on the researcher's personal beliefs, knowledge and experience it is suggested that a behavioural-systems approach should be followed.
- Safety is an integral part of the organisational culture and systems and it requires knowledge that is very specific to a workplace and industry, hence, selecting suitable internal coaches would be appropriate.
- The safety leadership competencies that need to be developed are varied and, depending on the individual development needs identified, the coaching program should include a combination of learning activities where possible.
- Both qualitative and quantitative measures should be employed to determine participants' development areas as well as to evaluate the overall effectiveness of the coaching program.

The researcher combined the information on all these aspects and developed a coaching program specifically tailored to improve safety leadership. The outline of this program is attached as Appendix F.

Following the above discussion, it was concluded that all the specific aims and sub-aims that were set in terms of the literature review were achieved. In addition, the first part of the overall aim, namely to develop a coaching program to improve safety leadership, was also achieved.

9.1.2. Conclusions: Empirical study

The empirical study consisted of two phases namely a quantitative study and a qualitative study. Specific aims for the quantitative and qualitative study as well as two aims that applied to both the quantitative and qualitative study were formulated as described in chapter 1. Achievement of these aims and the conclusions drawn are discussed in the next sections.

9.1.2.1. Research aim 1: To assess and describe the safety leadership of the mine before the coaching program.

The safety leadership of the mine before the coaching program was assessed as part of the quantitative phase of the research before implementing the coaching program. Aspects pertaining to the selection and application of the measuring instrument as well as the data collection and analyses methods were discussed in chapter 6. The assessment focussed on eight dimensions of safety leadership behaviours namely credibility, accountability, collaboration, learning orientation, business integration, action orientation, feedback and recognition, and vision and values. The results of the pre-test were reported in chapter 7 and the overall safety leadership profile was presented in Table 7.3.

The main conclusions drawn about the safety leadership of the mine before the coaching were as follow:

- None of the dimensions obtained mean scores below 3.2 (Odendaal & Roodt, 1998), however, these results cannot necessarily be considered satisfactory in relation to safety leadership. Especially considering that the description of the

rating of 3 on the measuring instrument is 'indifference' which means being uncaring and uninterested. In light of the importance of safety leadership in improving safety performance organisations can clearly not afford indifference regarding the matter (Boyd, 2008; Clark, 2002; Cooper, 2001; Dunlap, 2011; Flynn & Shaw, 2011; Krause, 2004; Krause, 2007; Krause & Weekley, 2005; Pater, 2012).

- The dimension of credibility received the highest overall ratings on the pre-assessment.
- Improvement was particularly desirable on the dimensions of feedback and recognition and vision and values as these dimensions received the lowest ratings overall.

9.1.2.2. Research aim 2: To compare the different biographical groups' assessment of the safety leadership to determine if there are any significant differences.

Comparisons of the results of the different biological groups' assessment of the safety leadership were presented in Tables 7.6, 7.7, 7.9, 7.11 and 7.13 contained in chapter 7. The conclusions drawn about the different biological groups' assessment of the safety leadership were:

- Ratings of safety leadership differed significantly according to biographical groups.
- The dimensions for which significant differences were recorded were not the same for the different groups.
- Females generally recorded higher ratings than males and this concurs with another study that found that 360 degree ratings varied according to gender with a strong relationship between more favourable ratings and the female gender (Manning & Robertson, 2010).
- Africans' ratings were generally higher than the ratings given by Whites. In the literature reviewed, no other studies investigated or reported on differences in 360 degree ratings according to race.

- Overall, senior management recorded the lowest scores of all the job levels on all dimensions. Manning and Robertson (2010) found that seniority has an impact on 360 degree ratings with a relationship between senior management and more negative ratings.
- The supervisor/foreman, employee and H&S representative levels were significantly more positive about all of the dimensions than senior management and management.
- Overall, the 51 to 60 years group gave lower ratings than the other age categories on all dimensions. In the literature reviewed, no other studies investigated or reported on differences according to age in the 360 degree safety leadership assessment.
- Site 2 recorded higher ratings than Site 1 on most of the dimensions. This means that the two sites had different ratings about safety leadership and performance despite having identical safety policies and procedures, similar work activities and workforces. According to Krause (2004) geographical separation or departmental designations can lead to the development of safety subcultures or so called 'site-level cultures'.

9.1.2.3. *Research aim 3: To assess the safety leadership after completion of the coaching program to determine the impact thereof on safety leadership.*

The safety leadership after completion of the coaching program was assessed as part of the quantitative study and the comparisons of the pre-test and post-test results were presented in chapter 7.

a) *Conclusions about the safety leadership after completion of the coaching program*

The result of the pre-test and post-test comparison of the overall safety leadership profile was presented in Table 7.14. The conclusions drawn included:

- Ratings of safety leadership were generally higher on the post-assessment than on the pre-assessment.
- Significant improvements were reported on three dimensions of safety leadership namely accountability, collaboration and feedback and recognition.

b) Conclusions about the impact of the coaching program on safety leadership

The impact of the coaching program on safety leadership was determined based on the comparisons of the pre-test and post-test results as presented in Tables 7.15 to 7.29. The main conclusions drawn about the impact of the coaching program on safety leadership were:

- Coaching has a positive impact on safety leadership as reflected by the overall higher, and in some cases significantly higher, ratings recorded on the post-test compared to the pre-test.
- The impact of coaching was the strongest for middle managers (as opposed to senior management) that have been coached. The management level's post-test ratings were on average 0.43 points higher than their pre-test ratings. This represents an average increase of 13% between pre-test and post-test results and this translated into statistically significant improvements on six of the eight safety leadership dimensions.
- Coaching had the greatest impact on interpersonal and communication aspects that linked to collaborative or participative behaviours. This was evident in that the dimension of feedback and recognition received the lowest pre-test ratings and were rated significantly higher on the post-test by seven out of the 16 groups.
- Performance improvement and behavioural changes after coaching are observable to others.

9.1.2.4. Research aim 4: To determine the impact of the safety coaching program on managers' attitudes toward safety.

The impact of the coaching program on managers' attitudes towards safety was determined as part of the qualitative study and the findings were reported in chapter 8. Theme 1 and Theme 2 provided evidence of the achievement of this aim. The main conclusions drawn were:

- The coaching program had a positive impact on managers attitude towards safety. In other words, their attitudes toward safety changed and they were more positive about safety after completion of the coaching program.
- The aspect of the coaching program that contributed the most to changing managers' attitudes toward safety was the increase in legal knowledge and subsequent increased awareness of their legal responsibilities in terms of occupational health and safety.

9.1.2.5. Research aim 5: To determine the managers' personal experiences of the coaching process.

Managers' personal experiences of the coaching program was analysed during the qualitative study and the findings were presented in chapter 8. Theme 7 provided evidence of managers' experiences of the coaching program. The conclusions drawn about manager's experiences of the coaching program were:

- Managers appreciated the fact that the program was designed to focus on each participant's individual development needs.
- Coaching was a positive experience for managers and they would recommend it to other levels of employees in the organisation.
- The experience of receiving feedback such as from the 360 degree survey during the coaching process was described as "good", "interesting" and "appreciated".

- Most of the managers indicated that they were interested in repeating the survey to see whether others' perceptions have changed and if they have improved.

From the above, it is concluded that research aims 1 to 5 of the empirical study was achieved. The achievement of research aim 6 and 7 were addressed under the recommendations section (point 9.3).

9.1.3. Conclusions regarding the central research hypotheses

Two hypotheses in terms of the empirical study were put forward:

Hypothesis 1: A coaching program will positively impact on the safety leadership of the organisation.

Hypothesis 2: A safety coaching program will positively impact on managers' attitudes toward safety.

9.1.3.1. Conclusions about hypothesis 1

It was concluded that a safety coaching program did have a positive impact on the safety leadership of the organisation. The conclusions drawn from the literature review provided evidence in support of hypothesis 1. The conclusions drawn from both the quantitative results and the qualitative findings of the empirical study provided further evidence that this hypothesis was upheld.

In terms of the quantitative study, the post-test results revealed higher overall ratings than the pre-test on all dimensions. In addition, three out of the eight dimensions indicated a statistically significant improvement on the post assessment. In terms of the qualitative findings, Themes 3, 4, 6, and 7 provided evidence that the coaching program had a positive impact on a personal (Increased self-awareness), professional (increased knowledge and improved skills), and organisational level (improved safety performance).

9.1.3.2. *Conclusions about hypothesis 2*

It was concluded that a safety coaching program had a positive impact on the managers' attitudes toward safety in that it contributed to changing their attitudes. The literature review provided evidence that coaching is intended to help leaders to make attitude adjustments. Conclusions drawn from the qualitative findings (sub-theme 2.1 and 2.2) provided evidence that hypothesis 2 was upheld. It should be noted that the coaching program was not the sole reason for the change in managers' attitudes toward safety and that the previous accidents (sub-theme 2.3) and observed workplace improvements (sub-theme 2.4) were also contributing factors.

9.1.4. Conclusions regarding the general research aim

The general aim of the research was two-fold namely 1) to develop a safety leadership coaching program and 2) to evaluate the impact of a coaching program to improve safety leadership. The aim to develop a safety leadership coaching program was addressed as part of specific research aim 5 of the literature review. The achievement of this part of the overall aim and the conclusions drawn were discussed in point 9.1.1.5. The following additional conceptual conclusions regarding developing a safety leadership coaching program were drawn from the qualitative part of the empirical study:

- Combining other training interventions, such as the legal workshop, with the coaching activities contributes to the effectiveness of the coaching program as suggested in the literature regarding leadership development strategies.
- All five elements of safety leadership that were addressed in the coaching program play a role in improving safety leadership as purported by the integrated model of safety leadership developed by the researcher as presented in Table 8.5.
- Improving safety leadership had a positive impact on the development of the safety culture of the organisation and subsequent improved safety performance, as purported in the literature.

The aim to evaluate a coaching program to improve safety leadership was addressed as part of the conclusions drawn about the specific research aims of the quantitative and qualitative study as discussed in the previous sections. Following from this, the most significant conclusion that was made in terms of the general aim of the research was that:

- A coaching program specifically developed to improve safety leadership is an effective leadership development tool that can be employed to improve safety leadership.

9.1.5. Conclusions about contributions to the field of industrial and organisational psychology

The findings of the literature review and the results of the empirical study contributed to the field of industrial and organisational psychology and in particular to the sub-field of organisational behaviour. In terms of the literature review the contributions are as follow:

- The literature review provided the understanding that an organisation's safety culture plays an important role in its safety performance and that safety leadership is one of the key elements of an optimal safety culture.
- The literature review delivered insight into concepts and theoretical models that describe and explain safety leadership. This knowledge led to the development of an integrated safety leadership model. This model contributed to the understanding of effective safety leadership as a combination of five interrelated elements.
- The existing literature provided information on the importance of developing safety leadership but lacked information on how safety leadership *per se* could be changed or improved. This led to the development of a safety leadership development model that contributed to the understanding of how leadership development practices may be applied to improve safety leadership. This model

could serve as a framework for industrial psychologists to help organisations with developing their safety leadership.

- The existing literature about employing coaching in a safety environment focus on the training of managers to act as safety coaches to influence the safety behaviours of employees but lacks information on coaching the managers to improve their own safety behaviours. The literature review provided insight into the concept and theoretical models of executive coaching. This led to the development of a coaching program that organisations could utilise as a guide to improve their safety leadership.

In terms of the empirical study the contributions are as follow:

- The results of differences in 360 degree ratings according to gender, race, job level, age and geographical location provides information that contributes to the understanding that employees have different perceptions of safety leadership.
- The results of the research contributes to the existing knowledge about coaching in that it supported the conclusion that coaching improves self-awareness, knowledge and skills that result in positive changes in attitude and enhanced leadership behaviour.
- The results of the research also contributed new information in that it provided empirical evidence that the principles of coaching and leadership development can be applied specifically to develop safety leadership.

9.2. LIMITATIONS

The limitations of the study are discussed in terms of the literature review and the empirical study. Suggestions for further research are also presented.

9.2.1. Limitations: Literature review

In terms of the literature review the following limitations should be noted:

- The resources consulted about safety culture and safety leadership were limited and were mostly of international origin. Very little South African research or research specific to safety leadership in the mining industry could be found.
- Research on differences in ratings in a 360 degree assessment of safety leadership according to the demographic characteristics of participants were limited to gender and job level and no research could be found that investigated and explained differences in ratings according to race, age or geographical location.

9.2.2. Limitations: Empirical study

The ability to generalise the results of the study and to make recommendations for the field of industrial psychology may be limited because of a number of factors that include the size and characteristics of the sample as well as the specific environment in which it was conducted. The study was limited to one, relatively small, organisation in the clay mining industry and the following limitations should be taken into consideration:

- The specific industry in which the research was conducted and the relatively small sample size implies a limitation in the ability to generalise the results to other types and sizes of mining concerns (e.g. platinum, coal, gold, diamond).
- Limiting the research to one organisation presented a limitation in terms of the unbalanced distribution of race, gender and job level in the sample for the quantitative study.
- The sample for the qualitative study was homogenous in terms of gender and race and may limit the application and interpretation of the findings.

9.2.3. Suggestions for further research

The following suggestions for further research are proposed:

- Repeat the study in other mining companies as this would provide bigger and more gender and racially balanced samples to increase the generalisability of the results.
- Repeated studies would also contribute to the body of research and literature regarding safety leadership and coaching as a safety leadership development tool in the South African mining industry.
- It would be interesting to conduct research to examine the reasons for significant differences in ratings according to biographical groups, particularly race, age and geographical location, in order to provide guidance to safety leaders.

9.3. RECOMMENDATIONS

Recommendations were formulated according to the achievement and conclusions drawn from research aim 6 and 7 of the empirical study.

9.3.1. Research aim 6: To formulate recommendations for the organisation to improve safety leadership.

Based on the results of the study certain conclusions were drawn and the following recommendations for the organisation to improve safety leadership were made:

- The organisation reported a significant reduction in the number and severity of accidents and managers need to be aware that this situation can breed complacency. Thus, it is important for the organisation not to lose focus now and to remain diligent with their safety efforts.
- Managers reported that increased legal knowledge and awareness of legal responsibilities contributed to the positive changes in their attitudes toward safety. This is an important element of safety leadership but managers need to be cautious of focusing too much effort on legal requirements and

consequences because it could actually pose a barrier to developing safety culture.

- The dimension of credibility was rated significantly higher on the post-test by the least number of groups and was the only safety leadership behaviour that did not feature in any of the themes of the qualitative study. This is a concern because if safety leaders are not consistent with what they say and do it has an adverse effect on the rest of the organisation. Thus, managers are urged to focus on leading by example and to consistently apply safety standards and procedures.
- The dimension of business integration was only rated significantly higher on the post assessment by two of the 16 groups and it was also indicated as a remaining challenge in the qualitative findings. Thus, managers are encouraged to balance the allocation of resources and to emphasise the equal importance of production and safety.
- The organisation should consider rolling out the coaching program to lower levels as also suggested by the participants.
- The organisation should consider allowing those managers who indicated that they would like to continue with coaching to re-contract.
- The organisation should consider providing managers with training on technical aspect, regulations and guidance to implement safety procedures in the workplace as requested by some of the participants.
- Participants in the coaching program reported that it remains a challenge to make employees understand and accept their own responsibility for safety. Thus, it is recommended that the organisation increase the emphasis of employees' duties and the concept of a shared responsibility for safety in the induction training of employees.
- It is recommended that the organisation include safety leadership as a key performance area in their performance review system. This will enable the organisation to continue to identify and address development areas and challenges in order to determine if they have made progress to achieve the generative safety culture. This would also enable the organisation to comply with their Mining Charter responsibilities.

9.3.2. Research aim 7: To formulate recommendations in terms of the utilisation of a coaching program as a tool to improve safety leadership.

Recommendations were made based on the results and conclusions drawn in terms of the utilisation of a coaching program as tool to improve safety leadership. The objective of research on doctorate level is also to contribute to the field of industrial psychology and therefore conclusions and recommendations for practitioners in the field of industrial psychology were made. The main recommendations for practitioners in the field of industrial psychology that intend to employ coaching to assist organisations to improve their safety leadership are:

- Select coaches that are knowledgeable on safety leadership and that have a basic understanding of the business and its safety systems.
- Ensure that all the elements of safety leadership are assessed and addressed in the program to enhance the effectiveness of the program.
- Combine the coaching with classroom interventions, especially if the participants' knowledge of legal requirements and regulations is poor.
- Refrain from applying standard interventions across the board and ensure that coaching activities focus on individual development needs.
- It is recommended that the scheduling of sessions be considered carefully and that sessions be conducted as regularly as practically possible to ensure that the momentum of the program is maintained.
- The coaching program should not be viewed as a magic wand that will fix safety leadership overnight, as clearly challenges for effective safety leadership in organisations remain. Rather, it should be viewed as a step in the process and the inclusion of monitoring and follow up activities, such as in the performance management system of the organisation, is important.

9.4. CHAPTER SUMMARY

In this chapter the main conclusions of the literature review and the empirical study to show the achievement of the specific aims of the research were presented. Conclusions drawn in terms of the literature review and the quantitative and qualitative study were presented. Conclusions drawn regarding the research hypotheses and the overall aim of the research were also presented. The limitations of the study were indicated and suggestions for further research were made. Recommendations were formulated based on the results of the research for the case organisation as well as for industrial psychology practitioners that intend to utilise a coaching program to improve safety leadership.

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APPENDIX A ETHICAL CLEARANCE



DEPARTMENT OF INDUSTRIAL AND
ORGANISATIONAL PSYCHOLOGY

13th of June 2013

Dear Wika Esterhuizen
Student no: 34088393

RE: APPLICATION FOR RESEARCH ETHICAL CLEARANCE

This serves to confirm that your application for ethical clearance regarding your research project, **developing and evaluating a coaching program to improve safety leadership** has been approved at Departmental level as per university guidelines and requirements.

Your documents will be forward to the College of Economic Management Science: Research Ethics Committee for record keeping purposes.

For more information you can contact Dr Ophillia Ledimo at 012 429 8219 or email at manetom@unisa.ac.za

We wish you well with your research project.

Kind regards,

A handwritten signature in black ink, appearing to read 'O M Ledimo', written in a cursive style.

Dr O M Ledimo
(On behalf of the IOP Department Ethics Committee)



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APPENDIX B MHTA AND MA REGULATIONS

SUMMARY OF MHTA REGULATIONS

Chapter Nr.	Chapter Heading	Description
1	Appointments and Administration	<ul style="list-style-type: none"> • Sets out the prescribed period for representations (30 days) and payment of fines (60 days).
2	Repealed	
3	Repealed	
4	Explosives	<ul style="list-style-type: none"> • Regulations regarding the use of explosives including: <ul style="list-style-type: none"> - Security, receipt, storage, issue, transportation and destruction of explosives; - Approval of explosives; - Competency of persons performing blasting; - Certification of blasting apparatus and systems; - General precautions when blasting; and - Prevention of flammable gas and coal dust explosions.
5	Fires and Explosions	<ul style="list-style-type: none"> • Regulations regarding precautionary measures to prevent fires and explosions and the safe handling, storage, transporting and disposal of flammable liquids and gasses.
6	Health and Safety Representatives and Committees	<ul style="list-style-type: none"> • Regulations regarding the nomination, election and appointment of health and safety representatives and employee committee members. (MHTA Section 25 & 29)
7	Inspectorate of Mine Health and Safety	<ul style="list-style-type: none"> • Regulations about the inspectorate including the qualifications of inspectors and requirements of the authorisation certificates that must be issued to and carried by inspectors.
8	Machinery and Equipment	<ul style="list-style-type: none"> • Regulations about machinery and equipment including: <ul style="list-style-type: none"> - Air Compressors; - Underground Rail bound Transport; - Scraper Winch and Mono-Rope installations; - Lifting Equipment; - Fans; - Refrigeration and Air-Conditioning Installations; - General Machinery Regulations; and - Conveyor Belt regulations.
9	Mine Environmental Engineering and Occupational Hygiene	<ul style="list-style-type: none"> • Regulation 9.1 sets out requirements for Environmental Engineering such as the use of compressed air, early warning systems and ventilation control devices. • Regulation 9.2 provides the limits for when a system of occupational hygiene measurements and reporting, as contemplated

		in Section 12 of the MSHA, must be in place. It also sets out the requirements for the provision of water, ablution and change house facilities, respiratory protective equipment and the illumination of working places.
10	Miscellaneous and General Provisions	<ul style="list-style-type: none"> • Regulations regarding hazardous locations, water storage, pumping, draw points, tipping points, rock passes and box fronts.
11	Occupational Medicine	<ul style="list-style-type: none"> • Sets out the procedure for appeal regarding a finding of unfitness to perform work under Section 20 of the MSHA. • Specifies the information to be included in the Annual Medical report under Section 16 of MSHA. • Specifies the information and format of the Exit Certificate contemplated in Section 17 of MSHA. • Outlines the requirements for a system of medical surveillance contemplated in Section 13 of MSHA for: <ul style="list-style-type: none"> - Noise; - Asbestos dust; - Coal dust; and - Crystalline Silica dust.
12	Repealed	
13	Outlets	<ul style="list-style-type: none"> • Regulations to prevent employees from being trapped in any underground excavation by providing designated entrances to ingress and egress the underground workings.
14	Protection of the Surface and the Workings	<ul style="list-style-type: none"> • Regulations regarding the safe entering of working places where there is a risk of: <ul style="list-style-type: none"> - Rock bursts, rock falls or roof falls; - Drowning, asphyxiation, inundation, physical impact, chemical exposure or being trapped; or - Collapse of surface buildings and structures.
15	Repealed	
16	Rescue, First Aid and Emergency Preparedness and Response	<ul style="list-style-type: none"> • Sets out the requirements for: <ul style="list-style-type: none"> - Reporting to employer on the adequacy of escape and rescue procedures relating to explosions, fires and flooding; - Issuing, monitoring and record keeping of self-Contained Self-Rescuers; and - Emergency preparedness and response procedures.
17	Surveying, Mapping and Mine Plans	<ul style="list-style-type: none"> • Sets out the definitions of and the responsibility and requirements for Surveying, Mapping and Mine Plans on land (surface and underground) and at sea.
18	Tripartite Institutions	<ul style="list-style-type: none"> • Sets out the procedure for the nomination and

		appointment of members to represent employees, owners and departments of State at tripartite institutions.
19	Repealed	
20	Definitions	<ul style="list-style-type: none"> • Provides definitions of various terms in the regulations.
21	Forms	<ul style="list-style-type: none"> • Prescribed forms for the reporting of accidents and dangerous occurrences to the Department. • Prescribed forms for quarterly, bi-annual and annual reports on Occupational Hygiene measurements (airborne pollutants, thermal stress and noise) to the Department.
22	Schedules	<ul style="list-style-type: none"> • Prescribed qualifications for the competent persons performing primary blasting, secondary blasting and blasting assistants. • Sets out the occupational exposure limits (OEL) for: <ul style="list-style-type: none"> - Airborne Pollutants; - Noise; - Thermal stress (heat and cold); - Potable water. • Prescribed qualifications for persons conducting occupational hygiene measurements and audiograms.
23	Reporting of Accidents and Dangerous Occurrences See Table 6	<ul style="list-style-type: none"> • Identifies the accidents that must be reported as well as the procedure and prescribed forms that must be completed. • Identifies the dangerous occurrences that must be reported as well as the procedure and prescribed forms that must be completed.

SUMMARY OF MA REGULATIONS

Chapter Nr.	Chapter Heading	Description
1	Definitions	<ul style="list-style-type: none"> Provides definitions of various terms in the regulations.
2	Responsible persons	<ul style="list-style-type: none"> Makes provision for the appointment of the following important responsible persons and defines the duties and responsibilities of each: <ul style="list-style-type: none"> - Owner; - Subordinate Manager; - Mine Surveyor; - Engineer; - Subordinate Engineer; - Mine Overseer; - Shift Boss; - Environmental officers; - Safety Officers; and - Safety Representatives
3	General Provisions	<ul style="list-style-type: none"> No unauthorized entry into mine allowed Requirements for safety signs and notices to be posted Prohibition to damage or remove anything provided in the interest of health and safety
4	Workmen	<ul style="list-style-type: none"> Regulations in terms of workmen such as: Regulations about recording of complaints / keeping of record books of any defective condition or complaint about change house Recording of attendance of workmen daily No person in state of intoxication to enter Working hours Manager to keep record of employee personal information Noise and hearing conservation requirements – supply of personal protective equipment free of charge etc.
5	Surface Protection, the making safe of undermined ground and the prevention and combating of pollution	<ul style="list-style-type: none"> Rehabilitation procedures for surfaces and re-establishment of vegetation Procedures to deal with contaminated water and other waste materials Prohibition of any kind of dumping except in demarcated and controlled dumping areas Protection of streams, dams, pans and lakes Requirements for Environmental Management Programmes
6	Outlets, ladder ways and travelling ways	Arrangements for providing adequate hoisting, ladder, walk and other travelling ways and roads for workers.
7	Protection in workings	<ul style="list-style-type: none"> Protection procedures for sinking, entering and working in vertical or steeply inclined shaft, sump, rock pass or other dangerous excavation Requirements and use of hard hats Requirements and use of lifelines
8	Responsibility in workings	Sets out responsibilities for ganger or miner.

9	Repealed	
10	Ventilation, Gases and Dust	Requirements for ventilation and procedure for sampling and monitoring of gases and dust, especially in coal mines.
11	Precautions against Fire	Stationary electric motors, switchgear and other electrical apparatus must be built and fitted with non-flammable materials – only regulation not repealed
12	Repealed	
13	Repealed	
14	Statistical Returns	Every owner or manager must supply the Chief Inspector on monthly and yearly intervals of information regarding: <ul style="list-style-type: none"> - Work accomplished; - Persons employed; - Salaries and wages; - Machinery; - Profit and loss.
15	Lightning, Safety Lamps and Contraband	Requirements for carrying personal lights and lights for mobile equipment underground and at night
16	Winding	<ul style="list-style-type: none"> • Conveyance of persons in shafts and winzes • Design of winding engines • Construction of winding plant conveyances • Connection to winding plant conveyances • Requirements for winding ropes • Winding plant signals • Requirements in shafts and winzes • Examination of winding plant and shaft • Winding engine drivers • Banksmen and onsetters • Notices required at winding plants • Requirements at shafts being sunk • Small winding plants • Chairlifts
17	Elevators	Requirements for <ul style="list-style-type: none"> • Elevators • Hatchways • Counterpoises • Cars • Winding and balance ropes • Elevator machinery
18	Traction	<ul style="list-style-type: none"> • Authorisation and conditions to operate self-propelled mobile machinery • Conditions for operating a locomotive or train
19	Repealed	
20	Machinery: Special Safety Measures	<ul style="list-style-type: none"> • Competence and supervision when machinery is operated • Fencing off and guarding for machinery and moving parts • No work or repairs on machinery unless switched off and power supply locked out
21	Electricity	<ul style="list-style-type: none"> • Selection, installation and maintenance of electrical apparatus

		<ul style="list-style-type: none"> • Fencing and access prohibition signs required • Competence and authorisation for electrical work • No work or repairs without power supply locked out • Minimum clearance for overhead power lines • Notices and signs required for power lines • Regulations for operating machinery in vicinity of power lines • Regulations for roads or railway lines that cross under power lines • Regulations for cables • Regulations for explosion protected equipment
22	Boilers	<ul style="list-style-type: none"> • Regulations for installation, use, cleaning, inspection, testing, repairing, moving and disposal of boilers • Safety precautions and safety devices required for boilers • Information required to be displayed on boilers
23	Pressure Vessels, Compressors and Refrigeration Plants	<ul style="list-style-type: none"> • Regulations for installation, use, cleaning, inspection, and testing of pressure vessels, compressors and refrigeration plants • Safety precautions and safety devices required for pressure vessels, compressors and refrigeration plants • Information required to be displayed on pressure vessels and compressors
24	First Aid and Rescue Brigades	<ul style="list-style-type: none"> • Required first aid equipment for surface workings • First aid room required with first aid equipment for surface workings with > 300 employees • Required first aid equipment and rooms for underground workings • Required first aid equipment and rooms for coal mines • First aid equipment and rooms to be under the charge of person with valid first aid certificate • Notices required to be displayed • Regulations for cyanide and other poisonous substances • Arrangements in case of an injury
25	Repealed	
26	Summoning of Witnesses	<ul style="list-style-type: none"> • The prescribed form to use when summoning a witness to give evidence at an inquiry • Authorisation to issue summons • Signatures required for summons
27	Appeals	<ul style="list-style-type: none"> • Procedure for mine owner to appeal against a notice, decision, order or instruction given in terms of the Act • Procedure to conduct the appeals hearing
28	Certificates of competency	<p>Requirements and application and examination procedures for certificates of competency for:</p> <ul style="list-style-type: none"> • Mine Manager • Mine Overseer • Mine Surveyor

		<ul style="list-style-type: none"> • Mechanical Engineer • Electrical Engineer • Mine Assayer • Winding Engine Driver • Locomotive Engine Driver • Stationary Engine Driver • Boiler Attendant • Blasting • Lampman • Onsetter
29	Suspension and Cancellation of Certificates of competency	<ul style="list-style-type: none"> • The Chief and principal Inspector of Mines may cancel and retain any certificate issued when presented with information that the holder of a certificate has been guilty of gross negligence, misconduct or non-compliance to the regulations • The holder of the certificate may appeal against the decision
30	Repealed	
31	Offshore Installations	<ul style="list-style-type: none"> • Applications for offshore installations • Certificate of Fitness of offshore installations • Construction requirements for offshore installations • Requirements for accommodation, ventilation, heating and cooling • Requirements for emergency equipment e.g. number of life jackets, life boats etc.
32	Application Fees	<p>List of Application fees payable for:</p> <ul style="list-style-type: none"> • Prospecting permit • Mining permit • Mining license • Lodging an appeal • Supply of copies of documents • Division of mineral rights • Permits • Cancellation fees
33	Sketch Plans	Requirements for sketches and plans of the mine
34	Forms	<p>Prescribed forms for:</p> <ul style="list-style-type: none"> • Prospecting permit • Mining permit • Mining license • Winding plant permit • Elevator permit • Chairlift permit • Boiler permit • Reportable Accidents in terms of Regulation 25 - repealed
35	Repealed	

APPENDIX C COMMUNALITIES OF ITEMS

	Initial	Extraction
Q1	1.000	.757
Q2	1.000	.810
Q3	1.000	.668
Q4	1.000	.741
Q5	1.000	.702
Q6	1.000	.704
Q7	1.000	.697
Q8	1.000	.703
Q9	1.000	.679
Q10	1.000	.607
Q11	1.000	.542
Q12	1.000	.693
Q13	1.000	.767
Q14	1.000	.825
Q15	1.000	.751
Q16	1.000	.573
Q17	1.000	.733
Q18	1.000	.606
Q19	1.000	.747
Q20	1.000	.658
Q21	1.000	.672
Q22	1.000	.827
Q23	1.000	.731
Q24	1.000	.644
Q25	1.000	.716
Q26	1.000	.711
Q27	1.000	.746
Q28	1.000	.694
Q29	1.000	.724
Q30	1.000	.693
Q31	1.000	.728
Q32	1.000	.712
Q33	1.000	.698
Q34	1.000	.693
Q35	1.000	.767
Q36	1.000	.551

Q37	1.000	.599
Q38	1.000	.710
Q39	1.000	.674
Q40	1.000	.717
Q41	1.000	.769
Q42	1.000	.816
Q43	1.000	.663
Q44	1.000	.698

APPENDIX D FACTOR ANALYSIS

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	20.466	46.513	46.513	20.466	46.513	46.513	5.095	11.579	11.579
2	2.299	5.226	51.739	2.299	5.226	51.739	4.489	10.203	21.782
3	1.698	3.858	55.597	1.698	3.858	55.597	4.243	9.642	31.425
4	1.563	3.552	59.150	1.563	3.552	59.150	3.540	8.046	39.470
5	1.431	3.251	62.401	1.431	3.251	62.401	3.525	8.012	47.483
6	1.276	2.900	65.301	1.276	2.900	65.301	3.486	7.922	55.405
7	1.168	2.656	67.957	1.168	2.656	67.957	3.374	7.669	63.074
8	1.014	2.305	70.262	1.014	2.305	70.262	3.163	7.188	70.262
9	.950	2.159	72.420						
10	.847	1.926	74.346						
11	.819	1.861	76.208						
12	.768	1.746	77.953						
13	.737	1.676	79.629						
14	.704	1.601	81.230						
15	.640	1.455	82.685						
16	.582	1.324	84.009						
17	.566	1.286	85.295						
18	.490	1.115	86.409						
19	.481	1.092	87.502						
20	.436	.991	88.493						
21	.419	.952	89.445						
22	.391	.888	90.332						
23	.370	.840	91.173						

24	.348	.790	91.963						
25	.313	.711	92.674						
26	.302	.686	93.359						
27	.284	.645	94.004						
28	.268	.610	94.614						
29	.246	.559	95.174						
30	.237	.539	95.713						
31	.217	.492	96.205						
32	.202	.460	96.665						
33	.181	.412	97.078						
34	.175	.398	97.476						
35	.157	.356	97.832						
36	.155	.352	98.184						
37	.139	.315	98.500						
38	.125	.285	98.785						
39	.112	.255	99.039						
40	.101	.229	99.268						
41	.097	.221	99.489						
42	.085	.192	99.682						
43	.073	.165	99.846						
44	.068	.154	100.000						

APPENDIX E POST HOC TESTS

Pre-test Job level

Multiple Comparisons

Dependent Variable	(I) Level	(J) Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Credibility	Senior management	Management	-.35185	.23773	.701	-1.0907	.3870
		Supervisor / foreman	-.89039	.22039	.003	-1.5753	-.2055
		Employee	-.85217	.20762	.003	-1.4974	-.2069
		H&S Representative	-.79536	.20193	.005	-1.4229	-.1678
	Management	Senior management	.35185	.23773	.701	-.3870	1.0907
		Supervisor / foreman	-.53854	.19305	.104	-1.1385	.0614
		Employee	-.50031	.17833	.101	-1.0545	.0539
		H&S Representative	-.44351	.17168	.159	-.9771	.0900
	Supervisor / foreman	Senior management	.89039	.22039	.003	.2055	1.5753
		Management	.53854	.19305	.104	-.0614	1.1385
		Employee	.03822	.15446	1.000	-.4418	.5183
		H&S Representative	.09503	.14673	.981	-.3610	.5511
	Employee	Senior management	.85217	.20762	.003	.2069	1.4974
		Management	.50031	.17833	.101	-.0539	1.0545
		Supervisor / foreman	-.03822	.15446	1.000	-.5183	.4418
		H&S Representative	.05681	.12674	.995	-.3371	.4507
H&S Representative	Senior management	.79536	.20193	.005	.1678	1.4229	
	Management	.44351	.17168	.159	-.0900	.9771	

			Supervisor / foreman	-0.09503	.14673	.981	-.5511	.3610
			Employee	-.05681	.12674	.995	-.4507	.3371
Dimension_2	Scheffe	Senior management	Management	-.42014	.22412	.478	-1.1167	.2764
Accountability			Supervisor / foreman	-.88823	.20777	.001	-1.5340	-.2425
			Employee	-.95427	.19573	.000	-1.5626	-.3460
			H&S Representative	-.90203	.19037	.000	-1.4937	-.3104
		Management	Senior management	.42014	.22412	.478	-.2764	1.1167
			Supervisor / foreman	-.46809	.18200	.162	-1.0337	.0975
			Employee	-.53413	.16812	.042	-1.0566	-.0116
			H&S Representative	-.48189	.16185	.068	-.9849	.0211
		Supervisor / foreman	Senior management	.88823	.20777	.001	.2425	1.5340
			Management	.46809	.18200	.162	-.0975	1.0337
			Employee	-.06604	.14562	.995	-.5186	.3865
			H&S Representative	-.01380	.13833	1.000	-.4437	.4161
		Employee	Senior management	.95427	.19573	.000	.3460	1.5626
			Management	.53413	.16812	.042	.0116	1.0566
			Supervisor / foreman	.06604	.14562	.995	-.3865	.5186
			H&S Representative	.05224	.11948	.996	-.3191	.4236
		H&S Representative	Senior management	.90203	.19037	.000	.3104	1.4937
			Management	.48189	.16185	.068	-.0211	.9849
			Supervisor / foreman	.01380	.13833	1.000	-.4161	.4437
			Employee	-.05224	.11948	.996	-.4236	.3191
Dimension_3	Scheffe	Senior management	Management	-.47917	.20066	.227	-1.1028	.1445
Collaboration			Supervisor / foreman	-.74662	.18603	.004	-1.3248	-.1685
			Employee	-.65607	.17524	.009	-1.2007	-.1114
			H&S Representative	-.63977	.17045	.008	-1.1695	-.1101
		Management	Senior management	.47917	.20066	.227	-.1445	1.1028

		Supervisor / foreman		-.26745	.16295	.611	-.7739	.2390
		Employee		-.17691	.15052	.847	-.6447	.2909
		H&S Representative		-.16060	.14491	.873	-.6110	.2898
	Supervisor / foreman	Senior management		.74662	.18603	.004	.1685	1.3248
		Management		.26745	.16295	.611	-.2390	.7739
		Employee		.09055	.13038	.975	-.3146	.4957
		H&S Representative		.10685	.12385	.945	-.2781	.4918
	Employee	Senior management		.65607	.17524	.009	.1114	1.2007
		Management		.17691	.15052	.847	-.2909	.6447
		Supervisor / foreman		-.09055	.13038	.975	-.4957	.3146
		H&S Representative		.01631	.10698	1.000	-.3162	.3488
	H&S Representative	Senior management		.63977	.17045	.008	.1101	1.1695
		Management		.16060	.14491	.873	-.2898	.6110
		Supervisor / foreman		-.10685	.12385	.945	-.4918	.2781
		Employee		-.01631	.10698	1.000	-.3488	.3162
Dimension_4	Scheffe	Senior management	Management	-.17083	.26264	.980	-.9871	.6454
Learning orientation			Supervisor / foreman	-.85101	.24348	.018	-1.6077	-.0943
			Employee	-.84258	.22937	.011	-1.5554	-.1297
			H&S Representative	-.78307	.22309	.017	-1.4764	-.0897
	Management	Senior management		.17083	.26264	.980	-.6454	.9871
		Supervisor / foreman		-.68018	.21328	.041	-1.3430	-.0173
		Employee		-.67175	.19701	.023	-1.2840	-.0595
		H&S Representative		-.61224	.18967	.037	-1.2017	-.0228
	Supervisor / foreman	Senior management		.85101	.24348	.018	.0943	1.6077
		Management		.68018	.21328	.041	.0173	1.3430
		Employee		.00843	.17065	1.000	-.5219	.5388
		H&S Representative		.06794	.16211	.996	-.4359	.5717

		Employee	Senior management	.84258	.22937	.011	.1297	1.5554
			Management	.67175	.19701	.023	.0595	1.2840
			Supervisor / foreman	-.00843	.17065	1.000	-.5388	.5219
			H&S Representative	.05952	.14002	.996	-.3756	.4947
		H&S Representative	Senior management	.78307	.22309	.017	.0897	1.4764
			Management	.61224	.18967	.037	.0228	1.2017
			Supervisor / foreman	-.06794	.16211	.996	-.5717	.4359
			Employee	-.05952	.14002	.996	-.4947	.3756
Dimension_5	Scheffe	Senior management	Management	-.51042	.23375	.315	-1.2369	.2160
Business integration			Supervisor / foreman	-.69848	.21670	.037	-1.3719	-.0250
			Employee	-.78655	.20414	.006	-1.4210	-.1521
			H&S Representative	-.70926	.19855	.014	-1.3263	-.0922
		Management	Senior management	.51042	.23375	.315	-.2160	1.2369
			Supervisor / foreman	-.18806	.18982	.912	-.7780	.4019
			Employee	-.27613	.17534	.649	-.8211	.2688
			H&S Representative	-.19884	.16880	.846	-.7234	.3258
		Supervisor / foreman	Senior management	.69848	.21670	.037	.0250	1.3719
			Management	.18806	.18982	.912	-.4019	.7780
			Employee	-.08807	.15188	.987	-.5601	.3839
			H&S Representative	-.01078	.14428	1.000	-.4592	.4376
		Employee	Senior management	.78655	.20414	.006	.1521	1.4210
			Management	.27613	.17534	.649	-.2688	.8211
			Supervisor / foreman	.08807	.15188	.987	-.3839	.5601
			H&S Representative	.07729	.12462	.984	-.3100	.4646
		H&S Representative	Senior management	.70926	.19855	.014	.0922	1.3263
			Management	.19884	.16880	.846	-.3258	.7234
			Supervisor / foreman	.01078	.14428	1.000	-.4376	.4592

		Employee		-0.7729	.12462	.984	-.4646	.3100
Dimension_6	Scheffe	Senior management	Management	-.43750	.24661	.535	-1.2039	.3289
Action orientation			Supervisor / foreman	-.81993	.22863	.014	-1.5305	-1.1094
			Employee	-.77055	.21538	.014	-1.4399	-1.1012
			H&S Representative	-.75712	.20948	.013	-1.4081	-1.1061
		Management	Senior management	.43750	.24661	.535	-.3289	1.2039
			Supervisor / foreman	-.38243	.20027	.458	-1.0048	.2400
			Employee	-.33305	.18499	.520	-.9080	.2419
			H&S Representative	-.31962	.17809	.523	-.8731	.2339
		Supervisor / foreman	Senior management	.81993	.22863	.014	.1094	1.5305
			Management	.38243	.20027	.458	-.2400	1.0048
			Employee	.04938	.16024	.999	-.4486	.5474
			H&S Representative	.06281	.15222	.997	-.4103	.5359
		Employee	Senior management	.77055	.21538	.014	.1012	1.4399
			Management	.33305	.18499	.520	-.2419	.9080
			Supervisor / foreman	-.04938	.16024	.999	-.5474	.4486
			H&S Representative	.01343	.13148	1.000	-.3952	.4220
		H&S Representative	Senior management	.75712	.20948	.013	.1061	1.4081
			Management	.31962	.17809	.523	-.2339	.8731
			Supervisor / foreman	-.06281	.15222	.997	-.5359	.4103
			Employee	-.01343	.13148	1.000	-.4220	.3952
Dimension_7	Scheffe	Senior management	Management	-.65104	.26284	.194	-1.4679	.1658
Feedback & recognition			Supervisor / foreman	-.98100	.24367	.003	-1.7383	-.2237
			Employee	-1.16446	.22955	.000	-1.8779	-.4511
			H&S Representative	-1.09672	.22326	.000	-1.7906	-.4028
		Management	Senior management	.65104	.26284	.194	-.1658	1.4679

		Supervisor / foreman		-.32995	.21345	.665	-.9933	.3334
		Employee		-.51342	.19717	.152	-1.1262	.0993
		H&S Representative		-.44568	.18982	.243	-1.0356	.1442
	Supervisor / foreman	Senior management		.98100	.24367	.003	.2237	1.7383
		Management		.32995	.21345	.665	-.3334	.9933
		Employee		-.18346	.17078	.885	-.7142	.3473
		H&S Representative		-.11572	.16224	.972	-.6199	.3885
	Employee	Senior management		1.16446	.22955	.000	.4511	1.8779
		Management		.51342	.19717	.152	-.0993	1.1262
		Supervisor / foreman		.18346	.17078	.885	-.3473	.7142
		H&S Representative		.06774	.14013	.994	-.3678	.5032
	H&S Representative	Senior management		1.09672	.22326	.000	.4028	1.7906
		Management		.44568	.18982	.243	-.1442	1.0356
		Supervisor / foreman		.11572	.16224	.972	-.3885	.6199
		Employee		-.06774	.14013	.994	-.5032	.3678
Dimension_8	Scheffe	Senior management	Management	-.38021	.25491	.695	-1.1724	.4120
Vision & values			Supervisor / foreman	-.99873	.23632	.002	-1.7332	-.2643
			Employee	-.89063	.22262	.004	-1.5825	-.1988
			H&S Representative	-.88430	.21652	.003	-1.5572	-.2114
	Management	Senior management		.38021	.25491	.695	-.4120	1.1724
		Supervisor / foreman		-.61852	.20700	.067	-1.2619	.0248
		Employee		-.51042	.19122	.134	-1.1047	.0839
		H&S Representative		-.50409	.18408	.116	-1.0762	.0680
	Supervisor / foreman	Senior management		.99873	.23632	.002	.2643	1.7332
		Management		.61852	.20700	.067	-.0248	1.2619

	Employee	.10811	.16563	.980	-.4066	.6228
	H&S Representative	.11444	.15734	.970	-.3745	.6034
Employee	Senior management	.89063	.22262	.004	.1988	1.5825
	Management	.51042	.19122	.134	-.0839	1.1047
	Supervisor / foreman	-.10811	.16563	.980	-.6228	.4066
	H&S Representative	.00633	.13590	1.000	-.4160	.4287
H&S Representative	Senior management	.88430	.21652	.003	.2114	1.5572
	Management	.50409	.18408	.116	-.0680	1.0762
	Supervisor / foreman	-.11444	.15734	.970	-.6034	.3745
	Employee	-.00633	.13590	1.000	-.4287	.4160

Post-test Job level

Multiple Comparisons

Dependent Variable	(I) Level	(J) Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Dimension_1 Credibility	Senior management	Management	-.79861	.21580	.010	-1.4693	-.1280
		Supervisor / foreman	-.99230	.20006	.000	-1.6140	-.3706
		Employee	-.99353	.18846	.000	-1.5792	-.4078
		H&S Representative	-.85839	.18330	.000	-1.4281	-.2887
	Management	Senior management	.79861	.21580	.010	.1280	1.4693
		Supervisor / foreman	-.19369	.17524	.874	-.7383	.3509
		Employee	-.19492	.16188	.835	-.6980	.3082
		H&S Representative	-.05977	.15584	.997	-.5441	.4245
	Supervisor / foreman	Senior management	.99230	.20006	.000	.3706	1.6140
		Management	.19369	.17524	.874	-.3509	.7383
		Employee	-.00122	.14021	1.000	-.4370	.4345
		H&S Representative	.13392	.13320	.908	-.2800	.5479
	Employee	Senior management	.99353	.18846	.000	.4078	1.5792
		Management	.19492	.16188	.835	-.3082	.6980
		Supervisor / foreman	.00122	.14021	1.000	-.4345	.4370
		H&S Representative	.13514	.11505	.847	-.2224	.4927
	H&S Representative	Senior management	.85839	.18330	.000	.2887	1.4281
		Management	.05977	.15584	.997	-.4245	.5441
		Supervisor / foreman	-.13392	.13320	.908	-.5479	.2800
		Employee	-.13514	.11505	.847	-.4927	.2224

Dimension_2 Accountability	Scheffe	Senior management	Management	-.98264	.22319	.001	-1.6763	-.2890
			Supervisor / foreman	-1.08193	.20691	.000	-1.7250	-.4389
			Employee	-1.07574	.19492	.000	-1.6815	-.4700
			H&S Representative	-.96743	.18958	.000	-1.5566	-.3783
		Management	Senior management	.98264	.22319	.001	.2890	1.6763
			Supervisor / foreman	-.09929	.18124	.990	-.6626	.4640
			Employee	-.09310	.16742	.989	-.6134	.4272
			H&S Representative	.01521	.16118	1.000	-.4857	.5161
	Supervisor / foreman	Senior management	1.08193	.20691	.000	.4389	1.7250	
		Management	.09929	.18124	.990	-.4640	.6626	
		Employee	.00618	.14501	1.000	-.4445	.4569	
		H&S Representative	.11449	.13776	.952	-.3136	.5426	
	Employee	Senior management	1.07574	.19492	.000	.4700	1.6815	
		Management	.09310	.16742	.989	-.4272	.6134	
		Supervisor / foreman	-.00618	.14501	1.000	-.4569	.4445	
		H&S Representative	.10831	.11899	.934	-.2615	.4781	
H&S Representative	Senior management	.96743	.18958	.000	.3783	1.5566		
	Management	-.01521	.16118	1.000	-.5161	.4857		
	Supervisor / foreman	-.11449	.13776	.952	-.5426	.3136		
	Employee	-.10831	.11899	.934	-.4781	.2615		
Dimension_3 Collaboration	Scheffe	Senior management	Management	-.70486	.20383	.020	-1.3383	-.0714
			Supervisor / foreman	-.89724	.18896	.000	-1.4845	-.3100
			Employee	-.92037	.17801	.000	-1.4736	-.3672
			H&S Representative	-.84085	.17314	.000	-1.3789	-.3028
	Management	Senior management	.70486	.20383	.020	.0714	1.3383	
		Supervisor / foreman	-.19238	.16552	.852	-.7068	.3220	
		Employee	-.21551	.15290	.738	-.6907	.2597	

		H&S Representative		-.13599	.14720	.931	-.5934	.3215
Supervisor / foreman		Senior management		.89724	.18896	.000	.3100	1.4845
		Management		.19238	.16552	.852	-.3220	.7068
		Employee		-.02313	.13244	1.000	-.4347	.3885
		H&S Representative		.05639	.12581	.995	-.3346	.4474
Employee		Senior management		.92037	.17801	.000	.3672	1.4736
		Management		.21551	.15290	.738	-.2597	.6907
		Supervisor / foreman		.02313	.13244	1.000	-.3885	.4347
		H&S Representative		.07953	.10867	.970	-.2582	.4172
H&S Representative		Senior management		.84085	.17314	.000	.3028	1.3789
		Management		.13599	.14720	.931	-.3215	.5934
		Supervisor / foreman		-.05639	.12581	.995	-.4474	.3346
		Employee		-.07953	.10867	.970	-.4172	.2582
Dimension_4	Scheffe	Senior management	Management	-.64583	.20314	.042	-1.2772	-.0145
Learning orientation			Supervisor / foreman	-.99155	.18833	.000	-1.5768	-.4063
			Employee	-.92733	.17741	.000	-1.4787	-.3760
			H&S Representative	-.81092	.17256	.000	-1.3472	-.2746
		Management	Senior management	.64583	.20314	.042	.0145	1.2772
			Supervisor / foreman	-.34572	.16497	.359	-.8584	.1670
			Employee	-.28150	.15239	.493	-.7551	.1921
			H&S Representative	-.16508	.14670	.867	-.6210	.2908
		Supervisor / foreman	Senior management	.99155	.18833	.000	.4063	1.5768
			Management	.34572	.16497	.359	-.1670	.8584
			Employee	.06422	.13199	.993	-.3460	.4744
			H&S Representative	.18064	.12539	.722	-.2090	.5703
		Employee	Senior management	.92733	.17741	.000	.3760	1.4787
			Management	.28150	.15239	.493	-.1921	.7551

			Supervisor / foreman	-.06422	.13199	.993	-.4744	.3460
			H&S Representative	.11641	.10830	.885	-.2202	.4530
		H&S Representative	Senior management	.81092	.17256	.000	.2746	1.3472
			Management	.16508	.14670	.867	-.2908	.6210
			Supervisor / foreman	-.18064	.12539	.722	-.5703	.2090
			Employee	-.11641	.10830	.885	-.4530	.2202
Dimension_6	Scheffe	Senior management	Management	-.87917	.21223	.002	-1.5387	-.2196
Action orientation			Supervisor / foreman	-1.08885	.19675	.000	-1.7003	-.4774
			Employee	-1.11716	.18535	.000	-1.6932	-.5411
			H&S Representative	-1.00332	.18027	.000	-1.5636	-.4431
		Management	Senior management	.87917	.21223	.002	.2196	1.5387
			Supervisor / foreman	-.20968	.17234	.830	-.7453	.3259
			Employee	-.23799	.15920	.693	-.7328	.2568
			H&S Representative	-.12416	.15326	.956	-.6005	.3522
		Supervisor / foreman	Senior management	1.08885	.19675	.000	.4774	1.7003
			Management	.20968	.17234	.830	-.3259	.7453
			Employee	-.02831	.13789	1.000	-.4569	.4002
			H&S Representative	.08553	.13099	.980	-.3216	.4926
		Employee	Senior management	1.11716	.18535	.000	.5411	1.6932
			Management	.23799	.15920	.693	-.2568	.7328
			Supervisor / foreman	.02831	.13789	1.000	-.4002	.4569
			H&S Representative	.11384	.11315	.908	-.2378	.4655
		H&S Representative	Senior management	1.00332	.18027	.000	.4431	1.5636
			Management	.12416	.15326	.956	-.3522	.6005
			Supervisor / foreman	-.08553	.13099	.980	-.4926	.3216
			Employee	-.11384	.11315	.908	-.4655	.2378

Dimension_7 Feedback & recognition	Scheffe	Senior management	Management	-.86979	.20605	.002	-1.5102	-.2294
			Supervisor / foreman	-1.03083	.19103	.000	-1.6245	-.4372
			Employee	-.94253	.17995	.000	-1.5018	-.3833
			H&S Representative	-.88825	.17503	.000	-1.4322	-.3443
		Management	Senior management	.86979	.20605	.002	.2294	1.5102
			Supervisor / foreman	-.16104	.16733	.920	-.6811	.3590
			Employee	-.07274	.15457	.994	-.5531	.4076
			H&S Representative	-.01846	.14880	1.000	-.4809	.4440
		Supervisor / foreman	Senior management	1.03083	.19103	.000	.4372	1.6245
			Management	.16104	.16733	.920	-.3590	.6811
			Employee	.08830	.13388	.979	-.3278	.5044
			H&S Representative	.14258	.12718	.868	-.2527	.5378
		Employee	Senior management	.94253	.17995	.000	.3833	1.5018
			Management	.07274	.15457	.994	-.4076	.5531
			Supervisor / foreman	-.08830	.13388	.979	-.5044	.3278
			H&S Representative	.05428	.10985	.993	-.2871	.3957
H&S Representative	Senior management	.88825	.17503	.000	.3443	1.4322		
	Management	.01846	.14880	1.000	-.4440	.4809		
	Supervisor / foreman	-.14258	.12718	.868	-.5378	.2527		
	Employee	-.05428	.10985	.993	-.3957	.2871		
Dimension_8 Vision & values	Scheffe	Senior management	Management	-.80208	.20946	.007	-1.4530	-.1511
			Supervisor / foreman	-1.14105	.19418	.000	-1.7445	-.5376
			Employee	-.93273	.18293	.000	-1.5012	-.3642
			H&S Representative	-.88489	.17792	.000	-1.4378	-.3320
		Management	Senior management	.80208	.20946	.007	.1511	1.4530
			Supervisor / foreman	-.33896	.17009	.412	-.8676	.1897

	Employee	-.13065	.15712	.952	-.6190	.3577
	H&S Representative	-.08281	.15126	.990	-.5529	.3873
Supervisor / foreman	Senior management	1.14105	.19418	.000	.5376	1.7445
	Management	.33896	.17009	.412	-.1897	.8676
	Employee	.20831	.13609	.673	-.2146	.6313
	H&S Representative	.25616	.12928	.419	-.1456	.6580
Employee	Senior management	.93273	.18293	.000	.3642	1.5012
	Management	.13065	.15712	.952	-.3577	.6190
	Supervisor / foreman	-.20831	.13609	.673	-.6313	.2146
	H&S Representative	.04784	.11167	.996	-.2992	.3949
H&S Representative	Senior management	.88489	.17792	.000	.3320	1.4378
	Management	.08281	.15126	.990	-.3873	.5529
	Supervisor / foreman	-.25616	.12928	.419	-.6580	.1456
	Employee	-.04784	.11167	.996	-.3949	.2992

Pre-test Age
Multiple Comparisons

Dependent Variable		(I) age	(J) age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Dimension_1 Credibility	Games-Howell	21-30 years	31-40 years	-.20345	.17637	.659	-.6761	.2692
			41-50 years	-.44754	.20615	.143	-.9927	.0976
			51-60 years	.00403	.21838	1.000	-.5796	.5877
		31-40 years	21-30 years	.20345	.17637	.659	-.2692	.6761
			41-50 years	-.24409	.14131	.319	-.6180	.1298
			51-60 years	.20749	.15862	.568	-.2335	.6484
		41-50 years	21-30 years	.44754	.20615	.143	-.0976	.9927
			31-40 years	.24409	.14131	.319	-.1298	.6180
			51-60 years	.45158	.19118	.102	-.0625	.9657
		51-60 years	21-30 years	-.00403	.21838	1.000	-.5877	.5796
			31-40 years	-.20749	.15862	.568	-.6484	.2335
			41-50 years	-.45158	.19118	.102	-.9657	.0625
		51-60 years	21-30 years	-.32594	.22823	.565	-.9691	.3173
			31-40 years	-.31314	.19635	.469	-.8665	.2402
			41-50 years	-.26070	.22185	.710	-.8859	.3645
Dimension_2 Accountability	Games-Howell	21-30 years	31-40 years	.01280	.14916	1.000	-.3847	.4103
			41-50 years	.06524	.18202	.984	-.4148	.5453
			51-60 years	.32594	.17462	.257	-.1404	.7923
		31-40 years	21-30 years	-.01280	.14916	1.000	-.4103	.3847
			41-50 years	.05244	.14072	.982	-.3197	.4245
			51-60 years	.31314	.13101	.103	-.0454	.6716
		41-50 years	21-30 years	-.06524	.18202	.984	-.5453	.4148

			31-40 years		-.05244	.14072	.982	-.4245	.3197
			51-60 years		.26070	.16746	.413	-.1859	.7073
		51-60 years	21-30 years		-.32594	.17462	.257	-.7923	.1404
			31-40 years		-.31314	.13101	.103	-.6716	.0454
			41-50 years		-.26070	.16746	.413	-.7073	.1859
Dimension_3	Games-Howell	21-30 years	31-40 years		-.01954	.13515	.999	-.3811	.3420
Collaboration			41-50 years		-.04577	.17486	.994	-.5068	.4152
			51-60 years		.20733	.17704	.648	-.2675	.6821
		31-40 years	21-30 years		.01954	.13515	.999	-.3420	.3811
			41-50 years		-.02624	.13449	.997	-.3835	.3311
			51-60 years		.22686	.13731	.373	-.1561	.6098
		41-50 years	21-30 years		.04577	.17486	.994	-.4152	.5068
			31-40 years		.02624	.13449	.997	-.3311	.3835
			51-60 years		.25310	.17653	.486	-.2194	.7255
		51-60 years	21-30 years		-.20733	.17704	.648	-.6821	.2675
			31-40 years		-.22686	.13731	.373	-.6098	.1561
			41-50 years		-.25310	.17653	.486	-.7255	.2194
			31-40 years		-.45153	.22354	.256	-1.0815	.1784
			41-50 years		-.57432	.25256	.163	-1.2861	.1374
Dimension_4	Games-Howell	21-30 years	31-40 years		-.29185	.23810	.615	-.9337	.3500
Learning			41-50 years		-.41465	.26161	.397	-1.1110	.2817
orientation			51-60 years		.15968	.26019	.927	-.5357	.8551
		31-40 years	21-30 years		.29185	.23810	.615	-.3500	.9337
			41-50 years		-.12280	.14396	.829	-.5037	.2581
			51-60 years		.45153	.14138	.019	.0623	.8407
		41-50 years	21-30 years		.41465	.26161	.397	-.2817	1.1110
			31-40 years		.12280	.14396	.829	-.2581	.5037

			51-60 years	.57432	.17815	.012	.0983	1.0503
		51-60 years	21-30 years	-.15968	.26019	.927	-.8551	.5357
			31-40 years	-.45153	.14138	.019	-.8407	-.0623
			41-50 years	-.57432	.17815	.012	-1.0503	-.0983
Dimension_5	Games-Howell	21-30 years	31-40 years	-.00917	.19107	1.000	-.5225	.5041
Business			41-50 years	-.05100	.20665	.995	-.6009	.4989
integration			51-60 years	.20111	.22203	.802	-.3912	.7934
		31-40 years	21-30 years	.00917	.19107	1.000	-.5041	.5225
			41-50 years	-.04183	.12016	.985	-.3583	.2747
			51-60 years	.21028	.14502	.483	-.1910	.6115
		41-50 years	21-30 years	.05100	.20665	.995	-.4989	.6009
			31-40 years	.04183	.12016	.985	-.2747	.3583
			51-60 years	.25211	.16501	.433	-.1938	.6980
		51-60 years	21-30 years	-.20111	.22203	.802	-.7934	.3912
			31-40 years	-.21028	.14502	.483	-.6115	.1910
			41-50 years	-.25211	.16501	.433	-.6980	.1938
Dimension_6	Games-Howell	21-30 years	31-40 years	-.22856	.21984	.728	-.8211	.3640
Action orientation			41-50 years	-.19634	.24427	.852	-.8458	.4532
			51-60 years	.04758	.24029	.997	-.5946	.6898
		31-40 years	21-30 years	.22856	.21984	.728	-.3640	.8211
			41-50 years	.03223	.13823	.995	-.3339	.3983
			51-60 years	.27615	.13106	.179	-.0846	.6368
		41-50 years	21-30 years	.19634	.24427	.852	-.4532	.8458
			31-40 years	-.03223	.13823	.995	-.3983	.3339
			51-60 years	.24392	.16886	.479	-.2067	.6945
		51-60 years	21-30 years	-.04758	.24029	.997	-.6898	.5946
			31-40 years	-.27615	.13106	.179	-.6368	.0846

			41-50 years	- .24392	.16886	.479	-.6945	.2067
Dimension_7	Games-Howell	21-30 years	31-40 years	-.33705	.20931	.385	-.8993	.2252
Feedback & recognition			41-50 years	-.18309	.24676	.880	-.8358	.4696
			51-60 years	.04284	.24819	.998	-.6194	.7051
		31-40 years	21-30 years	.33705	.20931	.385	-.2252	.8993
			41-50 years	.15396	.16447	.786	-.2822	.5901
			51-60 years	.37989	.16660	.133	-.0825	.8422
		41-50 years	21-30 years	.18309	.24676	.880	-.4696	.8358
			31-40 years	-.15396	.16447	.786	-.5901	.2822
			51-60 years	.22593	.21175	.711	-.3406	.7924
		51-60 years	21-30 years	-.04284	.24819	.998	-.7051	.6194
			31-40 years	-.37989	.16660	.133	-.8422	.0825
			41-50 years	-.22593	.21175	.711	-.7924	.3406
Dimension_8	Games-Howell	21-30 years	31-40 years	-.27001	.21661	.602	-.8531	.3131
Vision & values			41-50 years	-.44006	.24370	.282	-1.0870	.2069
			51-60 years	.11442	.26012	.971	-.5797	.8085
		31-40 years	21-30 years	.27001	.21661	.602	-.3131	.8531
			41-50 years	-.17005	.14566	.650	-.5557	.2156
			51-60 years	.38442	.17172	.146	-.0950	.8638
		41-50 years	21-30 years	.44006	.24370	.282	-.2069	1.0870
			31-40 years	.17005	.14566	.650	-.2156	.5557
			51-60 years	.55448	.20483	.049	.0023	1.1067
		51-60 years	21-30 years	-.11442	.26012	.971	-.8085	.5797
			31-40 years	-.38442	.17172	.146	-.8638	.0950
			41-50 years	-.55448	.20483	.049	-1.1067	-.0023

Post-test Age

Multiple Comparisons

Dependent Variable		(I) age	(J) age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Dimension_1 Credibility	Scheffe	21-30 years	31-40 years	-.17441	.14583	.699	-.5854	.2366
			41-50 years	-.28110	.15877	.374	-.7285	.1663
			51-60 years	-.26898	.21919	.681	-.8867	.3487
		31-40 years	21-30 years	.17441	.14583	.699	-.2366	.5854
			41-50 years	-.10669	.11425	.832	-.4287	.2153
			51-60 years	-.09457	.18944	.969	-.6285	.4393
		41-50 years	21-30 years	.28110	.15877	.374	-.1663	.7285
			31-40 years	.10669	.11425	.832	-.2153	.4287
			51-60 years	.01212	.19957	1.000	-.5503	.5746
	51-60 years	21-30 years	.26898	.21919	.681	-.3487	.8867	
		31-40 years	.09457	.18944	.969	-.4393	.6285	
		41-50 years	-.01212	.19957	1.000	-.5746	.5503	
Dimension_2 Accountability	Scheffe	21-30 years	31-40 years	-.17929	.15091	.703	-.6046	.2460
			41-50 years	-.34727	.16430	.218	-.8103	.1157
			51-60 years	-.41736	.22682	.338	-1.0566	.2219
		31-40 years	21-30 years	.17929	.15091	.703	-.2460	.6046
			41-50 years	-.16798	.11823	.570	-.5012	.1652
			51-60 years	-.23807	.19604	.689	-.7905	.3144
		41-50 years	21-30 years	.34727	.16430	.218	-.1157	.8103
			31-40 years	.16798	.11823	.570	-.1652	.5012
			51-60 years	-.07009	.20652	.990	-.6521	.5119
51-60 years	21-30 years	.41736	.22682	.338	-.2219	1.0566		

			31-40 years	.23807	.19604	.689	-.3144	.7905
			41-50 years	.07009	.20652	.990	-.5119	.6521
Dimension_3	Scheffe	21-30 years	31-40 years	-.10909	.13794	.890	-.4978	.2796
Collaboration			41-50 years	-.18277	.15017	.687	-.6060	.2404
			51-60 years	.01250	.20732	1.000	-.5718	.5968
		31-40 years	21-30 years	.10909	.13794	.890	-.2796	.4978
			41-50 years	-.07368	.10807	.926	-.3782	.2309
			51-60 years	.12159	.17919	.927	-.3834	.6266
		41-50 years	21-30 years	.18277	.15017	.687	-.2404	.6060
			31-40 years	.07368	.10807	.926	-.2309	.3782
			51-60 years	.19527	.18877	.784	-.3367	.7272
		51-60 years	21-30 years	-.01250	.20732	1.000	-.5968	.5718
			31-40 years	-.12159	.17919	.927	-.6266	.3834
			41-50 years	-.19527	.18877	.784	-.7272	.3367
Dimension_4	Scheffe	21-30 years	31-40 years	-.02000	.13916	.999	-.4122	.3722
Learning orientation			41-50 years	-.02102	.15150	.999	-.4480	.4059
			51-60 years	-.02250	.20915	1.000	-.6119	.5669
		31-40 years	21-30 years	.02000	.13916	.999	-.3722	.4122
			41-50 years	-.00102	.10902	1.000	-.3083	.3062
			51-60 years	-.00250	.18077	1.000	-.5120	.5070
		41-50 years	21-30 years	.02102	.15150	.999	-.4059	.4480
			31-40 years	.00102	.10902	1.000	-.3062	.3083
			51-60 years	-.00148	.19044	1.000	-.5382	.5352
		51-60 years	21-30 years	.02250	.20915	1.000	-.5669	.6119
			31-40 years	.00250	.18077	1.000	-.5070	.5120
			41-50 years	.00148	.19044	1.000	-.5352	.5382
Dimension_5	Scheffe	21-30 years	31-40 years	-.12803	.14611	.857	-.5398	.2837

Business integration		41-50 years		-.10862	.15907	.926	-.5569	.3397
		51-60 years		-.29479	.21960	.615	-.9137	.3241
31-40 years	21-30 years		.12803	.14611	.857	-.2837	.5398	
	41-50 years		.01941	.11447	.999	-.3032	.3420	
51-60 years		-.16676	.18980	.856	-.7017	.3681		
41-50 years	21-30 years		.10862	.15907	.926	-.3397	.5569	
	31-40 years		-.01941	.11447	.999	-.3420	.3032	
51-60 years		-.18618	.19995	.833	-.7497	.3773		
51-60 years	21-30 years		.29479	.21960	.615	-.3241	.9137	
	31-40 years		.16676	.18980	.856	-.3681	.7017	
41-50 years		.18618	.19995	.833	-.3773	.7497		
Dimension_6	Scheffe	21-30 years	31-40 years	.02182	.14718	.999	-.3930	.4366
Action orientation		41-50 years	51-60 years	-.04780	.16023	.993	-.4994	.4038
51-60 years		-.01750	.22120	1.000	-.6409	.6059		
31-40 years	21-30 years		-.02182	.14718	.999	-.4366	.3930	
	41-50 years		-.06961	.11531	.947	-.3946	.2553	
51-60 years		-.03932	.19119	.998	-.5781	.4995		
41-50 years	21-30 years		.04780	.16023	.993	-.4038	.4994	
	31-40 years		.06961	.11531	.947	-.2553	.3946	
51-60 years		.03030	.20141	.999	-.5373	.5979		
51-60 years	21-30 years		.01750	.22120	1.000	-.6059	.6409	
	31-40 years		.03932	.19119	.998	-.4995	.5781	
41-50 years		-.03030	.20141	.999	-.5979	.5373		
Dimension_7	Scheffe	21-30 years	31-40 years	.10227	.14070	.912	-.2942	.4988
Feedback &		41-50 years	51-60 years	.07458	.15318	.971	-.3571	.5063
recognition	51-60 years		-.05625	.21147	.995	-.6522	.5397	
31-40 years		21-30 years	-.10227	.14070	.912	-.4988	.2942	

		41-50 years		-.02770	.11023	.996	-.3383	.2830
		51-60 years		-.15852	.18277	.861	-.6736	.3566
	41-50 years	21-30 years		-.07458	.15318	.971	-.5063	.3571
		31-40 years		.02770	.11023	.996	-.2830	.3383
		51-60 years		-.13083	.19254	.927	-.6735	.4118
	51-60 years	21-30 years		.05625	.21147	.995	-.5397	.6522
		31-40 years		.15852	.18277	.861	-.3566	.6736
		41-50 years		.13083	.19254	.927	-.4118	.6735
Dimension_8	Scheffe	21-30 years	31-40 years	.05152	.14418	.988	-.3548	.4578
Vision & values			41-50 years	.04986	.15697	.992	-.3925	.4922
			51-60 years	-.06667	.21670	.992	-.6774	.5440
	31-40 years	21-30 years		-.05152	.14418	.988	-.4578	.3548
		41-50 years		-.00166	.11296	1.000	-.3200	.3167
		51-60 years		-.11818	.18729	.941	-.6460	.4096
	41-50 years	21-30 years		-.04986	.15697	.992	-.4922	.3925
		31-40 years		.00166	.11296	1.000	-.3167	.3200
		51-60 years		-.11653	.19731	.950	-.6726	.4395
	51-60 years	21-30 years		.06667	.21670	.992	-.5440	.6774
		31-40 years		.11818	.18729	.941	-.4096	.6460
		41-50 years		.11653	.19731	.950	-.4395	.6726

APPENDIX F OUTLINE OF THE COACHING PROGRAM

PURPOSE OF THE PROGRAM: The aim of this coaching program is to assist you in developing your safety leadership skills so that you may be prepared to deal with the challenges that face you and your company in the area of safety.

PROGRAM OUTCOMES: The outcomes to be achieved as a result of this coaching program are:

1. Improved self-knowledge and awareness
2. Improved abilities, skills and relationships
3. Improved business and safety performance

PROGRAM STRUCTURE:

This program is divided into five parts:

PART 1 PLANNING

You and your coach determine the coaching session arrangements and sign a formal coaching agreement concerning your roles and responsibilities.

PART 2 ASSESSMENT OF SAFETY LEADERSHIP

Your current safety leadership performance is assessed. The results of the assessment is analysed and discussed to identify your strengths and possible development areas.

PART 3 INDIVIDUAL DEVELOPMENT PLAN (IDP)

You and your coach create an individual development plan based on the assessment results.

PART 4 IMPLEMENTATION

You participate in the coaching sessions and implement the actions as identified in your IDP.

PART 5 EVALUATION

Your progress and achievement of goals are reviewed at the end of the program.

SESSION 1 - Planning

- Introduction to the program: Discussion of purpose, program outcomes and structure.
- Discussion of roles and responsibilities.
- Determining of coaching schedule.
- Signing of coaching agreement.

SESSION 2 – Assessment

- Introduction to the elements of safety leadership.
- Discussion and self-assessment of current performance on the elements of safety leadership.
- Feedback and discussion of 360 degree pre assessment results.

SESSION 3 – Individual development plan (IDP)

- Identify development areas.
- Identify goals, actions, time frames and how achievement of goals will be measured.
- Complete the IDP.

SESSION 4 to as needed - Implementation

- Discuss actions implemented and progress achieved and/or difficulties that remain.
- Address additional training needs if applicable.

FINAL SESSION – Evaluation

- Review achievement of goals.
- Provide feedback of and discuss 360 post assessment results.
- Conclude the coaching and/or discuss follow up measures.