THE INFLUENCE OF SUPERVISORY BEHAVIOUR AND THE INTERNAL WORK ENVIRONMENT ON EMPLOYEE-DRIVEN INNOVATION AND CREATIVITY IN AN OPEN DISTANCE e-LEARNING INSTITUTION IN SOUTH AFRICA

by

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submitted in accordance with the requirements for
the degree of

MASTER OF COMMERCE

in the subject

HUMAN RESOURCE MANAGEMENT

at the

UNIVERSITY OF SOUTH AFRICA

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January 2020

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I declare that the above dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the dissertation to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

18 January 2020

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SIGNATURE   **DATE**

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude and appreciation to everyone who supported me during my studies. I would like to specifically thank the following people:

- My Lord for his guidance and blessing through the entire process.
- My supervisor, Prof. Mariette Coetzee, for her patience, belief, encouragement and guidance throughout the research.
- My husband, Leon, who encouraged, listened and supported me on this amazing journey.
- My two children, Leané and Charl – all your hugs and kisses just made me work harder.
- All my colleagues, friends and family, who listened, advised and supported me.
- My employer, the University of South Africa, for the research and development leave, study bursary and MDSP funding.
- Each person who contributed to the study in some way.
- Mr Erik van Zyl, for his assistance with LimeSurvey.
- Dr Marthi Pohl, for her statistical expertise.
- Mr Thys de Jager, for his intensive and precise language editing.

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ABSTRACT

Innovation and creativity are regarded as key drivers for organisational innovative success. Organisations that do not have a strategic focus on innovation and creativity and do not have a culture fostering innovative behaviour, will find it difficult to survive in these turbulent times. The innovative ability of organisations depends heavily on all employees at all levels of the organisation. Innovations driven by employees are known as EDI and creativity. Even though organisations understand the importance of EDI, a significant number of barriers within organisations still hamper EDI and creativity.

The study was exploratory in nature and provided valuable insights into determining whether supervisory behaviour and the internal work environment had an impact on EDI and creativity in an ODeL institution in South Africa. A quantitative survey design was selected for this study. A census approach was followed, and primary quantitative data were collected from a subgroup within the identified institution, using self-administered electronic questionnaires. Through the process of exploratory factor analysis, five supervisory behaviour/management factors and five internal work environment factors were identified. The supervisory behaviour/management factors included supervisory support, management support, innovation management, innovative leadership, and team innovation. The internal work environment factors included organisational innovation culture, innovation mechanisms, innovative opportunities, risk-taking tolerance, and dedication to innovation. Correlation and structural equation modelling were conducted. The results indicate a relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity. Recommendations regarding supervisory behaviour and

creating enabling work environments to enhance and support EDI and creativity are made.

Key terms

employee-driven innovation, EDI, creativity, supervisory support, internal work environment, organisational innovation culture, innovative leadership, innovation management, higher education

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CHAPTER 1 – ORIENTATION AND BACKGROUND

The focus of this research was to establish whether supervisory behaviour and the internal work environment impacted employee-driven innovation (EDI) and creativity at an open distance e-learning (ODeL) institution in South Africa. Chapter 1 summarises the background to and reason for the research; formulates the problem statement, research questions, and research aims; describes the research plan and methodology and concludes with a framework of the study.

1.1 INTRODUCTION

Leading organisations throughout the world focus on innovation. These organisations recognise that effective and continuous innovation add value and drive competitiveness, and thus instill distinct strategies, processes, and a culture that support innovation (Ikeda & Marshall, 2016). The literature on innovation considers innovation as an important driver for long-term organisational success and even for survival. Organisations need to change in response to internal and external environment factors and innovation serves to deal with such turbulent external environments (Hueske & Guenther, 2015). If organisations wish to survive, they must learn to cope with high-speed change and the complexity thereof. Organisations that are able to innovate effectively will be capable of responding to changes faster (Chughtai, 2013; Naranjo-Valencia, Jiménez-Jiménez & Sanz-Valle, 2016). By determining whether supervisory behaviour and the internal work environment impact on the innovative and creative ability of employees, the ODeL institution will be able to determine whether changes should be made to facilitate more innovative behaviour.

1.2 BACKGROUND TO AND RATIONALE FOR THE STUDY

Research on employee innovation supports the notion that all employees have the ability to engage in innovative behaviour, irrespective of their qualifications or position (Aaltonen & Hytti, 2014). Employee innovation and creativity can, however, be stymied by many barriers blocking the opportunity to engage in innovative and creative behaviour (Aaltonen & Hytti, 2014).

Some of the areas that are discussed include supervisory behaviour and the organisation's internal work environment.

For the purposes of this study the creativity of the individual and society was not studied, although these topics were reviewed for a better understanding of what innovation and creativity entail (Mumford, Hester & Robledo, 2012). The study took a focused approach on EDI and creativity in an organisational context.

The research focus was not on research and development (R&D) innovation, but rather on non-R&D innovation. Non-R&D innovation implies involving employees through EDI. Vagn, Jense & Broberg (2016) describe that EDI improves the innovation potential of organisations by involving employees as innovative resources. Teglborg-Lefèvre (2010: 212) defines the term EDI as a "systematic and active contribution of employees to the process of innovation", and explains that EDI refers to the possibility of employees, of whom innovation in not necessarily expected, to suggest new innovative ideas.

The study focuses on employee innovation and creativity and the influence that a supervisor's behaviour and support, as well as the internal work environment at an institution, can have on EDI and creativity in an ODeL institution in South Africa. A short discussion of each topic follows.

1.2.1 Employee-driven innovation and creativity

In today's ever-changing business environment, an organisation's ability to come up with innovative ideas and processes in response to change is considered vital for organisational success and survival. In such an environment, motivating employees to engage and be actively involved in innovative and creative behaviour may result in the organisation obtaining a competitive advantage (Chughtai, 2013).

As previously stated, research on employee innovation supports the idea that all employees have the ability to innovate, regardless of their level of education or position (Aaltonen & Hytti, 2014). Employee innovation can be defined as "emergent, spontaneous, informal und unplanned generation and implementation of new ideas,

products and processes in the remaking of everyday work practice – including the everyday remaking of jobs and organisational practices" (Høyrup, Bonnafous-Boucher, Hasse, Lotz & Møller, 2012: 8). In their daily work employees face challenges that can be solved through creative and innovative thinking and they are able to assess whether the proposed solutions will be viable (De Spiegelaere & Van Gyes, 2012). Brandi and Hasse (2012) suggest that employee innovation is valuable as a bottom-up process, where employees, rather than management, identify problems and develop solutions for them. If innovation plays such an important role in organisational growth, performance or even survival, it is of critical importance that the following questions are asked:

- How innovative are organisations in South Africa?
- How important is innovation at an ODeL institution?

The following sections address the questions raised above.

a) A national perspective on the importance of innovation

In order to gain insight into how innovative organisation in South Africa are, the Department of Science and Technology commissioned the Centre for Science, Technology and Innovation Indicators of the Human Sciences Research Council to conduct a series of innovation surveys. In 2008 the staff at the Centre collected data for the South African Innovation Survey 2008 from which it was gleaned that organisations in South African have a reasonably high innovation rate (Moses, Sithole, Blankley, Labadarios, Makelane & Nkobole, 2012).

Figure 1.1 provides a graphical representation of the innovation rate of South African organisations. "From the South African Innovation Survey 2008 (covering the years 2005–2007) a total of 65.4% of enterprises engaged in innovation activities, while 34.6% of enterprises reported no innovation activities. Successful innovations (where innovative products were introduced to the market or innovative processes were implemented within the enterprise) were recorded by 27.2% of enterprises. Successful innovators consisted of product only innovators (8.9%), process only innovators (10.3%) and innovators with both product and process innovations (7.9%)" (Moses *et*

al., 2012: 2). Unsuccessful innovators (38.2% of enterprises) consisted of abandoned innovation activities (1%), both abandoned and on-going innovation activities (3.5%) and on-going innovation activities (33.7%) (Moses et al., 2012).

Figure 1.1: Innovation rate of South African enterprises by type of innovation activity
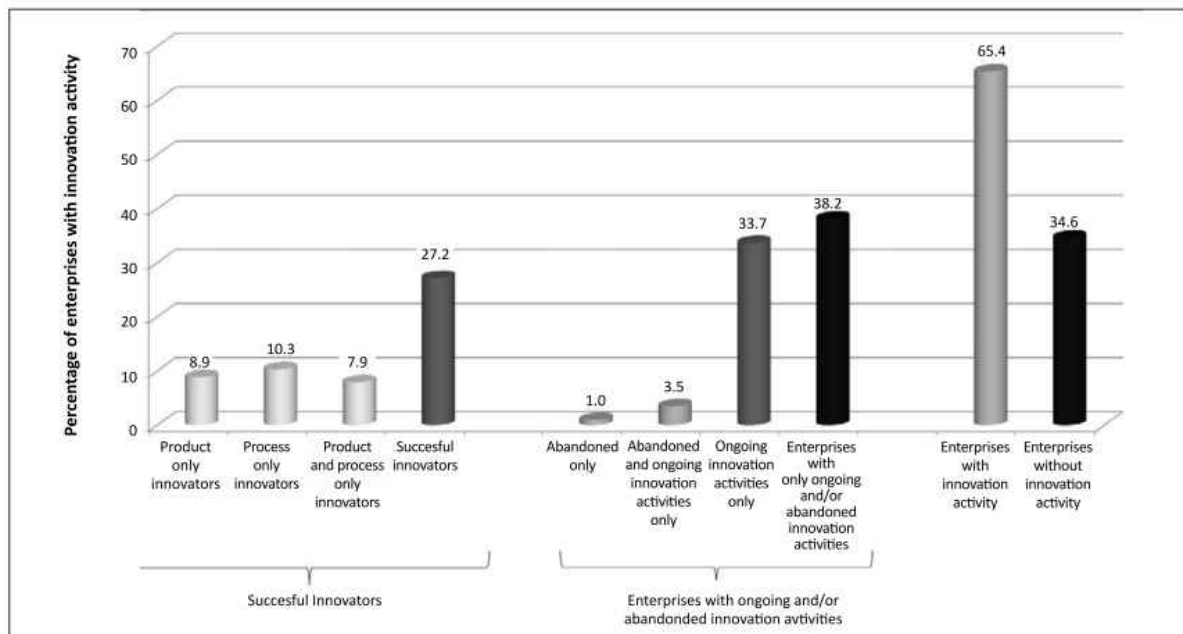
Source: Moses et al. (2012: 2)

The 2008 Innovation Survey results indicate that while 65.4% of organisations in South Africa are involved in innovative activities, only 27.2% of the organisations successfully introduced innovations to the market from 2005 to 2007 (Moses et al., 2012).

The results further indicate that organisations in South Africa were very concerned with innovation and its potential (Blankley & Moses, 2009). South African organisations compared well with those in European countries with regard to innovation, and in some cases even performed better (Blankley & Moses, 2009). Senior management in South African organisations should take advantage of these positive results by adapting policies or procedures and creating an innovative culture to support and encourage innovative behaviour from all employees (Moses et al., 2012). Managers in the services sector should identify and understand the processes behind innovation in their organisations and provide the necessary support and encouragement for such activities (Blankley & Moses, 2009).

b) An institutional perspective on the importance of innovation and creativity

The ODeL institution where the study was completed resulted from a merger of three higher education institutions in 2004 (University of South Africa, 2015a). To gain insight into how important innovation is in creating and sustaining a competitive edge, the focus is on the ODeL institution's strategic goals as outlined in the various policies and governance guidelines of the institution. According to the institution's 2015 strategic plan, the institution "aims to establish itself as a leading provider of world-class higher education opportunities through open and distance e-learning: nationally, on the African continent and internationally" (University of South Africa, 2015a: 2). In the international context for distance education, the institution seeks to establish itself and be recognised as a leading university among the mega-universities of the world (University of South Africa, 2015a).

As part of the institution's aim to sustain a competitive edge nationally, continentally and globally, the importance of innovation and creativity within the institution is set out in a number of documents:

- In 2011 12 key concepts were identified to promote a nurturing and strong culture at the institution. The document became known as the 11 Cs +1 and it would render support in changing the institution's culture (University of South Africa, 2011a: 11). One of the 11 Cs +1 is focusing on creativity: "the act of generating imaginative and innovative responses and solutions and liberating potential" (University of South Africa, 2011b: 1).
- The ODeL institution's 2016 to 2030 strategic plan was adopted by the University Council on 24 April 2015 (University of South Africa, 2015b). The strategic plan sets out the ODeL institution's vision, mission, values, and strategic focus areas for a fifteen-year period. The plan consists of three strategic focus areas, which will each be implemented over a five-year period. The first strategic focus area reconfirms the institution's aim "towards becoming a leading ODeL, being a comprehensive university in teaching and learning, and focusing on research, **innovation** and community engagement" (University of South Africa, 2015b: 5). The second strategic focus area focuses on "crafting and embedding an agile,

innovative, sustainable and efficient operational environment" (University of South Africa, 2015b: 5).

▪ The institution's 2030 mission statement "affirms the unique character of the institution specifically that it is the single dedicated comprehensive open distance learning higher education institution in South Africa" (University of South Africa, 2015b: 9). The institution's mission is further guided by the "principles of lifelong learning, student-centeredness, **innovation** and **creativity**" (University of South Africa, 2014a: 8).

▪ The innovation and excellence value as described in the institution's 2016 to 2030 strategic plan is stated as follows: "**Innovation** and excellence characterise the actions, attitudes and culture required to create new ideas, processes, systems, structures, or artefacts which, when implemented, lead to a sustainable and high performing institution. They are the underlying principles that we as change agents use to make a difference in the way we work with available resources to achieve our specific goals despite contextual and policy constraints. **Innovation** requires everyone to adopt a problem-solving approach that fosters intellectual ingenuity and novel solutions rather than simply problem identification" (University of South Africa, 2015b: 10).

▪ The "Leading Change" campaign was launched in June 2016 to give momentum to the institution's 2016 to 2020 strategic plan. Part of the campaign was an operational realignment initiative designed to achieve the strategic objectives of the institution (University of South Africa, 2016). The document confirms the need to enhance institutional effectiveness and efficiencies: "The promulgation of Unisa 2030 has stimulated a need to redefine service delivery for a new 21st century open distance and e-learning university. This will require all professional, administrative and support functions to reconceptualise their own understanding of what constitutes excellence in a high-performance university. This will require structures, processes, systems, policies and procedures to be defined in a manner that enhances institutional effectiveness and efficiencies in a coherent way. All of these changes, together with the relevant skills and competencies, will support a high-performance university" (University of South Africa, 2016: 2).

From the above it is clear that innovation and creativity plays an extremely important role in the institution's objective in sustaining a competitive edge. The research in this

study should, therefore, be viewed against the background of the institution's strategic objectives, the 11 Cs +1 document, the 2016 to 2030 strategic plan, the 2030 mission statement, the innovation and excellence values, and the "Leading Change" campaign.

1.2.2 Supervisory behaviour

This topic relates to how innovative ideas from employees are dealt with, how management acts in response to these innovative suggestions, and the type of support that employees receive from supervisors and higher management. To gain a competitive edge or to aid in organisational success, organisations should understand what inspires employees to engage in increased innovative behaviour at work. Supervisory support is a critical influencer of innovative behaviour, which can lead to employee engagement (Arora & Kamalanabhan, 2013). Employees who receive support from supervisors are able to engage in innovative behaviour, which explains why only some individuals will engage in innovative behaviour (Arora & Kamalanabhan, 2013).

Supervisory behaviour can hamper the progress of innovation in organisations as innovation is often talked about but rarely done internally. As a result, employee innovation efforts are met with silo approaches to innovation, resistance by leaders, and low-risk tolerance (Mayer, 2012). Supervisors should lead by example when it comes to innovation and should, therefore, promote innovation as central to business activity (Mayer, 2012). Supervisors need to encourage innovative behaviour through specific incentives, rewards and support, and ensure that the momentum of innovative behaviour is sustained (Ikeda & Marshall, 2016).

Supportive leadership (supervisory) behaviour can stimulate innovation among employees. In chapter 3 a number of leadership styles and the impact of these styles on EDI are discussed. For the purpose of this study, the focus was on supervisory behaviour required to encourage and support employee innovation.

Innovative leadership is one of the ideal leadership styles that promote and support EDI. Innovative leadership can be defined as the "use of innovative thinking and the

leadership that supports it; it is the key to finding what is new, what is better, and then what is next" (Horth & Buchner, 2014: 16). "Those with leadership responsibilities face an evolving range of challenges and opportunities that require unprecedented creativity and successful implementation of innovative solutions" (Vlok, 2012: 210). Horth and Bucher (2014) further argue that leaders need to become innovation leaders. "They need it for themselves as they learn to operate in challenging, unpredictable circumstances. They also need to create a climate for innovation within organisations. Innovative systems, tools, and thinking are essential for organisational health and future viability" (Horth & Buchner, 2014: 2).

Supervisors should become leaders who create an organisational culture where employees can use innovative thinking to solve problems and create new ideas. These supervisors (leaders) should then focus on growing a culture of innovation; they should assist employees to think and work in new ways to solve problems, and find ways to innovate even with limited resources (Horth & Buchner, 2014). Innovative leaders can assist the organisation to survive and stay ahead of the competition (Horth & Buchner, 2014). "Leaders shape the organizational environment and, in so doing, establish the context and opportunities in which innovation may (or may not) thrive" (Goulding & Walton, 2014: 30).

1.2.3   Internal work environment

According to Hueske and Guenther (2015) innovation is crucial for organisations to achieve and maintain a competitive advantage. In a volatile and rapidly changing business environment an organisation can obtain a competitive advantage by motivating its employees to participate in innovative work behaviour (Chughtai, 2013). Organisations need to create a work environment that will support and promote EDI and creativity. Innovation and creativity require an environment that is open to unplanned and unexpected things (Krut, 2012). In a recent study Ikeda and Marshall (2016) found that when it comes to innovation, successful organisations encourage innovation, create a culture that encourages innovation, and design procedures that support innovation. By focusing on innovation, these organisations consistently outperform their peers (Ikeda & Marshall, 2016).

It is essential to understand the factors that influences innovation and creativity in organisations to allow organisations to take advantage of the creative and innovative abilities that exist within all organisations (Mumford *et al.*, 2012). A number of researchers have attempted to find the key determinants of innovation success in organisations (Naranjo-Valencia *et al.*, 2016). In general, they can be grouped according to individual, organisational and environmental level (Naranjo-Valencia *et al.*, 2016). The focus in this study is on the organisational level. The organisational culture should place innovation at the core of the organisation, build an innovation culture and create a climate that will prioritise innovation (Ikeda & Marshall, 2016). Even though culture is regarded as a key stimulant for EDI and creativity, research on the matter is fairly limited (Naranjo-Valencia *et al.*, 2016). According to Horth and Bucher (2014), organisations that place a high value on innovation pay attention to a number of factors as shown in table 1.1.

Table 1.1: Factors influencing innovation

INNOVATIVE ORGANISATIONAL CULTURE	▪ Set a shared vision focused on innovation. ▪ Demonstrate reasonable and useful decisions regarding ideas. ▪ Provide mechanisms to encourage and develop an active flow of ideas. ▪ Reward and recognise innovative work.
INTERNAL ORGANISATIONAL BARRIERS	▪ Minimise internal politics. ▪ Reject negative criticism of new ideas. ▪ Minimise or eliminate negative internal competition. ▪ Reduce the avoidance of risk. ▪ Eliminate fear of failure. ▪ Change the status quo. ▪ Remove existing processes hampering new ideas.
SUFFICIENT RESOURCES	▪ Provide the required resources, which include funds, people, material, information, technologies, and facilities to make innovation a priority. ▪ Train employees to develop new ideas and new possibilities.
REALISTIC WORKLOAD	▪ Set realistic production expectations and avoid disruptions, extreme time pressures, or unrealistic timelines. ▪ Give employees time to focus on innovation.

FREEDOM	- Provide employees with the freedom to establish the work that needs to be done or how to do it. - Enforce constraints (e.g. time or cost) but not to the detriment of innovation. - Minimise rigid policies, procedures and processes that restrict freedom. - Reduce hierarchical boundaries that restrict innovation efforts. - Ensure that the organisational structure facilitates innovation activities.
CHALLENGING WORK	- Provide challenging work that will result in productivity and innovation. - Support high objectives and tough work with structures and systems focused on innovation.
TEAMWORK AND COLLABORATION	- Encourage good and open communication. - Embrace diversity and its positive impact on innovation. - Be open to and support ideas from all team members. - Create an environment and processes that encourage interaction and exchange of ideas.

A wealth of academic literature identifies innovation as a key success factor, and evidence shows a positive relationship between innovation and organisational growth and performance, which may lead to increased competitiveness and profitability (Aaltonen & Hytti, 2014; Dzisi, Ofori-Amanfo & Kwofie, 2013; Ikeda & Marshall, 2016; De Jager, Muller & Roodt, 2013; Kesselring, Blasy & Scoppetta, 2014; Moses *et al.*, 2012; Nusair, Ababneh & Kyung Bae, 2012; Ortega-Egea, Ruiz Moreno & Haro Domínguez, 2014; Selhofer, Arnold, Lassnig & Evangelista, 2012).

EDI and creativity face many obstacles that block the potential for innovation and creativity, which can result in poor organisational performance and a loss of competitiveness (Aaltonen & Hytti, 2014). An innovation-driven internal work environment and supervisory support can generate employee motivation and engagement in innovative behaviour (Arora & Kamalanabhan, 2013). "A work environment characterised by trust, short power distances, autonomy in own work tasks, challenging work tasks, forgiveness for failure, and slack in the work processes enhances employee-driven innovation" (Lindland & Billington, 2016). The influence that a supervisor's behaviour and the internal work environment can have on employee innovation and creativity, is of critical importance to ensure that organisations tap into the innovative and creative skills of their employees.

1.3 RESEARCH PROBLEM

As referred to in the background above, reference to the importance of innovation appears in many of the institution's strategic documents. Innovation, initiative, and creativity are crucial to the institution's future and these are the key skills that should be focused on and developed. The impact of the changing environment of the ODeL institution on its employees is not unique. Daniel (2015) states that institutions of higher education are functioning in a progressively complicated and competitive environment. The #RhodesMustFall, #FeesMustFall and #OutsourcingMustFall movements are examples of the contemporary challenges that the institution needed to respond to with innovative suggestions and solutions (University of South Africa, 2016: 1). While the institution continues to confront the challenges of development in South Africa, appropriate human resource development and skills training, linked to technological improvement and innovation, will remain key development areas and goals for the institution (University of South Africa, 2015a).

The vision of the ODeL institution to become a world-class, mega ODeL institution will have a definite impact on the afore-mentioned expectations of both the employer and the employees, who will need to focus more on innovation, initiative, and creativity. Colleagues at the institution have said so many times: "If they would just allow me to 'do my thing' without all this red tape and if management could support me, we will be able to change this section into something wonderful". Due to so many factors, the "wonderful" part is often not achieved. Sometimes a very talented, innovative, and motivated colleague is lost due to the difficulty and frustration caused by an environment/supervisor that does not support creativity or innovation. Often employees encounter organisational barriers, which inhibit innovation, resulting in these talented, innovative, and committed colleagues leaving the institution to contribute to another organisation's success.

Even though innovation is discussed at senior management meetings and documented in institutions' strategic documents as being the lifeblood of the institution, in most cases the commitment ends there, as innovation is often met with resistance, caution, and scepticism by supervisors (Mars, 2013). The truth is that innovation scares many supervisors because it is associated with risk, which forces supervisors

to function outside of their comfort zones. The Florentine political philosopher, Niccolo Machiavelli, argued that innovation is a serious threat to those in power and should be discouraged rather than embraced (Mars, 2013). Many supervisors/leaders acknowledge the power and advantages of innovation, but most continue to resist the intense investment and dedication that innovation requires (Mayer, 2012). Supervisors need to be trained not to regard innovation as a threat, but to act in ways that will support the innovative efforts of organisations (Horth & Buchner, 2014).

The internal work environment also plays an important role to unleash the creative potential of employees. The institution requires an innovative culture that motivates employees' innovation and learning, and employees are rewarded for innovative behaviour. The institution has a bureaucratic structure with rigid controls which might cause bottlenecks and stifle innovation attempts by employees. The institution is also governed according to many policies and procedures which may hamper innovation, as it may be too risky to deviate from the rules. Davis (2013: 171) mentions that "although the size and diversity of the institution can count as strengths, it can also work against good management with increasing levels of management and wider spans of control. This can lead to silos or barriers among the institution's many parts".

Bureaucracy combined with lengthy hierarchical approval and reporting procedures may result in a lack of coordination and communication between departments and many failed employee initiatives (Ahmed, 1998; Hueske & Guenther, 2015). The organisational structure and strategy may also have an impact on the distribution of resources, while a shortage of resources may further limit an organisation's employees to be innovative (Hueske & Guenther, 2015).

Employees should not fear any negative consequences as a result of failed innovation efforts, but employees should be protected against dismissal in bad faith to effectively motivate and nurture innovation in an organisation (Bradley, Kim & Tian, 2013). Trade unions play a vital role in promoting innovation, by negotiating greater job security and wages, but they can also hinder the organisation's innovative ability by interfering with management's ability to control the workplace (Bradley *et al.*, 2013; Walsworth, 2010).

The institution recognises and acknowledges the importance of innovation and creativity in its strategic documents and, therefore, it is management's responsibility to create an environment that encourages EDI and creativity. Supervisors should be provided with innovation training to become role models and to support and welcome new innovative ideas from subordinates.

Research suggests that limited attention has been given to identify the factors that influence employee creativity (Dong, Liao, Chuang, Zhou & Campbell, 2015). "Although leader behaviour is potentially one of the most influential factors in an employee's work environment, research exploring the relationships between specific supervisor behaviours and employee creativity is very limited" (Gupta, Singh, Kumar & Bhattacharya, 2012: 121). An organisation may become a follower in innovation instead of a leader if supervisors do not support an innovative and creative environment/culture.

This research aimed to identify areas that need further research and to make recommendations regarding ways to support and enhance EDI. The research contributes to the body of knowledge concerning the importance of creativity and innovation in gaining a competitive advantage at an ODeL higher education institution, and to identify factors that have a negative or positive influence on employee innovation and creativity.

1.3.1 Research questions: Literature review

The following specific research questions guided the literature review for this study:

- How are innovation, creativity and EDI, and creativity conceptualised in the literature?
- How is supervisory behaviour regarding EDI and creativity conceptualised in the literature?
- How is the internal work environment regarding EDI and creativity conceptualised in the literature?

1.3.2 Research questions: Empirical study

In terms of the empirical study, the following specific research questions were addressed:

- Which factors of supervisory behaviour play a significant role in influencing EDI and creativity?
- Which factors in the internal work environment play a role or influence EDI and creativity?
- Does a relationship exist between supervisory behaviour and the internal work environment with regard to EDI and creativity?
- Do demographic characteristics influence supervisory behaviour, the internal work environment and employees' innovation and creativity in terms of gender, ethnicity, age, post-level, department/unit, supervisory status, and qualifications?
- Which recommendations can be formulated regarding supervision and creating an enabling internal work environment to support and enhance EDI and creativity?

1.4 RESEARCH AIMS

The primary aim of this study was to determine whether supervisory behaviour and the internal work environment have an impact on EDI and creativity at an ODeL institution in South Africa.

The results of the study are used to make recommendations regarding supervisory behaviour and creating an enabling work environment which can enhance and support EDI and creativity, and general recommendations to the field of human resource management.

1.4.1 Specific aims: Literature review

The specific aims in terms of the literature review are listed below:
- To conceptualise EDI and creativity.
- To conceptualise supervisory behaviour regarding EDI and creativity.
- To conceptualise the internal work environment with regard to EDI and creativity.

1.4.2 Specific aims: Empirical study

The specific aims in terms of the empirical study are listed below:

- To determine the constructs of supervisory behaviour that influence EDI and creativity.
- To determine the constructs of the internal work environment that influence EDI and creativity.
- To determine the relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity.
- To determine whether demographic characteristics have an influence on supervisory behaviour, internal work environment and employees' innovation and creativity in terms of gender, ethnicity, age, post-level, department/unit, supervisory status, and qualifications.
- To make recommendations regarding supervisory behaviour and creating enabling work environments to enhance and support EDI and creativity.

1.5 RESEARCH DESIGN

A research design is a recipe or a specific plan for investigating a research problem (Joyner, Rouse & Glatthorn, 2013: 115) and a study should be designed to address and answer the identified research questions (Sumerson, 2014). Good research depends on the careful planning and execution of a study and research design, which forms an important part of the research process as it has a direct effect on the quality of data gathered and examined (Pallant, 2011). The research framework for this study is discussed in the following paragraphs.

1.5.1 Type of research

In order to achieve the research aims a quantitative approach was adopted in this research. Quantitative studies collect data in an attempt to learn about the evidence of the variables (Sumerson, 2014). A quantitative perspective is experimental in nature, emphasises measurement, and searches for a relationship (Joyner *et al.*,

2013). The quantitative perspective originated from a positivist epistemology, which states that an objective reality exists, which can be expressed numerically (Joyner *et al.*, 2013). Quantitative data can be measured and the magnitude thereof is then expressed in numbers, which can be analysed using mathematical procedures (Buckler & Walliman, 2016). Quantitative research is a more structured research method that quantifies problems, confirms theories or explores relationships (Kumar, 2011).

A quantitative survey design was selected for this study. Primary quantitative data were collected from a subgroup within the identified institution, using self-administered electronic questionnaires. Questionnaires can be a relatively economical method that saves costs and time when collecting data from a large number of participants (Neuman, 2014). Another advantage of self-administered electronic questionnaires is that the respondents have time to think about and respond to the questions, which can lead to more accurate information (Buckler & Walliman, 2016). According to Buckler and Walliman (2016) a disadvantage of a questionnaire is that the researcher cannot ask follow-up questions while the respondents are completing the questionnaire. Due to this disadvantage a pilot study was conducted to ensure that the respondents clearly understood the instructions and questions and could respond appropriately (Pallant, 2011).

Descriptive statistics and exploratory research were used in the study. A description of the situation or phenomenon was completed in the literature review and the constructs were conceptualised. The study used descriptive research as the objective to identify whether supervisory behaviour and the work environment influence EDI and creativity within the identified institution. The findings are therefore grounded in reality and not in the researcher's beliefs. Descriptive research is used to define a phenomenon, using frequencies, averages and percentages (Joyner *et al.*, 2013).

Exploratory research was used to become familiar with an unknown area (Neuman, 2014) and to offer a better understanding of supervisory behaviour, internal work environment, and EDI and creativity within an ODeL institution in South Africa (Babbie, 2010). The data collected were analysed by means of the descriptive, correlational, structural equation modelling (SEM), and inferential statistics. Descriptive statistics

was used to describe and summarise the data received from the sample (Pandey & Pandey, 2015). Correlational statistics and structural equation modelling (SEM) were used to explain the association between the variables, as well as its strength. Based on probabilities and generalising of the data to the specific population, inferential statistics was used to draw conclusions from the data obtained (Babbie, 2010; Coetzee & Schreuder, 2012; Leedy & Ormrod, 2015).

The study, therefore, aimed to identify whether supervisory behaviour and the internal work environment influence EDI and creativity in the identified institution, using self-administered electronic questionnaires as a structured instrument to collect data.

1.5.2 Research variables

This study aimed to research the impact that a supervisor's behaviour and the internal work environment may have on EDI and creativity. The dependent variable in this study was EDI and creativity, and the independent variables were supervisory behaviour and the internal work environment.

The research focused on determining whether a significant empirical relationship existed between

- supervisory behaviour and EDI and creativity
- internal work environment and EDI and creativity
- the two independent variables, supervisory behaviour and internal work environment

The research further focused on whether the respondents differed significantly regarding their socio-demographic variables.

1.5.3 Methods used to ensure reliability and validity

Validity and reliability measurements were in place to ensure that the study was effective and that the research process was valid and reliable. The following validity and reliability measures were in place to meet the requirements.

a) Validity

Validity refers to the degree to which a measuring instrument measures what it is intended to measure (Babbie, 2010; Kumar, 2011; Leedy & Ormrod, 2015; Pallant, 2011; Salkind, 2018). Content validity indicates the degree to which a measurement instrument is a representative sample of the concept being measured (Leedy & Ormrod, 2015). Content validity is particularly useful when assessing the usefulness of a test that samples a specific area of knowledge (Salkind, 2018). Construct validity is the degree to which the findings of a test are related to an underlying set of related variables, or whether it measures the characteristics that it is intended to measure (Leedy & Ormrod, 2015; Salkind, 2018). When an instrument measures an underlying construct, some kind of proof is required to indicate that the approach does measure the construct in question (Leedy & Ormrod, 2015). Factorial validity is important in the context of establishing the validity of latent variables, which cannot be measured directly, such as beliefs and perceptions (Gefen & Straub, 2005). Validity is further discussed in chapter 5.

The content, construct, and factorial validity of the questionnaire is confirmed by the exploratory factor analysis (EFA) discussed in chapter 6.

b) Reliability

The reliability of a scale "indicates how free it is from random error" (Pallant, 2011: 6). Buckler and Walliman (2016) state that reliability relates to the reliability or repeatability of the research. The instrument, when used on the same group repeatedly, will be reliable if it produces consistent results when the constructs being measured stay the same (Leedy & Ormrod, 2015). Kumar (2011: 345) states that "reliability indicates the accuracy, stability and predictability of a research instrument: the higher the reliability, the higher the accuracy; or the higher the accuracy of an instrument, the higher its reliability of the instrument". Reliability eventually indicates the credibility of the full research project.

To ensure the reliability of the measuring instrument, Cronbach's Alpha coefficients were used and reported on in chapter 6 (Kerlinger & Lee, 2000; Salkind, 2018).

Cronbach's Alpha coefficient is a method of measuring how consistently every item assesses the same underlying construct (Leedy & Ormrod, 2015; Salkind, 2018). According to Pallant (2011), a reliability coefficient of 0.7 or more is usually regarded as sufficient. The reliability of this study was also addressed through the standardised assessment conditions as well as the standard scoring instructions for the instrument (Foxcroft & Roodt, 2018). It is important to note that reliability should be established before validity, as reliability is a required, but not an appropriate condition of validity (Salkind, 2018). A measure can, therefore, be reliable and not valid, but it can never be valid without being reliable first.

1.5.4 Unit of analysis

The unit of analysis refers to the units on which variables are being measured and can fall in an individual, group, organisation, or society category (Mouton & Marais, 1996). The unit of analysis for this study was at individual level. EDI and creativity represent the unit of analysis in this study, as the primary objective was to examine the influence that supervisory behaviour and the internal work environment had on the innovation and creativity efforts of employees. The aim of the study was to determine whether a relationship exists between the last-mentioned variables. In terms of examining the differences between socio-demographic groups, the unit of analysis is the applicable sub-groups (Mouton & Marais, 1996; Salkind, 2018).

1.5.5 Methods to ensure adherence to ethical research principles

The ethical guidelines and requirements formed the basis on which the research was performed.

The research ethics procedure of the institution was followed throughout the study. Informed and voluntary consent was obtained from all the relevant respondents and the results and data remain strictly confidential. The research was developed in such a way that the employees and the institution would benefit and that no harm was inflicted on any respondents (Lefkowitz, 2008). The researcher remained neutral and conducted the research with integrity.

The Institutional Research Ethics Policy specifies the following principles of ethics in research (University of South Africa, 2014b: 5–6):

- Obtain ethical clearance and approval by the relevant ethics review committee.
- Conduct research contributing to the existing body of knowledge on the subject.
- Publish the research findings in the public domain.
- Comply with all relevant policies and legislation.
- Guard against destructive or unwanted consequences of the research.
- Be honest in actions and in response to the actions of others.
- Do not commit plagiarism, piracy, falsification, or fabricate results.
- Report research result in an accurate and truthful manner.
- Report regularly to the relevant ethics review committee when required.
- Conduct research grounded in excellence, integrity, and quality.
- Refrain from undertaking research that violates the institutional policy on research ethics.
- Adhere to applicable requirements with regard to data curatorship and data management.

1.6   RESEARCH METHODOLOGY

The research method comprised of two phases, the literature review and an empirical study. The literature review was conducted to gain in-depth knowledge of the theory that exists, and the empirical study was used to apply the theory and to investigate the research aims.

Phase one: Literature review

The literature review was conducted to obtain in-depth knowledge of the theory that exists. Phase one involved the following three steps:

Step 1: Conceptualising innovation and creativity and EDI.
Step 2: Conceptualising supervisory behaviour with regard to EDI and creativity.
Step 3: Conceptualising the internal work environment with regard to EDI and creativity.

Phase two: Empirical study

The empirical study was used to apply the theory and investigate the research aims. Phase two involved the following nine steps:

Step 1: Formulating the research aims

The research aims were formulated to decide on the suitable statistical analysis to use.

Step 2: Determining and describing the sample

In this step, the population and sample were identified. A detailed discussion of the description of the sample is presented in chapter 5.

After examining the research aims of the study, it was decided not to use sampling. A smaller group was selected from the population (a subset of that population), referred to as the target population (Neuman, 2014; Salkind, 2018). The target population consisted of 4 206 permanent employees from all ethnicities and both genders between the ages of 18 and 65 who were employed on post levels P5 to P9 within the academic and administrative environment of the institution. A census approach was followed where the questionnaire was sent to every member of the target population.

Step 3: Designing the measuring instrument

A self-administered web-based questionnaire was developed and distributed to the target population. After the literature review was conducted, a suitable questionnaire consisting of four sections was developed specifically for this study. The first section (A) dealt with demographic details of respondents. The second section (B) dealt with supervisory behaviour with regard to EDI and creativity and was completed by all the respondents. The third section (C) dealt with the internal work environment and the extent to which it supported employee innovation and creativity. The section was completed by all the respondents. The fourth section (D) dealt with supervisory behaviour from a management perspective (management factors) and was only

completed by respondents in supervisory roles. The questionnaire is attached as Annexure A.

Step 4: Administering the measuring instrument

Permission to conduct the research was obtained from the Unisa College Ethics Review Committee. Permission to use institutional staff members were obtained from the Research Permission Subcommittee (RPSC) of the Unisa Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC) before commencing with the collection of data. Certificates awarding ethical clearance and permission to conduct the study among staff members from the institution were issued and recorded. The members of the target population were invited to participate in the study via e-mail. The e-mail contained a link to the web-based questionnaire. Consent was obtained and confidentiality was guaranteed.

Step 5: Scoring the measuring instrument

The responses from all the participants to each item in the questionnaire were collected into a computer-based spreadsheet format. The data were then statistically analysed using the statistical programme, SPSS, developed specifically for social sciences research.

Step 6: Processing and analysing the data

The statistical program, SPSS, was used to analyse the data in several steps. The statistical procedure consisted of the following stages:

> **Stage 1:** Exploratory factor analysis (EFA) was conducted in order to evaluate the construct validity of the questionnaire. According to Field (2009) exploratory factor analysis serves three purposes: it aims to identify the structure of a group of variables, it is used to measure underlying variables in the questionnaire, and it is used as a reduction tool while retaining the original information. All three purposes of the EFA were served in this study.

Stage 2: Correlation tests were performed to explore the direction and strength of the relationship among variables. Descriptive statistics such as the Cronbach's Alpha was applied. Means and standard deviations were also used to analyse the normality of the data distribution and to assess the reliability and internal consistency of the measuring instrument.

Stage 3: Correlation statistics using the Pearson product-moment correlation coefficient was used to determine the direction and strength of the relationship between the variables. Structural equation modelling (SEMS) was used to test the interrelationship (expressed in a series of equations) among variables (Hair, Black, Babin & Anderson, 2014; Pallant, 2011). Structural equation modelling (SEM) tested the simultaneous evaluation of model construct relationships and ensured that measurement error was taken into account for all structural paths.

Stage 4: Inferential statistics was then used to draw inferences about the data. Tests for significant means differences were performed to determine whether significant differences existed between the demographical characteristics of the respondents in terms of the constructs measured. The independent t-tests were used to determine the statistical significance differences using gender, department/unit, and supervisory status. The Kruskal Wallis test was used to establish the statistical significance differences using ethnicity. Analysis of variance (ANOVA) was used to determine the statistical significance differences using age, post level, and qualifications. The statistical significance level of $p \leq 0.05$ was used. A level of $p \leq 0.05$ provides 95% of confidence in the results being recognised as the standard when applied in further research contexts (Kerlinger & Lee, 2000).

Step 7: Reporting and interpreting the results

The research results of the analysis of the data are presented in tables, graphs and/or diagrams. A systematic framework was used to discuss the findings and to present it in a coherent manner to limit uncertainty and misunderstanding.

Step 8: Integrating the research findings

The results of the empirical research findings were combined with the findings of the literature review and presented in the discussion of the findings.

Step 9: Formulating the research conclusions and recommendations

The final step comprised the drawing of conclusions based on the results obtained, and the integration of these the theory. The limitations of the study were reviewed, and recommendations made in terms of the impact of supervisory behaviour and support and the internal work environment on EDI and creativity. The overall contribution of the study is also discussed. All the steps in the two phases of the research process are presented in figure 1.2.

Figure 1.2: Steps in the two phases of the research process

PHASE 1: LITERATURE REVIEW

STEP 1: Conceptualising innovation and creativity and EDI

STEP 2: Conceptualising supervisory behaviour with regard to EDI and creativity

STEP 3: Conceptualising the internal work environment with regard to EDI and creativity

PHASE 2: EMPIRICAL STUDY

STEP 1: Formulating the research aims

STEP 2: Determining and describing the sample

STEP 3: Designing the measuring instrument

STEP 4: Administering the measuring instrument

STEP 5: Scoring the measuring instrument

STEP 6: Processing and analysing the data

STEP 7: Reporting and interpreting the results

STEP 8: Integrating the research findings

STEP 9: Formulating the research conclusions and recommendations

1.7 CHAPTER LAYOUT

The research report consists of seven chapters presented as follows:

Chapter 1: ORIENTATION AND BACKGROUND

Chapter 1 focuses on the purpose of and for the research.

Chapter 2: INNOVATION AND CREATIVITY

The importance of innovation and creativity with a specific focus on EDI is presented in this chapter, after which the importance of EDI and creativity in organisational growth, performance, or in gaining a competitive advantage are discussed. The different types of innovation, as well as innovation risk, are then explained. An overview of the 12 factors that limit innovation, the nine factors that foster innovation, and the level of innovation in South Africa are discussed. The chapter concludes with the institutional perspective on the importance of innovation and creativity and a chapter summary.

Chapter 3: SUPERVISORY BEHAVIOUR

In chapter 3 the role of supervisory behaviour and a number of leadership styles that influence innovation and creativity in the workplace are discussed. Supervisory behaviour and supervisory support for employee innovation and creativity are also discussed. Thereafter, the behavioural factors of supervisors that impact on employees' innovation and creativity efforts are investigated. The importance of managing innovation as well as the effects of teamwork on EDI and creativity are also explored. The chapter concludes with an overview of the ODeL perspective on innovation and leaders.

Chapter 4: INTERNAL WORK ENVIRONMENT

This chapter consists of eight subsections. The notion of the internal work environment with regard to the organisational structure, mission, objectives, and values is

addressed. The influence that an organisation's culture has on EDI and creativity as well as the importance of organisational encouragement and resource allocation, such as finances and time, are discussed. The role of job complexity and job autonomy as the two variables associated with innovative behaviour are explored. The chapter concludes with a section addressing the importance of innovation in the workplace and a chapter summary.

Chapter 5: RESEARCH METHODOLOGY

In this chapter the focus is on the empirical aspect of the study. A discussion on the research design and research methodology used for the study is provided. An overview of the sample and population is also provided. The measuring instrument is discussed and reasons justifying its use are provided. The data collection process and the statistical analysis used in the study are explained.

Chapter 6: RESEARCH RESULTS

The statistical results of the study are discussed in chapter 6. The statistical results in terms of the exploratory factor analysis, which was used to explore the interrelationships between supervisory behaviour and the internal work environment in terms of EDI and creativity, are reported. Further reporting focuses on descriptive and inferential statistics, which includes the structural equation modelling (SEM). The chapter concludes with a summary.

Chapter 7: FINDINGS AND RECOMMENDATIONS

In chapter 7 the integration of the results and an explanation of the conclusions made are addressed. The chapter indicates whether the aims of the research were reached. The limitations of the study are discussed, and recommendations are made for human resource management with regard to EDI and creativity. Suggestions for further research are made and the chapter concludes with a summary.

1.8 SUMMARY

The aim of this chapter was to provide the reader with an outline of the research that was conducted. The motivation for this study rests on the important role that EDI and creativity play in organisations. Innovation and creativity efforts by employees are however, not always supported and encouraged in the organisation. To take advantage of the creative and innovative abilities that exist, it is essential to understand the forces that influence and shape innovation and creativity in the institution. Beginning with the rationale and background, the outline continues with the purpose of the research, the research design, the research methodology, reporting on the results as well as the recommendations, limitations and ethical considerations. The outline concludes with the plan of the research.

CHAPTER 2 – INNOVATION AND CREATIVITY

This chapter provides a theoretical view of innovation and creativity in the workplace. Firstly, the importance of innovation and creativity is examined with specific focus on employee-driven innovation (EDI). The important role of EDI and creativity in organisational growth, performance, and in gaining a competitive advantage is discussed. The different types of innovation, innovation risk, 12 factors limiting innovation and nine factors fostering innovation are then discussed. The chapter is concluded with the institutional perspective on the importance of innovation and creativity, and a chapter summary.

2.1 INTRODUCTION

By challenging the status quo and creating new and improved solutions to increase performance and ensure long-term survival, there is an increased emphasis on the significant role of innovation and creativity in the workplace (Anderson, Potočnik & Zhou, 2014; Bamber, Bartram & Stanton, 2017). Employees are at the heart of innovation and creativity; employees engage in innovative behaviour, create ideas, and implement these ideas (Bamber *et al*., 2017). According to Leovaridis (2015) employees with their knowledge, skills and experience are the most valuable resource of any organisation and therefore their contribution to the innovative ways of the organisation is vital for organisational success (Standing, Jackson, Larsen, Suseno, Fulford & Gengatharen, 2016).

2.2 INNOVATION AND CREATIVITY DEFINED

Innovation and creativity are words that are often heard in arts programmes, politicians speaking about getting more done with less money, at business conferences, and even in everyday conversations at work or school. In virtually every case, creativity is perceived as desirable and something good.

Nowadays these words have become buzzwords that are used in every sphere imaginable. However, this was not always the case. For over 2 500 years, reference

to innovation created a defensive mindset – it was regarded as negative and inventors were regarded cheats or nonconformists (Sveiby, Gripenberg & Segercrantz, 2012). Opinions on the value of innovation only changed in the 19th century (Forbes & Wield, 2002; Mann & Chan, 2011). Perceptions about the value of innovation slowly turned positive. From the beginning of the 20th century innovation has been regarded as thoughtful work of a person's imagination and not merely as change. The term "innovation" has become a term of honour (Sveiby *et al.*, 2012). The word "creativity" focuses on originality by doing things differently (incremental innovation) or creating something completely new (radical innovation) (Das, Verburg, Verbraeck & Bonebakker, 2018; Gurova & Kurilov, 2015).

Innovation is a concept that is essential to understanding the history of man, the development of communities, societies and cultures, the foundations of modern wealth, and the promise of the future. Indeed, innovation is celebrated within and across many, if not most, societies and cultures (Mars, 2013). Perhaps, only when it comes to a discipline such as accounting, the word "creativity" might be regarded as "suspicious". Yet innovation and creativity are classic instances of concepts that everyone understands, but very few can explain (Clegg, 1999).

A vast amount of academic literature focusing on innovation and creativity exists in which all authors present their own definitions of creativity, innovation or both. The following section focuses on some of the definitions, some of which date back to 1954.

- Maslow (Maslow, 1954) regards creativity as part of human nature – an aspect of all human beings.
- Rogers' definition of innovation is remarkably short: "An innovation is an idea perceived as new by the individual" (Linton, 1998: 13). In the 3rd edition of Rogers' *Diffusion of Innovations* he amended the definition of innovation and defines it as "an idea, practice, or object that is perceived as new by an individual or other units of adoption" (Rogers, 1983: 11). Rogers wrote about innovations as ideas that are diffused into the daily lives of people to eventually emerge as cultural changes.
- Similarly, Van de Ven (1986: 591) defines innovation as: "…a new idea, which may be a recombination of old ideas, a scheme that challenges the present order, a

formula, or a unique approach which is perceived as new by the individuals involved".

- Weinman (1991) explains that creativity is not linked to only a specific subject or discipline and that creativity has no limits; the only limit that exists is the one created by one's own rigidity. She defines creativity as "the ability to go beyond the mundane and obvious and a rejection of the traps of repetition and pre-set categories" (1991: 1).

- Gilliam (1993) formulated a definition for each of the terms. Creativity is defined as "a process of discovering what has not been considered –the act of making new connections" (Gilliam, 1993: 1). More simply, creativity is regarded as "the production of novel and useful ideas in any domain" (Amabile, Conti, Coon, Lazenby & Herron, 1996: 1155).

- Amabile (Amabile, 1996, 1997) focuses her definition of innovation and creativity from an organisational perspective. Her opinion is that organisations such as universities, research institutes, research and development sections, and design centres hold favourable settings where innovation and creativity can be planned and nurtured (Amabile, 1996, 1997). She defines innovation as "the successful implementation of creative ideas" (Amabile & Pratt, 2016: 163)

- Clegg (1999: 2) states that, "from the origins of the words themselves, innovation seems to be about newness, while creativity is about bringing something into being".

- Clegg (1999: 2) states that "the Harvard Business School's Theodore Levitt also focused on the origins of the words and defined creativity as thinking up new things, while innovation was doing new things".

- Proctor (2010: 69) states that from an artist's perspective, Leonardo da Vinci defined innovation and creativity as "'The method of awakening the Mind to a Variety of Inventions . . . a new kind of speculative invention, which though apparently trifling and almost laughable, is nevertheless of great utility in assisting the genius to find variety for composition. By looking attentively at old and smeared walls, or stones and veined marble of various colours, you may fancy that you see in them several compositions, landscapes, battles, figures in quick motion, strange countenances, and dresses, with an infinity of other objects. By these confused lines, the inventive genius is excited to new exertions.' Leonardo da Vinci, A Treatise on Painting" (Proctor, 2010: 69).

- Cutler (2008a) combines the two terms, explaining that innovating requires the use of creative effort to find and then do things in a new way. Creativity involves coming up with new ideas which do not necessarily include the practical application thereof (Cutler, 2008a). It is imperative to understand that creativity is needed for innovation to prosper and if creativity is not promoted, there will be no opportunity for innovation (Cutler, 2008b; Howkins, 2013).

- Mann and Chan (2011: 5) also formulated a definition for each of the terms. "Very often, creativity refers to the quality of being innovative in thinking, planning or doing, whereas innovation refers to the end result of such creative thinking, planning or doing. Creativity is also conceived as a capability or a pattern of behaviour".

- Sveiby *et al.* (2012: 5) define innovation as a value-adding process and outcome by "implementing a new or significantly improved product (good or service), or a process...".

- Afuah (2014) elaborates on the 2012 definition of Sveiby *et al.* and describes innovation as changing the rules of the game, either slightly or radically. Innovation is about taking advantage or creating opportunities to create value (Afuah, 2014). "Innovation is about doing things differently from the norm" (Afuah, 2014: 4).

- Bos-Nehles, Renkema and Janssen (2017) focused their work on innovative work behaviour and to them innovation is more than just being creative. According to Bos-Nehles *et al.* (2017) creativity forms the first part of innovation and without a new and useful idea, innovation is not possible. "Innovation work behaviour is broader than creativity as it also includes the promotion of these creative ideas as well as the implementation thereof" (Bos-Nehles *et al.*, 2017: 1232).

- Hughes, Lee, Tian, Newman and Legood (2018) conducted a review of the current empirical literature and taking into consideration all the definitions that they received on innovation and creativity, they were able to identify a general definition. "Workplace creativity concerns the cognitive and behavioural processes applied when attempting to generate novel ideas. Workplace innovation concerns the processes applied when attempting to implement new ideas. Specifically, innovation involves some combination of problem/opportunity identification, the introduction, adoption or modification of new ideas germane to organizational needs, the promotion of these ideas, and the practical implementation of these ideas" (Hughes *et al.*, 2018).

- Gault (2018) proposes a general but shorter definition of innovation. "An innovation is the implementation of a new or significantly changed product or process" (Gault, 2018: 169).

It is evident from the above definitions that innovation and creativity have many descriptions or definitions. The definitions have changed somewhat over time, from newness, to challenging the status quo, changing behaviour by doing things differently, to innovation and creativity as a value-added process. More recent definitions of innovation and creativity indicate that creativity is the creation of a new idea and innovation is the application of the new idea (Bos-Nehles *et al.*, 2017; Gault, 2018; Hughes *et al.*, 2018). However, one keyword that stands out in the literature in describing innovation and creativity, is the word "new". The definitions are ultimately all about the newness; thinking new things, thinking in new ways, doing new things, doing existing things in new ways, promoting new ideas, and implementing these new ideas.

Mann and Chan (2011) explain in their book that the everyday use of the words "creative" and "innovative" are more or less interchangeable as being creative is no different from being innovative. Reference is often made to a creative or innovative person, an innovative or creative solution to a problem, or a creative or innovative process or product. Both terms focus on a solution or product that is new or original (Mann & Chan, 2011).

For the purpose of this study the terms "innovation" and "creativity" will be used interchangeably with no specific weighting intended.

2.3 EMPLOYEE-DRIVEN INNOVATION AND CREATIVITY

Great innovative ideas are not always discovered in a laboratory, in a research and development (R&D) unit, or by top managers in an executive office. Innovative ideas often result by involving employees as innovative resources through participation in the creation of innovative and creative ideas (Haapasaari, Engeström & Kerosuo, 2018; Spender & Strong, 2010; Vagn *et al.*, 2016). Organisations that only rely on research and development (R&D) units to generate innovate ideas are not utilising its

full innovative potential (Moll & De Leede, 2016). Organisations should make better use of the talents of its employees, which will not only lead to improved job quality, but also increased organisational performance. "Various names are being used for approaches which more or less relate to these issues and objectives. Some examples are: high performance workplaces, high involvement workplaces, innovative workplaces, innovative work organisation, workplace development, social innovation in the workplace, knowledge-based capital, relational coordination, employee-driven innovation, and workplace innovation" (Oeij, Rus & Pot, 2017: 2). For the purpose of this study, the term "employee-driven innovation" will be used.

2.3.1 Defining employee-driven innovation

Vagn *et al.* (2016) indicate that EDI has the potential to expand an organisation's innovation potential by utilising employees as innovative resources. Teglborg-Lefèvre (2010: 212) defines the term EDI as a "systematic and active contribution of employees to the process of innovation", and explains that EDI refers to employees, whose key functions are not innovation, to propose new innovative ideas. Employee innovation focuses on the creation and execution of new ideas or processes, and refers to situations where employees contribute to the innovation process in an impulsive, informal, and unplanned way (Aaltonen & Hytti, 2014; Høyrup *et al.*, 2012).

It is important to note that all employees have the ability to be innovative and creative, irrespective of their level, education or position (Aaltonen & Hytti, 2014; Brandi & Hasse, 2012; Høyrup *et al.*, 2012). The Danish confederation of Trade Unions indicates that EDI is driven from all employees that work for the organisation and not only by management or employees with power, and all employees should contribute enthusiastically in the innovation process (*Employee-driven innovation: A trade union priority for growth and job creation in a globalised economy*, 2007).

2.3.2 Employee-driven innovation as a bottom-up process

Through the use of experience and knowledge, employees can engage in innovative behaviour and solve daily challenges using innovative ideas. With employees contributing to the innovation process, innovative and creative ideas will emerge from

the bottom up rather than down from top management (Haapasaari *et al.*, 2018; Hughes, Rigtering, Covin, Bouncken & Kraus, 2018; Oeij *et al.*, 2017; De Spiegelaere & Van Gyes, 2012).

EDI as a bottom-up process is very valuable as it involves employees' knowledge and experiences to address problems, rather than top management identifying the problems (Brandi & Hasse, 2012). Innovations can, therefore, be categorised according to a hierarchal level. The first form is top-down innovation where the innovation process starts at the higher levels of the hierarchy, by employees in power who establish strategic objectives and goals; the second is bottom-up innovation where the innovation process starts at the lower levels of the hierarchy, by employees who base innovation on their daily challenges, experiences, and knowledge (Blackler, Crump & McDonald, 1999; Das *et al.*, 2018; Gurova & Kurilov, 2015; Haapasaari *et al.*, 2018; Oeij *et al.*, 2017; Oeij, Rus, Dhondt & Van Hootegem, 2019; Windrum, 2008).

Das *et al.* (2018) identified that top-down innovations, however, received more resources from the start of projects and received easier access and attention of top management when compared to bottom-up supported innovation.

According to Aaltonen and Hytti (2014) employees are the key to organisational innovation and securing a competitive advantage, and for this reason it is critical for management to support the bottom-up process of EDI. This will result in positive outcomes in the form of employee creativity, that can be utilised to generate a sustainable competitive advantage for an organisation (Jyoti & Dev, 2015; Sørensen, 2012).

2.3.3 Employee-driven innovation in the literature

EDI is still in the beginning phases of being recognised as a scientific concept (Brandi & Hasse, 2012). The link between employees' everyday search and sharing of information, and their innovation and creativity ability receive little attention in the existing literature (Brandi & Hasse, 2012). The informal bottom-up process, to increase organisational innovativeness through employee motivation (at all levels and functions), has also been largely overlooked (Park, Kim & Krishna, 2014).

EDI is not well documented in the field of research, but there has been a significant increase on this new approach in the literature (Høyrup *et al.*, 2012; Jensen, Jensen & Broberg, 2016; Kesting & Parm Ulhøi, 2010; Lindland & Billington, 2016; Sørensen, 2012; De Spiegelaere & Van Gyes, 2012). This significant growth in the literature on EDI indicates a great interest in the field, as it is possible for organisations to secure a competitive advantage by using their employees' skills, expertise, and innovative ability. Organisations should discover ways to unleash the creative potential of all employees and transform the ideas into innovative business solutions (De Jager *et al.*, 2013).

2.3.4 Importance of involving employees in innovation

Ma Prieto & Pilar Pérez-Santana (2014) emphasise the significance of employees as a source of competitive advantage. Kesting & Parm Ulhøi (2010) explain in their study that employees have an in-depth knowledge and understanding of their jobs, which their managers often do not have. Employees' knowledge, expertise, and skills are therefore important assets for an organisation (Proctor, 2010). Great innovative improvements can be achieved by aligning and combining the knowledge and experience of employees with the expertise and knowledge of senior management (Oeij *et al.*, 2017). EDI approaches can foster competitive advantages and develop an innovative culture and a learning environment for employees (Høyrup *et al.*, 2012). Florida (2014), however, warns organisations to not regard innovation and creativity as commodities, as these come from people and cannot be switched on and off.

2.3.5 Investment, coaching, and continuous development of innovation and creativity

Creativity involves the ability to come up with new and fresh perspectives and ideas by rearranging current knowledge about an issue. Creativity occurs when thoughts are reorganised to obtain a different or better understanding of the topic being considered (Proctor, 2010). Employee innovativeness has been recognised as a very valuable capacity to establishing new and better ideas (Sveiby *et al.*, 2012).

Proctor (2010) and Hu and Zhao (2016) focus on the qualities that a creative and innovative person holds. Creativity is something that everyone has, yet something which very few are able to use regularly. Many people still believe in the myth that creativity cannot be taught. Conventional wisdom holds that creativity is a mysterious quality that is only present in a select few individuals (Belussi & Staber, 2012). Gogatz and Mondejar (2005), however, believe that creativity is something anyone can learn. Over the past fifty decades research has shown that individuals can be educated, inspired, counselled, and trained to develop themselves and become more creative (Oeij *et al.*, 2017; Proctor, 2010). Gurova and Kurilov (2015) highlight that to gain experience and expand knowledge, constant training is required to develop a good and creative workforce. Contributing to the human capital of an organisation through investment, coaching, and continuous development of the employees' potential will result in the generation of valuable ideas (Oeij *et al.*, 2019).

The following are qualities of a creative and innovative person. These qualities should be developed continuously. The personal qualities commonly believed to be exhibited by a good leader/supervisor are discussed in chapter 3 and the characteristics of a creative and innovative work environment are focused on in chapter 4.

Table 2.1: Qualities of a creative and innovative person

Confront traditions	Challenge the status quo	Embrace challenges
Curious	Risk taker	Creative thinker
Future orientated	Adaptable to change	Highly imaginative
Ability to spot patterns in events	Adaptable to different work environments	Able to cope with paradoxes
Tend to think visually	Select unconventional strategies	Look past the first "right idea"
Like to explore new opportunities	Take initiative in most instances	See potential within the impossible
Distil unusual ideas down to their underlying principals	See relationships between disconnected elements	Prepared to make mistakes and learn from the mistakes

Organisations should inspire employees to enthusiastically innovate by influencing appropriate factors such as organisational culture, and continuously developing the innovative abilities of their employees through well-designed training (Li & Hsu, 2016).

2.3.6 Innovative culture to increase innovative behaviour

Organisations should develop the innovation skills of employees through on-the-job training to grow the organisation's innovative ability (Oeij *et al.*, 2017). It is vital to create an innovative and learning environment within an organisation. Barron (1988) highlights the importance of creating a culture and environment that will permit the creative talents of all human resources within the organisation to thrive. Innovative organisations create a learning environment by placing ideas at the heart of team creativity, and attempt to achieve conditions and an innovative culture favourable to idea generation, and encourages employee creativity (Mann & Chan, 2011; Yeh & Huan, 2017). Innovative organisations will welcome unusual and even improbable ideas that might just be brilliant, resulting in seeing things in a new way. There will also be good social support for these ideas and the support should promote further creativity. The conditions should be favourable to the selection and enhancement of certain ideas and development of possible innovation (Amabile, 1996; Mann & Chan, 2011). In creative cultures managers are role models and lead by example to show employees that it is acceptable to question established practices (Henry, 2013).

A creative culture not only allows employees to feel free to challenge ideas and encourage creative problem-solving, but also create a work environment where ideas are supported and mistakes are tolerated (Martins & Terblanche, 2003). Lindland & Billington (2016: 2) describe the characteristics of a work environment, favourable to EDI, as follow: "A work environment characterised by trust, short power distances, autonomy in own work tasks, challenging work tasks, forgiveness for failure, and slack in the work processes enhances employee-driven innovation. Such a work environment and work culture enable and legitimize acts of employees for exploring and exploiting innovative possibilities which they identify".

2.3.7 Benefits of employee-driven innovation

"The challenge for organisations that would like to become more innovative is to unleash the creative potential of their employees to generate those ideas that can be channelled into innovative business opportunities" (De Jager *et al.*, 2013: 3). A good

starting point is to learn from old mistakes. Employees should be encouraged to innovate but also to make mistakes and to then learn from those mistakes (Henry, 2013; Sveiby *et al.*, 2012). Great ideas can be born from mistakes and Albert Einstein himself once said that "a person who never made a mistake never tried anything new".

Innovation, initiative, and creativity are crucial for organisations' future success and are the key skills that should be focused on and developed in organisations. If an organisation has an innovative spirit, it will result in employees feeling part of the organisation, being motivated, and remaining loyal. Employees that are allowed to participate in the decision-making process or make decisions, will feel more valued and empowered, less stressed, and will experience greater job satisfaction and confidence, which could result in increased innovative behaviour (Prieto & Pérez-Santana, 2014). As an intangible and dynamic capability, which competitors cannot imitate easily, empowered employees will be more committed to the organisation and improve job performance, which will have a direct impact on the financial performance of an organisation. (Afsar, Badir & Saeed, 2014; Bagraim, Cunningham, Potgieter & Viedge, 2016; Berraies, Chaher & Ben Yahia, 2014; Dzisi *et al.*, 2013; Høyrup *et al.*, 2012; Luoh, Tsaur & Tang, 2014; Sveiby *et al.*, 2012). Organisations that are capable of providing a supportive innovation work environment as well as fostering the innovative ability of their employees may result in developing a sustained competitive advantage concerning innovation (Bammens, 2016; Kim & Koo, 2017).

2.4   TYPES OF INNOVATION

Innovation may be classified according to different criteria. The following section focuses on product and process innovation as well as incremental and radical innovation.

2.4.1   Product innovation and process innovation

Product innovations are seen as novel, tangible structures that are made of material goods (Majamäki & Akpinar, 2014; Mars, 2013; Mumford *et al.*, 2012; Naranjo-Valencia *et al.*, 2016):

- Product innovations can originate from incremental improvements being made to existing products.
- Product innovations can also occur as entirely new, stand-alone goods or services.

Process innovations include original approaches or strategies designed to aid in achieving a specific goal or set of goals, and are therefore intangible and often somewhat abstract (Majamäki & Akpinar, 2014; Mars, 2013; Mumford *et al.*, 2012; Naranjo-Valencia *et al.*, 2016):

- Process innovations can allow for tasks being met in ways that are more effective and efficient than other alternatives, which typically include adapting or building upon current approaches or strategies.
- Process innovations can also be developed ''from scratch'' as an entirely new process.

2.4.2 Incremental innovation and radical innovation

Innovation refers to the method of developing and implementing a new idea. Dewar and Dutton (1986) were the first to introduce the concept of incremental and radical innovation. The former can be achieved by engaging in exploitative activities resulting in minor enhancements of current technology while the latter refers to radical changes resulting from exploratory activities (Haapasaari *et al.*, 2018; Lin, McDonough, Lin & Lin, 2013; Oeij, Dhondt, Kraan, Vergeer & Pot, 2012; Yeh & Huan, 2017).

Organisational innovation can occur on a small scale, which is known as incremental innovation, and the process is normally initiated by formal leaders in line with the current strategy of the organisation (Lindland & Billington, 2016). Incremental innovation is about adhering to a successful solution while trying to improve or adjust existing procedures, competencies, knowledge, services, products, or technology, and is often referred to as exploitative innovation (Berraies *et al.*, 2014; Hong, Hou, Zhu & Marinova, 2018; Oke, Munshi & Walumbwa, 2009). Incremental innovations focus on improving internal processes or current services (Das *et al.*, 2018).

As per the definitions by Sveiby *et al.* (2012) and Afuah (2014), innovation is rarely limited to a single event and often occurs through a sequence of events with one influencing another – each adding value. In this regard, innovation can be regarded as a chain of events created by a series of incremental improvements involving the enhancement and/or the combination of existing skills (Sveiby, Gripenberg, Segercrantz, Eriksson & Aminoff, 2009). An example of incremental innovation is the transition from televisions using tubes to high-definition televisions. The purpose of the television is to provide entertainment and to be a visual form of communication. Through the development of the high-definition television, the purpose of the television remained the same, but the quality of the picture and sound was improved, in other words, value was added through the combination of existing and new technology (Mars, 2013). Incremental innovation such as technological enhancements is far more common than innovative events that emerge through the development of an entirely new innovation, also called radical innovation. The effect of incremental innovations can, however, be both as disruptive and profound as radical innovations (Berraies *et al.*, 2014; Goodman & Dingli, 2013; Høyrup *et al.*, 2012; Lin *et al.*, 2013; Lindgren & Abdullah, 2013; Mann & Chan, 2011; Mars, 2013; Mumford *et al.*, 2012; Wihlman, Hoppe, Wihlman & Sandmark, 2014).

Radical innovations can be described as highly novel and "destructive" innovation and is about questioning and challenging current understandings, often referred to as exploration (exploratory innovation). Radical innovation refers to the introduction of something new to the world, which may threaten current products, services, and knowledge (Goodman & Dingli, 2013; Lindland & Billington, 2016). Radical innovation is also sometimes called "revolutionary innovation", "breakthrough innovation", or "discontinuous innovation", due to the dramatic "paradigm shift" that occurs with this type of innovation (Goodman & Dingli, 2013).

The processes of radical innovation are generally initiated by employees and protected, encouraged, and enforced by middle managers throughout the process (Lindland & Billington, 2016). Radical innovations challenge and change the current way of doing things and can result in earth-moving modifications to ways of acting, which could lead to the creation of new businesses and massive shifts in technology (Berraies *et al.*, 2014; Lin *et al.*, 2013; Lindland & Billington, 2016; Mars, 2013; Mayer,

2012; Oeij *et al.*, 2012). Examples of radical innovation include the invention of the telephone, the refrigerator, the lightbulb, and the television (Henry, 2013).

Many organisations use a combination of radical and incremental innovations (Mars, 2013; Mayer, 2012; Oeij *et al.*, 2012). Lin *et al.* (2013) support this statement by emphasising that organisations need to engage in both radical and incremental innovation to survive in the long term.

2.5   INNOVATION RISK AND BALANCING INNOVATION

Innovative behaviours include idea generation, taking risks, and making decisions (Mokhber, Khairuzzaman & Vakilbashi, 2018).

Generating and presenting new innovative ideas create incentives to engage in risky innovative behaviour. Radical innovation is complex innovation that may be very costly and incur a significant risk, and could fail to produce the desired outcomes, but positive results may lead to long-term success (Jantz, 2016; Miao, Newman, Schwarz & Cooper, 2018; Roderkerken, 2011). Organisations that put too much emphasis on radical innovation abilities may run the risk of not capitalising on their costly investments in searching and developing new innovations (Qiuzhu Mei, Laursen & Atuahene-Gima, 2013). Deciding to proceed with radical innovations will be the most difficult, as radical innovations have a high financial risk – when it fails, the consequences might be disastrous for the organisation (Jantz, 2016; Roderkerken, 2011).

Incremental innovations, on the other hand, have low complexity, resulting in straightforward implementation, involves the use of fewer resources and is, therefore, less risky than radical innovation (Goodman & Dingli, 2013; Jantz, 2016). Incremental innovation is more commonly adopted as most organisations prefer to stay on the safe side and minimise risk by making only minor alterations or extensions to current products, services, or organisational processes in response to new demands or developments (Ciriello, Richter & Schwabe, 2016; González-Gómez & Richter, 2015; Hong *et al.*, 2018; Iyer, 2009; Lindland & Billington, 2016; Mann & Chan, 2011).

Incremental innovations are by no means risk free, but are easier to manage as they build on employees' existing know-how and skills, and develop improvements to something known (Hong *et al.*, 2018; Tidd, Bessant & Pavitt, 2005).

Established organisations do not adapt to change easily and places substantial emphasis on preserving the status quo. The focus is rather on incremental innovations with lower risk and cost than investing in radical innovations with high cost and increased risk (Jantz, 2016; Roderkerken, 2011). Focusing primarily on incremental innovation will mean that the impact of the innovations will also be incremental and will result in short-term success, which might be unstainable and ephemeral in today's rapidly changing world (Qiuzhu Mei *et al.*, 2013; Roderkerken, 2011).

With reference to the benefits and risks linked to the various types of innovation, it is important for organisations to engage in both incremental and radical innovation to survive in the long term (Lin *et al.*, 2013). Innovation is linked to a high failure rate, and for this reason, it is also important for organisations to adopt risk management to the innovation process to help achieve success in innovation projects and to stimulate creativity (Bowers & Khorakian, 2014; Das *et al.*, 2018).

2.6   LIMITING AND FOSTERING FACTORS OF INNOVATION

Various factors influence innovation, which can make long-term survival for an organisation a challenge. Ideas are fragile and the path of an innovative idea through the organisation will face numerous obstacles, for example a traditional culture, local power structures, availability of resources (e.g. technical expertise, access to internal funds), inadequate skills, managements attitude towards risk, resistance to innovation, and fear of failure (Durmusoglu, Nayir, Chaudhuri, Chen, Joens & Scheuer, 2018; Jantz, 2016).

In research led by Souza and Bruno-Faria (2013) they define 21 factors that influence innovation, consisting of 12 limiting factors and nine factors fostering innovation. Among the helping factors related to internal aspects are management support, workgroup support, diversity, communication, motivation, leadership, risk tolerance,

planning and coordination of activities, systemic approaches to innovation, application of extraordinary efforts in favour of innovation, and identification of best practices (Claudino, Santos, Cabral & Pessoa, 2017; Souza & Bruno-Faria, 2013).

The following is a brief overview of the 12 limiting and nine fostering factors defined by Souza and Bruno-Faria (2013) and further discussed by Claudino *et al.* (2017).

2.6.1 Factors limiting innovation

a) Limiting factor 1: Scepticism about innovation

Scepticism about innovation – Highly creative ideas and new strategic thinking are often met with caution, scepticism, hesitation, and resistance (Baer, 2012; Janssen, van de Vliert & West, 2004; Mars, 2013), because innovation challenges the status quo and violates the established frameworks of practices in organisations (Durmusoglu *et al.*, 2018; Janssen *et al.*, 2004). Management may fail to acknowledge innovative efforts, or may greet new ideas with scepticism, layers of evaluation, or even harsh criticism, as it will require the use of more resources (time, funds, energy, attention, and support), and success is not guaranteed (Amabile, 1998; Škerlavaj, Černe & Dysvik, 2014).

Employees may be sceptical of organisational innovation, thinking that it is false or disingenuous, and primarily intended to increase employee productivity or achieve other management objectives (Bammens, 2016; Fleming, 2005; Grant, Dutton & Rosso, 2008). In many cases employees are excluded from the decision-making process, as the authority lies with a specific function and a small number of managers (Kesting & Parm Ulhøi, 2010). This results in a lack of involvement and support by employees (Oeij *et al.*, 2017).

It is important to include employees in the innovation process, as they deal with everyday problems and are the ones with great ideas (Oeij *et al.*, 2017). This fact is often overlooked by management who think that their subordinates do not know what the organisation needs (Spender & Strong, 2010). Employee involvement is not only

beneficial for organisational performance, but also ensures loyalty from employees (Howaldt, Kopp & Pot, 2012; Oeij *et al.*, 2017).

b) Limiting factor 2: Difficulties of inter-functional integration

Difficulties in departmental interaction and integration are caused by organisational departments operating without cooperation between areas, a lack of communication, bureaucratic and rigid organisational structures, different objectives and motivations within the organisation, and standardised/stringent rules and procedures (Claudino *et al.*, 2017; Souza & Bruno-Faria, 2013).

Cooperation between employees in a department and across departments is important for the effective operation of the entire organisation (Proctor, 2010). In many organisations silos exist between functional departments, where each department pursues its own goals and interests (Oeij *et al.*, 2017). Organisations that share knowledge across departments and have lower competition between individual innovation projects generally perform better (Iferd & Schubert, 2017). Interdepartmental cooperation can be increased by having regular meetings where departmental representatives may share information and discuss any potential problems (Proctor, 2010).

From the above it is evident that communication plays a significant role in any organisation. Proctor (2010) highlights the importance of communication, stating that it is the lifeblood of any organisation. Communication is the key to establishing a partnership between organisation management, employees, and trade unions. Openness and two-way communication are required for this partnership to be successful, to create positive industrial relations, and to minimise resistance to change and conflict (Oeij *et al.*, 2017).

In a large bureaucratic organisation all forces are arrayed for stability and conservatism (Power, 2013), communication is done along the chain of command (Sørensen, 2012), decisions are made in a central place (Oeij *et al.*, 2017), and employees perform their work according to rigid rules, policies, procedures,

performance evaluation guidelines, and manuals in order to maintain the status quo (Naranjo-Valencia *et al.*, 2016; Romero, 2012; Wagner & Hollenbeck, 2010).

Strict adherence to rules and regulations discourages employees from engaging in innovative and creative behaviour, as it provides no room for flexibility, creative thinking, and spontaneity (Jantz, 2016; Romero, 2012; Wagner & Hollenbeck, 2010). The latter will result in the organisation losing its ability to predict and adjust to change (Jantz, 2016; Romero, 2012; Wagner & Hollenbeck, 2010).

c) Limiting factor 3: Excess of activities and time shortage

The inability to implement innovations results from a lack of time, time pressures to perform all tasks necessary for implementation, short target dates, a lack of time for interaction and training, low quality work, pressured employees, and implementation delays (Claudino *et al.*, 2017; Souza & Bruno-Faria, 2013).

Traditional projects are directed at efficiency, certainty, management, and minimising change, while innovation projects are about search, autonomy, exploring, and investigation (Das *et al.*, 2018; O'Reilly & Tushman, 2013). Organisations that are able to create an innovative support environment might realise a sustained competitive advantage when it comes to innovation (Bammens, 2016).

Many organisations control the creative process and its results by controlling the time and budget allocation (Yeh & Huan, 2017). These organisations may attempt to save time and money by rushing the creative process and pushing employees to meet an innovation and creativity quota (Yeh & Huan, 2017). Amabile, Hadley, and Kramer (2002) found that time pressure generally reduces creative thinking. The higher the overall sense of time pressure felt by employees, the lower the level of creative thinking (Amabile, Hadley & Kramer, 2002; Mussner, Strobl, Veider & Matzler, 2017). When employees believe that they have inadequate time to complete their daily tasks, the accompanying stress will lead to a reduction in innovative and creative behaviour (De Clercq, Dimov & Belausteguigoitia, 2016; Groth & Peters, 1999). Through staff development, skills training, and interaction with team members, employees will be

able to reduce stress by predicting, understanding, and controlling events occurring on the job (Bagraim *et al.*, 2016; Wagner & Hollenbeck, 2010).

Organisations need to avoid extreme time pressure by communicating realistic and carefully planned goals to all levels of the organisation, to achieve high levels of learning, idea generation, experimentation with new concepts, and quality work (Amabile *et al.*, 2002). By placing a team under time pressure in the initial phases of a project to settle on a complex problem approach may be detrimental to creativity when the aim is to generate ideas for discussion (Mann & Chan, 2011). Organisations need to implement their innovations quickly in order to maintain a competitive advantage (Accenture, 2017). When deadlines are unrealistic it may lead to unnecessary time pressure that negatively influences creativity, as employees will accept the easiest and fastest solution rather than a more intricate and creative one (Murray, 2002; Wagner & Hollenbeck, 2010). Excessive time pressure and workload not only jeopardise the well-being of employees, but places the quality of work and long-term development at risk (Sveiby *et al.*, 2012; Zika-Viktorsson, Sundström & Engwall, 2006).

d) Limiting factor 4: Lack of senior management support

Support from management is an essential contributor to EDI (Hon, 2011; Ro & Chen, 2011; Yeh & Huan, 2017). Managers can encourage and empower their subordinates to explore and engage in innovation in the workplace by acting as role models, demonstrating creativity-relevant skills, getting involved in entrepreneurial activities and encouraging subordinates to copy their behaviour by using their skills to create and implement novel ideas (Atitumpong & Badir, 2018; Meijer, 2014). Managers should also encourage, offer support, and alleviate employees' anxiety and concerns that may occur as a result of innovation uncertainties (Atitumpong & Badir, 2018; Goodman & Dingli, 2013).

Creativity is about generating new ideas, and employees may experience frustration and negative emotions during the process – in which management support is particularly important (Cheung & Wong, 2011). Unfortunately, much of the time, management is not open to new ideas that challenge their thinking. Some managers

may even withhold rewards for exceptional employee performance (Chowdhury, 2004), and are characterised by strong uncertainty avoidance, feel that diverse people and ideas are risky and should not be allowed, feel that tension and competition can result in conflict and should be prevented, and work should be done according to rules and regulations (Wagner & Hollenbeck, 2010). Innovative managers should not hold these characteristics, but should rather create ideas and creative solutions to problems, create a climate of innovation, and challenge the status quo by encouraging employees to take risks, and tolerate failed ideas (Meijer, 2014; Miao *et al.*, 2018). Employees will further engage in creative behaviour if they are motivated and encouraged by management to explore new ideas, take risks, make mistakes, and are provided with sufficient resources, such as money, equipment, and time to complete an innovative project (Amabile, 1998; Scott & Bruce, 1994).

Management needs to provide resource support to employees as well as access to information, to assist in the creation and implementation of new innovative ideas (Cheung & Wong, 2011). Innovation, driven by employees, can be classified as a bottom-up process, as the innovation process is initiated at lower levels of the hierarchy (Blackler *et al.*, 1999; Das *et al.*, 2018; Gurova & Kurilov, 2015; Haapasaari *et al.*, 2018; Oeij *et al.*, 2017, 2019; Windrum, 2008). The results from a study by Das *et al.* (2018) show that top-down supported projects receive more funding and easier access to resources from the start of the project when compared to bottom-up supported projects.

Management support can promote innovative behaviour and leadership training programmes that will assist management to recognise the value of management support, and provide them with the required skills to offer the necessary support to their subordinates (Chen, Li & Leung, 2016).

e) Limiting factor 5: Limitation in terms of human resources

Limitations in terms of human resources include a lack of skills, knowledge, and attitudes needed for innovation, implementation issues, inadequate number of employees, small diversity of skills and qualifications among employees, a lack of

teamwork, insufficient experience, and a lack of managerial qualifications (Claudino *et al.*, 2017; Souza & Bruno-Faria, 2013).

Although all employees must adhere to certain guidelines to work for any organisation, a lack of knowledge, skills, and creativity will hamper the innovative efforts of the organisation (Hueske & Guenther, 2015; Jun, Cai & Peterson, 2004; Kim, Lee & Gosain, 2005). Managers need to master the ability to elicit more creativity from their staffs, to preserve the integrity of the organisation and ultimately strengthening the organisation through happier employees, better creative ideas, and an environment that encourages development instead of hindering it (Chowdhury, 2004). Managers need to be mindful that choosing employees, based on their educational background only, will not assure innovativeness; they need to develop the creative self-efficacy of their employees, create conditions that will facilitate learning orientation, and deliver creativity (Atitumpong & Badir, 2018). Management should focus on employing creative supervisors who will assist to improve subordinates' innovation and creativity by being creative role models with proactive personalities, motivating subordinates and providing them with intellectual stimulation (Koseoglu, Liu & Shalley, 2017).

Managing diversity within the organisation is good for business strategy, as a diverse workforce will improve service delivery to a diverse market (Bagraim *et al.*, 2016; Wagner & Hollenbeck, 2010). Although diversity can be valuable to an organisation, it can also pose a problem; people from diverse backgrounds might find it difficult to work together due to their diverse perspectives (Bagraim *et al.*, 2016; Goodman & Dingli, 2013). Management and supervisors may find it difficult to manage diverse teams and, therefore, miss out on the potential that diversity can hold for group performance. To overcome this problem, organisations should offer diversity training programmes aimed at creating an understanding and appreciation of one another (Bagraim *et al.*, 2016; Homan, Buengeler, Eckhoff, van Ginkel & Voelpel, 2015; Hunt, Layton & Prince, 2014).

Organisation should encourage training programmes for supervisors to develop skills and attitudes required for innovation and diversity (Khaola & Coldwell, 2019; Koseoglu *et al.*, 2017). Organisations should provide employees with the opportunity to take advantage in areas reflecting their own initiative or expertise, whether creative,

innovative, operational or strategic, and aligning their activities with those of the team, resulting in a cooperative process (Oeij *et al.*, 2017).

When an organisation lacks a spirit of teamwork, a culture of individualism among the members will exist. Members are then more likely to go with their own point of view, and as a result, hinder the effectiveness of innovation and prohibiting teamwork focused on innovative ideas (Tian, Deng, Zhang & Salmador, 2018).

f)   Limiting factor 6: Limitation in terms of financial resources

Insufficient funds within organisations to finance innovation, and difficulty gaining access to finances outside the organisation can truly impact innovation performance (Božić & Rajh, 2016). Money is needed to innovate (Claudino *et al.*, 2017). Research on financial constraints highlights that a lack of appropriate financial sources (Das *et al.*, 2018; Hadjimanolis, 1999; Hueske & Guenther, 2015) creates an innovation barrier that is linked to insufficient external financing from investors, and a lack of internal financial resources at the organisational level (Czarnitzki & Hottenrott, 2010; Hueske & Guenther, 2015).

Financial resources refer to the actual budget, which includes the initial investment required to complete an innovation project. Inefficient use of such financial resources limits the organisation's innovative ability (Ciriello *et al.*, 2016). An organisation can also hamper its innovative ability through financial risks when innovations are rejected, resulting in missed potential profits or even non-monetary risk such as losing a competitive advantage (Rogers, 1983). Incremental and small-scale innovations have low complexity, resulting in straightforward implementation; it involves the use of fewer resources and is less risky than radical innovation, providing substantial improvements for organisations and can be implemented without the necessity of substantial investments (Claudino *et al.*, 2017; Goodman & Dingli, 2013; Jantz, 2016).

g)   Limiting factor 7: Limitations in terms of technological resources

Technological resources and innovations are considered as some of the most important aspects to provide organisations with opportunities to improve effectiveness

and efficiency, and to even offer a competitive advantage (Selhofer *et al.*, 2012). Investing in technology refers to the integration of technology into the way business is conducted within the organisation (Laryea & Ibem, 2014). Research on technological investment highlights that technological investment presents many benefits for organisations in competitive markets (Yildiz, Bozkurt, Kalkan & Ayci, 2013). The goal of the process and decision to invest aims at improving the current way in which business is done, with a specific focus on the areas of concern that are hindering organisations to perform optimally (Laryea & Ibem, 2014).

By effectively applying the knowledge and technological skills of employees, the performance of an organisation may be influenced by the employees' behaviour, resulting in innovative initiatives being triggering, enhancing the organisation's competitiveness (Shanker, Bhanugopan, van der Heijden & Farrell, 2017). However, it is widely recognised that technological changes have transformed job requirements (Hunt *et al.*, 2014), and the lack of technological skills in the workforce is seen as a major limitation to innovation (Selhofer *et al.*, 2012). To effectively use new and unfamiliar technology, employees need to have a sense of openness to new ideas, as prior knowledge and experience can form mental blocks against trying out new things, and employees may feel that the existing approach is the best (Forbes & Wield, 2002). Designing and monitoring the innovation process and appointing employees with the required special skills for technological activities are important sources of innovation (Dziallas & Blind, 2019; Huergo, 2006). A lack of expertise and technological skills will affect employees and will have an impact on the organisation's innovative ability (Claudino *et al.*, 2017). Organisations should, therefore, focus on reviewing the training and development systems to meet the professional and skills need of the organisation, and to improve the technical skills of its employees (Selhofer *et al.*, 2012).

Technological innovations are very capital intensive and consist of lengthier development periods compared to minor incremental innovations, and employees should also have the knowledge required to create these new technologies (Freel, 2005; Oke, Burke & Myers, 2007; Woschke, Haase & Kratzer, 2017). Technological innovation also presents risks connected with unclear returns of investment (Selhofer *et al.*, 2012).

h) Limiting factor 8: Obstacles originating from the external environment

Obstacles from the external environment include barriers from outside the organisation that cannot be controlled by its employees or managers. The focus of current research is not on the external environment, but it is important to briefly touch on this topic as organisations do not operate in a vacuum (Brown & Osborne, 2005). It is essential for organisations to have interactions with the external environment (Ghisetti, Marzucchi & Montresor, 2015). The external environment of an organisation includes factors beyond its management's immediate control, creating challenges and opportunities that should form part of the strategic management of the organisation (OECD/Eurostat, 2018).

Examples of external factors include the activities of customers, suppliers and competitors, economic conditions, the labour market, legal and regulatory conditions and the supply of technical and other forms of knowledge of value to innovation (OECD/Eurostat, 2018). Due to the rapidly changing technological environment, organisations are required to cooperate, as relying solely on one's own capacity seldom results in successful innovations (Nguyen & Nguyen, 2013). Due to the fluctuations in the external environment, such as scarce resource, the need to reduce risks, higher service level expectations and a reduction in performance gaps, organisations should cooperate with external organisations through participation and interactions in order to explore new technologies, to develop new products, to decrease time to market, and to reduce costs and risks (Miao *et al.*, 2018; Nguyen & Nguyen, 2013; Walker, 2007).

i) Limiting factor 9: Prioritisation of core and/or short-term activities

Many organisations realise that innovation is imperative; they talk about it and it is even referred to in organisations' strategic documents, but unfortunately, they focus on the routine activities that offer instant returns instead of long-term innovation. One of the substantial characteristics of innovation is long-term orientation, as the benefits of innovation are not instantly accessible but deemed vital for long-term success (Mussner *et al.*, 2017). Over the previous decades innovation and creativity have developed into a very popular topic in both the academic and business environments,

as innovation and creativity are considered key factors influencing long-term organisational success. The literature includes evidence that competitive success depends on an organisation's ability to manage the long-term innovation process (Bhatnagar, 2014). Organisations following a bureaucratic system where employees perform specialised tasks according to fixed rules, and decisions are taken centrally by hierarchical authorities, will find it difficult to create an innovative environment where members can submit new proposals (Loué & Slimane, 2017). A bureaucratic management system prioritises routine activities that present more immediate returns, instead of long-term projects focused on innovation (Claudino *et al.*, 2017; Loué & Slimane, 2017).

Leading organisations throughout the world have a clear aim on innovation. They acknowledge that efficient and continuous innovation drives both value creation and competitiveness, and thus have distinct strategies, processes and a culture that support innovation (Ikeda & Marshall, 2016).

j)   Limiting factor 10: Fear of innovation consequences

Organisations should focus on creating a culture with values that support and tolerate experimenting and risk-taking behaviour (Mokhber *et al.*, 2018). To stimulate innovation, organisations should be supportive of idea generation by creating a "safe-zone" for employees to express new ideas; should accept "mistakes" as a necessary part of innovation and should not criticise or punish (Loewe & Dominiquini, 2006; Mokhber *et al.*, 2018). Organisations that engage in innovative activities suggests that they are willing to take risks by tolerating, encouraging, and supporting their employees to take risks and encourage critical thinking to stimulate initiatives (Khalili, 2016; Yoshida, Sendjaya, Hirst & Cooper, 2014). Innovation provides a learning environment and a sense of security for employees to explore, imagine, take risks, and generate revolutionary ideas without being concerned about the harmful effects on their careers as a result of failed creative ideas (Hong *et al.*, 2018; Yoshida *et al.*, 2014).

Without a supporting innovative culture, fear will prevent employees from suggesting ideas, and organisations will remain trapped in the status quo (Loewe & Dominiquini,

2006; Mokhber *et al.*, 2018). Employees may feel that new innovative ideas threaten current knowledge, products, and services (Lindland & Billington, 2016), and may exclude older and less educated employees (Howaldt *et al.*, 2012). Management should refrain from constantly monitoring employee innovation, as employees may feel unsure and vulnerable at work, thinking that their jobs or employment may be under threat if they make mistakes (De Jong & Den Hartog, 2007; Oeij *et al.*, 2017).

k) Limiting factor 11: Resistance to innovation due to loss of power

Organisational creativity can be enhanced by permitting more openness, decentralisation, empowerment, and less management control (Henry, 2013). This change can, however, increase insecurities about possible job losses or career positions among managers (Moodley, 2010).

Employees that are allowed to take decisions or contribute in the decision-making process will feel more empowered, but when more people can have a say, it will take longer to reach an agreement and middle management may feel that they lose power (Henry, 2013; Prieto & Pérez-Santana, 2014). Decision rights are often linked to power, reputation, and a high salary, and managers may, therefore, be unwilling to share their decision-making powers, fearing that it may result in their positions being destroyed (Kesting & Parm Ulhøi, 2010). Power gives managers a feeling of control and security in the hierarchical relationship, and managers may be angered when their power is threatened or questioned (Chowdhury, 2004). Some managers may perceive employee initiatives as a loss of power and an attack on their authority, and as a result, they may suppress the innovative talents of employees to their own advantage and to reinforce their own positions (Kesting & Parm Ulhøi, 2010).

Liu, Ge & Peng (2016) found that junior managers will follow, instead of making radical changes to an existing strategy, to guard their positions and power, and preserve the stability within the organisation. Leaders may also be concerned about reducing the power differential between them and their employees, particularly in cases where the leader is younger and less experienced than the employees with whom he or she is working (Chowdhury, 2004).

I) Limiting factor 12: Resistance to innovation due to existing behaviour, attitudes and actions not supporting new ideas

Resistance to innovation focuses on issues such as behaviour, attitudes, and actions that inhibit innovation, resistance to change, a culture that does not support innovation, rigid organisational structures, maintaining the status quo, and avoiding risk (Claudino *et al.*, 2017; Souza & Bruno-Faria, 2013).

In large bureaucratic organisations all forces are arrayed for stability and conservatism (Power, 2013). Communication is done along the chain of command (Sørensen, 2012), and decisions are made at a central point (Oeij *et al.*, 2017). Employees perform their work according to rigid rules, policies, procedures, performance evaluation guidelines, and manuals to maintain the status quo (Naranjo-Valencia *et al.*, 2016; Romero, 2012; Wagner & Hollenbeck, 2010). Employee knowledge and an innovative organisational climate are crucial for organisations to become innovative and develop a competitive advantage (Deshpandé & Farley, 2004; Nybakk & Jenssen, 2012; Patterson, Warr & West, 2004; Shanker *et al.*, 2017). Managers should establish a work environment that supports EDI, encourage employees to take risks, investigate new thoughts, and exchange knowledge (Atitumpong & Badir, 2018; Khalili, 2016; Koseoglu *et al.*, 2017; Naranjo-Valencia *et al.*, 2016). Creative cultures are characterised by employee engagement, encouragement and inclusivity (Bagraim *et al.*, 2016). Bureaucratic organisations should aim at promoting such an innovative culture as it will not only improve the work-life quality and employee well-being, but also organisational performance (Howaldt *et al.*, 2012).

Organisations can embrace innovation by implementing strategies and policies that will create and support a creative atmosphere (Wong & Pang, 2003; Yeh & Huan, 2017). Laying a solid foundation for a high performing innovation culture will create a steady flow of ideas from involved employees (Accenture, 2017). Organisations with proactive cultures that stimulate creativity, encourage risk-taking behaviour, and endures mistakes, have enhanced performance and can develop innovations faster than competitors who do not have such cultures (Naranjo-Valencia *et al.*, 2016). Copying a new innovative product is straightforward, but it is incredibly difficult to copy an innovative culture (Accenture, 2017).

2.6.2 Factors fostering innovation

a) Fostering factor 1: Management support

Managers' leadership styles can either inspire or hamper employee's creativity (Yeh & Huan, 2017) and can range from purely transactional and brief to approaches that reflect a profound concern for employee well-being, such as transformational leadership (Bammens, 2016). Transformational leaders can create a work environment that is beneficial to innovation by inspiring organisational learning and enabling employee creativity (Durmusoglu *et al.*, 2018). Support from management can be a valuable contributor to EDI (Hon, 2011; Ro & Chen, 2011; Yeh & Huan, 2017). Management should encourage employees to explore and innovate in the workplace by acting as role models (Atitumpong & Badir, 2018; Meijer, 2014) and should offer support and reduce employee anxiety and fear as a result of innovation uncertainties (Atitumpong & Badir, 2018; Goodman & Dingli, 2013).

Leaders that recognise the contributions of their followers will naturally motivate their followers to think of and contribute new innovative ideas (Cheung & Wong, 2011). Resources can significantly increase the amount of creative performance, but less so the quality thereof (Yeh & Huan, 2017). Freedom has a positive effect on EDI and is more important for creative performance than resources (Yeh & Huan, 2017). Increased freedom among employees will result in positive feelings towards the organisation and as a result, employees will be more devoted to their responsibilities (Chiang & Hsieh, 2012; Sahoo & Das, 2011).

Management should use approaches and actions to assure employees of the value of innovation, stimulate dialogue and articulation between employees, and establish a relationship of trust (Souza & Bruno-Faria, 2013). Innovation support should be a significant and strategic goal for organisations (Owen & Zyngier, 2012).

When an employee is successful in attempting new ideas, the leader is always a key person to share the delight and success of the outcome (Cheung & Wong, 2011). Organisations are tasked with offering structure and stability that will motivate employees to engage in creative ideas and will provide consistent acknowledgement,

recognition, and affirmation (Leavitt, 2004; Osuigwe, 2016). Financial rewards can create a more innovative culture and increase employees' innovate output, but such rewards need to be well-structured so that they will not be the only reason for new creative ideas (Torres, 2015).

b) Fostering factor 2: Support of working groups and employees

Working groups include team members that have different abilities, each with unique strengths and weaknesses (Baggen, Biemans & Lans, 2015). When members in the group interact they are likely to be more open to new ideas, and be willing to discuss and constructively review the information they collect from each other (Heyden, Sidhu & Volberda, 2018). By engaging in constructive discussions and challenging one another's opinions and viewpoints, groups can, in the execution of certain organisational tasks, determine what is relevant and what is not (Chowdhury, 2004; Duncan & Weiss, 1979). Supportive co-workers may provide moral support to one another, share their knowledge and expertise, and increase motivational levels to commit to creative activities (Hon, 2011; Yeh & Huan, 2017). Support of working groups positively contributes to employee creativity (Yeh & Huan, 2017).

Working groups facilitate cross-functional teamwork throughout organisations, where teams can discover product and process adjustments that would otherwise be missed under the pressure of daily workloads. Working groups can bring people together that would otherwise not have met, and such groups can become sources of constructive discussion and creativity (Oeij *et al.*, 2017).

c) Fostering factor 3: Diversity of competencies in the group responsible for innovation

In today's business environment it is important to understand that the goals of organisations are to beat the competition and gain new customers. An organisation will gain a competitive advantage when it can do something that its competitors find difficult to imitate or that competitors cannot imitate at all (Urbancova, 2013; Wagner & Hollenbeck, 2010). Many organisations have employees with special abilities who are holders of knowledge, skills, and personal creativity, and have the ability to

develop new creative ideas that will assist organisations to gain a competitive advantage (Bagraim *et al.*, 2016; Urbancova, 2013). Utilising the innovative ability of employees and creating innovative ideas has become more significant than ever (Moll & De Leede, 2016).

Workforce diversity is a valuable stimulant to EDI. It refers to the heterogeneous nature of people in the workplace (gender, age, ethnicity, race, and sexual orientation) and bringing these people together. A diverse workforce has the potential to attain higher performance than a homogenous workforce, as it brings together people from different experiences, perspectives, and educational backgrounds (Bagraim *et al.*, 2016; Chowdhury, 2004), and organisations should put such diversity to optimal use (Homan *et al.*, 2015). Workforce diversity brings a wealth of viewpoints, traditions, experiences and problem-solving abilities from employees. Employees can learn from one another and become flexible to adapt to change, which can increase organisational effectiveness and lead to a competitive advantage (Chowdhury, 2004; Saxena, 2014). Organisational success, competitiveness and even survival relies on an organisation's ability to embrace diversity and realise the benefits that it has to offer (Kreitz, 2008; Shaban, 2016).

The positive consequences of diversity are generally recognised in terms of intellectual effects such as better ideas, creativity, and innovations that employees from different social backgrounds create (Shaban, 2016). Managing the diversity of the workforce within an organisation is good for the business strategy, as a diverse workforce will improve service delivery to a diverse market (Bagraim *et al.*, 2016; Wagner & Hollenbeck, 2010).

d) Fostering factor 4: Disclosure of information on innovation

Cooperation among employees, management, and trade unions requires open, clear, two-way communication to ensure constructive industrial relations (Oeij *et al.*, 2017). The degree of open, innovative, and trust-promoting communication will determine the degree of trust, readiness, and ability to work together and ensure involvement in the innovation and implementation processes (Gustavsen, 2015; Oeij *et al.*, 2017).

Organisations should aim to establish direct communication with management through broader workplace meetings, focused briefing groups, quality circles and problem-solving groups, to empower employees to manipulate organisational matters through such direct contact (Gallie, 2013; Oeij *et al.*, 2017). A "common" awareness of the aims and the challenges that face innovation in the workplace should exist (Oeij *et al.*, 2017). Organisations should invest in continuous two-way communication as people cannot support what they are not familiar with and what they do not comprehend (Gustavsen, 2015; Oeij *et al.*, 2017). Open dialogue in the workplace will ensure a smoother innovation process with improved focus by all participants (Gustavsen, 2015; Oeij *et al.*, 2017).

Communication is recognised as a key factor in promoting innovation and reducing resistance against any type of innovation (Shahin, Barati, Khalili & Dabestani, 2017). It is important to establish clear lines of communication for employees to share information and ideas with management directly and without delay (Tian *et al.*, 2018). Through clear, transparent and effective communication, coupled with a culture of trust, support, mutual respect, and employee involvement, employee resistance should not limit innovation (Page & Schoder, 2019).

Managers need to create a culture that not only promotes, but also protects effective communication in the organisation (Shahin *et al.*, 2017), as a culture focused on open and transparent communication will promote innovative work behaviour among employees (Dhar, 2016; Martins & Terblanche, 2003). Findings also point to the fact that communication and interactions among employees are crucial for innovation as the exchange of ideas between different levels of staff not only triggers and stimulates innovation, but also ensures different professional innovation perspectives (Moll & De Leede, 2016; Osuigwe, 2016).

e) Fostering factor 5: Strategies for incorporating innovation into organisational routines

The most innovative processes start with idea-generation, followed by the adoption phase, the tweaking phase, design phase, and finally, the implementation phase (Roderkerken, 2011).

Innovation acceptance refers to the decision of any individual or organisation to use a new idea or behaviour in an organisation (Frambach & Schillewaert, 2002; Terziovski, 2009). Innovation implementation, on the other hand, is generally more predictable and structured (Dediu, Leka & Jain, 2018). It is the critical phase and gateway between choosing to accept an innovation and it becoming part of the organisational routine (Haapasaari *et al.*, 2018; Klein & Sorra, 1996). Innovation implementation focuses on the transition period when employees gradually become more competent, constant, and dedicated in their use of innovation (Klein & Knight, 2005). The difference between adoption and implementation is fundamental: it is possible to adopt innovations but then be unsuccessful in implementing the innovation successfully (Haapasaari *et al.*, 2018; Klein & Knight, 2005).

Organisations should develop actions, strategies, policies, and practices for effective innovation implementation, which include the quality and amount of available training to explain to employees how to use the innovation, the availability of technical support to employees as and when needed, establishing rewards (e.g. acknowledgement, promotions) for innovation, and the accessibility, quality, and convenience of the innovation (Klein & Knight, 2005). Learning orientation supports and enables skills development and growth. Employees in organisations with solid learning cultures are eager to explore and take risks and are not limited by the fear of failure. Issues, errors, and bugs are likely, but a strong learning orientation will overcome such obstacles and allow its members to experiment, adapt, and persevere in innovation (Klein & Knight, 2005; Martins & Terblanche, 2003).

Managers play a critical role in simplifying the changeover period resulting from an innovation process. Management should act as leaders and provide strong, convincing, motivating, knowledgeable, and demonstrable support for implementation (Klein & Knight, 2005; Nguyen & Nguyen, 2013; Sharma & Yetton, 2003). Such support from senior management will enable the acceptance and implementation of the selected innovation by the employees (Othman, 2010). Employees that work together as a team will also produce more successful innovations and will be more interested in future attempts to innovate (Janssen *et al.*, 2004; Klein & Knight, 2005). Leaders should aim to create shared team learning by pronouncing a persuasive and inspiring reason to use innovations, emphasising the need for team members' support

and involvement due to managements' imperfection, and explaining to team members that they are knowledgeable, indispensable, and appreciated allies. Team members will then view innovation and its implementation as an exciting learning opportunity (Edmondson, Bohmer & Pisano, 2001; Pousa & Mathieu, 2014).

f)   Fostering factor 6: Participation of outside consultants and new employees

Organisations cannot operate in isolation and also succeed – they need vertical networks, which involve interactions with other organisations based on formal agreements to access and share resources (Teece, 1996). Organisations pursue such arrangements to improve their competitiveness and performance (Ireland, Hitt & Vaidyanath, 2002), to gain access to various knowledge sources and new markets, and to increase their market power or enhance their competencies (Berchicci, 2009; Hagedoorn & Duysters, 2002).

Organisations engage in information exchange, innovation and cooperation (Oeij *et al.*, 2017) by bringing together a number of actors (companies, consultants, researchers, et cetera) who share a common interest and have a wide diversity of expertise, knowledge, professional training and qualifications that complement each other (Borg & Söderlund, 2015; Claudino *et al.*, 2017; Gurova & Kurilov, 2015; Oeij *et al.*, 2017). Organisations' internal members, members from other organisations, external independent consultants, researchers, and other role players may all participate as members of innovation projects (Borg & Söderlund, 2015; Bredin & Söderlund, 2011; Høyrup *et al.*, 2012; Nesheim & Hunskaar, 2015; Reich, Liu, Sauer, Bannerman, Cicmil, Cooke-Davies, Gemino, Hobbs, Maylor, Messikomer, Pasian, Semeniuk & Thomas, 2013). These members will discover, exchange and talk about what people know and what they don't know (Høyrup *et al.*, 2012).

A new innovative idea may be original to an organisation, but not the world. Consequently, having access to outsiders (e.g. external consultants and new employees) who are knowledgeable in similar innovation projects can be useful to identify and prevent past mistakes (Tether & Tajar, 2008). External consultants can provide new insight and innovation (Kelley, 2010), and may be more willing than

internal employees to convey their concerns to higher management (Loh, Coyte & Cheng, 2019).

g) Fostering factor 7: Planning of actions necessary for implementation

The detailed planning of the actions required for the implementation phase of a new idea is vital. The plan should include the necessary testing and adjustments required, information that should be gathered, diagnoses to be made, identifying best practices, pilot projects, management of the projects, and allocation of resources (Claudino *et al.*, 2017; Souza & Bruno-Faria, 2013).

Implementation of an innovative idea is expensive as it requires extensive training, ongoing user support as well as a communication drive to explain the new innovation and the benefits thereof (Klein & Knight, 2005). The innovation implementation plans may require that employees are prepared and trained on all the techniques required to ensure successful implementation (Othman, 2010). The availability of financial resources has an immediate effect on the success of the organisation's innovation implementations (Klein & Knight, 2005).

Innovation implementations are complex. Oeij *et al.* (2019) advise on the following to assist with the implementation phase and increase the chance that the innovation will be used:

- Afford employees sufficient freedom and opportunities to express their opinions.
- Involve employees in the decision-making process on operational tasks.
- Stimulate employees' innovative behaviour.
- Ensure that innovation is perceived as useful and adding quality to employees' work or productivity.
- Ensure that innovation is easy to use.

Technological innovations should be sufficiently developed and user-friendly (Lin, Shih & Sher, 2007). Pilot projects play an important part in testing and "debugging" potential innovations (Brown & Osborne, 2005). During the pilot and innovation adjustment phase, employees should be involved in the testing and should be offered the chance

to comment on the ease of use and possible ways to improve the innovation adopted (Loué & Slimane, 2017; Oeij *et al.*, 2019). Employee involvement will increase the chances of the innovation being adopted (Oeij *et al.*, 2019). Enabling organisational participation of employees, supporting innovative behaviour, and working on the perception of innovation appear to expedite the positive and successful implementation of innovation (Oeij *et al.*, 2019).

h) Fostering factor 8: Acknowledgment of the value and need of innovation

The importance of EDI for organisations is reflected by a growing number of studies aimed at recognising the importance of successful innovations in organisations (Aaltonen & Hytti, 2014; Chen, 2017; Chughtai, 2013; Dzisi *et al.*, 2013; Hueske & Guenther, 2015; Ikeda & Marshall, 2016; De Jager *et al.*, 2013; Kesselring *et al.*, 2014; Moses *et al.*, 2012; Nusair *et al.*, 2012; Ortega-Egea *et al.*, 2014; Poutanen, Soliman & Ståhle, 2016; Selhofer *et al.*, 2012).

In the modern fast-changing and unpredictable business environment, an organisation's ability to create and apply innovation is considered crucial for increased organisational performance, success, and survival. Motivated employees that actively engage in innovative work will result in organisations being able to respond to change faster (Chughtai, 2013; Majaro, 1991; Mayer, 2012; Poutanen *et al.*, 2016; Proctor, 2010). The significance of innovation and creativity lies in its potential to improve organisational performance and profitability, and to sustain a competitive advantage (Bos-Nehles *et al.*, 2017; Lin *et al.*, 2013; Urbancova, 2013). Innovation also minimises use of resources, enhances employee job satisfaction, decreases absenteeism, and brings improvements in the quality of work-life (Dediu *et al.*, 2018; European Economic and Social Committee, 2011; Pot, 2011).

i) Fostering factor 9: Systemic perspective on innovation and interactions of organisational units

Cooperation among employees in a department and among departments are important for the effective operation of an entire organisation (Proctor, 2010). In many

organisations silos exist between functional departments, where each department pursues its own goals and interests (Oeij *et al.*, 2017). Organisations that share knowledge across departments and have lower competition among individual innovation projects generally perform better (Iferd & Schubert, 2017). Interdepartmental communication inspires employees from a diverse workforce, with diverse knowledge, qualifications, and backgrounds to engage in innovative behaviour (Cuijpers, Guenter & Hussinger, 2011; Moll & De Leede, 2016). Interaction and support from co-workers positively affect employee creativity (Füller, Hutter & Faullant, 2011). Increased interdepartmental contact is helpful for ideas that have a bigger scope than the employee's functional area of expertise. It allows for more interaction among employees to discuss ideas and opportunities and evaluate the organisational impact of an idea (Moll & De Leede, 2016). Interdepartmental efforts allow organisations to handle uncertainty better, to improve the quantity and quality of its innovation efforts, and discover new talent in the organisation (Cuijpers *et al.*, 2011; Loewe & Dominiquini, 2006).

Rigid adherence to policies, procedures, and rules discourages employees from taking the initiative and being creative, as it provides no room for flexibility, creative thinking and spontaneity, resulting in the organisation losing its ability to predict or adjust to changing conditions (Jantz, 2016; Romero, 2012; Wagner & Hollenbeck, 2010). The most effective organisations create innovation strategies and structures that are aligned with and support the organisation's mission and objectives (Ikeda & Marshall, 2016).

2.7   A NATIONAL PERSPECTIVE ON THE LEVEL OF INNOVATION IN SOUTH AFRICA

The South African Innovation Survey 2008 indicates that South African organisations have a relatively high innovation rate (Moses *et al.*, 2012). The results further indicate that organisations within South Africa were very concerned with innovation and its potential (Blankley & Moses, 2009). South African organisations compared well with those in European countries with regard to innovation, and in some cases even outperformed them (Blankley & Moses, 2009). Senior management in South African organisations should take advantage of these positive results by adapting policies and

procedures and creating an innovative culture to support and encourage innovative behaviour from all employees (Moses *et al.*, 2012). Managers in the services sector should identify and understand the processes behind innovation in their organisations and provide the necessary support and encouragement for such activities (Blankley & Moses, 2009).

2.8 AN INSTITUTIONAL PERSPECTIVE ON THE IMPORTANCE OF INNOVATION AND CREATIVITY

The ODeL institution where the study was completed was the result of a merger of three former higher education institutions in 2004. The institution faced a challenge during 2014 when the future direction of distance education in South Africa changed and the institution had to deal with the reality that it would no longer enjoy ODeL as an exclusive preserve (University of South Africa, 2014a: 4). There is a worldwide need for new approaches in higher education on the premise of it being part of an information society (Bruton, 2014). It is therefore of the utmost importance for the institution to be innovative in offering distance e-learning programmes and to compete with other institutions. The Principal and Vice-Chancellor of the institution emphasises that ODeL is now a highly contested space – even by traditional residential universities – making it crucial for the institution to creatively maintain a competitive edge nationally, continentally, and globally (University of South Africa, 2015b).

In an attempt to emphasise and support the importance of innovation in creating and sustaining a competitive edge, the strategic goals of the ODeL institution are outlined in various policies and governance procedures. Table 1 offers an abstract of the aims of the institution's strategic plan (University of South Africa, 2015a).

Table 2.2: Aims of the Unisa 2016–2030 strategic plan

The University of South Africa aims to
▪ establish itself as a leading provider of world-class higher education opportunities through open and distance e-learning: nationally, on the African continent, and internationally.
▪ establish itself in the international context and be recognised as a leading university among the mega-universities of the world.

While the institution continues to confront the challenges of development in South Africa and in a knowledge-driven world economy, appropriate human resource development and appropriate skills training linked to technological improvement and innovation remain key national development goals (University of South Africa, 2015a). As part of the institution's aim to maintain a competitive edge nationally, continentally, and globally, the significance of innovation and creativity within the institution is set out in several documents.

- During 2011, 12 key concepts were identified to promote a nurturing and strong culture at the institution. The document became known as the 11 Cs +1 and it would render support in changing the institution's culture (University of South Africa, 2011a: 11). One of the 11 Cs +1 is focusing on creativity: "the act of generating imaginative and innovative responses and solutions and liberating potential" (University of South Africa, 2011b: 1).
- The 2016–2030 strategic plan of the ODeL institution was adopted by the university Council on 24 April 2015 (University of South Africa, 2015b). The strategic plan sets out the ODeL institution's vision, mission, values, and strategic focus areas for a fifteen-year period. The plan consists of three strategic focus areas, which will each be implemented over a five-year period. The first strategic focus area of the institution's 2016–2030 strategic plan reconfirms the institution's aim "towards becoming a leading ODeL, being a comprehensive university in teaching and learning, and focusing on research, innovation and community engagement" (University of South Africa, 2015b: 5). The second strategic focus area in the strategic plan focuses on "crafting and embedding an agile, innovative, sustainable and efficient operational environment" (University of South Africa, 2015b: 5).
- The institution's 2030 mission statement "affirms the unique character of the institution specifically that it is the single dedicated comprehensive open distance e-learning higher education institution in South Africa" (University of South Africa, 2015b: 9). The institution's mission is further guided by the "principles of lifelong learning, student-centeredness, innovation and creativity" (University of South Africa, 2014a: 8).
- The innovation and excellence values as described in the institution's 2016–2030 strategic plan states: "Innovation and excellence characterise the actions, attitudes and culture required to create new ideas, processes, systems, structures, or

artefacts which, when implemented, lead to a sustainable and high performing institution. They are the underlying principles that we as change agents use to make a difference in the way we work with available resources to achieve our specific goals despite contextual and policy constraints. Innovation requires everyone to adopt a problem-solving approach that fosters intellectual ingenuity and novel solutions rather than simply problem identification" (University of South Africa, 2015b: 10).

- The Leading Change campaign was launched in June 2016 to give momentum to the institution's 2016–2020 strategic plan. Part of the campaign was an operational realignment initiative designed to achieve the strategic objectives of the institution (University of South Africa, 2016). The document confirms the need to enhance institutional effectiveness and efficiencies: "The promulgation of Unisa 2030 has stimulated a need to redefine service delivery for a new 21st century open distance and e-learning university. This will require all professional, administrative and support functions to reconceptualise their own understanding of what constitutes excellence in a high-performance university. This will require structures, processes, systems, policies and procedures to be defined in a manner that enhances institutional effectiveness and efficiencies in a coherent way. All of these changes will support a high-performance university together with the relevant skills and competencies" (University of South Africa, 2016: 2).

From the above, it is clear that innovation and creativity plays an extremely important role in the institution's objective in sustaining a competitive edge. The research in this study should, therefore, be viewed against the background of the institution's strategic objectives, the 11 Cs +1 document, the ODeL institution's 2016–2030 strategic plan, the 2030 mission statement, the innovation and excellence values, the Leading Change campaign, and other innovative projects of the institution.

2.9   SUMMARY

Innovation and creativity have developed into a very popular topic in academic and business environments, as innovation and creativity are considered key factors influencing long-term organisational success. That does not mean that innovation and

creativity did not exist before, but that the impact of innovation and creativity on sustained organisational success was not recognised. In a world that is always changing and presenting new challenges, the interest in creative problem-solving is only growing stronger and solutions to new kinds of problems are always in demand. Nowadays, many organisations are aware of just how important innovation and creativity are to prosper and be competitive in a dynamic environment. Even established organisations understand that new and better solutions should be developed in order to survive in the long term.

This chapter provides a theoretical view of supervisory behaviour and the management factors required to promote employee-driven innovation (EDI) and creativity in the workplace. Various leadership approaches are discussed with a specific focus on the innovative leadership approach. Further discussions focus on supervisory and management support, and their willingness to promote innovative behaviour and provide the required resources. The importance of managing the innovation process and the benefits of effective team innovation are discussed. The aim of this chapter is not only to provide theoretical constructs on supervisory behaviour, but also to show what kind of support and management factors play a role in enhancing EDI and creative behaviour.

3.1   INTRODUCTION

Over the years the need for organisations to innovate has become a necessity (Sveiby *et al.*, 2012) and although innovation is debated at senior level meetings and documented in strategic documents as being the lifeblood of organisations, in most cases the commitment ends there, as innovation is often met with caution, scepticism, and resistance by supervisors. The reality is that innovation frightens many supervisors because it is inevitably linked to risk, and forces supervisors to function outside of their comfort zones. The Florentine political philosopher, Niccolo Machiavelli, argued that innovation was a serious threat to those in power and needed to be discouraged rather than embraced (Mars, 2013). Many supervisors and leaders understand the power and benefits of innovation, but most remain opposed to the intense investment and dedication that innovation requires (Mayer, 2012). Supervisors need to be trained to act in ways that promote and support organisational innovation and not to regard it as a threat. (Horth & Buchner, 2014).

Findings in a study by Van Lamoen (2012) confirms that supervisory behaviour indirectly affects subordinate attitudes and behaviour. Through changes in supervisory behaviour and introducing structures, subordinates may have fewer doubts about their roles and experience increased job independence and improved relationships, which

in turn, stimulate positive work outcomes, enhance employee work engagement, increase teamwork and motivation, and ultimately result in positive behaviour and commitment to the organisation. Innovative behaviour is vital for organisational competitiveness and it is, therefore, crucial to discover how supervisors can stimulate subordinate innovativeness (Chen *et al.*, 2016).

3.2   WHAT IS A SUPERVISOR?

According to the Cambridge Advanced Learner's Dictionary and Thesaurus (2019) a supervisor can be defined as "a person whose job is to supervise someone or something" and the Cambridge Business English Dictionary (2019) defines a supervisor as "a person who is in charge of a group of people or an area of work and who makes sure that the work is done correctly and according to the rules". Synonyms for supervisor include "manager, director, administrator, overseer, controller, boss, chief, superintendent, inspector, head, governor, superior, organiser, conductor, steward and foreman" (Cambridge Advanced Learner's Dictionary and Thesaurus, 2019). In this study the general term "supervisor" with no specific title linked to it, and the basic definition of the term supervisor, "to supervise someone", are used.

Van Lamoen (2012) determined that a supervisor has a major influence on the work experience of employees. O'Driscoll & Beehr (1994) also argues that a supervisor has a direct influence on subordinate behaviour as the supervisor is the most immediate and relevant person in an individual's work context. Supervisors that are perceived as helpful, considerate, honest, and loyal will lead to higher commitment, effort, and positive work outcomes (Atitumpong & Badir, 2018; Ellemers & Rink, 2016).

Supervisor behaviour is one of the most important factors affecting innovation and creativity in the workplace (Anderson *et al.*, 2014). Each supervisor holds a leadership style that can either motivate or hinder EDI and creativity (Yeh & Huan, 2017). In the following section different leadership styles are discussed briefly with a focus on the leadership style that promotes EDI and creativity.

3.3   WHAT IS LEADERSHIP?

The question of what leadership is has been under investigation for much of the 20th century and still no universally agreed-upon definition of leadership exists (Yordanova & Blagoev, 2015). The difficulty to provide one universal definition comes from the broad scope of the term as it includes a large number of qualities, skills, approaches, competencies, and situations (Yordanova & Blagoev, 2015). The institution where the study was conducted, however, defines leadership as having the power to shift the masses, change mindsets, and create a social influence (University of South Africa, 2011a). Goodman and Dingli (2013) discuss the importance of managers becoming leaders and state that leadership is about discovering answers to questions others have yet to consider, and not about presenting someone else's answer. A large number of definitions has been created and developed by scholars and the notion of influence appears in almost all the definitions that exist (Yordanova & Blagoev, 2015).

A definition by Goodman and Dingli (2013) explains that managers are not always born leaders, but that it is important for managers to become leaders. This implies that supervisors/managers can be trained to become effective leaders, be more flexible and provide the necessary support to subordinates, which can promote innovative behaviour (Chen *et al.*, 2016). Leadership training programmes can assist leaders to appreciate the importance of supportive supervision and equip them with the skills needed to offer support to subordinates (Chen *et al.*, 2016). Leaders need to influence and persuade people of the value of innovation, establish relationships of trust, promote teamwork and involvement and stimulate dialogue among employees (Souza & Bruno-Faria, 2013). Being a leader proposes being somewhat different and leading towards some changes within the organisation, which should improve the current state of affairs (Yordanova & Blagoev, 2015).

Organisational leaders are frequently charged with introducing and implementing various initiatives to change their organisations (Choi & Ruona, 2013). Business leaders and diversity specialists argue that for organisations to survive and thrive, they need to take competitive advantage of the diverse workplace with their innovative ideas by redefining their management and leadership styles (Kreitz, 2008). Because change is inevitable, research suggests that the more employees regard an

organisation as having the ability to adapt to changing situations and the more trust exists among the employees, their peers, and leaders, the more likely they will be ready for a change initiative and suggest positive change initiatives (Choi & Ruona, 2013). Leaders need to influence others to work together towards achieving a particular aim (Yordanova & Blagoev, 2015).

Leadership styles have traditionally been a popular way to view a supervisor's influence on subordinates in the workplace setting. The most contemporary leadership approaches that are discussed are transactional leadership (Burns, 1978), transformational leadership (Bass, 1985), leader-member exchange, also known as LMX (Dansereau, Graen & Haga, 1975), empowering leadership (Kirkman & Rosen, 1999), authentic leadership (Walumbwa, Avolio, Gardner, Wernsing & Peterson, 2008), servant leadership (Hale & Fields, 2007), and innovative leadership (Gliddon, 2006).

3.3.1 Transactional leadership

Transactional leadership was introduced by Burns in 1978 and has proven to be a very popular topic resulting in numerous further studies on this type of leadership style (Burns, 1978; Loué & Slimane, 2017) Transactional leadership refers to a relationship of exchange between leaders and subordinates and aims to benefit both members (Xie, Xue, Li, Wang, Chen, Zheng, Wang & Li, 2018). Supervisors with transactional leadership influence their employees by setting clear goals and offering material incentives in a mutual exchange relationship while focusing on the goal and achieving the task (Burns, 1978; Schweitzer, 2014; Wang, Tsai & Tsai, 2014). Transactional leaders reward their followers for meeting performance targets (Sousa & Rocha, 2019). Because of the task-orientation of the transaction leadership style, it relates more to top-down management where employee engagement is under-utilised (Oeij *et al.*, 2017).

Bass (1985) identifies three forms of transactional leadership: contingent reward, management by exception-active, and management by exception-passive.

- Contingent reward leadership aims at establishing the expectation of the employee in terms of rewards for good performance.

- Management by exception-active leadership focuses on monitoring subordinate deviations from performance standards and taking corrective action when needed.
- Leaders who employ passive management by exception wait to be notified of performance deviations instead of actively monitoring it.

Transactional leadership focuses on the role of supervision, the organisation group performance (Sousa & Rocha, 2019), and on keeping things the same instead of looking at changing the future. Based on the discussion above, it is clear that transactional leadership will not enhance EDI, but it should be noted that transactional leadership is effective in crisis and pressured situations, and for projects that need to be completed in a specific way, for example, during the innovation implementation phase (Anderson *et al.*, 2014; Odumeru & Ogbonna, 2013).

3.3.2 Transformational leadership

Transformational leadership is a people-oriented foundation, which uses a bottom-up approach and provides employees with space (Oeij *et al.*, 2017). Supervisors with transformational leadership influence their subordinates by boosting their confidence (Bass, 1985; Burns, 1978). Bass and Steidlmeier (1999) theorise that transformational leadership is composed of four behaviours: idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration (Bass, 1985; Bass & Steidlmeier, 1999; Nusair *et al.*, 2012).

- Idealised influence refers to a leader being a role model who has gained the admiration and respect of employees, and positively influences their views and actions. These leaders express confidence in the vision of the organisation, are persistent, determined, show a sense of purpose, trust other people, and highlight achievements.
- Inspirational motivation refers to a leader that shapes a vision, gains commitment and optimism, and sparks enthusiasm to overcome challenges and cooperatively accomplish a collective goal. The leader communicates a clear vision of the future, aligns organisational goals with personal goals, and treats problems and threats as learning opportunities.

- Intellectual stimulation refers to a leader motivating subordinates intellectually to question assumptions, re-examine problems, increasing their intellectual curiosity, and inspire the implementation of new approaches. Transformational leaders aim at minimising mistakes proactively through ongoing diagnosis and anticipation; they do not punish or criticise followers for making mistakes, but turn mistakes and failures into learning experiences (Bass & Avolio, 1990). Intellectual motivation combined with individual attention forms the basis for an effective mentoring and coaching role.

- Individualised consideration involves understanding and appreciating diversity in the workplace where followers receive personal attention and are treated "differently but equitably" (Bass & Avolio, 1990). Transformational leaders aim at developing the potential of their followers by identifying the personal needs, abilities and concerns of individuals, providing matching opportunities and challenges in a supportive learning environment, developing individuals by delegating authority, providing developmental feedback, and through continuous coaching.

Transformational leadership can inspire employees to accomplish goals through higher-level self-reinforcement, by providing followers with useful feedback and encouraging them to make additional efforts to reach new solutions, which in turn will increase their intrinsic motivation to think creatively (Bass & Steidlmeier, 1999; Gumusluoglu & Ilsev, 2009; Shin & Zhou, 2003; Wang *et al.*, 2014). Shin and Zhou (2003) found that employees under transformational leadership responded strongly and positively to the influence by showing greater creativity. This finding is supported by the research done by Rank, Nelson, Allen, and Xu (2009) who found that the employees' innovative behaviour was higher under supervisors exhibiting transformational leadership.

3.3.3 Leader-member exchange (LMX)

Extensive research has been done on the relationship between leaders and employees, which is known as the leader-member exchange (LMX) theory, which emerged from the vertical-linkage dyad model (Dansereau *et al.*, 1975). The principle of LMX is that leaders build different types of exchange relationships with their

followers and the quality of these relationships influences important leader and member mindsets and actions (Ilies, Nahrgang & Morgeson, 2007).

The LMX theory focuses on the social exchange relationships between leaders and employees and proposes that the relationship quality between a leader and follower has an impact on outcomes such as performance, commitment, subordinate and supervisor satisfaction, adaption to change, role clarity, role conflict, and turnover intentions (De Jong & Den Hartog, 2007).

Research on the leader-member exchange theory reveals that the quality of the relationship between leaders and subordinates has a positive impact on the number of time followers engage in activities that do not form part of their employment contract (Hobman, Jackson, Jimmieson & Martin, 2011; Wayne & Green, 1993). The latter indicates that a leader-member exchange leadership style can have a positive influence on, and promote EDI.

3.3.4 Empowering leadership

According to a review done by Li and Hsu (2016), which focuses on employee innovative behaviour, it shows that not only transformational leadership enhances EDI and creativity, but empowering leadership also increases employees' creative self-efficacy and motivation to innovate (Wang *et al.*, 2014). Amundsen and Martinsen (2014) define empowering leadership as encouraging an employee intrinsically by offering support for the employee's development and by sharing power. Hughes *et al.* (2018) describe that empowering leadership involves allocation of authority to employees, sharing information, asking for input, as well as the advancement of self-directed and independent decision-making.

With a more empowering supervisor employees will feel empowered to express creative motivation and will engage in more creative activities as they perceive their efforts as being valued (Pieterse, van Knippenberg, Schippers & Stam, 2010). Empowering leadership supervisors will provide employees with the opportunity to explore, experiment, and search for new solutions while appealing to their desires for success (Friedman & Förster, 2001). Empowering supervisors display confidence in

the abilities of their employees, release employees from bureaucratic restrictions dictating to them how to work, and permit employee discretion to adapt as they see fit, which in turn results in employees feeling capable of pursuing creative outcomes (Mathieu, Ahearne & Taylor, 2007). Employees will, as a result, take more risks to pursue novel ideas (Friedman & Förster, 2001; Neubert, Kacmar, Carlson, Chonko & Roberts, 2008).

Empowering leadership has motivational influences on followers by providing greater authority and autonomy, promoting confidence in their jobs and promoting a sense of control and feelings of being empowered (Kim & Beehr, 2018). Employees who engage in more self-development and have added opportunities to participate in decisions-making and work activities display more affection and are more loyal towards the organisation (Chen, Sharma, Edinger, Shapiro & Farh, 2011; Den Hartog & De Hoogh, 2009).

3.3.5 Authentic leadership

Authentic leaders are posited to focus on follower development and building enduring relationships and leading with a purpose, meaning, and value (Avolio & Gardner, 2005; Gardner, Avolio, Luthans, May & Walumbwa, 2005). Authentic leaders are also transparent when dealing with challenges.

Authentic leadership builds on and encourages a constructive ethical climate and positive psychological capacities to foster greater self-awareness, balanced processing of information, and relational transparency between leaders and followers (Walumbwa *et al.*, 2008). In short, authentic leadership is ethical, transparent, open and empowering, and involves subordinates in decision-making (Avolio, Walumbwa & Weber, 2009; Walumbwa *et al.*, 2008).

Walumbwa *et al.* (2008) identified four constructs of authentic leadership, namely self-awareness, internalised moral perspective, relational transparency, and balanced processing.

- Self-awareness indicates the appropriate understanding of one's sense-making processes, strengths and weaknesses.
- Internalised moral perspective refers to one's moral values and self-regulated behaviour and acting in line with those standards.
- Relational transparency suggests expressing one's authentic self by sharing information and showing emotions.
- Balanced processing explains the method of examining information objectively before making a decision (Avolio *et al.*, 2009; Schuckert, Kim, Paek & Lee, 2018; Walumbwa *et al.*, 2008).

3.3.6 Servant leadership

Greenleaf (1970) created the term "servant leadership" and wrote about it in an essay called, "The Servant as a Leader". The servant leadership style places the focus and the needs of team members first before leaders consider their own needs (Greenleaf, 1970). The main goal of the leader is, therefore, to serve, which is very different from traditional leadership styles focused on ensuring that the organisation thrives. Collins (2001) calls the servant leadership style, "level 5 leadership" and discusses it as one of the distinguishing features between good and great organisations.

Followers of servant leaders show higher levels of trust in both the leader and at the organisational level (Bligh & Kohles, 2013). Kouzes and Posner (2012) wrote about five behaviours contained in the servant leadership style, namely inspiring a shared vision, challenging the process, modelling the way, delegating to others, and encouraging the heart. Servant leadership focus on bringing out the best in people. Leaders rely on communication on an individual level to understand the requirements, desires, objectives, abilities, and potential of each follower (Liden, Wayne, Zhao & Henderson, 2008). Grant (2013) goes further to show that when the servant leadership style is combined with a focus on outcomes, it can lead to unbelievable success (Loué & Slimane, 2017).

One of the key aspects of leadership is to be faithful to the core values of the organisation. The servant leadership style emphasises outstanding accomplishment, innovation, courage, and empathy. Servant leaders should provide the linkage

between the core values of the organisation and its strategic intent, and focus on providing an environment built on support, creativity, and curiosity (Loué & Slimane, 2017). The core values of an organisation define the absolute beliefs held by all employees of the organisation (Loué & Slimane, 2017).

3.3.7 Innovative leadership

Innovative leadership is the skill to influence others to produce "new and better" ideas. Gliddon (2006) developed the competency model of innovation leaders and established the concept of innovation leadership. Innovative leadership can be defined in short as, the use of innovative thinking and support for innovation; it is the key to finding what is new, what is better, and then what is next (Horth & Buchner, 2014). "Those with leadership responsibilities face an evolving range of challenges and opportunities that require unprecedented creativity and successful implementation of innovative solutions" (Vlok, 2012: 210).

Horth and Bucher (2014) argue that leaders need to be innovative leaders. Because of unpredictable and challenging circumstances, leaders need to learn to operate in such environments and need to create climates that encourage innovation within the organisation. Innovative thinking, tools, and systems are essential for the future viability and health of the organisation (Horth & Buchner, 2014).

Supervisors must become leaders who create organisational climates where employees apply innovative thinking to solve problems and to develop new products and services. These leaders should then focus on growing a culture of innovation; they should assist employees to think differently and work in new ways to face challenges and find ways to innovate – even when all resources are stressed and constrained. Innovative leaders can assist organisations to stay alive and stay ahead of the competition (Horth & Buchner, 2014). "Leaders shape the organizational environment and, in so doing, establish the context and opportunities in which innovation may (or may not) thrive" (Goulding & Walton, 2014: 30).

Horth and Bucher (2014) identified several requirements for leaders to encourage employee innovation within an organisation:

a) Encouragement
- Encourage and develop an active flow of ideas.
- Reward and recognise innovative work.

b) Leadership encouragement
- Show support and confidence in the work and value employees' contributions.
- Nurture and promote creative people.
- Encourage innovation through participation in the innovation process by neutralising negative people.
- Watch out for systems, processes, and responses that overpower innovation.
- Use innovative thinking in day-to-day work.
- Exhibit real commitment and lead by example and actions rather than just empty exhortation.

c) Teamwork and collaboration
- Good communication.
- Work environment and processes to encourage interaction, "easy exchange of ideas, fun, and serious play" (Horth & Buchner, 2014: 15).

Amabile *et al.* (1996) also support these requirements by emphasising that supervisory encouragement is vital for employees to feel more secure in themselves, their jobs, and the functions that they perform. The fear of negative criticism is essentially absent in organisations where the leaders set clear goals and encourage employees to present new ideas. Open interaction and communication between employees and leaders will assist employees to understand what is expected. The innovative leader should provide support for new ideas and teamwork, value individual teamwork, and show confidence in the team. If the above factors are present, a favourable working environment will be created and employees will be encouraged to foster innovation (Amabile, 1997; Nybakk & Jenssen, 2012).

The innovation leader has a responsibility to assist to create and uphold the mission, vision and values of the organisation as well as explaining, conveying, and teaching it to employees as a foundation for the adoption of innovation (Gliddon, 2006). Innovation leaders should communicate with their followers frequently and precisely

regarding the goals and strategies of the organisation as well as the links between the individuals and the organisational goals. Leaders should provide employees with opportunities to discuss and to clarify any uncertainties that they might have regarding the goals of the organisation (Garg & Dhar, 2017). Good communication is an important element in the process of achieving change to successfully facilitate the introduction of new ideas and help preserve an effective organisation aimed at achieving a competitive advantage (Proctor, 2010).

3.4 SUPERVISORY BEHAVIOUR

It is important to understand what encourages employee innovative behaviour at work, for organisations to gain a competitive edge or to aid in organisational success. Supervisory support is a critical influencer of innovative behaviour, which can lead to employee engagement – employees who gain support from supervisors can engage themselves in innovative behaviour, thus answering the very pertinent question of why only some individuals engage in innovative behaviour (Arora & Kamalanabhan, 2013). The following section focuses on five behaviours that contribute to EDI and creativity, namely providing supervisory support, inspiring subordinates, being a role model, exhibiting a passion towards coaching, and developing, recognising and rewarding subordinate's creative efforts.

3.4.1 Support from supervisor

Research indicates that supervisory support plays a vital role in organisational effectiveness across many industries (Lu, L. Cooper & Yen Lin, 2013; Thomas, Bliese & Jex, 2005; Tourigny, Baba & Lituchy, 2005). Supervisory support can be defined as the level to which employees perceive that their supervisor encourages and supports their concerns and work performance (Burke, Borucki & Hurley, 1992). Research also reports that employees with supervisors who create a supportive environment are more inclined to support supervisors and commit to reaching organisational goals (Eisenberger, Stinglhamber, Vandenberghe, Sucharski & Rhoades, 2002). Lukes and Stephan (2017) propose that supervisory support has the most proximal contextual influence on the innovative behaviour of employees.

Hayton (2005) suggests that the presence of a high degree of perceived supervisory support and trust increases the willingness of employees to engage in innovative activities and behaviour aimed at serving the interest of the organisation. The work environment embodies the internal basis to stimulate innovative behaviour (Chandler, Keller & Lyon, 2000; Hornsby, Kuratko & Zahra, 2002), and when combined with supervisory support, further encourages innovative work behaviour (Prieto & Pérez-Santana, 2014). Employees will be encouraged to carry out innovative activities at work when they perceive their supervisor as being supportive (Janssen, 2005). Support from supervisors is, therefore, an important contributor to employee creativity and innovation (Dediu *et al.*, 2018; Hon, 2011; Ro & Chen, 2011; Yeh & Huan, 2017).

From the above, it is evident that employees attach significant importance to supervisory support and guidance from their immediate supervisors. Employees with these quality relationships are more willing to repay their supervisors by having higher levels of work engagement and increased innovative behaviour (Garg & Dhar, 2017).

3.4.2 Senior management support

Senior management support refers to the readiness of management to promote and support innovative behaviour; including the championing of innovative ideas and providing the required resources to taking innovative actions (Morris, Kuratko & Covin, 2008). Lukes and Stephan (2017) found that managerial support had the most proximal contextual influence on employee innovative behaviour (Lukes & Stephan, 2017) and for that reason, management support also forms part of this study. The following section focuses on three areas that contribute to EDI and creativity, namely the importance of senior management support, empowerment and encouragement of employees, and involving and challenging employees to be more innovative, which ultimately leads to greater organisational success.

Senior management support is a critical and important issue to achieve in maintaining a competitive advantage (Al Shaar, Khattab, Alkaied & Manna, 2015). Support from senior management is also an important contributor to employee creativity (Hon, 2011; Ro & Chen, 2011; Yeh & Huan, 2017). Senior management support can be defined as the actions and strategies developed by managers in supporting the

implementation of new ideas and processes (Souza & Bruno-Faria, 2013). Senior managers' support focuses on items such as freedom and autonomy for employees, encouragement of creativity, innovation support from managers, acceptance of risk and errors in the innovation process, innovation rewards, creative leaders and role models, and establishment of innovation as an organisational goal (Claudino *et al.*, 2017; Souza & Bruno-Faria, 2013).

Senior management needs to encourage innovation, offer support, and alleviate employees' fears and anxieties that may arise due to innovation uncertainties (Atitumpong & Badir, 2018; Goodman & Dingli, 2013). Management should provide innovative strategies focused on defining clear goals, establishing innovation as an organisational goal, increasing employee initiatives, providing direction, resolving conflict resulting from innovation, demonstrating a willingness to innovate and showing confidence in the success of innovation (Souza & Bruno-Faria, 2013). Management should create a climate for innovation that will encourage idea generation, creative problem-solving, reassure employees that they should take risks, challenge the status quo, and tolerate failed ideas (Meijer, 2014; Miao *et al.*, 2018). When management supports innovation and provides the required resources (such as funds, equipment, access to information, and time), it will lead to more creative employees who are accepting to explore new ideas, take risks, and make mistakes (Amabile, 1998; Cheung & Wong, 2011; Scott & Bruce, 1994). Management support is particularly important during the innovation process, as employees may experience frustration and negative emotions during the process (Cheung & Wong, 2011).

It is important for management to provide the same support, attention, access, and funding for innovation projects driven by employees (bottom-up), compared to management-driven projects (top-down) (Das *et al.*, 2018; Haapasaari *et al.*, 2018; Oeij *et al.*, 2019). When senior management recognises the contributions of EDI and creativity, they naturally motivate their employees to think of and contribute new innovative ideas (Cheung & Wong, 2011). Management should use strategies and actions to convince employees of the value of EDI and creativity, stimulate communication between employees, and establish a relationship of trust (Souza & Bruno-Faria, 2013). Innovation support should be a significant and strategic goal for any organisation (Owen & Zyngier, 2012).

3.4.3 Inspirational motivation

Inspiration can be defined as "the process of being mentally stimulated to do or feel something, especially to do something creative" (Oxford Dictionary, 2019). The Oxford Advanced Learner's Dictionary (2019) defines inspiration (to/for somebody) as a person or thing that makes you want to be better, more successful, et cetera.

Inspirational motivation involves inspiring employees to believe in their abilities to achieve an exciting vision by encouraging and motivating them (Afsar *et al.*, 2014; Mokhber *et al.*, 2018).

Inspirational leaders often possess significant vision and can inspire their followers by their creative talents (Proctor, 2010: 9). Leaders should inspire their followers by sharing the organisational vision, gain commitment and optimism, and spark enthusiasm to overcome challenges, and cooperatively accomplish a collective goal (Bass & Steidlmeier, 1999). With inspirational motivation, supervisors provide innovative ideas, meaning, and challenges to the work of their subordinates and through intellectual stimulation involve employees to question and resolve existing problems using new approaches (Mokhber *et al.*, 2018; Schuckert *et al.*, 2018).

Inspired and intellectually stimulated employees will encourage idea sharing, contribute to decision-making and have empowered critical thinking to develop individual solutions (Schweitzer, 2014). To accomplish this, supervisors should inspire employees and talk optimistically about the future, express confidence that goals will be accomplished, talk enthusiastically about what should be accomplished, and articulate a powerful and inspiring vision for the future (Loué & Slimane, 2017; Schweitzer, 2014).

3.4.4 Empowerment and encouragement

Employees are more creative if they are motivated, encouraged, and empowered by management (Amabile, 1998; Scott & Bruce, 1994). Management should also create a work environment that supports and encourages EDI and creativity, and permit employees to explore new ideas, take risks, make mistakes (and learn from them),

exchange knowledge, and make decisions (Atitumpong & Badir, 2018; Khalili, 2016; Koseoglu *et al.*, 2017; Naranjo-Valencia *et al.*, 2016). Such an environment will not only lead to better innovations and more effective processes, but also to happier employees and ultimately a stronger organisation (Chowdhury, 2004).

It is important to encourage employees to be creative by giving them time to innovate, allowing them to experiment, to make mistakes, and to then learn from those mistakes (Henry, 2013; Sveiby *et al.*, 2012). As previously discussed, management should act as role models by demonstrating creativity-relevant skills and encouraging employees to emulate their behaviour (Atitumpong & Badir, 2018; Meijer, 2014). Managers should also encourage, offer support and ease employees' fears and anxieties that may arise due to failed efforts (Atitumpong & Badir, 2018; Goodman & Dingli, 2013). Managers should empower employees by encouraging involvement in the planning and decision-making process, to gain their commitment to the organisation (Wong & Pang, 2003). A positive link exists between empowering behaviour from management and employees perceiving the organisation as being supportive towards creativity and innovation (Scott & Bruce, 1994). Empowered employees result in greater perceived self-efficacy, motivation, and autonomy, which are all key factors for the innovative process (Dediu *et al.*, 2018; Zhang & Bartol, 2010).

Training and development is another way in which management can support employees to become more innovative. This can be done by influencing contextual factors such as the organisational culture, and continuous development of innovative qualities via well-designed training (Li & Hsu, 2016), as explained previously. It is important to create an innovative and learning environment as an innovation and learning orientation is recognised as the future platform for organisational success, and forms the foundation for strategic change implementation in organisations (McGuinness & Morgan, 2005). Organisations should focus on developing innovation skills on the job and grow the organisation's innovative ability through training (Oeij *et al.*, 2017). The results from a study by Anderson *et al.* (2014) suggest that organisations that provide training and employee involvement practices witness higher levels of innovation. Research on workplace training programmes aimed at empowering and encouraging employees has shown that such training programmes

successfully stimulate innovation activities among employees (Atitumpong & Badir, 2018; Calantone, Cavusgil & Zhao, 2002; Jiménez-Jiménez & Sanz-Valle, 2011).

3.4.5 Idealised influence

Supervisory behaviour can hamper the innovation progress in organisations since innovation is often talked about, but rarely executed internally. As a result employee innovation efforts are met with silo approaches to innovation, resistance by leaders, and low-risk tolerance (Mayer, 2012). Supervisors should lead by example when it comes to innovation and should, therefore, promote innovation as central to business activity. Supervisors need to lead by example or serve as good role models for creativity (Gardner *et al.*, 2005; Gumusluoglu & Ilsev, 2009).

Idealised influence refers to a leader being a charismatic role model who has gained the admiration and respect of employees, and positively affects their perceptions and behaviours. These leaders express confidence in the vision of the organisation, are persistent, determined, and show a sense of purpose; they trust other people and highlight accomplishments. (Bass, 1985). Leaders should be role models throughout and should communicate the vision, the importance of innovation, and the desired changes and advantages that innovative change will bring (Tayal, Kumar Upadhya, Yadav, Rangnekar & Singh, 2018).

Idealised influence provides direction and instils pride, admiration, respect, and trust by having high expectations, demonstrating extraordinary ability in the pursuit of objectives, and articulating shared goals in simple ways (Bass & Avolio, 1990; Gardner *et al.*, 2005; Joseph, 2011; Oshagbemi & Ocholi, 2006). By acting as role models for employees and furnishing them with support in their engagement in innovative and creative activities, supervisors positively influence subordinates to engage in innovative behaviour (Miao *et al.*, 2018).

It is therefore important for supervisors to not only encourage their subordinates to experiment and innovate in the workplace, but to act as a role models by also engaging in entrepreneurial activities, and encouraging subordinates to emulate their behaviour (Meijer, 2014; Miao *et al.*, 2018).

3.4.6 Coaching

Research has shown that people can be educated, inspired, counselled, coached, and trained to develop themselves and become more creative (Oeij *et al.*, 2017; Proctor, 2010). Gurova and Kurilov (2015) highlight that to gain experience and expand knowledge, constant training and coaching is required to develop a good and creative workforce. Contributing to the human capital of an organisation through coaching, investment and continuous development will result in the generation of valuable ideas (Oeij *et al.*, 2019).

Coaching is a cooperative partnership centred on achieving goals where the primary objective is to develop the person being coached (Sousa & Rocha, 2019). Coaching has been identified as a key supervisory behaviour that organisations should promote to develop employees and achieve higher levels of performance and innovative behaviour (Pousa & Mathieu, 2014). Creativity within the organisation can be increased through effective coaching and mentoring (Yordanova & Blagoev, 2015). Developing supervisor's coaching and mentoring skills is therefore important as it may be beneficial for fostering employee creativity and team innovation within the organisation (Yoshida *et al.*, 2014).

Supervisors need to engage with and lead subordinates to create a corporate culture aimed at promoting innovative behaviour through coaching (as opposed to ordering), and facilitating teamwork across the organisation (Barsh, Capozzi & Davidson, 2008). Supervisors should focus on their subordinates' individual needs by coaching, mentoring, and providing opportunities for learning according to each individual's needs, and by creating a supportive climate for growth (Jung, Wu & Chow, 2008; Mokhber *et al.*, 2018; Oke *et al.*, 2009). Supervisor support can promote innovative behaviour through coaching, mentoring and coaching training programmes to improve individuals' interpersonal skills at supervisory levels. Such support can assist supervisors to understand the importance of supportive supervision and coaching, and equip them with the necessary skills to provide subordinates with such support (Chen *et al.*, 2016; Garg & Dhar, 2017; Yordanova & Blagoev, 2015).

3.4.7 Reward and recognition

When employees are successful in trying out new ideas, the supervisor is always one of the key persons to share the joy and sense of accomplishment (Cheung & Wong, 2011). Supervisors are tasked with providing structure and consistency that will motivate employees to pursue creative ideas, and will consistently acknowledge, recognise, and affirm (Leavitt, 2004; Osuigwe, 2016). Financial rewards may create a more innovative culture and increase employees' innovate output, but these rewards need to be well-structured so that they do not become the only reason for new creative ideas (Torres, 2015).

Supervisors need to encourage innovative behaviour through specific incentives, rewards, recognition and support, and then ensure that the innovation momentum is sustained (Ikeda & Marshall, 2016).

3.4.8 Challenge

It is important for management to not only encourage employees by providing support and advice to continue engaging in innovative behaviour, but to also directly challenge employees to come up with new ideas or new processes. Challenge and involvement refer to how an organisation involves employees in the organisation's daily operations, visions and long-term strategic goals (Nybakk & Jenssen, 2012). Organisations should design future work that challenges employees to learn and innovate and create challenging jobs that require a certain job complexity aimed at encouraging innovative behaviour (Baggen *et al.*, 2015). It is important for organisations to anticipate and confront the challenges of the future, rather than managing the organisations based on experience from past events (Morgan, 1988). Management should, therefore, create an environment conducive to creativity, where employees are willing and challenged to try new and different approaches, and where risk-taking is tolerated (Ghosh, 2015). For employees to not be hesitant and to share their thoughts and opinions, management should provide leeway to take risks by allowing unconventional ideas with uncertain outcomes (Nybakk & Jenssen, 2012).

Employees that are challenged to engage in stimulating work and are involved in the decision-making process are most likely to innovate. Studies have shown that employees engaged in complex tasks that require specific skills are not only more satisfied, but also enjoy more freedom to propose new ideas and engage in more innovative behaviour (Basadur, Runco & Vegaxy, 2000; Dediu *et al.*, 2018; Noefer, Stegmaier, Molter & Sonntag, 2009).

3.5 INNOVATION WITHIN TEAMS

Innovation in a team is an atmosphere that focuses on innovation with a vision and shared goals, and where participation and innovation support is provided (West, 2002). Team innovation is the backbone of every successful organisation because it helps the organisation to grow and prosper. Good team innovation sets an organisation apart from its competitors (Robert Half, 2019). The following section focuses on the innovative ability of employees and the importance of innovative teamwork.

3.5.1 Employees' innovative ability

Organisations need to constantly evolve to create a basis for long-term success and secure their economic survival by improving the innovative ability of the organisation to adapt to change (Agarwal, Datta, Blake-Beard & Bhargava, 2012; Janssen, 2000; Kim & Koo, 2017; Al Shaar *et al.*, 2015). This can be done by making employees the focus point of attention, as innovative activity can always be traced back to the behaviour of employees (Agarwal *et al.*, 2012).

The innovative ability of staff can be developed by providing employees with challenging work and comprehensive training programmes, which will also enhance employees' innovation enthusiasm (Ge & Wang, 2013).

Employees should be encouraged to increase their innovative behaviour, to actively participate in innovative activities and to collect all kinds of innovative information to increase their innovation ability. Therefore, the willingness to innovate contributes to the improvement of innovation ability (Xue, Qian, Xu & Zhou, 2017). Organisations

that engage in innovation activities and have an innovation plan in place will positively affect the innovative behaviour of the employees and ultimately improve the organisation's innovation ability (Chen, Xu & Wu, 2014). Research supports this finding and shows that strong innovation cultures encourage innovation activities, and as a result, improve the innovation ability of the organisation in response to changes (Garg & Dhar, 2017; Xue *et al.*, 2017).

Managers play an important role in the innovative ability of staff (Amabile & Pratt, 2016). The results of Amabile and Pratt's (2016) study show that employees with leaders that welcome new ideas, grant considerable autonomy, provided clear goals, and the required resources, consistently developed creative solutions of high quality and stayed motivated (Amabile & Pratt, 2016). Supportive supervisors, positive moods, and positive energy in organisations have shown to promote employee confidence, divergent thinking, and increased creativity at work (Ghosh, 2015). Supervisor feedback regarding work processes and performance has also shown to be successful in increasing the innovative ability of employees, as it enables employees to structure their tasks more effectively, and as a result, reduce time pressure and create space to implement innovative ideas (Bos-Nehles *et al.*, 2017). Employees' innovation abilities also play an important role in shortening the innovation cycle and responding quickly to changes (Zhong, 2018).

3.5.2 Importance of teamwork

In the previous sections the emphasis is on creating an innovative and creative culture that values exploration, stimulates knowledge sharing, generates new ideas, promotes management participation and support, and rewards and recognises creative behaviour (Belussi & Staber, 2012). Verloop (2013) states that a favourable and supportive environment influences innovation success. "The challenge for organisations that would like to become more innovative is to unleash the creative potential of their employees to generate those ideas that can be channelled into innovative business opportunities" (De Jager *et al.*, 2013: 3). Innovation cannot be done in isolation as it requires support from, and interaction with a diverse range of people – a team (Verloop, 2013).

Innovation should be regarded as a core value that manifests throughout the organisation regardless of rank or teamwork. Within this framework, the set of individual skills plays a strategic role in fostering innovation (Osuigwe, 2016). Teamwork is the ability to work effectively with others and in a team environment (Hall & Rowland, 2016). Teamwork can influence creativity through interaction between diverse sources of knowledge and skills, through open communication, constructively challenging each other's work, and by promoting collaboration, commitment, and mutual trust among the members of the team (Belussi & Staber, 2012).

According to Horth and Bucher (2014), organisations that place a high value on innovation pay attention to teamwork and collaboration, through

- good communication among members of the team
- being receptive to other's ideas, and supporting each other in shared work
- creating an environment and processes to encourage interaction and the exchange of ideas

Many organisations invest in a creativity-innovation pipeline, which consists of the flow of ideas among team members, providing a pool from which the most novel and useful ideas could be selected, supported, and adopted (Mann & Chan, 2011). Communication among team members is thus of importance to enhance problem-solving and individual performance (Dediu *et al.*, 2018). Team members have a positive influence on creativity through encouraging and supporting each other during difficult and tedious stages (Amabile *et al.*, 1996; Amabile & Pratt, 2016; Ghosh, 2015). Social support from team members and supervisors are important drivers of innovation and are essential for idea generation and implementation (Dediu *et al.*, 2018). Employees will be more comfortable and have better control over their work when they know that they can rely on the assistance of their team members and supervisor when needed (Oeij *et al.*, 2017). Teamwork, with regular discussions about new ideas and issues, will stimulate a positive attitude towards innovation and change (Proctor, 2010).

A team may consist of people from diverse backgrounds who might find it difficult to work together due to their diverse perspectives (Bagraim *et al.*, 2016; Goodman &

Dingli, 2013). Team diversity is, however, an important stimulant to creativity and innovation as it contributes a wealth of viewpoints, traditions, experiences and problem-solving abilities that can lead to easier adoption to change (Chowdhury, 2004; Saxena, 2014). For employees to function productively, individual differences should be regarded as an asset, rather than a liability (Shaban, 2016). Organisations need to embrace diversity, as the positive consequences of team diversity are usually recognised in terms of intellectual outcomes such as greater ideas, creativity and innovations (Kreitz, 2008; Shaban, 2016).

Organisations are beginning to understand that good collaboration based on teamwork and diversity can be very powerful as it leads to collective creativity, which is sometimes more relevant than individual creativity (Belussi & Staber, 2012). The results from a study by Lee, Gillespie, Mann and Wearing (2010) indicate that a positive link exists between team leaders that build and share task-related knowledge, and the innovative performance of team members.

Supervisors can further encourage creativity by setting goals, providing support to teams, appreciating individual contributions and diversity, and displaying confidence in the team's abilities (Belussi & Staber, 2012). Management should not only focus on empowerment and providing autonomy to encourage successful teamwork, but should also provide direction for the innovation work without too much structure (Johnsson, 2017). It is evident that teamwork has a positive influence on the personal growth of employees – it creates a culture of cooperation and has a positive overall impact on the organisational performance of the organisation.

3.6 MANAGING INNOVATION

Innovation is a very difficult process to manage and for this reason many organisations do not innovate (Verloop, 2013). Most innovations fail, but Chesbrough (2006) explains that organisations that do not innovate, will die. Innovation and the process to manage innovation is therefore vital for organisational sustainability and growth (Chesbrough, 2006). In the following section the management of innovation and the importance of management influence, organisational bureaucracy, the simplicity of the

decision-making process with the organisation, and the availability of resources allowing the innovation management process to be successful are briefly discussed..

3.6.1 Management of innovation

Innovation management focuses on managing the innovation process and consists of a set of tools that management and employees use to work together to understand the processes required to achieve a common goal and ensuring the continuous development of the organisation (Patrício & Peetri, 2014). By applying innovation management tools like brainstorming, innovative teams, idea management, design thinking, prototyping, project management, rewards and recognition, management can stimulate employees' creative and innovative behaviour (Ciriello *et al.*, 2016; Iyer, 2009; Mayer, 2012; Mintzberg, 1973; Tirabeni, Pisano & Soderquist, 2010). Innovation management requires the involvement of employees at each level of the organisation to contribute creatively in response to the external and internal opportunities by introducing new ideas, processes, or products (Kelly & Kranzburg, 1978).

Research has shown that organisations that successfully manage the innovation process within the organisation, not only reap the social benefits of innovation, but also outperform their competitors in terms of performance, growth, and employment (Tidd, 2012; Tidd & Thuriaux-Alemán, 2016). The process to manage innovation is however not automatic and not easy. Innovation management is a mixture of management methods, innovation, and change management. It requires specific skills, knowledge, and experience, which are very different from the business administration skills that managers have, which are aimed at maintaining stability (Fagerberg, Fosaas & Sapprasert, 2012; Rafols, Leydesdorff, O'Hare, Nightingale & Stirling, 2012; Tidd & Bessant, 2018). Innovation needs to be managed with creativity, passion, determination, more flexible processes, and less formal business administration (Verloop, 2013). Weman and Kantanen (2018) emphasise that managing relationships in the organisation are the biggest challenge when managing innovation.

Innovation management is a business process that can either be neglected or managed to its full potential, but because of its complexity, it is most often neglected

(Verloop, 2013). Because innovation leads to change and most innovations fail, the idea of innovation can be unattractive and regarded as a risk. Innovation can, therefore, result in change and change can create resistance (Verloop, 2013). It is vital for all levels of management and all employees to change their behaviour and regard change as an integral part of innovation, and to effectively manage resistance and eliminate any negative consequences (Sveiby *et al.*, 2012: 179; Verloop, 2013). Innovation management is, therefore, a role to be performed by managers and employees alike (Bossink, 2004). Influencing people to view new ideas as favourable, involves influencing and changing employees' attitudes (Audenaert, Vanderstraeten & Buyens, 2017; Proctor, 2010). Most organisations consist of diverse groups of employees and management need to know how to communicate with the target audience and how to identify the opinion leaders, action initiators, people with status, and employees with influence within the organisation to successfully manage the innovation process (Proctor, 2010: 259).

3.6.2 Bureaucracy and employee involvement

In large bureaucratic organisations communication is done along the chain of command (Sørensen, 2012), decisions are made centrally by hierarchical authorities (Oeij *et al.*, 2017), and employees perform their work according to rigid rules, policies, procedures, performance evaluation guidelines, and manuals in order to maintain stability (Naranjo-Valencia *et al.*, 2016; Power, 2013; Romero, 2012; Wagner & Hollenbeck, 2010). Organisations that have a bureaucratic system will find it more difficult to create a work environment where employees can be innovative and creative when it comes to performing their work (Loué & Slimane, 2017). Medium and long-term projects such as the implementation of innovations are generally not the main focus of a bureaucratic management system, but rather routine activities that present more immediate returns aimed at maintaining stability (Claudino *et al.*, 2017; Loué & Slimane, 2017). The threat of the possible negative impact and undesired changes generally creates resistance to innovation and creative solutions (Verloop, 2013). In general, management largely aims at solving problems but although creative thinking can solve many organisational problems, experience has shown that under pressure, management revert back to the tried and trusted solutions rather than trying new and creative ones (Proctor, 2010).

Bureaucracy has many layers of authority, which result in a slower decision-making process, making it difficult to compete with other organisation that have smaller teams, which can take quick decisions and solve problems faster (Bagraim *et al.*, 2016). Employees that need to adhere to strict and rigid rules and regulations will be discouraged to engage in creative and innovative behaviour, and as a result, the organisation will not be able to anticipate and adapt to changing conditions (Jantz, 2016; Romero, 2012; Wagner & Hollenbeck, 2010). It is also important to note that in many instances the person who creates and shapes an idea is not necessarily the person to present the idea, and it is therefore important that the inventor and the presenter share the same commitment to the success and the value of the idea (Verloop, 2013). EDI and creativity are crucial to organisations' futures and are key skills to be developed. It is vital for organisations to create an innovative culture and involve employees in the decision-making processes, which will ultimately lead to more support and innovative behaviour from employees (Kesting & Parm Ulhøi, 2010; Oeij *et al.*, 2017). Employees will feel less empowered and have a reduced intention to search for new working methods, technologies, processes, and products when required to ask a supervisor before doing almost anything, and following written rules, policies, and procedures to solve work-related problems (Rhee, Seog, Bozorov & Dedahanov, 2017). Employees that are allowed to make decisions or participate in the decision-making process will feel more empowered, will be less stressed and experience greater job satisfaction; they will feel more valued and will be more willing to increase innovative behaviour at work (Prieto & Pérez-Santana, 2014).

In many large organisations innovation is inhibited by formalisation and centralisation (Jantz, 2016; Loué & Slimane, 2017; Woodsworth & Penniman, 2014). The central aim of innovation management should be to protect identified innovation teams from the bureaucracy and standard rules that apply, and to provide more freedom to be innovate and to explore (Gee & Hanwell, 2014; Verloop, 2013). Management should aim at breaking down organisational silos through enhanced collaboration between functional departments, which will ultimately lead to less bureaucracy and fewer delays or conflicts (Oeij *et al.*, 2019).

Organisations should aim at creating a working environment where ideas do not simply fall between the bureaucratic cracks (Proctor, 2010). Organisations need to change

their attitudes towards innovation and creativity by implementing policies and strategies that will generate a creative atmosphere and drive employee innovation and creativity (Yeh & Huan, 2017). When an organisation has empowered employees, it is an intangible and dynamic capability that cannot be easily imitated by competitors (Afsar *et al.*, 2014; Bagraim *et al.*, 2016; Berraies *et al.*, 2014; Dzisi *et al.*, 2013; Høyrup *et al.*, 2012; Luoh *et al.*, 2014; Sveiby *et al.*, 2012). Organisations capable of fostering a supportive innovation work environment and the innovative potential of their employees may appreciate a sustained competitive advantage regarding innovation (Bammens, 2016; Kim & Koo, 2017).

3.6.3 Availability of resources

Employees are more innovative and creative when intrinsically motivated and encouraged by management to investigate new ideas, take risks, and make mistakes. However, innovativeness and creativity is dependent on the availability of resources such as money, equipment, and time to finish innovative projects (Amabile, 1998; Scott & Bruce, 1994).

According to Horth and Bucher (2014) organisations that place a high value on innovation not only create an innovative culture with limited rigid policies, procedures, and hierarchical boundaries restricting freedom an innovation, but also provide the following in terms of resources:

- Provide access to appropriate resources, which include funds, material, information, people, and facilities to make innovation a priority.
- Train employees to develop new ideas and new possibilities.
- Provide employees with time and the freedom to determine what work needs to be done or how to do it.

It is imperative for management to provide support and make resources available for the implementation of new ideas (which also include people) and establish a plan, which includes the leadership structure, deadlines, budgets, assessments, and rewards. The effectiveness of this stage of innovation depends on the resource

availability and the management's innovation management skills (Amabile & Pratt, 2016; Lukes & Stephan, 2017).

Money is required to innovate (Claudino *et al.*, 2017). Research on financial constraints highlights that a lack of finances creates an innovation barrier (Czarnitzki & Hottenrott, 2010; Das *et al.*, 2018; Hadjimanolis, 1999; Hueske & Guenther, 2015). However, the inefficient use of funds allocated for innovation project will also limit an organisation's innovative ability (Ciriello *et al.*, 2016). Organisations can further hamper their innovative ability by rejecting good innovative ideas. When this occurs, it could result in missed potential profits or even non-monetary risks such as losing a competitive advantage (Rogers, 1983).

Technological resources and innovations are some of the most important aspects in providing organisations with opportunities to increase efficiency and effectiveness (Selhofer *et al.*, 2012). Technological resources required for innovations should be available, accessible, and used effectively with sufficient investment in technical resources, tools, equipment, storage, and computerised systems (Claudino *et al.*, 2017; Souza & Bruno-Faria, 2013).

Resources can significantly improve the quantity of creative performance, but time and freedom are directly linked to the quality of innovation (Yeh & Huan, 2017). Providing employees with time and freedom will not only result in more devotion to their responsibilities, but will also positively influence their creative performance and quality (Chiang & Hsieh, 2012; Sahoo & Das, 2011; Yeh & Huan, 2017). Employees and leaders should be given support and sufficient time to implement innovative ideas (Nybakk & Jenssen, 2012).

During the implementation of new ideas and practices, organisations should provide employees with sufficient time and realistic target dates to perform all the tasks required. Failure to do so will result in unplanned processes, lower quality work, delays in implementation, missed deadlines, pressured employees, and a lack of time for testing and training (Souza & Bruno-Faria, 2013).

3.7 INNOVATION AND CREATIVITY IN AN OPEN DISTANCE e-LEARNING ENVIRONMENT

The institution where the study was conducted published a document in 2011 emphasising the challenges that tertiary institutions faced: "….universities are increasingly being managed rather than led, are failing to take the lead and, at the same time, mould future leaders; they might be installing solar panels, materials recycling facilities and implementing other 'best-practice initiatives', but that's essentially following" (University of South Africa, 2011a: 7). The core values of the institution where the study was conducted are "ethical and collective responsibility; integrity; innovation and excellence; responsive student-centredness, and dignity in diversity" (University of South Africa, 2015b: 5). These values should guide the actions of its leaders in supporting work and in implementing a strategy.

During 2011 the institution communicated a vision and formalised several documents aimed at supporting the ethos of servant leadership (University of South Africa, 2011a). The Thabo Mbeki Institute (TMALI) was established, "...to breed a special kind of thought leader who will change the continent" (University of South Africa, 2011a: 69). The University also stated that "leaders must respect their constituencies and should not be far away from people and so immersed that they are not able to engage on issues that affect people. Service, commitment and loyalty build a good leader" (University of South Africa, 2011a: 72).

In 2014 the institution published a report that builds on the 2011 documents aimed at supporting the ethos of servant leadership, and quoted Robert Greenleaf, stating that the leaders in the institution should become servant leaders: "The servant-leader is a servant first. It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead. The difference manifests itself in the care taken by the servant – first to make sure that other people's needs are being served. The best test, and difficult to administer is: Do those served grow as persons; do they, while being served, become healthier, wise, freer, more autonomous, more likely themselves to become servants? And what effect on the least privileged in society; will they benefit, or at least not be further deprived? – Robert K. Greenleaf, Servant As Leader" (University of South Africa, 2014a: 22).

The institution developed the following leadership pledge: "Unisa's leadership is committed to upholding the principles and values of excellence with integrity and social justice and fairness and commits to the visible demonstration of this commitment through personal conduct and example" (University of South Africa, 2014a: 27). The institution also provided the following list of servant leadership values that all employees should adhere to:

- Understanding and acting in the best interest of student needs.
- Responding and providing the appropriate service and product to fulfil the needs of students.
- Performing work to the highest standards and quality.
- Reporting inadequate service delivery.
- Ensuring that commitments to internal and external stakeholders (including students) are met.
- Being a role model to all stakeholders in upholding the servant values (University of South Africa, 2014a).

The institution further states in the Unisa strategic plan 2016–2030 (2015b: 79) and in the 2017 Annual Report (2017: 7) that "transformational leaders are to be found at all levels and in all sectors of the organisation, not necessarily dependent on positional power. They are distinguished from mere actors by their insight into how things are in comparison to where they need to be, with the resolve and capability to act catalytically in pursuit of institutional and societal change imperatives in the face of opposition, resistance and limited resources". The institution explains that transformation keeps it at the forefront as pathfinders "to find ever better and innovative ways of enriching the student experience, elaborating and building upon African epistemologies and philosophies, developing alternative knowledge canons and advancing indigenous knowledge systems that ground us on the African continent, without averting our gaze from the global horizon" (University of South Africa, 2015b: 80). The institution further undertook to provide quality, visionary, and visible leadership at all levels of the institution, and to provide a clear direction and achieve the objectives as set out in the charter of the institution (University of South Africa, 2015b). The institution stated that 2017 has lead the way to more pro-active leadership aimed at staying close to issues

on the ground while balancing the need to respond to these issues and contributing at a strategic level (University of South Africa, 2017).

It is evident from the above that the institution is focused on the importance of the institutional leaders providing clear direction to its employees and ultimately achieving the objectives of the institution. However, tertiary institutions are more frequently presented with new challenges in a competitive environment, as a result of new technological developments, changing student demographics, reduced funding, and increased pressures from the society it serves. The sustainability of these institutions is not only threatened by the external environmental challenges, but also by changing internal focus (Davis, 2013). How tertiary institutions respond to and deal with these challenges will ultimately influence the competitiveness and long-term sustainability of the institutions as well as the societies they serve.

3.8   SUMMARY

It has been said that behind every creative team is a competent supervisor/leader. An active and growing area of research focuses on the link between leadership and creativity and innovation. The correct type of leadership (supervisory) behaviour and management support can stimulate innovation among employees. Research has identified the contextual and personal antecedents of innovative behaviour and the influence that such behaviour can have on innovation. From research there is clear empirical and theoretical evidence that leadership is an essential variable that can either enhance or prohibit EDI and creativity in the workplace. It is vital for leaders to understand the factors that shape innovation and creativity, and to take advantage of the creative and innovative abilities of employees.

This chapter provides a theoretical view of the internal work environment required to promote EDI and creativity in the workplace. Because EDI and creativity, supervisory behaviour, and the internal work environment are very closely related, many of the internal work environment factors have already been discussed in the previous two chapters. A summary of the following internal work environment elements is provided: the importance of the organisational mission, objectives and values, the impact of the organisational structure on innovation, the organisational culture, resources and encouragement, and the importance of innovation in the workplace.

4.1   INTRODUCTION

Research has shown that work environments embody the internal basis to stimulate innovative behaviours (Chandler *et al.*, 2000; Hornsby *et al.*, 2002). For organisations to become more creative, they need to create the right culture and climate, an effective system should be put in place to communicate ideas, and procedures to effectively manage innovation should be in place (Majaro, 1991). Research supports the idea that every employee has the ability and potential to innovate, regardless of their educational background or career position (Aaltonen & Hytti, 2014). This study argues that the internal work environment plays a mediating role in the relationship between employees and innovative work behaviour. The internal work environment, however, brings with it many barriers that can block employees' potential to engage in innovative and creative behaviour (Aaltonen & Hytti, 2014). A number of these barriers within the internal work environment are discussed.

4.2   ORGANISATIONAL MISSION, OBJECTIVES AND VALUES

Organisations have a purpose and a specific mission that they want to achieve, and a mission statement provides the members of the organisation with a shared sense of direction (Wagner & Hollenbeck, 2010). A mission statement should identify the product or service that the organisation will provide as well as the market that it will be serving (Wagner & Hollenbeck, 2010). Employees should be aware of their

organisation's mission statement and should combine their efforts to work toward the common purpose stated in the mission statement (Alimo-Metcalfe, 2013; Wagner & Hollenbeck, 2010). Employees need to be aware of how their work contributes to reaching organisational success (Page & Schoder, 2019). This, in turn, will motivate employees and create a culture where innovation and change to achieve organisational success are welcomed (Page & Schoder, 2019).

Top management should set the direction by articulating a clear and convincing long-term vision of what the future growth path of the organisation will be (Terziovski, 2009). An inspirational vision coupled with effective communication will result in better performance, improved readiness for change, and will increase initiatives aimed at growth and competitiveness (Haque, TitiAmayah & Liu, 2016).

Organisations should further establish the functional and operational strategic objectives that it wishes to accomplish by pursuing its mission (Wagner & Hollenbeck, 2010). Organisational values should be developed in line with the ethical beliefs guiding the organisation to realise its mission and objective. By grounding the vision in the organisation's values, leaders can influence their followers to work towards the organisation's vision and mission (Haque *et al.*, 2016).

From an institutional perspective, the strategic plan sets out the long-term vision, mission, values, and specific strategic objectives required to achieve the stated vision. To ensure that all institutional efforts are coordinated towards achieving specific outcomes, institutions should translate the vision, mission, and the broad objectives of the institution into more manageable and measurable short-term and medium-term objectives (Davis, 2013).

An organisation's vision, mission, objectives, and values play an important role in innovation and creativity, as it allows employees to focus on a common set of goals (Soken & Barnes, 2014). Good leaders will encourage a diverse workforce to use their skills and knowledge to achieve important strategic objectives, and create a climate that encourages innovative and creative behaviour to achieve a common set of goals (Soken & Barnes, 2014).

4.3 ORGANISATION STRUCTURE

EDI and creativity have many stumbling blocks, and organisational structures with formal processes may burden the innovative efforts of organisations' employees (Ahmed, 1998). Organisational structure refers to the positions and tasks which indicate the departments and determine the approval hierarchy of ranks, and how information flows within the organisation (Ahmady, Mehrpour & Nikooravesh, 2016; Brown & Osborne, 2005; Kanter, 1996). Ahmady *et al.* (2016: 455) describe the organisational structure as a framework of jobs, systems, people, and groups in which the organisation organises, divides, and coordinates its activities to achieve the organisation's goals. The allocation of resources, interdepartmental communication and an organisation's ability to respond to changes through innovative ideas are also influenced by an organisation's structure (Chen, Huang & Hsiao, 2010; Dekoulou & Trivellas, 2017).

An organisations' structure has a considerable influence on its daily operations and its ability to innovate and generate ideas (Dekoulou & Trivellas, 2017). Innovation in the workplace depends on the structure of the organisation, and whether the structure enables cooperation and communication among employees, managers, and different departments (Kesselring *et al.*, 2014). Organisational structures often inhibit the flow of information and new knowledge (Jafari, Fathian, Jahani & Akhavan, 2008). If the structure affects the free flow of information the diverse workforce will not be able to share their ideas, which will hinder experimentation and generation of new knowledge and ideas (Dekoulou & Trivellas, 2017). Research confirms that organisational structures impact innovation in the workplace (Damanpour & Gopalakrishnan, 1998; Marín-Idárraga & Cuartas, 2016).

Ahmed (1998) writes that innovation is enhanced by organic structures rather than mechanistic structures. Organic structures have fewer horizontal levels, high vertical and horizontal level participation and collaboration, informal and flexible tasks, informal communication, and a decentralised decision-making process (Ahmady *et al.*, 2016; Bagraim *et al.*, 2016; Wagner & Hollenbeck, 2010). In mechanistic structures units are differentiated at various horizontal levels and inflexible and strict relationships

according to delegations and formal communication channels exist (Ahmady *et al.*, 2016; Bagraim *et al.*, 2016; Wagner & Hollenbeck, 2010).

Table 4.1 indicates the characteristics of organic structures, which promote innovation, and mechanistic structures, which hinder innovation (Ahmed, 1998; Bagraim *et al.*, 2016).

Table 4.1: Characteristics of organic and mechanistic organisational structures

ORGANIC STRUCTURES promote innovation	MECHANISTIC STRUCTURES hinder innovation
▪ Non-hierarchical	▪ Hierarchical
▪ Decentralised	▪ Centralised
▪ Freedom from rules	▪ Many rules and set procedures
▪ Participative and informal	▪ Formal reporting
▪ Little red tape	▪ Bureaucratic
▪ Face-to-face communication	▪ Communication via the written word
▪ Emphasis on creative interaction	▪ Little individual freedom of action
▪ Inter-disciplinary teams; breaking down departmental barriers	▪ Rigid departmental separation and functional specialisation
▪ Information flow downwards as well as upwards	▪ Much information flows upwards; directives flow downwards
▪ Flexibility concerning changing needs	▪ Long decision chains and slow decision-making

Mechanistic organisational structures are also known as bureaucratic structures (Bagraim *et al.*, 2016). Many small organisations fail because they are not able to mature into larger organisations, but many large organisations fail because they are becoming increasingly bureaucratic, which then stifles their ability to innovate (Sveiby *et al.*, 2012).

The institution where the study was conducted was identified as a bureaucratic organisation (Davis, 2013). In a large bureaucratic organisation all forces are arrayed for stability and conservatism (Power, 2013), communication is done along the chain of command (Sørensen, 2012), decisions are made centrally (Oeij *et al.*, 2017), and employees perform their work according to rigid rules, policies, procedures,

performance evaluation guidelines, and manuals in order to maintain the status quo (Naranjo-Valencia *et al.*, 2016; Romero, 2012; Wagner & Hollenbeck, 2010). Strict adherence to rules and regulations discourages employees from taking the initiative to be creative, as it allows no room for flexibility, creative thinking, and spontaneity, resulting in an organisation subsequently losing its ability to anticipate or adapt to changing conditions (Jantz, 2016; Romero, 2012; Wagner & Hollenbeck, 2010).

Organisations with bureaucratic systems where employees perform specialised tasks according to fixed rules, and decisions are taken centrally by hierarchical authorities, will find it difficult to create an innovative environment where members can submit new proposals (Loué & Slimane, 2017). A bureaucratic management system prioritises routine activities that present more immediate returns, instead of medium and long-term projects such as the implementation of innovations (Claudino *et al.*, 2017; Loué & Slimane, 2017).

4.4 ORGANISATIONAL CULTURE

Beyond the issue of organisational structure is the matter of creating and maintaining an organisational culture favourable to innovation and creativity (Peters & Austin, 1985). Some researchers have highlighted the importance of organisational culture for stimulating innovation and creativity (Mann & Chan, 2011).

4.4.1 Characteristics of an innovation culture

A wealth of academic literature identifies innovation as a key success factor, and evidence indicates a positive relationship between innovation and organisational growth and performance, which may lead to increased competitiveness and profitability (Aaltonen & Hytti, 2014; Dzisi *et al.*, 2013; Ikeda & Marshall, 2016; De Jager *et al.*, 2013; Kesselring *et al.*, 2014; Moses *et al.*, 2012; Nusair *et al.*, 2012; Ortega-Egea *et al.*, 2014; Selhofer *et al.*, 2012). An innovative culture should, however, exist for an organisation to achieve this level of innovation.

According to Lindland & Billington (2016) employees will engage in more innovative behaviour and will explore more new ideas in a work environment characterised by

- trust and shorter power distances
- more independence in how tasks are being performed
- the provision of challenging work
- risk-taking tolerance
- acceptance of the consequences of failed innovative efforts
- flexibility in processes

Organisational leaders should take responsibility, and influence employees to embrace innovation and create a culture that supports innovation and intelligent risk-taking (Soken & Barnes, 2014). According to Proctor (2010) organisations should encourage innovative behaviour in the workplace by

- encouraging risk-taking
- providing freedom and autonomy
- providing rewards and recognition for innovative performance
- encouraging different and diverse viewpoints on problems
- positively involving the top management
- supporting innovative behaviour and encouraging the continual flow of ideas
- positively responding to new ideas

Innovative leadership also plays an important role in creating an innovation culture. Innovative leaders need to encourage and support innovative thinking from employees as it is key to finding new or improved ideas (Horth & Buchner, 2014).

4.4.2 Risk-taking tolerance

Innovation and creativity require an environment open to what cannot be planned or expected, but such an environment may be linked to risk (Krut, 2012). Operating in a positive and supportive innovation environment is an important asset for an organisation and its employees, and can mean the difference between success and failure (Verloop, 2013). Innovation is linked to experimentation, risk-taking and possible failure (Serdyukov, 2017). Managers should establish an environment that is open to risk-taking and tolerates failure (Hornsby *et al.*, 2002). Because failure essentially occurs more frequently than success in innovation, a negative response to

failure may create a barrier for future innovative behaviour and efforts (Verloop, 2013). Many organisations focus on short-term objectives as they provide quick returns with financially measurable results and are linked to less risk (Proctor, 2010). Many organisations are hesitant to take risks as the existing status quo provides stability, whereas risk-taking is linked to failure and may be seen as "a sentence for life" (Joseph, 2011; Verloop, 2013). Many employees are also hesitant to take risks as failure may put their positions at risk, so it is safer to stick to traditions and be conservative (Hon, 2011; Joseph, 2011).

In order to survive, organisations need to respond creatively to the challenges it faces (Proctor, 2010). To stimulate innovation, organisations need to support idea generation, and accept risk and mistakes as part of the innovation process (Loewe & Dominiquini, 2006; Mokhber *et al.*, 2018). Creativity and innovation require employees and teams to move away from traditions, put in the effort, and challenge the status quo (Joseph, 2011). Organisations' values should support and tolerate experimentation and risk-taking (Mokhber *et al.*, 2018), and managers should live by the values, lead by example, and be innovation role models (Henry, 2013). Employees will then see that it is acceptable to question the existing practices, to be creative in problem-solving, to take risks, and know that mistakes will be tolerated (Martins & Terblanche, 2003).

4.4.3 Communication

Communication is recognised as a key factor in promoting innovation and reducing innovation resistance in organisations (Shahin *et al.*, 2017). Organisations should create a culture that encourages and focuses on open and transparent communication, which will lead to innovative thinking and teamwork among employees on all levels (Dhar, 2016; Martins & Terblanche, 2003; Shahin *et al.*, 2017). Managers play a vital role in fostering communication about the organisation's vision, mission, values, and strategic goals (Hornsby *et al.*, 2002; Quinn, 1985). Organisations should invest in continuous two-way communication as employees will not be able to support the objectives of the organisation if they do not know or understand them (Gustavsen, 2015; Oeij *et al.*, 2017).

Soken and Barnes (2014) state that communication needs to go beyond an intellectual and analytical statements of the vision, mission, and strategy; it needs to be practised and preached by management. Organisational leaders should communicate and share information to keep the workforce up to date with important information (Jyoti & Dev, 2015). Open communication about the organisational objectives, its performance and what employees can do to contribute to achieving the objectives will indicate to employees that innovation is welcomed, encouraged, and supported (Soken & Barnes, 2014). It is important to establish clear communication lines for employees to share information and ideas with management directly and without delay (Tian *et al.*, 2018). Clear, transparent and effective communication, coupled with a culture of trust, support, mutual respect, and employee involvement, will promote innovative work behaviour among employees (Dhar, 2016; Martins & Terblanche, 2003; Page & Schoder, 2019).

Providing support for creative and innovative behaviour will result in a better communicating atmosphere for employees and leaders, and will ultimately lead to a more innovative organisation (Mokhber *et al.*, 2018). Knowledge sharing, combined with regular communication and feedback among colleagues will result in increased idea generation (De Clercq *et al.*, 2016). Managers need to create a culture that not only promotes, but also protects communication in the organisation (Shahin *et al.*, 2017). Research findings point to the fact that communication and interactions among employees are crucial for innovation as the exchange of ideas between different levels of staff, not only triggers and stimulates innovation, but also ensures different professional innovation perspectives (Moll & De Leede, 2016; Osuigwe, 2016).

Interdepartmental communication is vital to overcome cross-functional communication barriers and to increase the flow of information and the coordination of activities between departments (Brown & Eisenhardt, 1995; Jyoti & Dev, 2015). Interdepartmental cooperation can be increased by having regular meetings where departmental representatives share information and discuss potential problems (Proctor, 2010).

Proctor (2010) highlights the importance of communication, stating that it is the lifeblood of any organisation. It also plays an important role in the partnership between

organisation management, employees, and trade unions. Openness, transparency, and two-way communication are required for this partnership to be an effective tool for positive industrial relations, minimising resistance to change, and for the smooth functioning of the organisation (Oeij *et al.*, 2017).

4.4.4 Cooperative teamwork

Innovation cannot be done in isolation as it requires support from and interaction with a diverse range of people in the form of a team (Verloop, 2013). A lack of teamwork will not only lead to a culture of individualism (where members prefer their own ways), but will also have a negative impact on group interactions to create innovative ideas (Tian *et al.*, 2018). Ideas are at the heart of team innovation, which increases creative behaviour, and accordingly creates an innovative organisation (Mann & Chan, 2011). Organisations should place ideas at the heart of team creativity and create a culture that encourages and supports teamwork (Mann & Chan, 2011; Yeh & Huan, 2017). Innovation training will further stimulate the innovative behaviour of the employees, which will ultimately lead to a more innovative organisation (Oeij *et al.*, 2017).

Innovation should be regarded as a core value of the organisation, and teamwork, which includes a set of individual skills, plays a strategic role in fostering innovation (Osuigwe, 2016). Teamwork is the ability to work effectively with other employees in a team environment (Hall & Rowland, 2016). Teamwork can influence innovative behaviour and creativity through interaction between diverse sources of knowledge and skills, through open communication, constructively challenging each other's work, and by promoting collaboration, commitment and mutual trust among the members of the team (Belussi & Staber, 2012). Team diversity is an important stimulant to creativity and innovation as it contributes a wealth of viewpoints, traditions, experiences and problem-solving abilities, which can lead to easier adoption of change (Chowdhury, 2004; Saxena, 2014). Organisations that have the advantage of a diverse workforce should take advantage of the differences that the diverse workforce has to offer (Kreitz, 2008), as combining these differences can result in wonderful innovative ideas. According to Mann and Chan (2011) innovation and creativity will flourish in an environment where diverse ideas are created, exchanged, investigated, distributed and used again. Creating spaces and processes for innovation will lead to

better communication, encourage team interaction and make the exchange and support of ideas easier (Horth & Buchner, 2014).

4.4.5 Interdepartmental interaction

Interdepartmental cooperation is important for the effective operation of the entire organisation (Proctor, 2010). In many organisations silos exist between functional departments where each department pursues its own goals and interests (Oeij *et al.*, 2017). As stated above, such behaviour is not beneficial towards achieving the organisational vision and mission. Organisations in which knowledge is shared among departments and where there is less competition between individual innovation projects generally perform better (Iferd & Schubert, 2017). Interdepartmental cooperation can be increased through regular meetings, scheduling dedicated times for interaction, and having a suggestion area on the internal intranet to share information and ideas (Proctor, 2010).

Interdepartmental interaction within an organisation enhances the innovation capacity of employees through knowledge sharing, knowledge transfer, and knowledge generation (Majamäki & Akpinar, 2014). Participation in formal or informal interactions to which all contributors bring their own distinctive competencies can create opportunities for knowledge sharing needed for sustainable innovation (Dubina, 2013; Taneja, Pryor & Hayek, 2016). Social interaction encourages information and idea-sharing among employees, which has a positive influence on their innovative behaviour (Jain, 2015).

4.4.6 Learning and development

Creativity requires employees to move away from traditions and to come up with new or better perspectives (Proctor, 2010). When engaged in innovation, change is introduced that brings about a difference to the established order (Sveiby *et al.*, 2012). Research has shown that people can be educated, encouraged, counselled, coached, and trained to continuously develop themselves and become more creative (Oeij *et al.*, 2017; Proctor, 2010). Gurova and Kurilov (2015) highlights that to develop a creative workforce, employees need to gain experience and expand their knowledge

through continuous training. Investing in, coaching, and developing employees will lead to an increased generation of knowledge and valuable ideas (Oeij *et al.*, 2019).

Management needs to focus on developing creative supervisors to act as role-models, motivating subordinates and providing them with intellectual stimulation (Koseoglu *et al.*, 2017). Organisations should encourage training programmes for all supervisors to develop the skills and attitudes required for managing creativity and innovation (Khaola & Coldwell, 2019; Koseoglu *et al.*, 2017). Employees in organisations with strong learning cultures are eager to explore and take risks, and are not constrained by the fear of failure (Klein & Knight, 2005; Martins & Terblanche, 2003). Innovation may end in failure, but a strong learning orientation will use failure as a learning experience and allow its members to experiment, adapt, and persevere in innovation (Klein & Knight, 2005; Martins & Terblanche, 2003).

Studies have shown that organisations often invest in employee training but neglect to provide relevant innovation training to managers (Dhar, 2016; Weaver, Trevino & Cochran, 1999). Employees look to their managers as role models and for this reason organisations should prioritise training for managers to improve their innovative behaviour and innovation management skills (Dhar, 2016; Maladzhi, Yan & Makinde, 2012).

4.4.7 Resistance to innovation

Over the years, the need for organisations to innovate has become inevitable (Sveiby *et al.*, 2012). Innovation is discussed at senior-level meetings and documented in strategic documents as being the lifeblood of the organisation, but innovation is often met with caution, scepticism, and resistance (Sveiby *et al.*, 2012). People are often afraid of new ideas. Employees may feel vulnerable when ideas are introduced by management, known as top-down innovation, fearing that they will not be able to deal with the change or might even lose their jobs (Haapasaari *et al.*, 2018; Proctor, 2010). Management may also resist innovation from employees, known as bottom-up innovation, as it may present a threat to their positions, power, status, and decision-making powers (Claudino *et al.*, 2017; Haapasaari *et al.*, 2018; Souza &

Bruno-Faria, 2013), and forces them to function outside of their comfort zones (Oeij *et al.*, 2017).

Many supervisors and leaders understand the importance of innovation, but do not engage in or support innovation due to the intense investment and commitment required (Mayer, 2012). Innovative thinking may also be resisted as it challenges the status quo and violates the established frameworks of practices in the organisation (Baer, 2012; Durmusoglu *et al.*, 2018; Janssen *et al.*, 2004; Mars, 2013). Organisations need to identify resistance and its reasons early (Proctor, 2010) for it to be overcome through effective, open, transparent, and two-way communication, which will minimise resistance to change and conflict (Oeij *et al.*, 2017). Resistance also reinforces the need for leaders to have a clear vision, to communicate the vision, and to provide a safe and supportive environment for innovation (Page & Schoder, 2019). All employees in an organisation need to be trained to act in ways that promote and support organisational innovation and not to regard innovation as a threat (Horth & Buchner, 2014). Eliminating resistance to innovation will assist organisations to produce and implement innovative ideas in an effort to achieve their overall objectives (Soken & Barnes, 2014).

4.4.8 Rewards

How organisations deal with success and failure indicates how innovative an organisation's culture is (Ahmed, 1998). Employees who demonstrate drive, effort, energy, and perseverance should be encouraged through recognition, incentives, and rewards (Casely, 2016; Ikeda & Marshall, 2016). Rewards and recognition are important factors to foster innovation (Hornsby *et al.*, 2002).

When employees are successful in trying out new ideas, the supervisor is always one of the key persons to share the joy and sense of accomplishment (Cheung & Wong, 2011). Supervisors need to provide consistent acknowledgement and recognition to employees in response to innovative efforts (Leavitt, 2004; Osuigwe, 2016). Financial rewards, which will also result in a more innovative culture and increase employees' innovate output, should be well-structured so that they do not become the sole reason employees to present creative ideas (Torres, 2015).

While most of the literature centres around rewarding creative and innovative activities, there are also discussions on rewarding failed innovative efforts (Alexander, Berthod, Kunert, Salge & Washington, 2015; Casely, 2016; Henry, 2015; Mention, Pinto Ferreira & Torkkeli, 2019). Many famous organisations like Google, BMW, and Nokia not only encourage and reward successful innovation, but also encourage learning from failures, and even reward failures (Kriegesmann, Kley & Schwering, 2005). Rewarding innovative failures will assist in creating an environment that encourages innovative behaviour and risk-taking (Figueroa, 2018). Organisations committed to innovation will be fearless towards failures and openly promote individuals for failed projects, indicating an organisational commitment to rewarding risk-taking (Casely, 2016).

Organisational leaders are talking about the principle of rewarding failure and its benefits, but yet few organisations implement such rewards (Henry, 2015). Many organisations are so entrenched in the way that things have always been done that they are afraid of doing things, of trying new things, of taking risks and of failing, because many leaders have become conservative (Henry, 2015). For organisations to become more innovative they need to allow experimentation and accept failure as part of the process. Organisations should, however, differentiate between mistakes that are caused by incompetence, and intelligent risk-taking and experimentation (Henry, 2015). The latter is the category that organisations should start rewarding for them to become more innovative (Alexander *et al.*, 2015; Casely, 2016; Henry, 2015; Mention *et al.*, 2019).

4.5   ORGANISATIONAL ENCOURAGEMENT

Organisational encouragement refers to the perception that the organisation expects, values, supports, and encourages innovation (Mann & Chan, 2011). According to Hueske and Guenther (2015), innovation is crucial for organisations to gain and sustain a competitive advantage. In a volatile and rapidly changing business environment, organisations can obtain a competitive advantage by motivating employees to engage in daily innovative work behaviour (Chughtai, 2013). Without a culture and work environment supporting innovation, employees will not engage in innovative behaviour and organisation will remain trapped in the status quo (Loewe &

Dominiquini, 2006; Mokhber *et al.*, 2018). It is, therefore, vital for organisations to encourage an innovation culture to enable the creative talents of all human resources within the organisation to flourish (Barron, 1988). The continuous development of the innovative qualities of employees via well-designed training can further encourage innovation (Li & Hsu, 2016). Organisations with an innovative culture share a vision for innovation, encourages idea generation, rewards and recognises innovative work, and inspires employees to create an active flow of ideas (Horth & Buchner, 2014).

Organisational leaders should also encourage innovation. Innovative leaders need to support and encourage idea generation, neutralise negativity and remove innovative barriers (Horth & Buchner, 2014). Management should further act as role models to indicate that experimentation and risk-taking are supported (Atitumpong & Badir, 2018; Meijer, 2014). Management should finally offer support and reduce employee anxiety and fear as a result of innovation uncertainties (Atitumpong & Badir, 2018; Goodman & Dingli, 2013). Encouragement has a strong influence on employees and their propensity to behave in innovative and creative ways (Casely, 2016).

4.6   RESOURCES

Employees will explore new ideas, take risks, make mistakes and be more creative when they are encouraged and supported by management and provided with enough resources (Amabile, 1998; Scott & Bruce, 1994). To create an innovative culture, organisations should be prepared to finance creative ideas (Proctor, 2010). Organisations with better resources, better technology, more time, more human resources, and knowledge are generally more likely to innovate (Shi & Wu, 2017).

Innovation will only become a priority to employees when they are provided with sufficient resources such as funds, materials, information, freedom, and time (Horth & Buchner, 2014; Mann & Chan, 2011). Many organisations have trouble innovating as employees are not given sufficient resources to conduct innovative projects (Rao & Weintraub, 2013). Employees are then pressured to achieve more with fewer resources, which is ironic, as cutbacks will require organisations to become more creative (Proctor, 2010). Resource constraints interfere with the innovation abilities of organisations (Woschke *et al.*, 2017). Organisations might have a clear understanding

of the areas that need to be improved, but are unable to do so, due to a lack of resources (Nguyen & Nguyen, 2013). Financial accessibility is a very significant factor for innovation activities (Shi & Wu, 2017).

Resources can significantly improve the quantity of creative performance, but less so the quality aspect, as freedom is more important for creative performance than regulations (Yeh & Huan, 2017). Management control can stifle innovative behaviour as autonomy and freedom are critical to increasing creative thinking (Proctor, 2010). Yeh and Huan (2017) confirm that freedom has a positive influence on the creative performance of employees.

Time is another important resource. In a study done on EDI it was shown that time constraints were more problematic than limited funding (Wihlman *et al.*, 2014). Time pressure, such as tight deadliness is an important driving force for work progress (Zika-Viktorsson *et al.*, 2006), but time pressure has a negative impact on innovation. Voigt, Bergener and Becker (2013) discovered that time constraints impact negatively on creative performance. Employees cannot innovate when they do not have the time (Soken & Barnes, 2014). Organisations may be presented with innovation opportunities, and employees may be committed to innovation and may be open to new ideas, but without sufficient time, innovation cannot take place (Wihlman *et al.*, 2014). Many organisations try to rush the creative process by regulating the budget, time, and resource allocated, to be cost-effective (Yeh & Huan, 2017). Employees should, however, be given sufficient time to implement the ideas that emerge from time for creative thought, time for reflection, and time for communication within the team (Wihlman *et al.*, 2014).

4.7   JOB CONTEXT AND EMPOWERMENT

Job context and empowerment aim to focus on whether team members feel encouraged and have the autonomy to develop new ideas (Mann & Chan, 2011). The nature of work has drastically changed over the last two decade, reflecting greater global competition, job restructuring, and flatter organisations (Shalley, Gilson & Blum, 2009). These changes have resulted in a need for employees at all levels and in all kinds of positions to engage in innovative and creative behaviour. Such behaviour is

aimed at developing new or improved ideas, processes, products, or services (Shalley *et al.*, 2009).

Job characteristics play an important role in the level of innovative behaviour that employees will engage in (Jain, 2015). Complex and stimulating work, job autonomy and empowerment will result in employees feeling free to achieve their goals more innovatively and creatively within guidelines (Martins & Terblanche, 2003)**.** The output expected should, however, be realistic, free from distractions, and within realistic timelines (Horth & Buchner, 2014). Job complexity and job autonomy are the two variables associated with innovative behaviour (Axtell, Holman, Unsworth, Wall, Waterson & Harrington, 2000; Jain, 2015).

Job complexity refers to how intellectually demanding and complex tasks are (Amabile, 1996; Jain, 2015), and is an important factor influencing employee innovation and creativity (Oldham & Cummings, 1996). It is believed that more complex jobs are linked to increased innovative behaviour from employees (Li & Hsu, 2016). Employees that participate in complex and intellectually demanding tasks tend to express greater intrinsic motivation to engage in creative and innovative behaviour than those carrying out uncomplicated and routine tasks (Oldham & Cummings, 1996; Shalley *et al.*, 2009; Wang *et al.*, 2014). Baer and Oldham (2006) found a positive correlation between job complexity and innovative behaviour. This finding indicates that providing employees with a sense of being challenged at work is conducive to innovation and productivity (Horth & Buchner, 2014). Employees engaging in complex tasks will experience interest, curiosity, involvement, satisfaction or positive challenge, which in turn will result in creative and innovative behaviour (Jain, 2015).

Job autonomy has frequently been identified as an important predictor of innovative and creative behaviour (Mumford, Scott, Gaddis & Strange, 2002; De Spiegelaere, Van Gyes, De Witte, Niesen & Van Hootegem, 2014). Hammond, Neff, Farr, Schwall and Zhao (2011) identified job autonomy as one of the drivers of employee innovation. Job autonomy refers to the degree of authority that employees have to perform their tasks without close supervision (Jain, 2015). Adequate job autonomy leads to increased innovative behaviour as employees can make decisions and have control over how to perform tasks (Jain, 2015). By allowing employees to apply their

knowledge and involving them in the decision-making process, will further create a culture of autonomy and responsibility (De Spiegelaere & Van Gyes, 2012). Job autonomy motivates employees, influences their self-efficacy, and provides a sense of trust, which results in more confident employees who engage in more innovative behaviour with higher success rates (Dorenbosch, Van Engen & Verhagen, 2005; Li & Hsu, 2016; Tierney & Farmer, 2002).

4.8 IMPORTANCE OF INNOVATION IN THE WORKPLACE

As discussed in chapter 2, a variety of definitions of innovation and creativity exist. However, the terms are broadly used to indicate anything new in organisations (Standing *et al.*, 2016). Increasing emphasis is placed on the importance of innovation and creativity in the workplace to eliminate old ways of thinking, to challenge the status quo, and to create a new or improved solution to increase performance and ensure long-term survival (Anderson *et al.*, 2014; Bamber *et al.*, 2017).

Employees' experiences, knowledge and skills are the most valuable resources of any organisation (Leovaridis, 2015). People are the heart of creativity and innovation; people engage in innovative behaviour, create ideas, and implement these ideas (Bamber *et al.*, 2017). Their contribution to the innovative practices of the organisation is vital for organisational success (Standing *et al.*, 2016). Even though all organisation have creative employees, it is still up to the organisational leaders to encourage the expression of innovation and creativity, as it is not an automatic process (Joseph, 2011).

All an organisation's employees should have a clear understanding of the vision of the organisation, and realise the important role that innovation plays in achieving specific objectives towards achieving the vision (Standing *et al.*, 2016). Soken and Barnes (2014), however, state that organisations should go beyond the knowledgeable and analytical statement of the vision, mission, and strategy; management need to apply these by

- creating an innovation vision, mission, and strategy
- demonstrating true commitment to innovation and communicate its importance

- motivating and inspiring employees to feel excited about innovation
- infusing employees with energy and a sense of urgency inspiring real commitment
- gaining employees' trust and confidence
- providing a sense of security for the future
- rewarding innovative efforts
- prioritising innovation and demonstrating that innovation is indeed a top priority
- assigning well-established leaders to focus on and drive these innovative efforts
- regularly communicating the importance of innovation

Organisational leaders need to demonstrate their willingness to challenge the status quo by acting as role models and engaging in innovative activities themselves (Afsar *et al.*, 2014; Newman, Tse, Schwarz & Nielsen, 2018). Leaders should encourage and intellectually stimulate employees to use their imagination, and also question the status quo (Bass & Avolio, 1990; Joseph, 2011).

Gee and Hanwell (2014) explain that organisations should seek to develop innovative ways of working to

- increase innovative and creative behaviour which can result in new or improved ideas, products, or services
- challenge the status quo and have employees break patterns and move away from the existing framework of ideas and behaviour
- get employees to feel enthusiastic and to recommit to their jobs and the vision and goals of the organisation, therefore, avoiding the organisation from stagnating and having employees "retired on the job".
- reduce costs in organisations by finding innovative ways of minimising the time and resources required for existing processes, products, and services

Organisations should investigate how work is being performed and how objectives are being achieved, and then provide an invitation to employees to challenge, experiment, and develop new innovative ways to achieve better results (Gee & Hanwell, 2014). In many cases a hierarchical culture places emphasis on rules, processes and procedures for conformity, but such a culture will reduce creativity due to limited autonomy and extreme control (Naranjo-Valencia *et al.*, 2016). For this reason,

management should provide sufficient support and ensure that existing rules and processes do not hinder employees and teams in developing innovative ideas (Standing *et al.*, 2016). If needed, management should review and renegotiate the relevance of rules, policies, and procedures, and revise them so that they do not stifle innovation (Bamber *et al.*, 2017). Line managers also play an important role in engaging, developing, and empowering creativity among employees (Bamber *et al.*, 2017; Standing *et al.*, 2016). Empowering employees to be more innovative is a challenge, but should be effectively managed (Standing *et al.*, 2016). Creativity and innovation are complex and multi-levelled and require skillful leadership to maximise the benefits of new and improved ways of working (Anderson *et al.*, 2014). Management should be provided with the necessary training to improve their innovative management skills.

Innovation in the workplace, from idea generation to implementation, has become a source of distinct competitive advantage (Anderson *et al.*, 2014). Organisations focused on innovation value new ways of thinking and understand the potential it has to provide a competitive edge (Bamber *et al.*, 2017), which can result from employee's knowledge, skills, and innovative ability (Leovaridis, 2015). An internal work environment, which supports innovation and provides employees with a variety of stimulating tasks, autonomy, participation in decision-making, and learning, will have a positive impact on employees' welfare, health and, therefore, on their level of motivation and loyalty (Leovaridis, 2015). Bamber *et al.* (2017) mention that such an environment will result in increased employee satisfaction, commitment, productivity, and increased innovative behaviour. Rewards and recognition for innovative efforts will result in further innovative behaviour ("Innovative behavior starts at the top", 2013).

Many organisations are beginning to understand the vital role of innovation and are introducing change, innovation, and renewal (Sebora & Theerapatvong, 2010). An innovative work environment will result in more innovative ideas by employees with a more significant impact and more employee involvement in the implementation of innovations (Standing *et al.*, 2016). In the future only a few organisations will be able to grow and survive without innovation (Anderson *et al.*, 2014).

4.9 SUMMARY

Research has shown that the internal work environment embodies the internal basis to stimulate EDI and creativity. The internal work environment, however, brings with it many barriers that can block EDI and creative behaviour. Many organisations have rigid hierarchical structures, where ideas are often over-analysed and response times to changes are slow, resulting in wasted time and a possible wasted competitive advantage. It is essential for organisations to make innovation and creativity a central part of the culture, and to design processes that will support EDI and creativity. To create an innovative culture and climate, organisations should invest in innovation and provide the required resources to engage in innovative behaviour. Management should encourage creativity, avoid negativity, and act as role models. Effective communication channels should be established, and employees should be encouraged to challenge the status quo and traditions. Increased freedom, flexibility, and teamwork will result in idea sharing and can further promote EDI and creativity. Organisations with a solid innovation foundation will be able to respond to changes faster and will generate more and better innovations than organisations that do not have an innovative culture. Organisations should actively work to create an internal work environment that will enable and foster EDI and creativity because without innovation, few organisations will survive.

The preceding chapters provide a theoretical overview of the literature dealing with innovation and creativity, supervisory behaviour, and the internal work environment. This chapter provides an outline of the research methodology used in this study. The empirical investigation conducted in this study and the results and findings are presented according to the steps outlined in the research process. This chapter starts with a discussion of the formulation of the research aims, followed by a description of the sampling strategy and population. The design and development of the questionnaire as the measuring instrument are also discussed and the data collection methods explained. The chapter concludes with the ethical considerations of the study and a summary of the chapter.

5.1 INTRODUCTION

The empirical research used of a number of steps, as outlined in figure 5.1. Each of these steps is discussed in this chapter.

Figure 5.1: Steps in the research process

STEP 1: Formulating the research aims

STEP 2: Determining and describing the sample

STEP 3: Designing the measuring instrument

STEP 4: Administering the measuring instrument

STEP 5: Scoring the measuring instrument

STEP 6: Processing and analysing the data
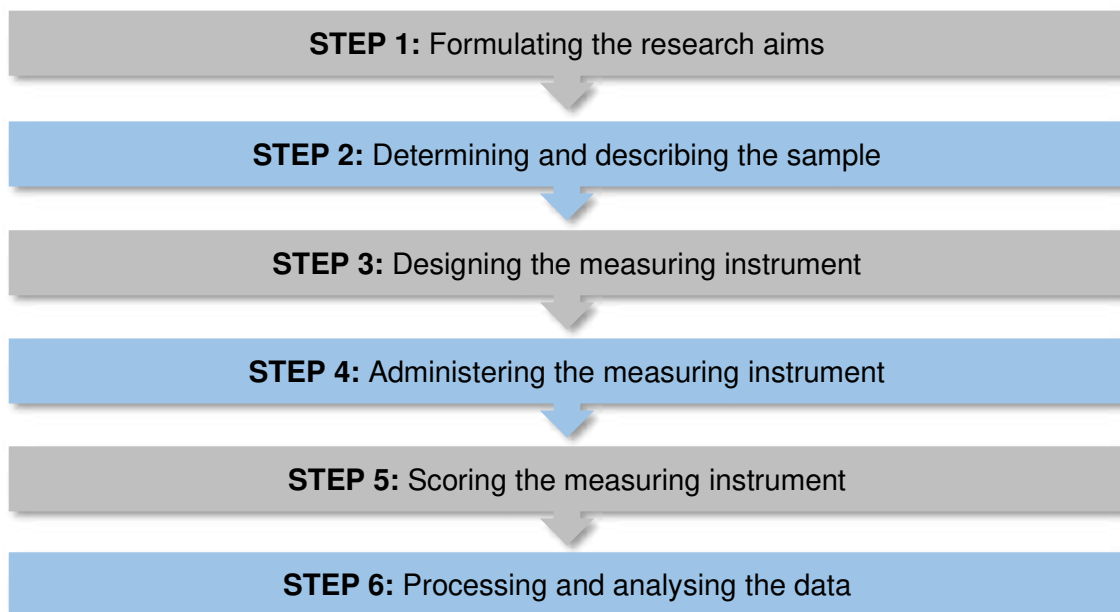
5.2   STEP 1: FORMULATING THE RESEARCH AIMS

The specific aims of the empirical study are listed below:

- **Research aim 1:** To determine the constructs of supervisory behaviour that influence EDI and creativity.
- **Research aim 2:** To determine the constructs of the internal work environment that influence EDI and creativity.
- **Research aim 3:** To determine the relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity.
- **Research aim 4:** To determine whether demographic characteristics have an influence on supervisory behaviour, internal work environment, and employees' innovation and creativity in terms of gender, ethnicity, age, post-level, department/unit, supervisory status, and qualifications.
- **Research aim 5**: To make recommendations regarding supervisory behaviour and creating enabling work environments to enhance and support EDI and creativity.

5.3   STEP 2: DETERMINING AND DESCRIBING THE SAMPLE

5.3.1   Sampling strategy used

Researchers are often faced with a decision on whether or not sampling is needed for a study. Sometimes it is impractical, uneconomical and often impossible to directly test the entire population (Salkind, 2018). For this reason, data are collected from a large sample that is considered to represent a particular population so that generalisations can be made about the population (Leedy & Ormrod, 2015; Taherdoost, 2016). Sampling, therefore, allows the researcher to obtain a representative picture of the population, without studying the entire population (Molenberghs, 2010). According to Kumar (2011) there are three different types of sampling, which include random/probability sampling designs, non-random/non-probability sampling designs and mixed sampling design. When using probability sampling, the possibility of a member of the population being selected is known (Salkind, 2018; Stangor, 2011).

Non-probability sampling is a technique where the likelihood of each element of the population being chosen is unknown (Terre Blanche, Durrheim & Painter, 2006).

After careful examination of the research aims and the purpose of the study, it was decided not to use sampling, but to rather follow a census approach, where data were collected from every member of the target population as identified through the sampling frame (Cooper & Schindler, 2011). It can be assumed that when all items are covered, no elements are left to chance and that the highest accuracy is obtained (Kothari, 2004).

A population refers to a large group of potential participants under investigation for research purposes (Salkind, 2018). The higher education institution where the study was conducted, employs 5 899 permanent employees (Department of Human Resource Information Systems (HRIS), 2019). A smaller group was selected from the population (a subset of that population) and is referred to as the target population (Neuman, 2014; Salkind, 2018). The target population consisted of permanent employees between the ages of 18 and 65 of all ethnicities both genders who were employed on post levels P5 to P9 in the academic and administrative environments. The institution employs 5 899 employees of which 71% were chosen as the sample (N = 4 206 permanent employees). According to Khaola and Coldwell (2019) it is beneficial to use more than 300 participants, as samples of 300 and above have more statistical power. This is based on the principle that larger sample sizes will ensure that people with diverse backgrounds are included and therefore make the sample representative of the study population (Field, 2009; Kumar, 2011).

When using the census approach, information is obtained from each member of the target population (Kothari, 2004). A list of all the employees that met the criteria of the target population was provided to the researcher and the questionnaire was e-mailed to the 4 206 members of the target population. A total of 624 completed questionnaires were returned, resulting in a response rate of 15%. This number was deemed fair for data analysis and interpretation to make a valuable contribution to the subject of EDI and creativity within the institution.

Before commencing with the collection of data, the questionnaire was sent to a statistician and a group of 12 individuals as part of a pilot study. The participants in the pilot study were requested to provide feedback about the wording of the questions, the time required to complete the survey, and the clarity of the statements. It is common practice to pre-test a questionnaire with a small number of participants before distributing it to the sample (Salkind, 2018; Walliman, 2011). The results from the pilot study were solely used for quality purposes and were not used for any further analysis. Recommendations were considered, and where appropriate, the necessary changes were made to the questionnaire.

5.3.2 Representation of the sample

Information on the population was obtained from the Directorate: Organisational Development Human Resource Information Systems (HRIS) at the higher education institution after ethical clearance was obtained from the Unisa College Ethics Review Committee. Permission to use institutional staff members was obtained from the Research Permission Subcommittee (RPSC) of the Unisa Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC). Certificates were issued and recorded.

The representability of the sample was analysed in terms of demographic data such as gender, ethnicity, age, post level, years of service, years in current position, working in academic/administrative department/unit, supervisory position, and qualifications. Further analysis focused on the respondents' relationships with their supervisors, as well as the supervisors' gender, ethnicity and age.

5.3.3 Demographic characteristics of the sample

a) Gender

The gender distribution of the sample is illustrated in figure 5.2.

Figure 5.2: Gender distribution of the sample

GENDER DISTRIBUTION

35.7%

64.3%
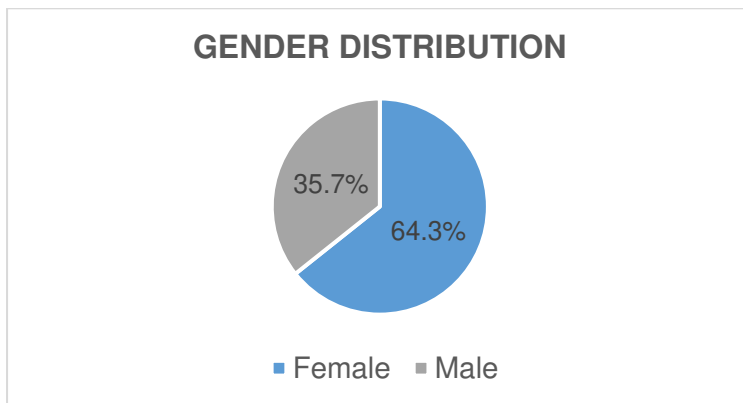
■ Female ■ Male

The gender distribution of the sample shows a higher representation for females (64.3% female compared to only 35.7% male). The higher number of females in the target population and realised sample could be attributed to transformation initiatives at the institution to employ more female workers. The response rate is, therefore, a good representation of the target population.

b) Ethnicity

The distribution of the realised sample according to ethnicity is shown in figure 5.3. It should be noted that seven respondents selected "other ethnicity" and after examining the data, it was determined that two of the responses could be reclassified. Five respondents preferred not to disclose their ethnicity and were classified as "other (prefer not to disclose)".

The figures of the target population and the realised sample are illustrated in figure 5.3, from which it is clear that the two largest ethnic groups were Africans (Black) and Whites respectively. The majority of respondents were African (Black) employees (47.6%), followed by White employees (43.9%). The number of Coloured (4.2%) and Indian/Asian (3.2%) employees in the sample was not that high but was considered as reasonable when compared to the population distribution. The results also indicate that there was a small over-representation of White respondents and a slight over representation of Coloured respondents, but the overall figures are regarded as a good representation of the target population.

Figure 5.3: Ethnic distribution of the sample and target population
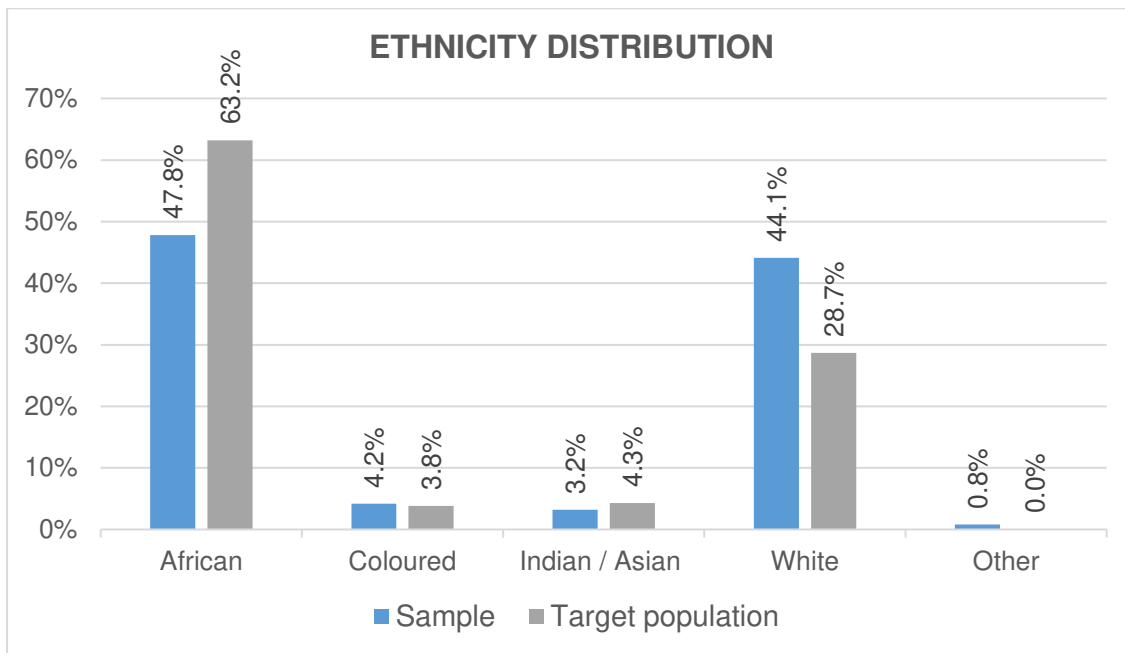
c) Age

The age distribution of the sample and the target population is illustrated in figure 5.4.

Figure 5.4: Age distribution of the sample and target population
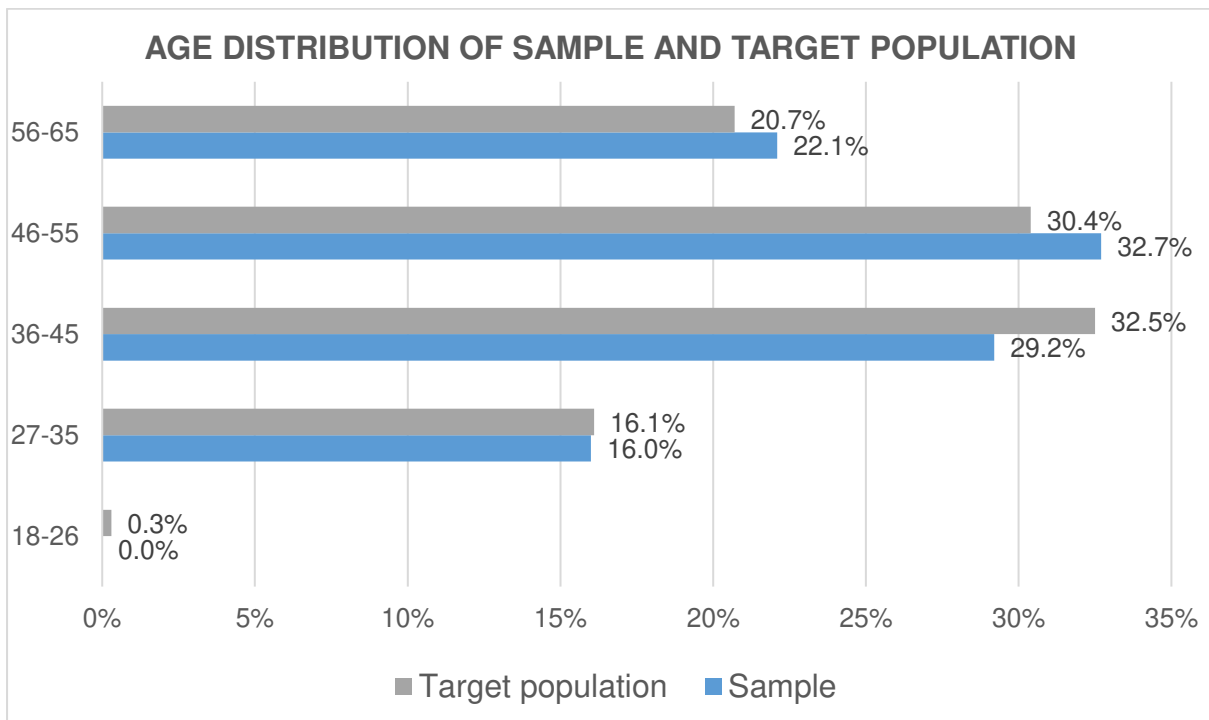
The smallest number of respondents (16%) fell within the age group of 27 to 35 years. 29.9% of participants were in the 36 to 45-year age group, while the largest number of respondents fell within the 46 to 55-year (32.7%) age group. Only 22.1% of respondent were in the 56 to 65-year age group. When the data from the realised sample is compared to the target population, it is evident that the distribution of the sample is a very good representation of the population.

d) Post level

The respondents were asked to indicate their post levels (P5–P9). The post level distribution of the sample and the target population is illustrated in figure 5.5.

Figure 5.5 shows that the majority of the target population occupied positions on post level 8 (33.5%) followed by post level 7 (23.6%). This is not surprising as the primary function of an educational institution is linked to post levels 7 and 8 occupied by lecturers in the academic environment and specialist and senior admin support in the administrative/support environment.

Figure 5.5: Post level distribution of the sample and target population

POST LEVEL	P5	P6	P7	P8	P9
▪ Target population	9.4%	13.3%	23.6%	33.5%	20.3%
▪ Sample	7.9%	17.6%	27.9%	29.2%	17.5%
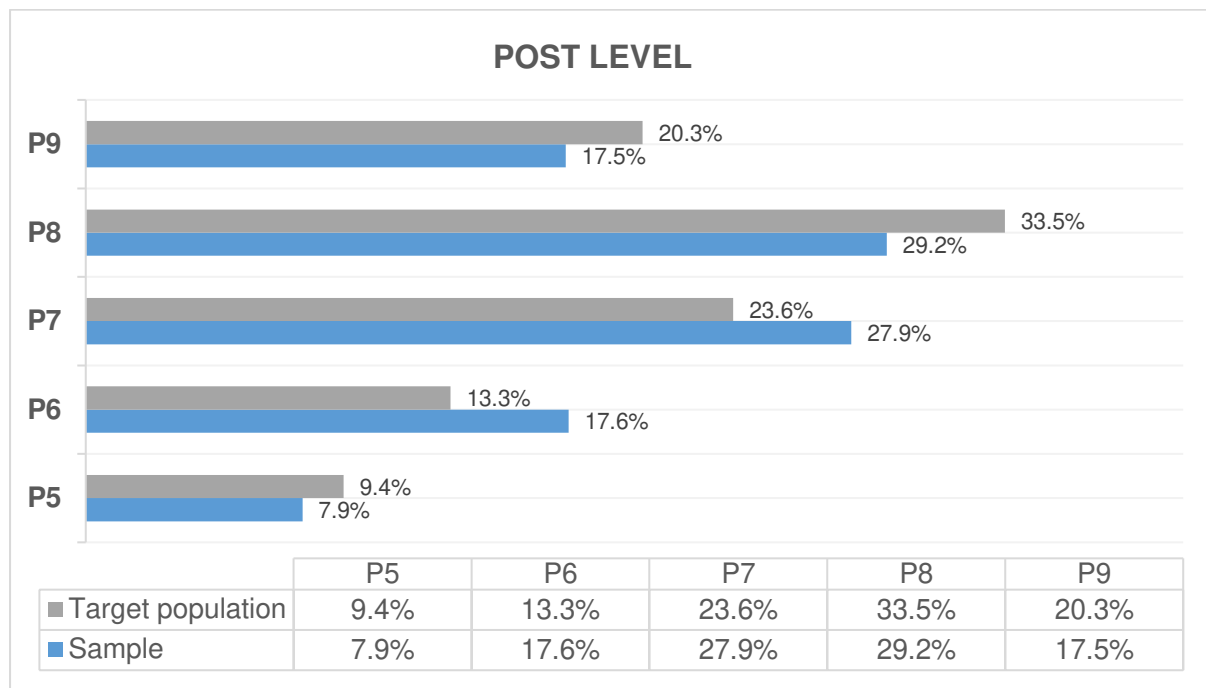
From figure 5.5 it is clear that the majority of the respondents in the sample were on post level 8 (29.2%) with the second-highest number of respondents on post level 7 (27.9%), resulting in a slight over-representation of this post level. Post levels are categories of authority that are used within the institution. Each post level is typically associated with a series of job titles and a salary range. Table 5.1 lists an example of academic and administrative/support positions at the different post levels.

It should be noted that a large number of job titles are linked to each post level. The position titles listed in table 5.1 are examples of the job titles linked to the post levels for the reader to get a better understanding of the level/seniority of the levels.

Table 5.1: Post level and positions

Post level	Academic environment	Administrative environment
P5	Professor	Director
P6	Associate professor	Manager
P7	Senior lecturer	Specialist
P8	Lecturer	Administrative support
P9	Junior lecturer	Administrative support

When comparing the post level responses with the target population, it was noted that post levels 6 and 7 had the largest representation. A possible reason for the high representation at post levels 6 and 7 could be the result of these post levels playing an important role in promoting and supporting innovation, and that the study might have been of more interest to staff members at these post levels. Overall, the sample responses were representative of the target population.

e) Number of years' service at the institution and number of years' service in current position

The respondents were asked to indicate their number of years' service at the institution as well as the number of years that they had been employed in their current position. Figure 5.6 indicates that a total of 47.6% of the respondents had 10 years or less service at the institution. The highest percentage of respondents (33.7%) have been

employed at the institution for between 6 and 10 years, and the second-highest percentage of respondents (13.9%) have been working at the institution for 1 to 5 years. This figure shows that respondents worked at the institution for longer periods compared to the 3.9 years median job tenure (median amount of time employees spend with an employer) of South Africans in 2016 (Statistics South Africa, 2018).

Figure 5.6: Years of service and years in current position distribution of the sample
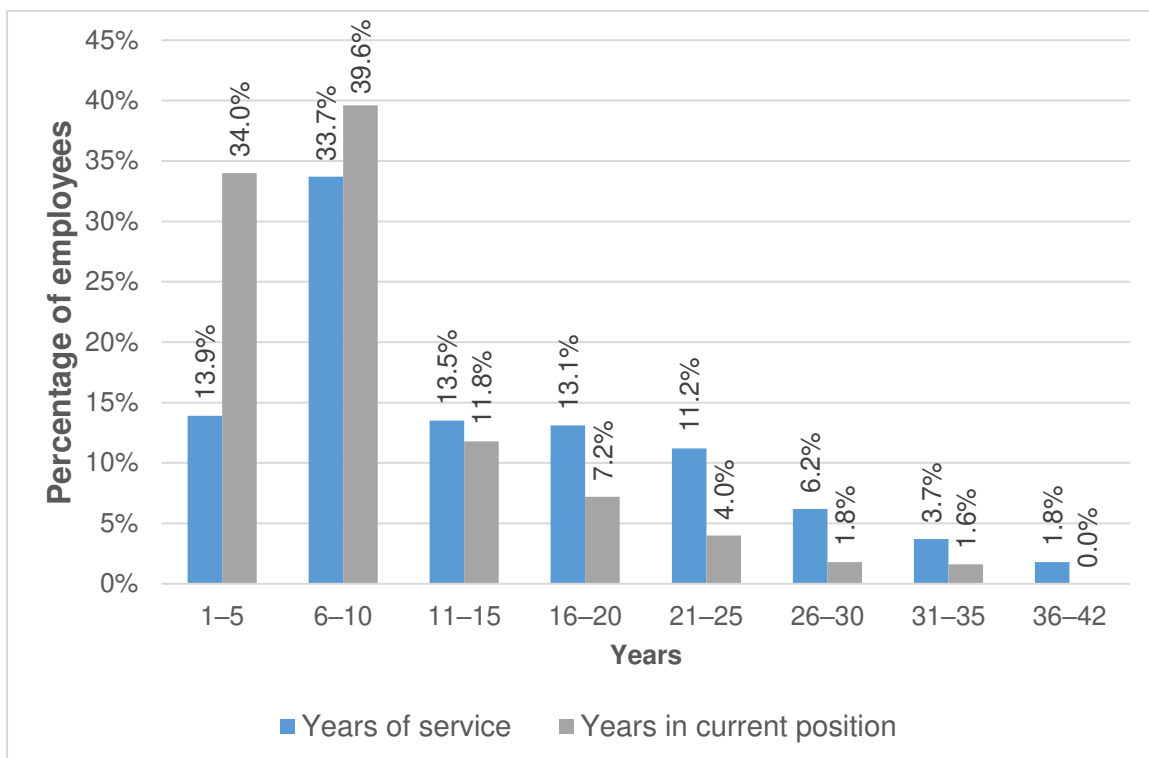
In a study that Moosa (2016) conducted at the institution the respondents indicated that, based on elements such as organisational innovation climate, salary and benefits, many were content with working at the institution and considered staying at the institution until retirement. This finding by Moosa may also apply to the 49.5% respondents in this study that have been employed for longer than 11 years. The two lowest percentages of 3.7% (31–35 years of service) and 1.8% (36–42 years of service) could be due to older workers stepping down from their roles, and retirement.

When looking at the respondents' years of service in their current positions, 73.6% of the respondents indicated that they had been in their current position for 10 years or less, and a total of 19% had been in their position between 11 and 20 years.

f) Employed in academic / administrative department/unit

The respondents were asked to indicate whether they were employed in an academic or administrative department/unit since a significant difference exists in the roles and functions of academic and administrative employees. The distribution of the sample and the target population among the academic or administrative department/unit is depicted in figure 5.7.

Figure 5.7: Academic/Administrative department/unit distribution of the sample and target population
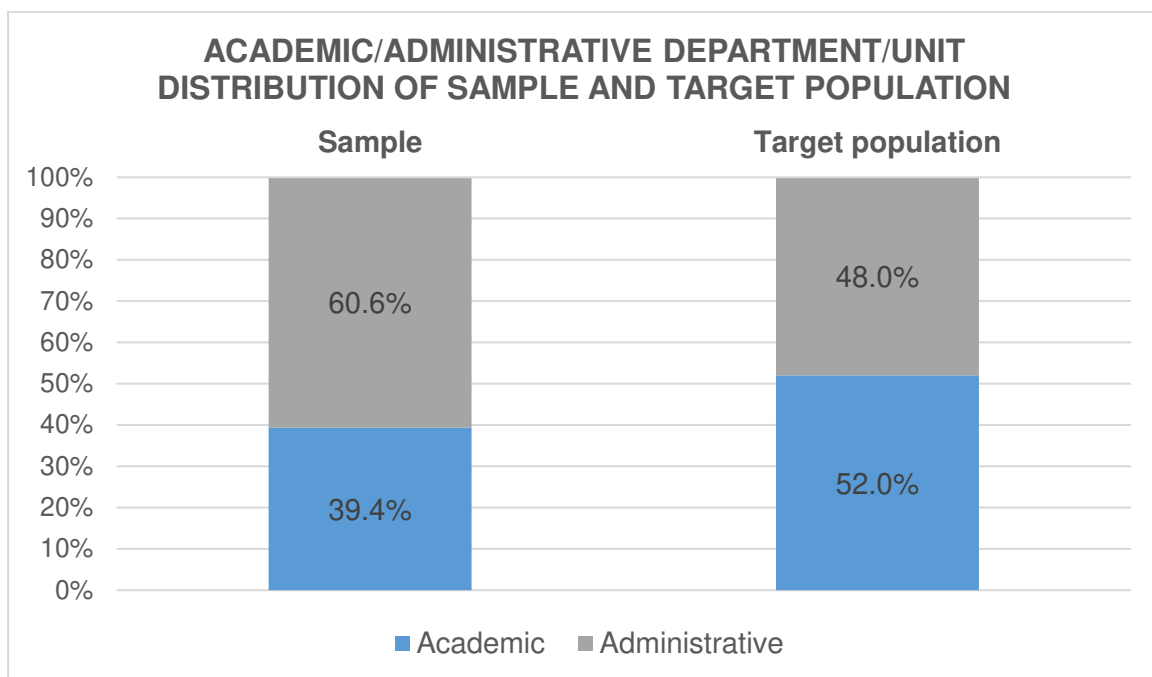
Figure 5.7 shows the department/unit distribution of the sample and target population. 39.4% of the respondents in the sample worked in the academic environment whereas academics made up 52% of the target population. Although academics are slightly underrepresented in the sample, the sample is still regarded as a good representation of the target population.

Looking at the administrative departments/units, 60.6% of the sample, but only 48% of the target population, worked in administrative departments/units, which indicates a slight over-representation of administrative staff. However, the sample is regarded as a good representation of the target population.

g) Respondents in a supervisory position

It was important to determine whether the respondents were supervisors with staff reporting to them. Respondents were asked to select either "Yes" or "No". Respondent who replied "Yes" where required to complete an additional section of the questionnaire that became active based on their responses. The results are illustrated in figure 5.8.

Figure 5.8: Respondents in a supervisory position distribution of the sample

RESPONDENTS IN A SUPERVISORY POSITION

30.4%

69.6%

■ Yes ■ No
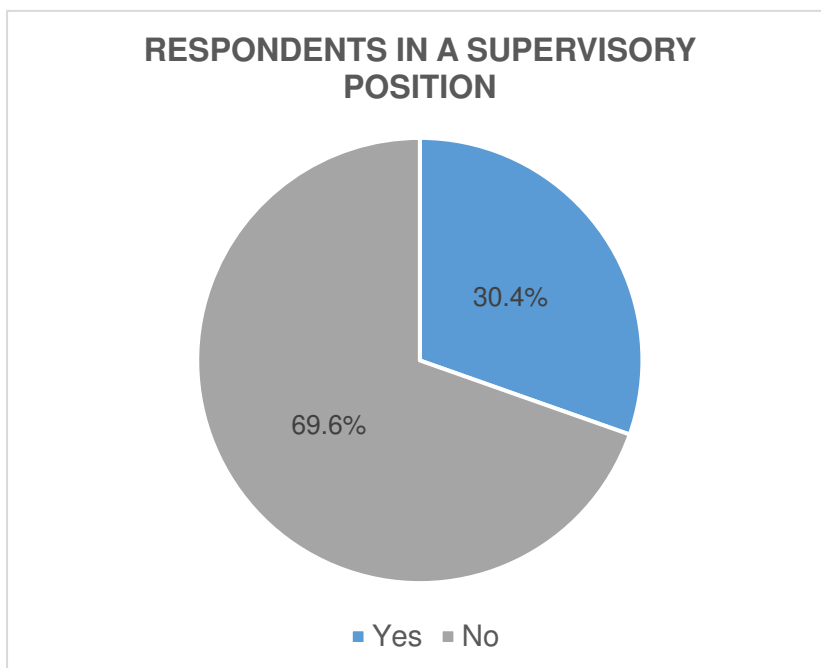
Figure 5.8 indicates that the majority of respondents (69.6%) were not employed in a supervisory role or did not have any staff reporting to them. 30.4% of respondents were in a supervisory role and could complete the additional section of the study which focused on supervisors. Figure 5.5 indicates the post level distribution of the target population. Staff members on post levels 8 and 9 (53.9 % of the population) are normally not employed in supervisory positions. Staff members on post levels 5 and 6 (22.6%) commonly fulfil supervisory roles, whereas members on post level 7 (23.6%) may in some cases (mostly academic positions) fulfil a supervisory role. Taking the distribution of the target population into account, it is evident that, regarding supervisory roles, the sample is representative of the target population.

h)   Highest educational qualification

Respondents were asked to select their relevant qualification level. The results are presented in figure 5.9. It should be noted that nine respondents selected "Other qualification" but after examining the data, seven of the responses could be reclassified. Two responses could not be classified and were marked as "Other".

Figure 5.9: Highest educational qualification distribution of the sample
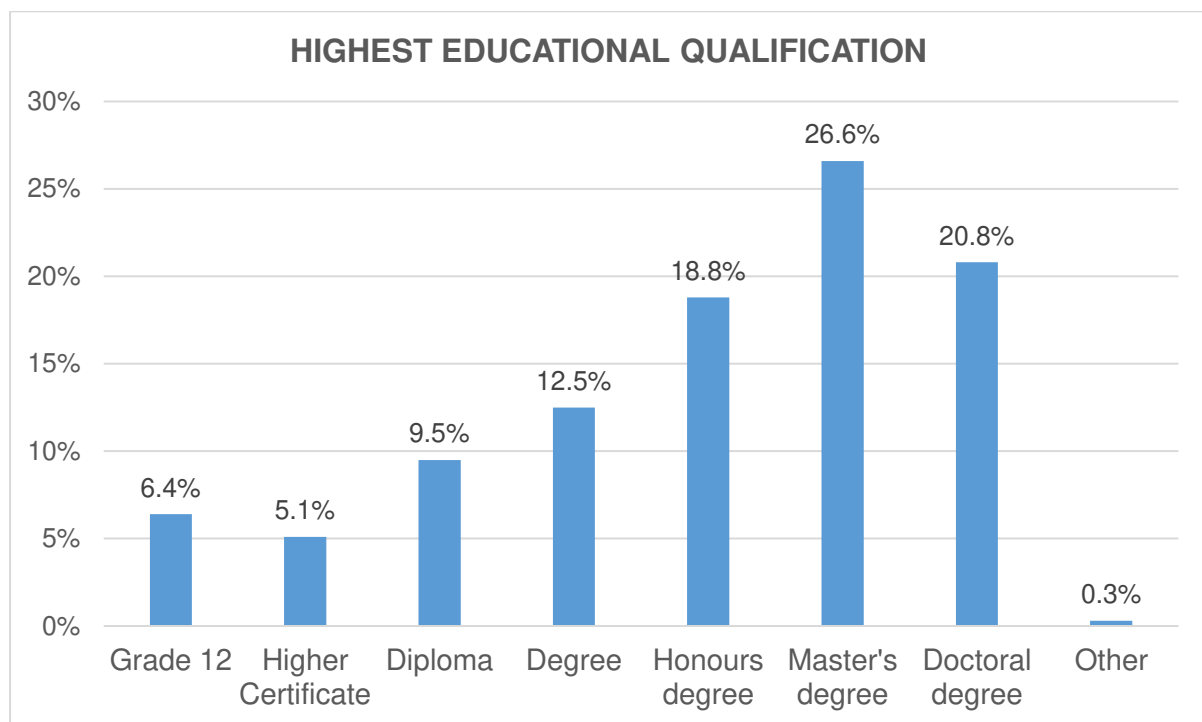
As illustrated in figure 5.9, the majority of respondents held master's degrees (26.6%) followed by respondents holding doctoral degrees (20.8%). 18.8% of the respondents held honours degrees, 12.5% bachelor's degrees and 9,5% diplomas. A total of 11.1% held qualifications lower than a diploma (Higher certificate/Grade 12) and 0.3% of the responses were classified under "Other" as the respondents did not have Grade 12 qualifications.

Form figure 5.9 it is clear that the respondents were highly qualified, with 66.2% of the respondents holding postgraduate qualifications (honours, master's or doctoral qualifications). This is not surprising considering the post levels and the number of academic and professional employees who participated in the study, as well as the fact that the study was conducted at a higher education institution.

i) Relationship with supervisor

This study aimed at determining whether supervisory behaviour influenced EDI and creativity at the institution; respondents were asked to score their relationship with their supervisor as it may have influenced their innovative ability. The responses regarding the quality of relationships with supervisors are presented in figure 5.10.

Figure 5.10: Relationship with supervisor distribution
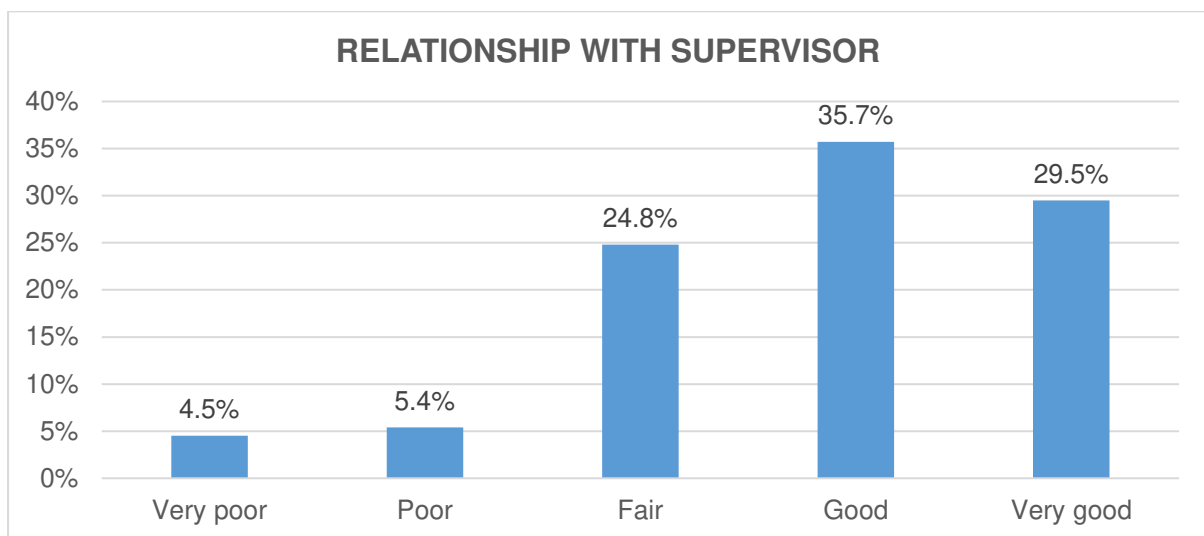
Figure 5.10 shows that the majority of respondents (65.2%) indicated good to very good relationships with their supervisors, 24.8% indicated fair relationships with their supervisors, while 5.4% indicated poor relationships and 4.5% indicated very poor relationships.

j) Supervisor gender

Three questionnaire questions related to the respondent's supervisors. Respondents were asked to indicate their supervisors' gender, ethnicity and age. These questions were included as the study involved the behaviour of supervisors and whether factors such as gender, ethnicity or age played a role in relationships.

The supervisor gender distribution is illustrated in figure 5.11.

Figure 5.11: Supervisor gender distribution

Figure 5.11: Supervisor gender distribution
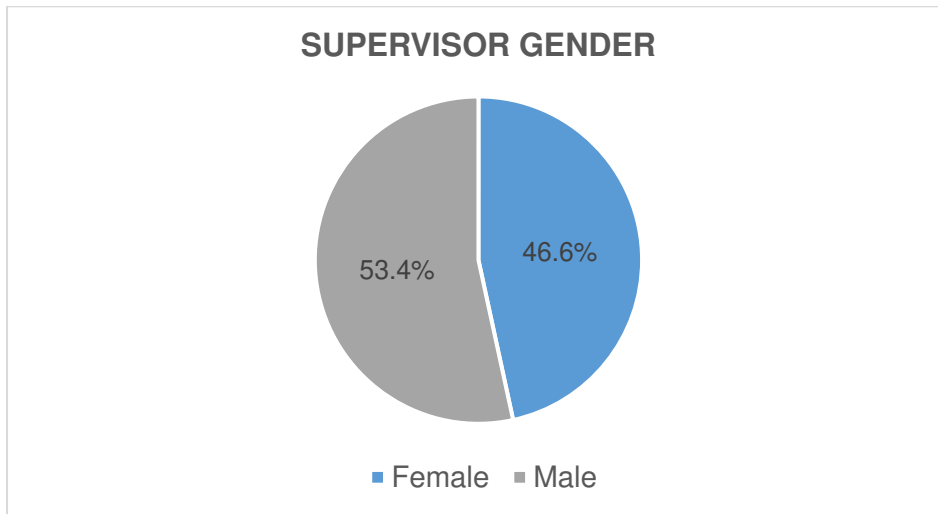
Figure 5.11 shows that 53.4% of the respondents' supervisors were male and 46.6% female.

k) Supervisor ethnicity

The ethnicity of the respondents' supervisors is illustrated in figure 5.12. Four respondents preferred not to disclose their supervisors' ethnicity.

Figure 5.12: Supervisor ethnicity distribution

Figure 5.12: Supervisor ethnicity distribution
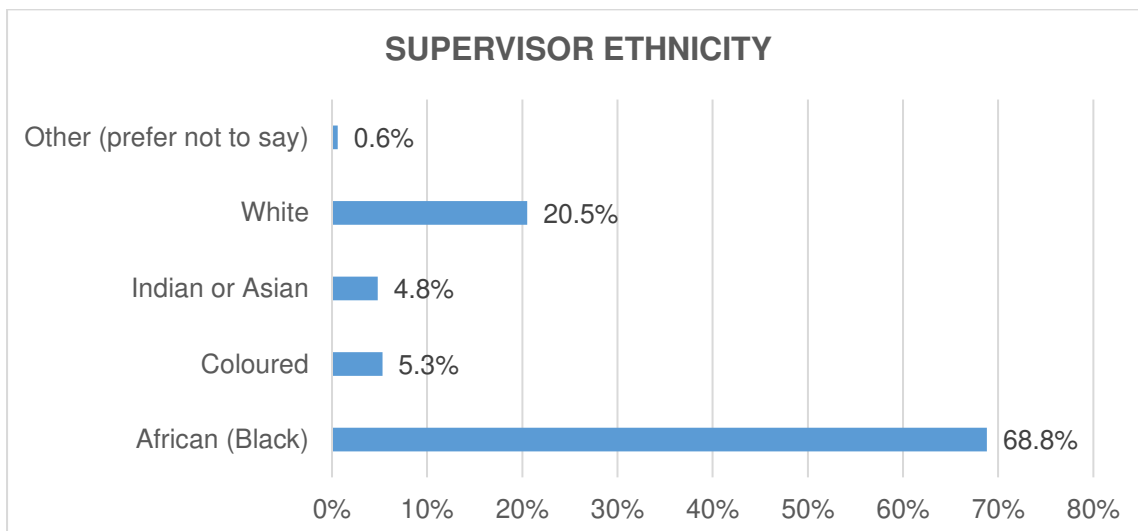
From figure 5.12, it is clear that the majority of supervisors were African (Black) (68.8%).

I)   Supervisor age

The age of supervisors is indicated in figure 5.13.

Figure 5.13: Supervisor age distribution
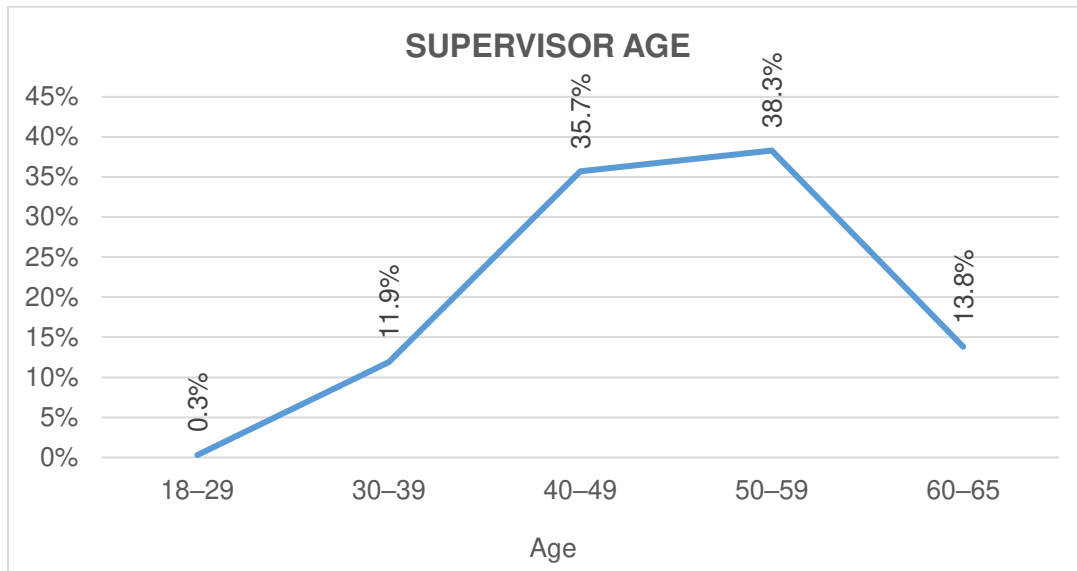
Figure 5.13 indicates that the majority of supervisors (74%) were above the age of 40 years. This indicates that years of experience plays a vital role in the appointment of supervisors within the institution and allows supervisors to draw on their experience in managing subordinates. The number of supervisors between the ages of 60 and 65 was considerably lower at 13.8%. This lower figure could be as a result of retirement where staff are stepping down from their supervisory/leadership roles to focus on research (in the academic environments) or facilitating on-the-job training to younger supervisors.

5.3.4   Interpretation of demographic details of sample

Section 5.3 of this chapter provides information on the demographic details of the sample of respondents. Information about the gender, age and ethnicity of supervisors was also obtained in an attempt to determine whether these factors had an impact on relationships, and hence on innovation and creativity of subordinates.

Age and ethnicity (race) of the sample were identified as key elements to be analysed to establish the representability of the population. The age of the sample indicated that

the workforce comprised of more mature workers; 36 to 45-year-old respondents made up 29.2% of the sample and 32.7% of the respondents were between the ages of 46 and 55. The older workforce is characteristic of a higher education institution where a professional workforce with the necessary experience is of the utmost importance. In terms of ethnicity, the two largest ethnic groups were African (Black) at 47.6% and White at 43.9% respectively. The number of Coloured and Asian respondents was not that high but was considered as reasonable when compared to the population distribution.

The demographic details were examined in terms of gender, which showed a higher representation for females (64.3%) compared to males (35.7%). Transformation initiatives to employ more female workers may be the reason why there is a higher representation of female respondents. The sample was considered to be a fair representation of the population.

The majority of the respondents in the sample were on post level 8 (29.2%) followed by respondents on post level 7 (27.9%). Employees on post level 5 represented 7.9% of the sample, post level 6, 17.6%, and 17.5% of employees were on post level 9. The sample responses were overall distributed well and were a fairly good representation of the total population.

The majority of the respondents (73.6%) had 10 years or less experience in their positions and a total of 47.6% had 10 years or less service at the institution. It should be noted that the median job tenure (median amount of time employees spend with an employer) in South Africa was 3.9 years in 2016 (Statistics South Africa, 2018), which indicates that respondents were employed for longer periods at the institution than the median job tenure. It is, however, vital that the institution creates a "culture for teaching" to reduce the amount of institutional knowledge lost when a person leaves the institution. In a study done by Moosa (2016) employees of the institution indicated that they were satisfied with working at the institution and considered staying at the institution until retirement. This finding may also apply to the 49.5% respondents in this study that have been employed for longer than 11 years.

The majority of the respondents (60.6%) worked in administrative departments/units and 39.4% worked in the academic environment. In terms of supervisors, 30.4% of the respondents were in supervisory roles and 69.6% not. The responses show that 66.2% of the respondents held postgraduate qualifications (honours, master's or doctoral qualifications), which is not unusual considering the post levels and the number of academic and professional employees who participated in the study.

The majority of respondents (65.2%) indicated good relationships with their supervisors and a minority (9.9%) indicated poor relationships with their supervisors. 53.4% of the respondents' supervisors were male and 46.6% female, while 68.8% had African (Black) supervisors and 20.5% White supervisors. These figures were a good representation of the population. The majority of supervisors were between 40 and 49 years old (35.7%), while 38.3% were between 50 and 59 years old, which indicates that supervisors can draw on their experience in managing subordinates.

5.4   STEP 3: DESIGNING THE MEASURING INSTRUMENT

5.4.1   Overall research design

The research design guides the choice of the type of measuring instrument to be applied. A quantitative research design was adopted for this study. The empirical study adopted a cross-sectional descriptive, explanatory, and exploratory research design to determine the influence of supervisory behaviour and the internal environment on EDI and creativity in an ODeL institution in South Africa, as well as to study the relationships between them. Cross-sectional studies provide a general view on the research topic in which comparisons are made across different variables, while at the same time surveying a selection of respondents (Stangor, 2011). Cross-sectional studies are beneficial in obtaining an overall picture at the time of the study (Kumar, 2011). It is a simple survey design as a sample of respondents are only approached once with associated low cost in gathering data (Salkind, 2018).

Descriptive studies do not aim to conclude causality but instead, attempt to explore a particular situation at a specific point in time by selecting a specific sample (Leedy & Ormrod, 2015). Explanatory studies, however, aim to explain why and how a

relationship exists between two aspects of a phenomenon (Kumar, 2011). Exploratory research should, therefore, be used to investigate the research questions without offering binding or conclusive solutions to current problems (Terre Blanche *et al.*, 2006).

5.4.2 Type of measuring instrument chosen: Web-based questionnaire

The type of data required determines the most suitable measuring instrument to be used. When examining a potential relationship between two or more variables, a survey research method could be used (Welman, Kruger & Mitchell, 2006). Measuring instruments are used as a method for understanding data and associating data with a specific qualitative criterion (Leedy & Ormrod, 2015; Mouton & Marais, 1996). Because this study focuses on exploring and explaining the relationship between supervisory behaviour, the internal work environment, and EDI and creativity, a survey research method was used in line with the quantitative approach.

Questionnaires are frequently used in disciplines that involve people (Walliman, 2011). Questionnaires collect data by inviting participants to answer a set of identical questions in an established order (Kumar, 2011). The data collected from such questionnaires are used for analysis (Babbie, 2010).

Questionnaires are a very flexible tool, having the advantages of a structured format, it is convenient and easy to complete. Web-based questionnaires are also cost-effective and quick to administer to a large number of participants, and can cover a large geographical area (Salkind, 2018; Walliman, 2011). Another advantage of a questionnaire is that it saves time, as no direct assistance is required by the respondents and they can provide honest answers as their anonymity is virtually secured (Salkind, 2018). Salkind (2018), however, warns that one of the major disadvantages of using web-based questionnaires is a low response rate as people must make some effort to complete and submit the questionnaire (Salkind, 2018).

A self-administered electronic questionnaire was used as the measuring instrument for this study. The sample was invited to participate through a webpage link to the questionnaire. A follow-up reminder was sent.

5.4.3 Development and design of the questionnaire

After a careful review of the literature on the topics to determine the influence of supervisory behaviour and the internal environment on EDI and creativity in an ODeL institution in South Africa, it was established that there was no existing questionnaire that would address the aims of this study. As a result, such instrument was created by the researcher. The questionnaire was called the Supervisor/Internal Environment Questionnaire (SIEQ). To create the questionnaire items, the researcher conducted an exhaustive study of the literature, which included research articles and subject-specific books on the topics of supervisory behaviour, leadership, internal work environment, and EDI and creativity. The instrument was used to measure supervisory behaviour and the internal work environment within an ODeL institution in South Africa; in particular to determine the factors that influence EDI and creativity. Furthermore, it was also used to determine how supervisory behaviour would impact on EDI and creativity, and how the internal work environment would affect employees' willingness to be innovative and creative.

a) Scaling of the questions

Several types of tests are used in research. Commonly-known types are attitude tests or scales which measure respondents' feelings regarding an event, person, or object (Kumar, 2011; Salkind, 2018). When an attitude scale is used, a statement is presented for which the answer should be selected from the scale provided. According to Salkind (2018), two of the standard methodologies used for creating types of scales are the Likert scale and Thurstone.

Rensis Likert developed the Likert scale in 1932 and due to its extensive application and ease of design, it was identified as the method to use in this study. A six-point Likert scale was used in this questionnaire to assess the strength of the participants' agreement or disagreement with a statement. The respondents were requested to indicate the degree to which they agreed or disagreed with each statement provided, using a precise scale (Neuman, 2014). For each point on the scale a label was developed to express the intensity of the respondent's feelings (Hair, Celsi, Money,

Samouel & Page, 2015). To avoid the "error of central tendency" (Kumar, 2011), a 6-point Likert-type scale (even-numbered) with the following labels assigned to each score were chosen:

1 = Strongly Disagree   4 = Slightly Agree

2 = Disagree   5 = Agree

3 = Slightly Disagree   6 = Strongly Agree

b) Scaling of the questions

Questionnaire items were created through the use and consultation of various guidelines to ensure well-written and clear items. The methodology was pilot tested as it was essential to ensure that the questionnaire was well understood, and to identify any potential problems, before embarking on a full-fledged study (Leedy & Ormrod, 2015). Questions were prepared to specifically address the research aims of the study. The questionnaire was divided into four sections with different categories as illustrated in figure 5.14.

Figure 5.14: Layout of the questionnaire
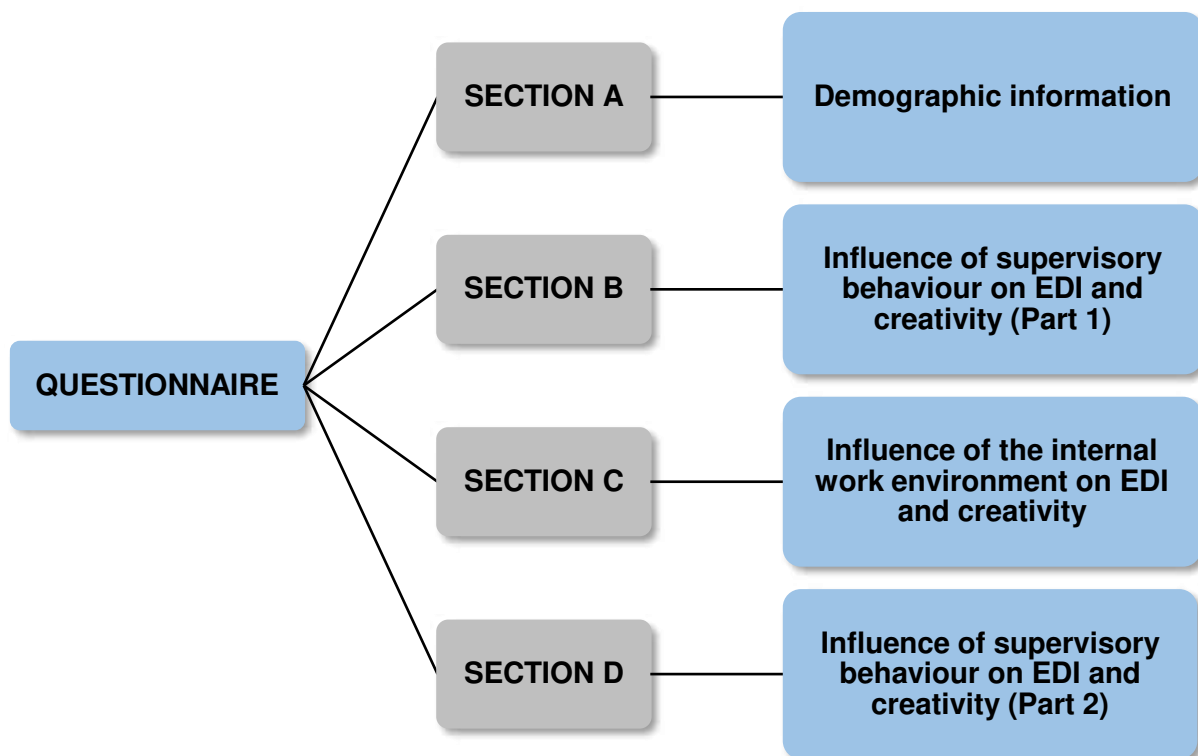
- **Demographic information:** The respondents' demographic information included the following elements: gender, ethnicity, age, post level, the number of years at the institution, the number of years in current position (at the institution), employed in an academic or administrative department/unit, employed in a supervisory role, and qualifications. The demographic details requested in terms of the respondents' supervisors related to the quality of the relationship and the supervisor's, gender, ethnicity, and age.

- **Influence of supervisory behaviour on EDI and creativity (Part 1):** The first part of the section: Influence of supervisory behaviour on EDI and creativity constituted 21 statements to be completed by all respondents. This section included statements about supervisory support and the factors that play a critical role in EDI and creativity.

- **Influence of the internal work environment on EDI and creativity:** The section on the internal work environment comprised 21 statements and an optional comments box. The statements related to the organisational innovation culture, innovation mechanisms, innovation opportunities, risk-taking tolerance, and dedication to innovation and creativity.

- **Influence of supervisory behaviour on EDI and creativity (Part 2):** The last section formed part 2 of the section on the influence of supervisory behaviour and was only completed by respondents that held supervisory positions/had subordinates reporting to them. The section included statements relating to management support, innovation management, innovative leadership and team innovation.

c) Pretesting the questionnaire

A brief pilot study was run to pre-test the questionnaire before it was distributed to the sample (Salkind, 2018; Walliman, 2011). A group of 12 individuals (n = 12) participated in the pilot study and were requested to give feedback about the time required to complete the survey, wording of questions, and clarity of statements.

According to Igwenagu (2016), Hair *et al* (2015) and Neuman (2014), any unsuspected obscurities and difficulties with the questions reported should be considered and corrections made before the survey is administered. A pilot study provides an

opportunity to confirm the relevance and feasibility of the study (Leedy & Ormrod, 2015). The results from the pilot study were solely used for audit purposes and were not used for any additional analysis.

5.4.4 Reliability and validity of the measuring instrument

It is essential to report on the extent to which instruments used in a study have reliable and valid scores, and whether the research design is valid.

a) Reliability

The reliability of a scale "indicates how free it is from random error" (Pallant, 2011). Reliability relates to the "reliability or repeatability of the research" (Buckler & Walliman, 2016). An instrument is reliable when it yields the same outcome when used repeatedly on the same group, and when the constructs being measured remain the same (Leedy & Ormrod, 2015). In simple terms, reliability refers to obtaining the identical or similar results, using the same instrument, to obtain the same or similar data but only at a different point in time. "Reliability indicates the accuracy, stability and predictability of a research instrument: the higher the reliability, the higher the accuracy; or the higher the accuracy of an instrument, the higher its reliability of the instrument" (Kumar, 2011: 345). Reliability ultimately refers to the trustworthiness of the full research project.

To ensure the reliability of the measuring instrument, the Cronbach's alpha coefficient (developed by Cronbach in 1951) was used and reported on in chapter 6 (Kerlinger & Lee, 2000; Salkind, 2018). The Cronbach's alpha coefficient is a means of measuring how constantly each item assesses the same basic construct (Leedy & Ormrod, 2015; Salkind, 2018). According to Pallant (2011), a reliability coefficient of 0.7 or more is generally considered sufficient. The reliability of this study was also addressed through the standardised assessment conditions as well as the standard scoring instructions for the instrument (Foxcroft & Roodt, 2018). It is important to note that reliability should be established before validity, as reliability is a necessary but not a sufficient condition of validity (Salkind, 2018). A measure can, therefore, be reliable but not valid, but it can never be valid without first being reliable.

b) Validity

The validity of a measurement instrument refers to the extent to which the instrument measures what it is expected to measure (Babbie, 2010; Kumar, 2011; Leedy & Ormrod, 2015; Pallant, 2011; Salkind, 2018).

Content validity indicates the extent to which a measurement instrument is a representative sample of the construct being measured (Leedy & Ormrod, 2015). Content validity is particularly helpful when assessing the usefulness of a test that samples a particular area of knowledge (Salkind, 2018). Content validity in this study was achieved by asking experts, academics and statisticians for feedback on the measuring instrument as well as conducting a pilot study to test and adapt the instrument.

Construct validity is the degree to which the results of a test are associated with an underlying set of related variables, or measures the characteristics it is intended to measure (Leedy & Ormrod, 2015; Salkind, 2018). When an instrument is assessing an underlying construct, some kind of evidence is required to indicate that the approach does measure the construct in question (Leedy & Ormrod, 2015). Factorial validity is important in the context of establishing the validity of latent variables, which cannot be measured directly, such as beliefs and perceptions (Gefen & Straub, 2005).

Exploratory factor analysis (EFA) is a widely used statistical method to study and determine the underlying latent structure of a large number of observed variables (Auerswald & Moshagen, 2019). Exploratory factor analysis is known as a "data reduction approach" used to reduce a larger number of measurement items into a smaller and more manageable number of factors (Gefen & Straub, 2005; Pallant, 2011). Exploratory factor analysis was used to establish which variables correlated with or were independent of one another.

Content, construct, and factorial validity of the questionnaire were established through the results of exploratory factor analysis (EFA) as discussed in chapter 6.

In light of the purpose of this study to explore and investigate broad trends and certain relations between variables, the instrument was deemed to be psychometrically acceptable for the study.

5.5 STEP 4: ADMINISTERING THE MEASURING INSTRUMENT

Permission to conduct the study was granted and ethical clearance was obtained before commencing with the collection of data. The e-mail addresses of the sample were requested and provided by the Human Resources: Organisational Development and Human Resources Information Systems (HRIS) directorate at the higher education institution where the study was performed.

The members of the target population were invited to participate in the research study via e-mail. The e-mail contained a link to the survey. The respondents were then directed to the online survey platform, LimeSurvey. Respondents received a welcome message and instructions on how to proceed and were then requested to indicate their acceptance to participate in the study.

The questionnaire was self-explanatory with no required supervision. The survey did not take more than 20 minutes to complete, and no time limit was enforced. The online platform, LimeSurvey, automatically captured the answers of each completed survey.

The data collection and administration procedures that were followed are outlined in table 5.2. The data were collected over a period of one month. The survey was closed as soon as an adequate number of completed surveys were received, after which the data-analysis phase started. None of the participants who participated in the research process were harmed in any way.

Table 5.2: Data collection

STEPS	DETAILS
Step 1: Ethical consideration	Permission to conduct the research was obtained from the Unisa College Ethics Review Committee. Permission to use institutional staff members were obtained from the Research

	Permission Subcommittee (RPSC) of the Unisa Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC). Certificates were issued and recorded.
Step 2: Cover letter and welcome message	An e-mail was sent to the target population. The body of the e-mail contained a cover letter providing basic details of the study and requesting employees to participate in the study. A participation information sheet was prepared for the online platform. Employees were provided with the purpose of the research, informed that there was no risk involved, and that they could withdraw from the study at any time. Participants provided voluntary consent to participate in the study by completing the survey and clicking the "submit" button.
Step 3: Pretesting of the questionnaire/ Pilot study	As a means of pretesting the measurement tool, the questionnaire was distributed to a small group of individuals to provide feedback. Minor changes were made to the questionnaire.
Step 4: Uploading questionnaire onto the online platform	The paper-based questionnaire was converted to an online web-based survey and uploaded onto LimeSurvey. The final survey included a demographic, supervisory behaviour, and internal environment questionnaire. Codes, which later assisted with data analysis, were allocated to each questionnaire item. Instructions for completion were supplied at the beginning of the survey. Respondents were only allowed to complete the full questionnaire once.
Step 5: Invitation to participate sent out to sample	The e-mail drafted in step 2 was sent out to the target population as an invitation to participate in the study. The researcher's contact details were provided for further enquiries. A reminder e-mail was sent one week after the initial e-mail was distributed.
Step 6: Waiting period	The researcher closed the online survey once a sufficient number of responses had been received.

5.6 STEP 5: SCORING THE MEASURING INSTRUMENT

All the completed questionnaires were automatically received, and the data captured on the researcher's LimeSurvey profile. The responses were arranged according to the codes that were established beforehand.

The survey was closed once a sufficient number of responses had been received. The data set was downloaded into a Microsoft Excel spreadsheet for statistical analysis using the Statistical Package for Social Sciences (SPSS), version 22.0. The data obtained from the study were loaded into the program for further statistical analysis.

5.7 STEP 6: PROCESSING AND ANALYSING THE DATA

Quantitative data analysis was used in this study. Quantitative studies are based on measuring quantity and applying that to phenomena that can be articulated in terms of quantity (Kothari, 2004). These observations are then analysed and explained using statistics in a numerical way (Babbie, 2010). A brief description of the statistical processes used in this study are provided.

This quantitative study started by describing what was observed, after which the observations were recorded. The quantitative data were collected using web-survey software, LimeSurvey, and the data were then organised and manipulated to disclose things of interest. The data analysis software used was specialist research data analysis software, known as the Statistical Package for the Social Sciences (SPSS). A statistician was employed to perform this step in the research process. During the data analysis process a large amount of data is transformed into verifiable sets of conclusions and reports (Sreejesh, Mohapatra & Anusree, 2014).

The data are presented in charts, graphs, and tables, and essential characteristics of the data are shown. Statistical analysis assisted to gain insights from the data and to arrive at informed judgments and conclusions. The concluding step of data analysis was to review the research aims, which allowed the researcher to analyse the different hypothetical theories and determine correlations between constructs. Conclusions

were then drawn and used to offer recommendations and serve as a basis for further research.

Table 5.3 illustrates the research aims formulated for the study and the statistical procedures used to investigate each objective.

Table 5.3: Research aims and statistical procedures used

EMPIRICAL RESEARCH AIM	STATISTICAL PROCEDURE
Research aim 1: To determine the constructs of supervisory behaviour that influence EDI and creativity.	**DESCRIPTIVE STATISTICAL ANALYSIS** Exploratory factor analysis Cronbach alpha Means Standard deviations Skewness Kurtosis Frequencies
Research aim 2: To determine the constructs of the internal work environment that influence EDI and creativity.	
Research aim 3: To determine the relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity.	**INFERENTIAL STATISTICS** Correlation analysis Structural equation modelling (SEM)
Research aim 4: To determine whether demographic characteristics have an influence on supervisory behaviour, internal work environment behaviour, and employees' innovation and creativity.	**INFERENTIAL STATISTICS** Tests for significant mean differences
Research aim 5: To make recommendations regarding supervisory behaviour and creating enabling work environments to enhance and support EDI and creativity.	Interpretation and integration of research findings

Data obtained in this study were analysed using descriptive statistics and inferential statistics. Figure 5.15 indicates the statistics used.

Figure 5.15: Statistical processes

Descriptive statistics	Inferential statistics
• Exploratory factor analysis • Cronbach's alpha coefficient • Means, standard deviations, skewness, kurtosis and frequencies	• Correlation analysis • Structural equation modelling (SEM) • Tests for significant mean differences (ANOVA, t-test, Kruskal Wallis)
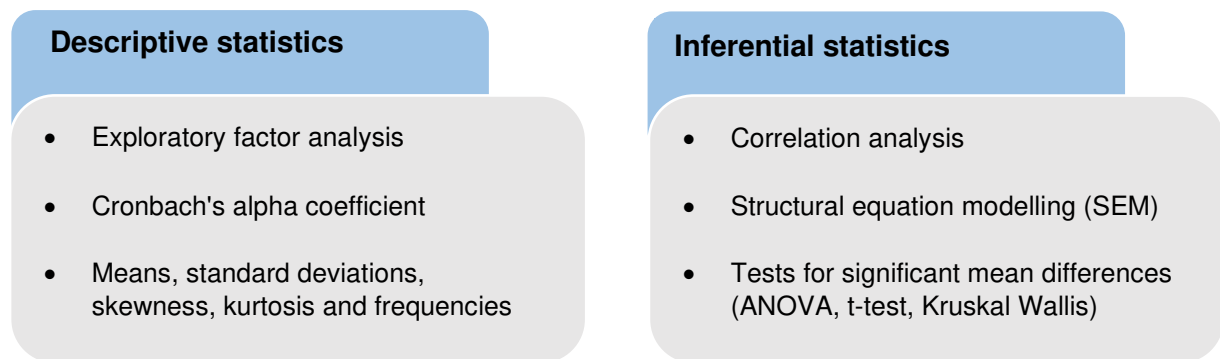
5.7.1 Exploratory factor analysis

When using quantitative analysis, it is essential to determine the type of analysis required and how it should be presented (i.e. frequency distribution, cross-tabulations or other statistical procedures, such as factor analysis and analysis of variance) (Kumar, 2011). The variables to be subjected to these statistical procedures should also be identified.

Factor analysis was used in the study and can be described as an advanced statistical technique that examines the correlation among variables, and identify clusters of highly interrelated variables, thus reducing the number of variables that represent a particular construct or underlying theme (Leedy & Ormrod, 2015; Salkind, 2018). The advantage of factor analysis is that it allows researchers to examine sets of variables and how they are related, rather than deal with individual variables (Salkind, 2018).

Two types of factor analysis exist, namely confirmatory and exploratory factor analysis. In this study exploratory factor analysis (EFA) was used to investigate the fundamental factors underlying supervisory behaviour and the internal work environment. EFA is a multivariate statistical method used to analyse an underlying pattern of correlations between a set of measured variables, and to develop a simplified description of the relationships among these variables (Stangor, 2011). The EFA approach is generally used when the researcher does not already have an expectation about which variables will correlate with each other, but rather wishes to learn about the correlations by examining the collected data (Auerswald & Moshagen, 2019; Stangor, 2011).

Furthermore, two types of models can be used for EFA, namely principal component factor analysis (PCA) and common factor analysis (CFA) (Kim, 2008; De Winter & Dodou, 2016). Principal component factor analysis, where the primary factors are identified by summarising many variables into a smaller number of components, known as data reduction, was used in this study.

The suitability of the data for factor analysis was established before the factors were identified using principle-axis factor analysis. This was accomplished by using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1974) and Bartlett's test of sphericity (Bartlett, 1954). The KMO test statistic "aims to calculate the feasibility of principle-axis factor analysis as a data reduction technique and the degree to which it produces meaningful components" (Coleman, 2010: 4). The KMO index ranges from 0 to 1, with 0.6 suggested as the minimum value for good factor analysis (Kaiser, 1974; Pallant, 2011; Taherdoost, Sahibuddin & Jalaliyoon, 2014). The strength of the relationships among variables were measured through Bartlett's test of sphericity. For factor analysis to be deemed suitable, Barlett's test of sphericity must be significant ($p < 0.05$) to indicate that there a relationship exists between the variables (Bartlett, 1954; Hadia, Abdullah & Sentosa, 2016).

The Kaiser criterion was used for factor extraction, which specifies that factors with eigenvalues greater than 1 should be retained for interpretation since it represents a significant amount of variance and stability (Field, 2009; Pallant, 2011; Taherdoost, 2016). As a result, eigenvalues less than 1.0 should be eliminated from the analysis (Coleman, 2010).

Factor analysis aims at finding common underlying dimensions within the data and researchers are primarily only interested in the common variance (Field, 2009). Once the number of factors was identified, the variable with common underlying factors was identified (Salkind, 2018). This proportion of common variance present in a variable is known as the communality (Field, 2009; Kothari, 2004; Salkind, 2018). When factor analysis is run, it is fundamental to know how much of the variance present in the data is common variance (Field, 2009). The principal component of factor analysis is to generate estimate factor loadings for each factor. Factor loadings indicate the connection between the observed relations among variables plus the correlations

between each variable and each factor (Babbie, 2010). The factor loadings present a view "about how much a variable contributed to a factor; the larger the factor loading the more the variable contributed to that factor" (Yong & Pearce, 2013: 81).

The data were analysed in a factor pattern matrix (Yang, 2010). "Pattern matrix is preferable for interpretative reasons: because it contains information about the unique contribution of a variable to a factor" (Field, 2009: 667). A theoretical review of the factors was conducted to ensure the alignment of factors within each category and to explain the proportion of variance (Kothari, 2004; Yang, 2010). The factor loading threshold for inclusion of an item in a factor was set at ≥ 0.30 for this study. According to Yang (2010), the threshold or cut-off value depends on the field of study and is randomly selected. Field (2009: 644) states that the "significance of a factor loading will depend on the sample size", but in general, "researchers take a loading of an absolute value of more than 0.3 to be important". The theoretical expectations and the content of the factors and items were considered when decisions to include or omit an item were unclear.

The results of the exploratory factor analysis are discussed in chapter 6.

5.7.2 Descriptive statistics

The first step in analysing data is to compute a set of descriptive statistics, to describe the general characteristics of a large amount of data, and to analyse the distribution of scores (Salkind, 2018). Descriptive statistics describe a body of data and identifies basic patterns in the data by providing a logical and straightforward picture (Leedy & Ormrod, 2015; Mishra & Alok, 2017; Neuman, 2014). The descriptive statistics summary aims at describing the general nature of the data in the following way: "i) how certain measured characteristics appear to be 'on average', ii) how much variability exists within a data set, and iii) how closely two or more characteristics are associated with one another" (Leedy & Ormrod, 2015: 29). The descriptive statistics applied in this study included Cronbach's alpha coefficient, frequency data, means, standard deviations, skewness and kurtosis.

a) Cronbach's alpha coefficient

A variety of methods for calculating internal consistency exists, and one of the most frequently used and most accurate is Cronbach's alpha designed by LJ Cronbach in 1951 (Cronbach, 1951; Field, 2009; Saunders, Lewis & Thornhill, 2009). Correlation coefficients are measures of internal consistency that estimates the average correlation among all of the items on a scale (Stangor, 2011), in other words, Cronbach's alpha is used to measure the relationships between variables. The reliability of the questionnaire was evaluated through analysing the Cronbach's alpha coefficient of each factor identified in the factor analysis (Field, 2009; Pallant, 2011).

The Cronbach's alpha coefficient is symbolised as α (Stangor, 2011). Statistical computer programs are available and are used to calculate coefficient alpha, which reflects the underlying correlational structure of a scale and ranges from a $\alpha = 0.0$ (indicating that the measure is entirely error) to a $\alpha = +1.0$ (indicating that the measure has no error) (Stangor, 2011). The Cronbach alpha coefficient of a factor should ideally be above 0.7 (DeVellis, 2003). Pallant (2011) indicates that it is important to consider the number of items in a factor, as a lower number of items could cause lower Cronbach's alpha coefficients. Different suggestions have been proposed for an acceptable level of coefficient alpha, but an alpha above 0.8 constitutes a reliable measure (Carmines & Zeller, 1979). It is generally agreed that the lower limit for Cronbach's alpha is 0.70, although it may decrease to 0.60 in exploratory research (Hair *et al.*, 2014; Slavec & Drnovšek, 2012).

Since this study was highly exploratory, the critical value of the Cronbach's alpha coefficient was set at 0.70. Factors that scored below this value were rejected and excluded from any further statistical analysis.

b) Means, standard deviations, skewness, kurtosis and frequencies

One of the most common research statistics is the analysis of the central tendency. Three measures of central tendency exist namely, the mean, the median, and the mode (Leedy & Ormrod, 2015; Salkind, 2018). The measure most commonly used, and the most reliable in research is the mean (M), which mathematically represents

the arithmetic average of the scores within the data set and is calculated by adding the scores and dividing it by the number of scores (Leedy & Ormrod, 2015; Salkind, 2018). The mean, therefore, indicates the midpoint or centre of the distribution of the scores. The standard deviation, symbolised as s, is the most commonly used measure of dispersion (Stangor, 2011). The standard deviation (SD) indicates how the raw data are spread around the mean and is mathematically calculated as the square root of the variance (Molenberghs, 2010; Saunders *et al.*, 2009). Smaller standard deviation values indicate that the values are more tightly clustered around the mean – a high standard deviation value indicates a wide spread (Babbie, 2010). Both the mean and standard deviation provide beneficial information regarding the distribution of the set of scores.

One of the most commonly used statistical techniques of analysing data is testing data for normality of distribution, which can be indicated by the skewness and kurtosis values (Singh, 2006). Kurtosis compares the distribution of data to a normal distribution and measures the degree to which the distribution is unusually flat or pointy (Leedy & Ormrod, 2015). The kurtosis value, therefore, is the point where the data indicates this unusual pointy of flat distribution. "A positive value indicates a relatively peaked distribution and a negative value indicates a relatively flat distribution" (Hair *et al.*, 2014: 33). For a perfectly normal distribution, the kurtosis value should be 0 (Pallant, 2011). In terms of frequency distribution, the skewness statistic measures symmetry; this implies that perfectly symmetrical distributions have a skewness of 0 and represents a normal distribution. "Skewness occurs when the mean shifts to one side of the median" (Walliman, 2011: 118). "A positively skewed distribution has relatively few large values and tails off to the right, whereas a negatively skewed distribution has relatively few small values and tails off to the left" (Hair *et al.*, 2014: 34). Skewness values falling outside the range of -1 to +1 indicate a substantially skewed distribution (Hair *et al.*, 2014; Leedy & Ormrod, 2015). A number between -1 and 1 indicates the direction of two different variables and the strength between the variables (Leedy & Ormrod, 2015).

The simplest way to explain the numerical data of variables is with frequency distribution (Neuman, 2014). A frequency distribution is usually presented as a table that indicates how many, and in most cases, what percentage of individuals in the

sample fell into each of a set of categories (Stangor, 2011). The frequency distribution is usually displayed from the lowest to the highest values in the table (Walliman, 2011). In this study frequency data were analysed to interpret the results and report on how respondents reacted to certain items.

5.7.3 Inferential statistics

Inferential statistics were used to further investigate the relationship between the variables. Inferential statistics focuses on reducing data or making deductions. The data obtained from the inferential statistics can then be used to make predictions and to generalise the sample findings to the population (Field, 2009; Salkind, 2018; Stangor, 2011). "Inferential statistics are used to infer something about the population from which the sample was drawn based on the characteristics (often expressed using descriptive statistics) of the sample" (Salkind, 2018: 144). When analysing inferential statistics, it is important to take the level of statistical significance ($p \leq 0.05$) into account.

a) Correlation statistics

Relationships play a crucial role in data analysis and the objective of correlation is to determine whether a relationship exists between variables, and the strength and the direction of such a relationship (Pallant, 2011; Yong & Pearce, 2013).

The most widely used statistic for determining correlation is the Pearson product-moment correlation, sometimes called the Pearson *(r)* (Leedy & Ormrod, 2015). In this study the Pearson product-moment correlation was used to identify whether a relationship existed between the variables as well as the direction and the strength of the relationship. Correlation is a statistical process to determine whether two or more variables are in some way associated with one another (Leedy & Ormrod, 2015). The resulting statistic, called a correlation coefficient, is a number ranging between −1 (perfect negative correlation) and +1 (perfect positive correlation); most correlation coefficients are decimals somewhere between these two extremes (Leedy & Ormrod, 2015; Yang, 2010). Positive correlation implies that as the value of one variable increases, the value of the other variable would also increase, while negative

correlation implies an inverse relationship in which one variable increases while the other decreases (Leedy & Ormrod, 2015; Saunders *et al.*, 2009; Singh, 2006; Stangor, 2011). However, correlational statistics does not necessarily investigate the underlying reasons or causes of such relationships (Leedy & Ormrod, 2015).

b) Structural equation modelling (SEM)

Leedy and Ormrod (2015: 157) state that "ideally, a good researcher isn't content to stop at a correlational relationship, because beneath the correlation may lie some potentially interesting dynamics". One way to discover these dynamics is by using structural equation modelling (SEM).

Structural equation modelling (SEMS) is a relatively new method that is superior to other techniques, allowing a researcher to test the interrelationship (expressed in a series of equations) among variables using various models (Hair *et al.*, 2014; Pallant, 2011). The equations indicate all the relationships among the dependent and independent variables (constructs) in a study (Hair *et al.*, 2014). Constructs are latent or unobservable factors represented by multiple variables, very similar to variables representing a factor in factor analysis (Hair *et al.*, 2014; Leedy & Ormrod, 2015). One particular advantage of SEM is that, in addition to the relationships between the variables, the relationship among the latent variables can also be studied (Stangor, 2011). SEM is based on multiple regression and factor analysis techniques, aimed at evaluating the importance of each independent variable and testing the overall fit of the theoretical model to the sample data (Pallant, 2011; Stangor, 2011; Taherdoost *et al.*, 2014).

Hair *et al.* (2014) summarise structural equation models in the following three characteristics:

- estimating the interrelated and multiple dependence relationships among variables
- being able to signify latent concepts in the identified relationships, and account for measurement errors in the estimation process
- establishing a model to describe the entire set of identified relationships

It should, however, be noted that when using SEM, the data are correlational in nature, which indicates that any conclusions about cause-and-effect relationships among the variables are speculative at best (Leedy & Ormrod, 2015). For the purpose of this study, a structural equation model (SEM) was conducted to test the relationships between employee-driven innovation, supervisor behaviours, and the internal work environment. A structural equation model was developed based on the statistical relationships between these variables.

c) Test for significant mean differences

Statistical significance is the likelihood that a relationship between two or more variables is caused by something other than chance. A significance level of 0.05 indicates a 5% risk of assuming that a difference exists when there is no actual difference. The significance level thus refers to the probability of rejecting the null hypothesis when it is in fact true. The lower the significance level, for example at 5%, the greater the possibility that the relationship that does exist will not be rejected erroneously, and that the relationship can be accepted with a 95% confidence to exist (Babbie 2010).

For this study, the $p \leq 0.05$ level of significance was applied, which is the level of significance generally used, and affords a 95% level of confidence in the result (Salkind, 2018). Two forms of errors could be made in terms of the level of significance (Field, 2009; Salkind, 2018):

- Type I error: the researcher might believe that there is no statistical difference or effect in the population when, in fact, there is a difference.
- Type II error: the researcher might believe that a statistical effect or difference in the population exists when, in fact, no difference exists.

The result with a p-value that indicated a level smaller than the selected significance level set for the study, in this case, $p \leq 0.05$, was presented as statistically significant and the null hypothesis was rejected.

Once a statistically significant relationship was identified in this study the focus shifted to the practical effect size of the correlation. The effect size statistically determines the estimate of the strength of a relationship among two variables (Leedy & Ormrod, 2015). Salkind (2018: 253) explains that "effect size tells us something about how strong the relationship between variables is, and as it increases, we know the difference between groups is greater". The size of the correlation coefficient demonstrates the strength of the relationships between variables (Leedy & Ormrod, 2015). It is important to make a distinction between the significant level and effect size. A significant level simply refers to the probability of whether or not a difference exists in the sample of the population whereas the effect size refers to the magnitude of the difference (Field, 2009; Pallant, 2011).

The following guidelines, as set out by Cohen (1992), where used to determine the practical significance of correlation coefficients for this study:

Small effect	r = 0.10 to 0.29
Medium effect	r = 0.30 to 0.49
Large effect	r = 0.50 to 1.0

One of the most useful tools to determine whether conclusions can be drawn about the population based on information obtained from the sample is to test for statistical significance (Salkind, 2018). The study tested for statistically significant differences between the employees of different ages, gender, ethnicity, post levels, years of service, years in current position, working in academic/administrative department/unit, supervisory status, and qualifications. Parametric and non-parametric tests were used. The analysis of variance (ANOVA) was applied to compare the mean scores or the variance in the scores with more than two groups (Pallant, 2011; Stangor, 2011). The one-way analysis of variance included one independent variable or factor, which had different levels or groupings (Pallant, 2011). The t-test was used to test the significance of the difference between two means based on two unrelated and independent groups (Salkind, 2018). The Kruskal-Wallis test was accepted as the non-parametric alternative to the one-way analysis between groups due to small group sizes (Field, 2009; Pallant, 2011). This test compared scores on a variance for three

or more groups by converting the scores to ranks and analysing the mean rank for each group (Leedy & Ormrod, 2015; Pallant, 2011).

The level of statistical significance was set at $p \leq 0.05$. The following tests were used for each category:

- Analysis of variance (ANOVA): Age, post level, and qualifications.
- Kruskal-Wallis test: Ethnicity.
- T-test: Gender, department/unit, and supervisory status.

5.8 ETHICAL CONSIDERATIONS

Strict ethical considerations should be adhered to in order to support the integrity of the findings. Ethical guidelines and standards formed the basis on which the research study was performed.

To ensure that the ethical requirements were met, the following actions were conducted in terms of the procedures employed to conduct the research:

- The research was done within recognised limits.
- Permission to conduct the research was obtained from the Unisa College Ethics Review Committee.
- Permission to use institutional staff members were obtained from the Research Permission Subcommittee (RPSC) of the Unisa Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC).
- Standard and current resources were included for examining and explaining concepts.
- Theories by experts in the field of research were used to ensure that a scientific research process was conducted.
- All sources used were quoted and referenced clearly.
- Participation in this study was entirely voluntary, and no participants were intimidated, bribed, or forced.

In terms of protecting the participant's privacy, the following procedures applied:

- Informed and voluntary consent was obtained from each participant.
- A cover letter provided participants with information regarding the research, which included the research aims.
- The researcher's contact details were provided.
- The survey could only be opened via a link contained in an e-mail distributed to the target population.
- Confidentiality of participants was guaranteed.
- Participants were not requested to disclose any personal information that could reveal their identity.
- Participants are not identified in the final report.
- Participants could choose not to participate in the study and could opt out at any time.

The following steps relating to the protection of data was/will be carried out:

- The questionnaires are stored in an online database secured with a password.
- The data are password protected and will be retained for a period of five years.

5.9   SUMMARY

Chapter 5 focuses on the research design and methodology of this study. The empirical study and the methods used are explained in detail by means of the following steps: 1) formulating the research aims, 2) determining and describing the sample, 3) designing the measuring instrument, 4) administering the measuring instrument, 5) scoring the measuring instrument; and 6) processing and analysing the data. The chapter concludes with an overview of the ethical considerations adhered to in this study.

6.1   INTRODUCTION

In this chapter the statistical results of the study are discussed, and the empirical research findings are incorporated with the information obtained from the literature review. The statistical results of the research aims presented in chapter 1 are reported on and the empirical study is presented according to the steps outlined in figure 6.1.

Figure 6.1: Steps in the research process

STEP 7: Reporting and interpreting the results

STEP 8: Integrating the research findings
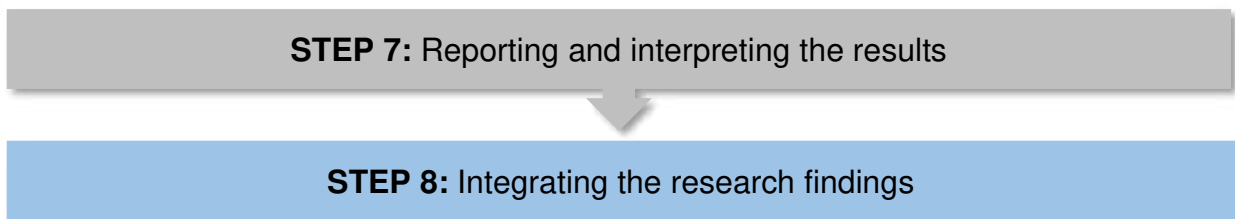
The statistical results of the exploratory factor analysis and descriptive, correlational, and inferential statistics are discussed in the sections that follow.

6.2   EXPLORATORY FACTOR ANALYSIS

This section relates to research aims 1 and 2:

- **Research aim 1:** To determine the constructs of supervisory behaviour that influence EDI and creativity.
- **Research aim 2:** To determine the constructs of the internal work environment that influence EDI and creativity.

Exploratory factor analysis (EFA) with principal axis factoring as an extraction method, and promax rotation were used. Before factors could be identified for each category using the principal-axis factor analysis, the appropriateness of the data for factor analysis had to be determined by analysing the results of the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test. KMO values between 0.5 and 0.7 were regarded as

mediocre, values between 0.7 and 0.8 as good, values between 0.8 and 0.9 as very good and values above 0.9 were regarded as superb. The strength of the relationship among variables was assessed through Bartlett's test of sphericity, which had to be significant ($p < 0.05$) to indicate that there was some relationship between the variables and for factor analysis to be deemed suitable.

Table 6.1 displays the results of the KMO and Bartlett's tests for Sections B, C and D of the questionnaire. Please note that for reporting purposes, the sections from the questionnaire are named as indicated in Table 6.1 from here on.

Table 6.1: KMO and Bartlett's tests – Supervisory/Internal work environment questionnaire

		Section B: Supervisory behaviour	Section C: Internal work environment	Section D: Supervisory behaviour (Management factors)
Kaiser-Meyer-Olkin measure of sampling adequacy		.976	.895	.921
Bartlett's test of sphericity	Approximate Chi-square	12846.854	5914.147	2571.573
	df	210	210	231
	Significance	.000	.000	.000

An exploratory factor analysis was conducted, using principal axis factoring as the extraction method and promax as rotation method. The Kaiser-Olkin measure of sampling adequacy was well above the .60 threshold (0.976 for Section B: Supervisory behaviour, 0.895 for Section C: Internal work environment and 0.921 for Section D: Supervisory behaviour (Management factors). The Bartlett's test of sphericity was significant ($p = 0.000$). The results of the Kaiser-Olkin measure of sampling adequacy as well as Bartlett's test of sphericity indicate that factor analysis was appropriate.

6.2.1 Diagnostic statistics for factor analysis

Once the KMO and Bartlett's test values were concluded, the number of factors to be extracted using eigenvalues was determined. The Kaiser criterion was applied for factor extraction in this study.

a) Section B: Supervisory behaviour

The principal axis factor analysis revealed the presence of only one factor with eigenvalues above 1.0, which cumulatively describe 65% of the variance in the data. As only one factor was extracted, the solution could not be rotated (shown in table 6.2).

Table 6.2: Section B: Supervisory behaviour – Total variance explained

Factor	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	13.649	64.996	64.996	13.334	63.497	63.497
2	.878	4.179	69.176			
3	.817	3.890	73.066			
4	.728	3.467	76.533			
5	.631	3.004	79.537			
6	.515	2.454	81.991			
7	.406	1.932	83.923			
8	.392	1.868	85.790			
9	.332	1.583	87.373			
10	.330	1.569	88.943			
11	.310	1.476	90.419			
12	.294	1.401	91.820			
13	.286	1.360	93.181			
14	.246	1.173	94.353			
15	.223	1.061	95.414			
16	.210	.998	96.413			
17	.189	.901	97.314			
18	.172	.818	98.132			
19	.148	.707	98.839			
20	.139	.661	99.500			
21	.105	.500	100.000			

Once the number of factors and the total variance were clarified, the factor loadings were analysed in line with the theory. As explained above, one factor was created, and the factor was labelled as follows:

Factor 1: Supervisory support

Table 6.3 illustrates the factor matrix values for each item included in the exploratory factor analysis for Section B: Supervisory behaviour. With reference to table 6.3, it is clear that, with the exception of two items, all the items loaded high on a single factor.

Table 6.3: Section B: Supervisory behaviour – Factor loadings

B	Item description	Factor Supervisory support
1	My supervisor is prepared to implement new ideas received from staff	.868
2	My supervisor is flexible about how I accomplish my work	.798
3	My supervisor encourages informal communication to support our innovation efforts	.861
4	My supervisor promotes employee involvement in decision-making	.869
5	My supervisor supports training opportunities aimed at enhancing our innovation ability	.778
6	My supervisor encourages us to ask work-related questions in order to expose ourselves to new ideas or information	.866
7	My supervisor communicates the vision of the institution	.803
8	My supervisor is an innovative person	.833
9	My supervisor will reject innovative ideas with valid reasons	.449
10	My supervisor challenges me to come up with new creative ways to perform my job	.855
11	My supervisor encourages teamwork for the generation of innovative ideas	.863
12	My supervisor facilitates cooperation between different departments	.822
13	My supervisor gives us exposure to higher level decision-making	.831
14	My supervisor relies heavily on current practices and procedures to guide his/her decisions	.492
15	My supervisor makes time to consider my suggestions	.884
16	My supervisor implements innovative ideas as far as possible	.895

B	Item description	Factor Supervisory support
17	My supervisor makes resources available to support me in doing my job	.824
18	I am satisfied with my level of participation in our department's innovation initiatives	.794
19	My supervisor gives me credit when I have a valuable idea	.848
20	My supervisor shows me appreciation for a job well done	.814
21	We have a departmental rewards/appraisal system (e.g. an afternoon off) for rewarding employee innovation/creative ideas	.438

b) Section C: Internal work environment

The principal axis factor analysis showed the presence of five factors with eigenvalues above 1.0, which cumulatively explain 62.6% of the variance in the factor (shown in table 6.4).

Table 6.4: Section C: Internal work environment – Total variance explained

Factor	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	7.297	34.748	34.748	6.879	32.759	32.759
2	2.090	9.955	44.702	1.683	8.017	40.776
3	1.438	6.846	51.548	.999	4.757	45.533
4	1.194	5.687	57.235	.738	3.515	49.048
5	1.121	5.339	62.574	.608	2.897	51.945

Once the number of factors and the total variance were determined, the factor loadings in the pattern matrix were investigated in line with the theory to name or label each factor. As explained above, five factors were created, and the factors were labelled as follows:

Factor 1: Organisational innovation culture

Factor 2: Innovation mechanisms

Factor 3: Innovative opportunities

Factor 4: Risk-taking tolerance

Factor 5: Dedication to innovation

Table 6.5 reveals the items loaded under each factor and the names afforded to the factors for Section C: Internal work environment. Item number 7 did not load onto any of the factors and was therefore eliminated from any further analysis. Item number 6 cross-loaded on both factor 1 (.426) and factor 2 (.360), and because of the higher loading on factor 1, was included in factor 1.

Table 6.5: Section C: Internal work environment – Pattern matrix

C	Item description	Factor				
		1 Organisational innovation culture	2 Innovation mechanisms	3 Innovative opportunities	4 Risk-taking tolerance	5 Dedication to innovation
1	The institution's formal and multi-level structure makes provision for EDI	.587				
6	The institution has a reward system for EDI ideas and creativity	.426				
8	The institution uses the information technology platform (e.g. intranet and internet) efficiently to communicate and exchange ideas	.755				
9	The institution has many creative employees	.708				
10	Employees are enthusiastic about generating winning ideas	.765				
13	The institution encourages ideas from employees at all levels	.606				
21	The institution uses open communication to gain new perspectives	.486				
11	We have an innovation task team in our department/unit		.577			
12	We have a suggestion scheme (suggestion box for ideas)		.818			
14	We have internal competitions for generating innovative ideas		.808			
2	My job requires me to be creative			.403		
18	We have regular informal sessions in the office to share ideas			.674		
19	We are encouraged to learn creative thinking skills			.821		
20	We are supported to keep our knowledge and skills up to date by attending training and development opportunities			.790		
15	I do not have to fear negative consequences when an idea fails				.708	

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C	Item description	Factor				
		1 Organisational innovation culture	2 Innovation mechanisms	3 Innovative opportunities	4 Risk-taking tolerance	5 Dedication to innovation
16	We have an error tolerance culture (we learn from unsuccessful ideas)				.929	
17	We use conflict constructively to promote creativity and innovation				.582	
3	I will welcome a change to my job description to include innovation activities as an "official" task					.825
4	I will welcome special assignments that will help me to be more creative					.872
5	I utilize opportunities to come up with my own ideas to do my job more effectively					.384

c) Section D: Supervisory behaviour (Management factors)

The principal axis factor analysis uncovered the presence of four factors with eigenvalues above 1.0, which cumulatively describe 64.1% of the variance in the factor (shown in table 6.6).

Table 6.6: Section D: Supervisory behaviour (Management factors) – Total variance explained

Factor	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	9.863	44.831	44.831	9.469	43.039	43.039
2	2.007	9.123	53.955	1.577	7.167	50.205
3	1.122	5.099	59.053	.761	3.457	53.662
4	1.110	5.046	64.099	.701	3.185	56.847

The number of factors and total variance were determined, and the factor loadings in the pattern matrix were then examined in line with the theory to name or label each factor. The four factors were created and labelled as follows:

Factor 1: Management support

Factor 2: Innovation management

Factor 3: Innovative leadership

Factor 4: Team innovation

Table 6.7 indicates the items that loaded under each factor and the names allocated to the factors for Section D: Supervisory behaviour (Management factors). Item number 10 did not load onto any of the factors and was therefore eliminated from further analysis. Item number 4 cross-loaded on factor 1 (.566) and factor 3 (.348), and because of the higher eigenvalue, was included in factor 1. Item number 5 cross-loaded on factor 3 (.396) and factor 4 (.354) but was included in factor 3 due to it being more relevant to this factor. Item number 6 cross-loaded on both factor 1 (.362) and factor 3 (.500), and because of the higher eigenvalue, was included in factor 1. Item number 9 cross-loaded on both factor 1 (.319) and factor 3 (.412) and because of the higher eigenvalue, was included in factor 3. Item number 17 cross-loaded on both factor 1 (.375) and factor 2 (.428), and because of the higher eigenvalue, was included in factor 2. Item number 19 cross-loaded on both factor 2 (.366) and factor 3 (.367) and was included in factor 2 due to it being more relevant to this factor. Item number 22 cross-loaded on both factor 2 (.533) and factor 4 (.409) but because of the higher eigenvalue, was included in factor 2.

Table 6.7: Section D: Supervisory behaviour (Management factors) – Pattern matrix

		Factor			
D	**Item description**	**1 Management support**	**2 Innovation management**	**3 Innovative leadership**	**4 Team efficiency**
2	I encourage new ways of thinking	.937			
3	I provide my staff the freedom to pursue innovative opportunities	.931			
4	I deliberately stretch/build my staffs' competencies through their participation in new initiatives	.566			
9	I frequently challenge my staff to think in innovative/creative ways	.319			

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D	Item description	Factor			
		1 Management support	2 Innovation management	3 Innovative leadership	4 Team efficiency
12	I support my staff after failed innovation efforts	.505			
13	We use failed innovation efforts as a learning opportunity	.364			
11	I have enough power to influence management decisions on the implementation of innovation		.574		
15	I am able to minimize rules, policies, procedures, and bureaucracy to simplify work		.404		
17	I know exactly how to get initiatives implemented		.428		
18	We have the right processes in place to support an innovative culture		.753		
20	The institution provides dedicated finances to my unit/department to explore innovative ideas		.761		
21	Our innovation efforts built capabilities that we did not have five years ago		.690		
5	I inspire my staff with a vision for the future			.396	
6	I model innovation behaviours for my staff to follow			.500	
7	I devote time to coach my staff on innovation			.996	
8	I devote time to provide feedback on my units' innovation efforts			.802	
19	I give my staff dedicated time to pursue innovative opportunities			.367	
1	My staff is capable of recommending innovative ideas for implementation				.610
14	My unit works as a team to generate innovative ideas				.864
16	My staff is prepared to move out of their comfort zones by placing efficiency above compliance with ineffective procedures				.481
22	I am satisfied with my units' participation in the institutions' innovation initiatives				.409

6.2.2 Summary: Factor analysis

Table 6.8 summarises the findings of the factor analysis. It indicates the factors extracted from Section B: Supervisory behaviour, Section C: Internal work environment and Section D: Supervisory behaviour (Management factors) of the questionnaires and provides a brief description of the factors and items included in each factor.

Table 6.8: Summary of factor analysis

	Dimension name	Dimension description	Items per dimension
Section B: Supervisory behaviour			
Factor 1	**Supervisory support**	Refers to the level of encouragement and support that employees receive from supervisors regarding their concerns, work performance, and innovation efforts.	1 - 21 Total = 21
		Total number of items:	21
Section C: Internal work environment			
Factor 1	**Organisational innovation culture**	Refers to different elements, such as breaking down hierarchical barriers, support for innovation, promoting open communication, enthusiasm and involvement from all, admiration for risk-taking, valuing education and knowledge, accepting failure, and rewarding success.	1, 6, 8, 9, 10, 13. 21 Total = 7
Factor 2	**Innovation mechanisms**	Refers to elements setting innovation in motion with a specific focus on the social components of the innovation process, active participation in the innovation process, and applying methods that encourage creative actions.	11, 12, 14 Total = 3
Factor 3	**Innovation opportunities**	Refers to a set of different elements enabling employees to identify, act upon, and realise new combinations of resources and needs, and try to benefit from their future potential.	2, 18, 19, 20 Total = 4
Factor 4	**Risk-taking tolerance**	Risk tolerance refers to both the possibilities of inherent risk incidents occurring and the resulting impact of those instances.	15, 16, 17 Total = 3
Factor 5	**Dedication to innovation**	Refers to work practices aimed at encouraging employees at all levels of the organisation to welcome creativity and innovation into their daily functions, to be enthusiastic about innovation and its benefits, and to actively participate in innovation.	3, 4, 5 Total = 3
		Total number of items:	20

	Dimension name	Dimension description	Items per dimension
Section D: Supervisory behaviour (Management factors)			
Factor 1	**Management support**	Refers to the willingness of senior management to promote innovative behaviour and provide support. Encouraging and challenging employees and providing the required resources to take innovative actions.	2, 3, 4, 9, 12, 13 Total = 6
Factor 2	**Innovation management**	Innovation management focuses on the management of the innovation processes as well as change management.	11, 15, 17, 18, 20, 21 Total = 6
Factor 3	**Innovative leadership**	Innovative leadership is the skill to influence others to produce new and better ideas.	5, 6, 7, 8, 19 Total = 5
Factor 4	**Team innovation**	Refers to an atmosphere that focuses on innovation, with a vision and shared goals, and where participation and innovation support are provided.	1, 14, 16, 22 Total = 4
		Total number of items:	21

6.3   RELIABILITY

The Cronbach's alpha coefficients for each factor identified in the exploratory factor analysis were analysed to determine the reliability of the scale. The required reliability criteria were set at 0.60 for this study. All the factors met this requirement, and no factors were excluded from further analysis. The reliability of the questionnaire scales is reported in table 6.9.

Table 6.9: Reliability of the questionnaire

	Dimension name	Cronbach's alpha	Number of items
Section B: Supervisory behaviour			
Factor 1	**Supervisory support**	0.971	21
		Total number of items:	21
Section C: Internal work environment			
Factor 1	**Organisational innovation culture**	0.868	7
Factor 2	**Innovation mechanisms**	0.751	3
Factor 3	**Innovation opportunities**	0.759	4
Factor 4	**Risk-taking tolerance**	0.802	3
Factor 5	**Dedication to innovation**	0.732	3
		Total number of items:	20

	Dimension name	Cronbach's alpha	Number of items
Section D: Supervisory behaviour (Management factors)			
Factor 1	**Management support**	0.848	6
Factor 2	**Innovation management**	0.813	6
Factor 3	**Innovative leadership**	0.893	5
Factor 4	**Team innovation**	0.777	4
		Total number of items:	21

Table 6.9 indicates the Cronbach's alpha coefficients for each section of the questionnaire. In Section B: Supervisory behaviour, the Cronbach's alpha value was 0.971, without any items being deleted. This value was acceptable as it represents high internal consistency and fell within the predetermined ranges set for this study. Should the questionnaire be used for future studies the number of items can be reduced in accordance with the effect of the deletion on the difference in variance and the Cronbach's alpha value.

In the analysis of Section C: Internal work environment, the Cronbach's alpha values ranged between 0.732 and 0.868, which was within the predetermined reliability ranges set for the study. No items were deleted.

The Cronbach's alpha coefficients for Section D: Management factor, ranged between 0.777 and 0.893. The value for this section was appropriate as it fell within the pre-set ranges for the study. As a result, this portion of the study did not require any items to be removed to meet the predetermined reliability requirements.

6.4   DESCRIPTIVE STATISTICS

After the reliability of the questionnaire was established, further descriptive analysis was performed to investigate the distribution of scores. The means (M), standard deviations (SD), skewness and kurtosis were calculated for each of the factors. The descriptions of the scales were used to assist with the analysis of the descriptive statistics. The highest scale option (6) suggested that the participant strongly agreed with the statement regarding the particular item, while the lowest scale option (1) indicated that the participant strongly disagreed with the statement.

In terms of Section B: Supervisory support, the factor had a mean of 4.16 and a standard deviation of 1.15. The factor with the highest mean score in Section C: Internal environment, was dedication to innovation (M = 4.93, SD = 0.86), and the factor with the lowest mean score was innovation mechanisms (M = 2.20, SD = 1.08), which indicates that the institution should focus on providing the required environment to set innovations in motion. The means of the remaining factors, organisational innovation (M = 3.53), innovative opportunities (M = 3.73), and risk-taking tolerance (M = 3.36) tend to reflect an average opinion about the factors. The factor with the highest mean in Section D: Supervisory behaviour (Management factors), was management support (M = 4.87, SD = 0.72) and that with the lowest mean score was innovation management (M = 3.46, SD = 1.08). The two remaining factors also had high scores, with innovative leadership (M = 4.39) scoring a little higher than team innovation (M = 4.14).

The skewness values indicate that with regard to Section B: Supervisory behaviour, the score for the factor supervisory support was positively skewed (bounded to the left). In Section C: Internal work environment, all the scores were positively skewed (bounded to the left), except for innovation mechanisms, which was negatively skewed (bounded to the right). In Section D: Supervisory behaviour (Management factors), the factor, innovation management, was negatively skewed, while the remaining scores were positively skewed. It is confirmed that for a normal distribution to occur, skewness values must fall within the range of -1 to +1 to be deemed acceptable (Hair *et al.*, 2014). The skewness of innovation mechanisms indicated a substantially skewed positive distribution (1.06), while the rest of the factors ranged from -0.91 to 0.05, which was within the normal range of -1 to +1 set for these coefficients. It should, however, be noted that with reasonably large samples the skewness will not result in a significant difference in the analysis (Field, 2009; Pallant, 2011). The kurtosis values for all the sections ranged between -0.80 and 0.92, which is considered normal, except for management support, which had a kurtosis value of 1.90. The distribution is considered steep (leptokurtic) due to a kurtosis value greater than 1 (Cloete, 2011). The kurtosis value for this dimension was very high and when considered in conjunction with the high mean (4.87), this suggests that employees tended to be positively inclined when they responded to the item. The employees were thus in agreement regarding this dimension.

Table 6.10: Means, standard deviation, skewness and kurtosis

Construct	Mean (M)	Standard deviation (SD)	Skewness	Kurtosis
Section B: Supervisory behaviour				
Supervisory support	4.16	1.15	-0.84	0.02
Section C: Internal work environment				
Organisational innovation culture	3.53	1.11	-0.09	-0.70
Innovation mechanisms	2.21	1.08	**1.06**	0.92
Innovation opportunities	3.73	1.13	-0.29	-0.62
Risk-taking tolerance	3.36	1.26	-0.13	-0.80
Dedication to innovation	4.93	0.86	-0.90	0.91
Section D: Supervisory behaviour (Management factors)				
Management support	4.87	0.72	-0.91	**1.90**
Innovation management	3.46	1.08	0.05	-0.44
Innovative leadership	4.39	1.01	-0.76	0.72
Team innovation	4.14	1.02	-0.59	0.12

6.5   INFERENTIAL STATISTICS: Correlational analysis

This section relates to research aim 3:

- **Research aim 3:** To determine the relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity.

After the reliability statistics and descriptive analysis of the data were completed, correlation analysis was performed. These correlations identified the direction and strength of the relationship between Section B: Supervisory behaviour, Section C: Internal work environment, and Section D: Supervisory behaviour (Management factors).

Table 6.11 represents a summary of the correlation statistics and relationship strength.

Table 6.11: Correlation analysis: Section B, C and D

VARIABLES		Section B: Supervisory behaviour	Section C: Internal work environment					Section D: Supervisory behaviour (Management factors)			
		Supervisory support	Organisational innovation culture	Innovation mechanisms	Innovation opportunities	Risk-taking tolerance	Dedication to innovation	Management support	Innovation management	Innovative leadership	Team innovation
Section B: Supervisory behaviour	Supervisory support	1									
Section C: Internal work environment	Organisational innovation culture	.362**	1								
	Innovation mechanism	.370**	.544**	1							
	Innovation opportunities	.630**	.587**	.544**	1						
	Risk-taking tolerance	.465**	.546**	.475**	.541**	1					
	Dedication to innovation	0.067	.279**	.097*	.182**	.200**	1				
Section D: Supervisory behaviour (Management factors)	Management support	.301**	.411**	.193**	.422**	.400**	.562**	1			
	Innovation management	.472**	.687**	.456**	.587**	.503**	.331**	.535**	1		
	Innovative leadership	.325**	.482**	.296**	.406**	.440**	.549**	.788**	.622**	1	
	Team innovation	.361**	.535**	.350**	.489**	.364**	.324**	.603**	.645**	.653**	1

Note: N = 624, ** $p \leq .01$, * $p \leq .05$, $r = .10 \leq .29$ are practically significant (small effect). $r \geq .30 \leq .49$ are practically significant (medium effect). $r = .50 \leq 1.0$ are practically significant (large effect).

The shading in table 6.11 represents the following:

- Orange shading: the relationship between supervisory behaviour variables.
- Light blue shading: the relationship between internal work environment variables.
- Dark blue shading: the relationship between management factor variables.
- Grey shading: the relationship between supervisory behaviour, internal work environment and management factor variables.
- No shading: relationship insignificant.

The relationships between the variables, Section B: Supervisory behaviour, Section C: Internal work environment, and Section D: Supervisory behaviour (Management factors) (grey shading) were all significant.

Table 6.11 indicates that supervisory support had significant relationships with all of the variables of Section D: Internal work environment, namely organisational innovation culture (r = 0.36; p = 0.00; medium practical effect); innovation mechanism (r = 0.37; p = 0.00; medium practical effect); risk-taking tolerance (r = 0.47; p = 0.00; medium effect), and innovation opportunities (r = 0.63; p = 0.00; large practical effect), which shows the strongest positive relationship (large effect). There was no significant relationship between supervisory support and dedication to innovation (r = 0.067; p = 0.096). The positive relationships suggest that supervisory support assists in creating an organisational innovation culture and assists in providing the required innovation mechanisms and opportunities to promote EDI and creativity.

Other significant positive relationships were found. Supervisory support were linked to the following factors in Section D: Supervisory behaviour (Management factors); management support (r = 0.30; p = 0.00; medium practical effect), innovation management (r = 0.47; p = 0.00; medium practical effect), innovation leadership (r = 0.33; p = 0.00; medium practical effect), and team innovation (r = 0.36; p = 0.00; medium practical effect). The correlations indicate that supervisory support plays an important role in team innovation to promote EDI and creativity. The link between innovative leadership and supervisory support indicates that an innovative leadership style is an important factor to influence subordinates, and to encourage them to generate new ideas and engage in innovative behaviour. Management support and innovation management both have a strong relationship with supervisory support. This

finding indicates that support from management is vital for innovation to be successful, and it is crucial that the innovation process be managed.

Strong significant relationships were found between organisational innovation culture and each of the factors in Section D: Supervisory behaviour (Management factors) (management support, innovation management, innovative leadership and team innovation). All the correlations found were positive. Organisational innovation culture correlated with innovation management ($r = 0.69$; $p = 0.00$; large practical effect) and with team innovation ($r = 0.54$; $p = 0.00$; large practical effect). Management support ($r = 0.41$; $p = 0.00$; medium practical effect) and innovation leadership ($r = 0.48$; $p = 0.00$; medium practical effect) had a strong relationship with organisational innovation culture. This result shows that an organisational innovation culture will support innovation management, enhance team innovation, and have a positive impact on innovative leadership and management support. Three factors from Section C: Internal environment, namely innovation mechanism ($r = 0.54$; $p = 0.00$; large practical effect), innovation opportunities ($r = 0.59$; $p = 0.00$; large practical effect) and risk-taking tolerance ($r = 0.55$; $p = 0.00$; large practical effect) had a strong correlation with organisational innovation culture ($r = 0.63$; $p = 0.00$; large practical effect).

Innovation mechanisms within the internal work environment focus on elements that set innovation in motion with a specific focus on the social component of the innovation process. Innovation opportunities ($r = 0.54$; $p = 0.00$; large practical effect) displayed a significant relationship with innovation mechanisms, and also showed a positive relationship with the factor, risk-taking tolerance ($r = 0.48$; $p = 0.00$; medium practical effect). Dedication to innovation ($r = 0.10$; $p = 0.015$; small practical effect) showed a significance value of 0.015, which indicates that there is no statistically significant relationship at the 1% level, but that there is an indication of significance on the 5% level. These results indicate that innovation opportunities, risk-taking, and dedication to innovation play important roles in the internal environment to set innovation in motion and to increase the innovative behaviour of employees. Three of the four factors in Section D: Supervisory behaviour (Management factors) namely, innovation management ($r = 0.46$; $p = 0.00$; medium practical effect), innovative leadership ($r = 0.30$; $p = 0.00$; medium practical effect), and team innovation ($r = 0.35$; $p = 0.00$; medium practical effect) showed positive relationships with innovation mechanisms.

Management support (r = 0.19; p = 0.008; small practical effect) showed a significance value of 0.008, which indicates that there is a statistical significant relationship on the 1% level. The results suggest that all the factors under Section D: Supervisory behaviour (Management factors), are vital to promote innovative behaviour and set innovation in motion.

Innovation opportunities displayed significant relationships with each of the factors in Section D: Supervisory behaviour (Management factors). Three of the variables namely, management support (r = 0.42; p = 0.00; medium practical effect), innovative leadership (r = 0.41; p = 0.00; medium practical effect) and team innovation (r = 0.49; p = 0.00; medium practical effect) had a medium effect on innovation opportunities, while innovation management (r = 0.59; p = 0.00; large practical effect) had a significant correlation with innovation opportunities. This relationship indicates that managing innovation effectively is an important process to benefit from the innovative opportunities identified. Innovation opportunities also showed a significant relationship with the risk-taking factor (r = 0.54; p = 0.00; large practical effect) in Section C: Internal work environment. This shows that preparedness to take risks plays an important role in identifying innovation opportunities. Dedication to innovation (r = 0.18; p = 0.00; small practical effect) was also positively related to innovation opportunities. This finding indicates that in order for innovation opportunities to be identified, employees should be dedicated to innovation and actively participate on all levels within the organisation.

Significant relationships were found between risk-taking tolerance and the following factors under Section D: Supervisory behaviour (Management factors): innovation management (r = 0.50; p = 0.00; large practical effect), innovation leadership (r = 0.44; p = 0.00; medium practical effect), management support (r = 0.40; p = 0.00; medium practical effect) and team innovation (r = 0.36; p = 0.00; medium practical effect). This finding indicates that innovation leadership, support from management, and proper management of the innovation process have a strong impact on the risk-taking ability of the organisation.

Risk-taking also had a significant relationship with the factor, dedication to innovation (r = 0.20; p = 0.00; small practical effect) under Section C: Internal work environment.

This result shows that employees who are encouraged and supported to apply innovation in their daily functions will be more willing to take risks.

Dedication to innovation showed a significant relationship with all of the factor under Section D: Supervisory behaviour (Management factors). Two of the factors, management support (r = 0.56; p = 0.00; large practical effect) and innovation leadership (r = 0.55; p = 0.00; large practical effect), showed significant relationships with dedication to innovation, while innovation management (r = 0.33; p = 0.00; medium practical effect) and team innovation (r = 0.32; p = 0.00; medium practical effect) had a medium effect.

The results indicate that the factor, management support under Section D: Supervisory behaviour (Management factors) had a significant relationship with the variables, innovation management (r = 0.54; p = 0.00; large practical effect), innovation leadership (r = 0.79; p = 0.00; large practical effect) and team innovation (r = 0.60; p = 0.00; large practical effect). Innovation management also had a significant relationship with innovation leadership (r = 0.62; p = 0.00; large practical effect) and team innovation (r = 0.65; p = 0.00; large practical effect). Innovative leadership had a strong relationship with team innovation (r = 0.65; p = 0.00; large practical effect). This finding indicates that the four factors under Section D: Supervisory behaviour (Management factors) complement each other and when combined, can be a powerful tool to unleash the creative potential of employees.

The concern for multicollinearity was also addressed. Multicollinearity is present when the correlation coefficient is high (r ≥ 0.90) (Yong & Pearce, 2013). Since the highest value for the Person product-moment coefficient for this study was r = 0.79 (as shown in table 6.10), the concern for multicollinearity could be dispelled.

Table 6.12 presents a summary of the correlation statistics and relationship strength between the variables as discussed and depicted in table 6.11.

Table 6.12: Summary of variable relationships

LARGE EFFECT	MEDIUM EFFECT	SMALL EFFECT
SUPERVISORY SUPPORT		
▪ Innovation opportunities	▪ Organisational innovation culture ▪ Innovation mechanism ▪ Risk-taking tolerance ▪ Management support ▪ Innovation management ▪ Innovative leadership ▪ Team innovation	
ORGANISATIONAL INNOVATION CULTURE		
▪ Innovation mechanisms ▪ Innovation opportunities ▪ Risk-taking tolerance ▪ Innovation management ▪ Team innovation	▪ Management support ▪ Innovative leadership	▪ Dedication to innovation
INNOVATION MECHANISMS		
▪ Innovation opportunities	▪ Risk-taking tolerance ▪ Innovation management ▪ Team innovation	▪ Dedication to innovation ▪ Management support ▪ Innovative leadership
INNOVATION OPPORTUNITIES		
▪ Risk-taking tolerance ▪ Innovation management	▪ Management support ▪ Innovative leadership ▪ Team innovation	▪ Dedication to innovation
RISK-TAKING TOLERANCE		
▪ Innovation management	▪ Management support ▪ Innovative leadership ▪ Team innovation	▪ Dedication to innovation
DEDICATION TO INNOVATION		
▪ Innovative leadership ▪ Management support	▪ Innovation management ▪ Team innovation	
MANAGEMENT SUPPORT		
▪ Innovation management ▪ Innovative leadership ▪ Team innovation		
INNOVATION MANAGEMENT		
▪ Innovative leadership ▪ Team innovation		
INNOVATIVE LEADERSHIP		
▪ Team innovation		

6.6 INFERENTIAL STATISTICS: Structural equation modelling (SEM)

Research aim 3 focused on the relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity. This section addresses research aim 3 through the use of structural equation modelling (SEM).

Correlation analysis (refer to section 6.5) tests the bidirectional relationship between two variables. In addition, in normal multiple regression analysis, the measurement error is aggregated in a single residual error term. As the core aim was to test the simultaneous evaluation of model construct relationships. and to ensure that measurement error was taken into account for all structural paths, structural equation modelling (SEM) was the preferred choice.

The results of the exploratory factor analysis (EFA) (refer to section 6.2) were used as input to test an SEM model. Section B: Supervisory behaviour, focused on innovation and creativity from the employees' perspective and was measured by 21 items from which one factor, supervisory support, was identified through EFA, and labelled as such. Section C: Internal work environment with regard to supporting innovation and creativity was measured by 20 items, and five factors, organisational innovation culture, innovation mechanisms, innovation opportunities, risk-taking tolerance, and dedication to innovation, were identified through EFA and labelled as such. Lastly, Section D: Supervisory behaviour (Management factors), focused on innovation and creativity from the supervisors' perspective and was also measured by 21 items, from which four factors, management support, innovation management, innovation leadership and team innovation, were identified through EFA and labelled as such. All ten factors demonstrated acceptable internal consistency as illustrated by the Cronbach's alpha coefficients (refer to section 6.3).

The first model included supervisory support, organisational innovation culture, innovation mechanisms, innovation opportunities, risk-taking tolerance, and dedication to innovation as endogenous variables, and management support, innovation management, innovation leadership and team innovation as exogenous variables.

Figure 6.2 illustrates the full SEM model incorporating the structural relationships.

Figure 6.2: SEM Model 1
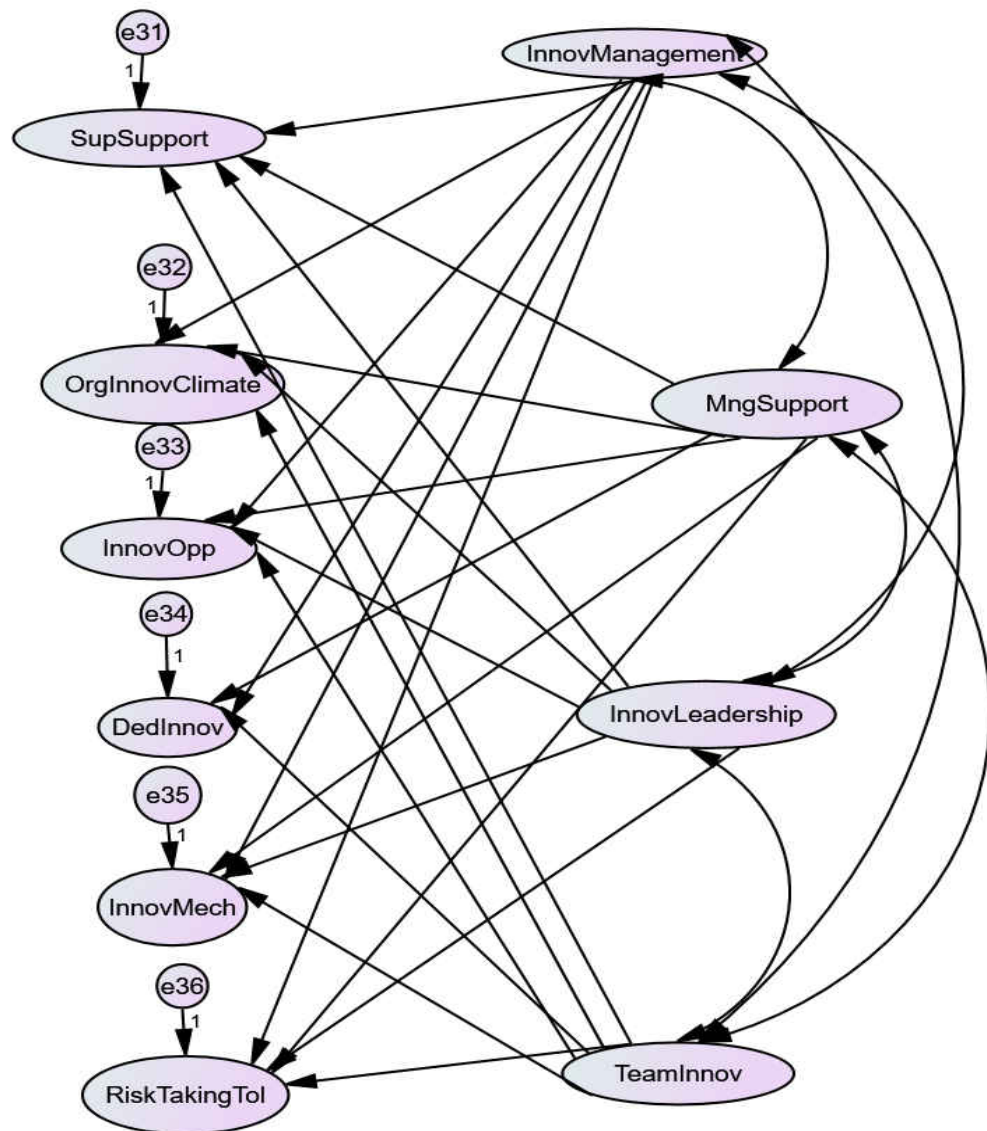
The model was evaluated by goodness-of-fit indices and the results are provided in table 6.13.

Table 6.13: Goodness-of-fit indices: SEM Model 1

Model	CMIN (X2)	df	p	CMIN/df	RMSEA	CFI	TLI	IFI
Model 1 - Goodness-of-fit indices	3083.540	1512	0.000	2.039	0.074	0.822	0.812	0.824
Indicate acceptable fit	-	-	-	<3	<0.08	>0.80	>0.80	>0.80

The CMIN/df ratio (2,039), which was below 3, indicated a good fit. RMSEA should ideally be below 0.05 for a good fit, and below 0.08 for an adequate fit (Hu & Bentler, 1999). Therefore, the RMSEA (0.074) with the lower and upper confidence interval ranging between 0.070 and 0.078 indicated an acceptable model fit. The CFI (0.822), TLI (0.812) and IFI (0.824) were above 0.8, which indicates an acceptable fit. Although values of 0.9 or even 0.95 have been recommended by some authors, they were deemed to be conservative, as a value below 0.8 indicates a poor fit (Hair *et al.*, 2014; Hooper, Coughlan & Mullen, 2008; Kline, 2011). Thus, according to the set of recommended fit indices, the model indicates an acceptable fit.

Some of the standard regression coefficients associated with the structural paths were, however, greater than 1. A common misunderstanding is that the standardised coefficients in a measurement or structural relationship must be smaller than 1 (Jöreskog, 1999). Deegan (1978) condemns the notion that the existence of standardised regression coefficients greater than 1 raise questions regarding the legitimacy of such coefficients and pose problems with interpretation. His research demonstrates that standardised regression coefficients greater than 1 can legitimately occur (Deegan, 1978). One potential cause of standardised weights larger than 1 is the existence of multicollinearity between the latent constructs. The structural parameter estimates are shown in table 6.14.

Table 6.14: Structural parameter estimates - SEM Model 1

Relationships			Un-standardised regression weights	S.E.	C.R.	P	Standardised regression weights
SupSupp	<---	InnovMng	21.395	24.995	0.856	0.392	10.955
OrgInvCult	<---	InnovMng	15.157	18.000	0.842	0.400	7.794
InnovOpp	<---	InnovMng	36.503	42.578	0.857	0.391	16.623
DedInnov	<---	InnovMng	1.160	0.250	4.634	***	0.685
InnovMech	<---	InnovMng	20.227	23.957	0.844	0.399	11.271
RiskTol	<---	InnovMng	20.520	23.777	0.863	0.388	14.529
SupSupp	<---	ManagSupp	3.277	3.413	0.960	0.337	2.815
OrgInvCult	<---	ManagSupp	3.211	2.467	1.301	0.193	2.769
InnovOpp	<---	ManagSupp	5.645	5.811	0.971	0.331	4.312
DedInnov	<---	ManagSupp	0.336	0.168	2.005	0.045	0.333
InnovMech	<---	ManagSupp	3.507	3.277	1.070	0.285	3.279
RiskTol	<---	ManagSupp	3.291	3.254	1.011	0.312	3.909
SupSupp	<---	InnovLead	-17.532	20.291	-0.864	0.388	-12.289
OrgInvCult	<---	InnovLead	-12.430	14.613	-0.851	0.395	-8.749
InnovOpp	<---	InnovLead	-30.154	34.569	-0.872	0.383	-18.797
DedInnov	<---	InnovLead	-16.803	19.451	-0.864	0.388	-12.818

Relationships			Un-standardised regression weights	S.E.	C.R.	P	Standardised regression weights
InnovMech	<---	InnovLead	-16.548	19.299	-0.857	0.391	-16.040
RiskTol	<---	InnovLead	-0.362	1.822	-0.199	0.842	-0.266
SupSupp	<---	TeamInnov	-0.685	1.319	-0.519	0.604	-0.506
OrgInvCult	<---	TeamInnov	-0.546	3.099	-0.176	0.860	-0.357
InnovOpp	<---	TeamInnov	-0.552	0.260	-2.123	0.034	-0.468
DedInnov	<---	TeamInnov	-0.523	1.747	-0.300	0.764	-0.419
InnovMech	<---	TeamInnov	-0.751	1.734	-0.433	0.665	-0.764
RiskTol	<---	TeamInnov	21.395	24.995	0.856	0.392	10.955

Upon investigation of the potential existence of multicollinearity, it was observed that multicollinearity existed between the two constructs (management support and team innovation) with a correlation value of 0.81. They were subsequently consolidated into one construct (management support teams) and another two constructs (innovation management and innovative leadership) with a correlation value of 0.99, were consolidated into one construct (innovative management and leadership).

Based on the consolidation of the constructs as indicated above it was necessary to test a second model. The two new constructs (**management support teams** and **innovative management and leadership**) were used as exogenous variables and supervisory support, organisational innovation culture, innovation mechanisms, innovation opportunities, risk-taking tolerance and dedication to innovation as endogenous variables.

Figure 6.3 illustrates the second SEM model incorporating both the measurement and structural relationship.

Figure 6.3: SEM Model 2
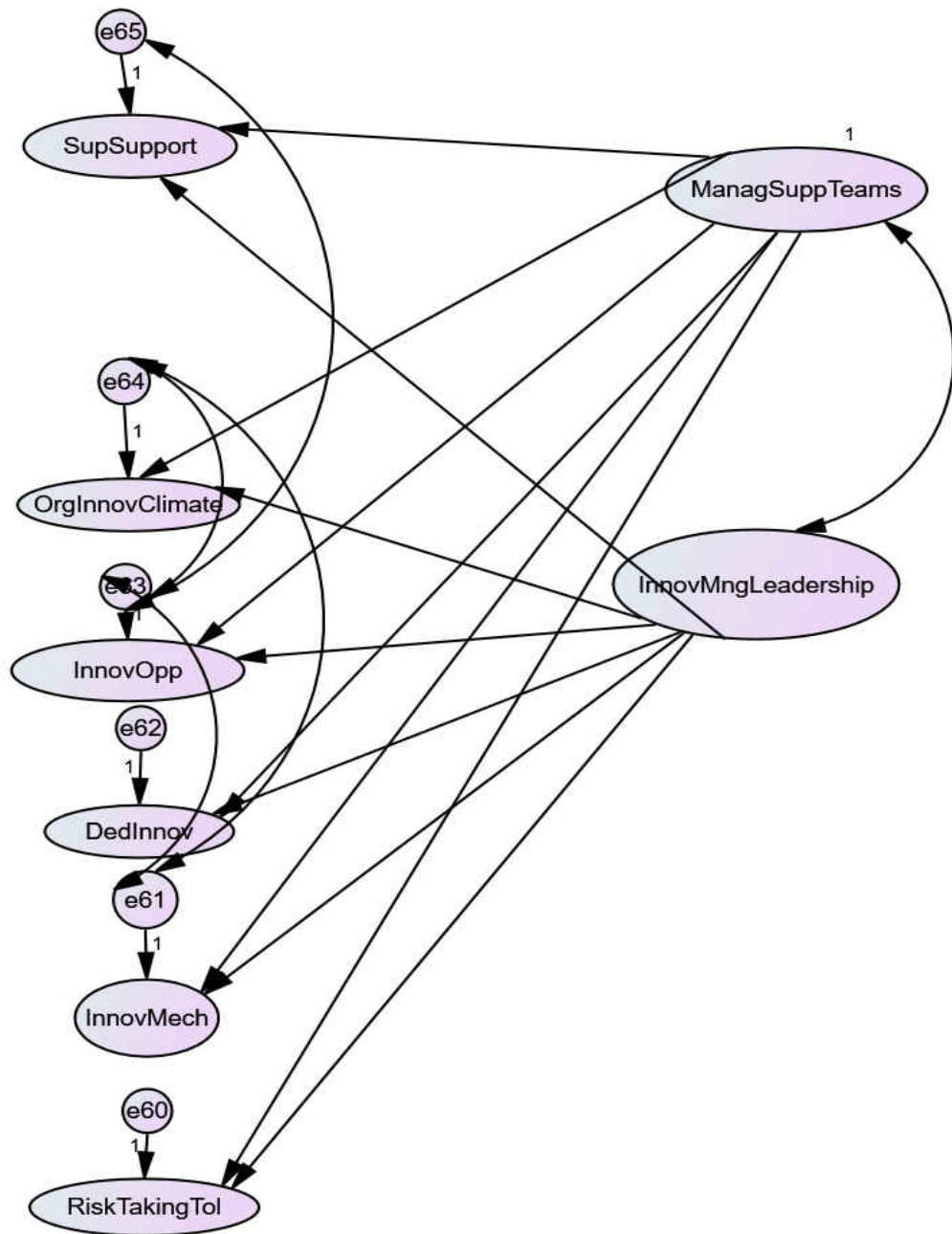
The second model was evaluated by good-of-fit indices and the results are illustrated in table 6.15.

Table 6.15: Goodness-of-fit indices: SEM Model 2

Model	CMIN (X2)	df	p	CMIN/df	RMSEA	CFI	TLI	IFI
Model 2 - Goodness-of-fit indices	2925.774	1518	0.000	1.927	0.070	0.841	0.833	0.842
Indicate acceptable fit	-	-	-	<3	<0.08	>0.80	>0.80	>0.80

The CMIN/df ratio (1.927), which was below 3, indicated a good fit. RMSEA should ideally be below 0.05 for a good fit, and below 0.08 for an adequate fit (Hu & Bentler, 1999). Therefore, the RMSEA (0.070) with the lower and upper confidence interval ranging between 0.066 and 0.074, indicated an acceptable model fit. The CFI (0.841), TLI (0.833) and IFI (0.842) were above 0.8, indicating an adequate fit. Thus, according to the set of recommended fit indices, model 2 has an acceptable fit. The structural parameter estimates are shown in Table 6.16.

Table 6.16: Structural parameter estimates - SEM Model 2

Relationships			Un-standardised regression weights	S.E.	C.R.	P	Standardised regression weights
SupSupp	<---	ManagSupp Teams	0.800	0.144	5.539	***	0.678
OrgInvCult	<---	ManagSupp Teams	1.297	0.149	8.686	***	1.102
InnovOpp	<---	ManagSupp Teams	1.417	0.174	8.124	***	1.064
DedInnov	<---	ManagSupp Teams	-0.011	0.130	-0.087	0.930	-0.011
InnovMech	<---	ManagSupp Teams	0.982	0.174	5.653	***	0.922
RiskTol	<---	ManagSupp Teams	0.693	0.146	4.760	***	0.836
SupSupp	<---	InnovMng Leadership	-0.266	0.161	-1.657	0.098	-0.194
OrgInvCult	<---	InnovMng Leadership	-0.497	0.146	-3.407	***	-0.363
InnovOpp	<---	InnovMng Leadership	-0.650	0.179	-3.639	***	-0.420
DedInnov	<---	InnovMng Leadership	-0.516	0.179	-2.884	0.004	-0.417
InnovMech	<---	InnovMng Leadership	-0.195	0.106	-1.846	0.065	-0.202
RiskTol	<---	InnovMng Leadership	0.654	0.155	4.213	***	0.549

*** Significant at 1% level of significance (P-value <0.01)

From table 6.16 some standardised regression coefficients were greater than 1, for example, the relationship between organisational innovative culture and management support team innovation, and between innovation opportunities and management support team innovation. The structural path estimates were significant, and the estimated coefficients were approximately 1.10 for both relationships. These values, close to 1, are a result of the estimation method used.

Table 6.16 further shows a statistically significant relationship between management support teams and supervisory support (0.678), risk-taking tolerance (0.836), and innovation mechanisms (0.922). These standardised regression coefficient values all indicate a strong positive relationship with management support teams. Higher levels of management support teams (management support and team innovation) are therefore related to higher levels of supervisory support, innovation mechanisms, and risk-taking tolerance. The relationship between management support teams and dedication to innovation is not statistically significant. Furthermore, table 6.16 indicates that the structural path estimates are statistically significant and show a moderate negative relationship between innovative management and leadership, and organisational innovation culture (-0.363) and innovation opportunities (-0.420). Higher levels of innovative management and leadership (innovation management and innovative leadership) therefore tend to be related to lower levels of organisational innovation culture and innovation opportunities. The results also show a statistically significant relationship with a strong positive effect between innovative management and leadership, and risk-taking tolerance (0.549). Higher levels of innovative management and leadership (innovation management and innovative leadership) therefore tend to be related to higher levels of risk-taking tolerance. Innovative management and leadership show a statistically non-significant relationship with supervisory support, dedication to innovation, and innovation mechanisms.

6.7 INFERENTIAL STATISTICS: Tests for significant mean differences

This section addresses research aim 4 through the use of inferential statistics. The sample was analysed using tests for significant mean differences.

This section relates to research aim 4:

- **Research aim 4:** To determine whether demographic characteristics have an influence on supervisory behaviour, internal work environment behaviour, and employees' innovation and creativity.

The most important demographic characteristics of the sample and the test used are discussed in this section. The t-test for independent samples was used for gender, department/unit, and supervisory status, which contained only two groups. Ethnicity was considered using the Kruskal-Wallis test. Age, post level, and qualifications were examined using the analysis of variance (ANOVA) statistical measure.

It should be noted that the supervisor's gender, ethnicity and age, and the years of service were discarded from any further analysis because these variables were not directly linked to the research aims.

6.7.1 Gender

The independent t-test was used to determine whether statistically significant differences exist between employees' gender and their perceptions of how supervisory behaviour (Section B), internal work environment (Section C), and supervisory behaviour (management factors) (Section D) influenced EDI and creativity. The mean values per gender group are shown in table 6.17 was used to determine the statistical difference between the various ethnic groups.

Notes: 1 = Male, 2 = Female

Table 6.17: Mean values per gender group

Gender		N	Mean	Standard deviation
Supervisory support	1	401	4.14	1.16
	2	223	4.20	1.13
Organisational innovation culture	1	401	3.52	1.08
	2	223	3.54	1.16
Innovation mechanisms	1	401	2.19	1.04
	2	223	2.23	1.13

Gender		N	Mean	Standard deviation
Innovation opportunities	1	401	3.69	1.14
	2	223	3.81	1.11
Risk-taking tolerance	1	401	3.31	1.29
	2	223	3.46	1.21
Dedication to innovation	1	401	4.91	0.86
	2	223	4.96	0.87
Management support	1	110	4.84	0.77
	2	80	4.91	0.65
Innovation management	1	110	3.29	1.07
	2	80	3.70	1.04
Innovative leadership	1	110	4.27	1.08
	2	80	4.57	0.87
Team innovation	1	110	4.07	1.03
	2	80	4.23	1.01

The results of the t-test for gender are shown in table 6.18.

Table 6.18: Independent t-test results for gender

Independent samples test						
		Levene's test for equality of variances		t-test for equality of means		
		F	Sig.	t	df	Sig. (2-tailed)
Supervisory support	Equal variances assumed	0.455	0.500	**-0.609**	**622**	**0.542**
	Equal variances not assumed			-0.614	468.70	0.540
Organisational innovation culture	Equal variances assumed	4.044	0.045	-0.117	622	0.907
	Equal variances not assumed			**-0.114**	**430.99**	**0.909**
Innovation mechanisms	Equal variances assumed	2.079	0.150	**-0.382**	**622**	**0.703**
	Equal variances not assumed			-0.373	427.72	0.710
Innovation opportunities	Equal variances assumed	0.060	0.806	**-1.294**	**622**	**0.196**
	Equal variances not assumed			-1.302	467.71	0.193
Risk-taking tolerance	Equal variances assumed	2.292	0.131	**-1.432**	**622**	**0.153**
	Equal variances not assumed			-1.459	484.20	0.145
Dedication to innovation	Equal variances assumed	0.162	0.687	**-0.707**	**622**	**0.480**

Independent samples test							
		Levene's test for equality of variances		t-test for equality of means			
		F	Sig.	t	df	Sig. (2-tailed)	
	Equal variances not assumed			-0.703	450.91	0.483	
Management support	Equal variances assumed	1.551	0.215	**-0.631**	**188**	**0.529**	
	Equal variances not assumed			-0.649	184.30	0.517	
Innovation management	Equal variances assumed	0.036	0.850	**-2.589**	**188**	**0.010**	
	Equal variances not assumed			-2.601	173.06	0.010	
Innovative leadership	Equal variances assumed	3.070	0.081	**-2.037**	**188**	**0.043**	
	Equal variances not assumed			-2.108	186.10	0.036	
Team innovation	Equal variances assumed	0.048	0.826	**-1.063**	**188**	**0.289**	
	Equal variances not assumed			-1.067	172.58	0.288	

The t-test results indicate that no statistically significant difference exists between males and females in terms of their perceptions of supervisory support, management support, team innovation, and all the factors under Section C: Internal work environment.

However, the results indicate a statistically significant difference between males and females in terms of the following variables:

- Innovation management (F = 0.036; t (188) = -2.589; p ≤ .01) shows that there is a statistically significant difference between males and females in terms of their perceptions of innovative leadership. The average mean score for males was 3.29 and the average mean score for females was 3.70. The innovation management section was completed only by employees in a supervisory role. The findings indicate that female supervisors engaged more and had a greater influence on innovation management activities than male supervisors. Female supervisors also felt more strongly about innovation management and the empowering role that it plays in EDI and creativity.

- Innovative leadership (F = 3.07; t (188) = -2.037; p ≤ .05) shows that there is a statistically significant difference between males and females in terms of their perceptions of innovative leadership. The innovative leadership section was completed only by employees in a supervisory role. The average mean score for males was 4.27 and the average mean score for females was 4.57, which indicates that female supervisors engaged in more innovative leadership activities than male supervisors. Female supervisors also regarded innovation leadership as a more important contributor in encouraging EDI and creativity than male supervisors.

6.7.2 Ethnicity

The Kruskal-Wallis test was used to determine the statistical difference between the various ethnic groups. The groups were classified as follows:

1 = African
2 = Coloured
3 = Indian or Asian
4 = White

The Kruskal-Wallis test for ethnicity results are shown in table 6.19.

Table 6.19: **Kruskal-Wallis test for ethnicity**

	Chi-square	Df	Asymp. Sig. (2-tailed)	Mean rank			
				African (Black)	Coloured	Indian or Asian	White
Supervisory support	19.170	3	0.000	**336.11**	201.08	264.10	295.34
Organisational innovation culture	138.280	3	0.000	**397.24**	259.06	254.58	224.31
Innovation mechanisms	18.742	3	0.000	**340.99**	247.13	279.13	284.61
Innovation opportunities	44.786	3	0.000	**357.53**	211.58	225.25	273.96

	Chi-square	Df	Asymp. Sig. (2-tailed)	Mean rank			
				African (Black)	Coloured	Indian or Asian	White
Risk-taking tolerance	64.995	3	0.000	**368.98**	207.12	258.55	259.55
Dedication to innovation	82.188	3	0.000	**374.74**	299.38	301.35	241.47
Management support	4.406	3	0.237	101.21	108.11	121.38	87.10
Innovation management	34.044	3	0.000	117.72	81.72	**140.25**	71.88
Innovative leadership	9.453	3	0.026	106.88	91.67	**122.00**	82.91
Team innovation	9.466	3	0.033	107.36	86.61	**117.00**	83.17

With the exception of management support, all the other variables show a statistically significant difference. The results of the mean rank are also included in the discussion.

- Supervisory support: Black employees indicated the highest mean rank (336.11) while Coloured employees showed a considerably lower mean rank (201.08). This finding indicates that Black employees regard supervisory support and encouragement for work performance and EDI and creativity as critical. It further shows that Black employees feel that they are receiving sufficient supervisory support. Coloured employees, on the other hand, indicated that they received little support. This finding can also indicate that Coloured employees regard supervisory support as a less important enabler for employee innovation and creativity.
- Organisational innovation culture: Black employees indicated the highest mean rank (397.24) and White employees the lowest (224.31). These results show that White employees doubt the influence of an organisational innovation culture on the ability of employees to be innovative. The results further indicate that White employees feel that the institution does not have a suitable innovative culture to stimulate innovation and creativity. The Black employees indicated that organisational innovation culture was vital in promoting innovation and that the institution did have an innovative culture.

- Innovation mechanisms: Black employees indicated the highest mean rank (340.99) while Coloured employees showed the lowest mean rank (247.13). This finding indicates that Black employees regard innovation mechanisms, such as social interactions, availability of resources, and appraisal of innovation results as important triggers for innovation to occur. Black employees further indicated that the institution provided these tools to enable innovation.

- Innovation opportunities: Black employees showed the highest mean rank (357.53) and Coloured employees the lowest (211.58). This finding suggests that Black employees feel that many innovation opportunities are available to stimulate creativity, to build innovation knowledge, and to be creative. Coloured employees indicated a less favourable response.

- Risk-taking tolerance: Black employees indicated the highest mean rank (368.98) and Coloured employees the lowest (207.12). This finding indicates that Black employees felt that the institution did tolerate risk-taking and that employees did not have to fear any negative consequences resulting from failed efforts. Coloured employees, on the other hand, felt that there might be consequences for failed efforts and that the institution was less open to risk.

- Dedication to innovation: Black employees indicated the highest mean rank (374.74) and White employees the lowest (241.47). The results indicate that Black employees were more dedicated to innovation than White employees. Black employees were also more open to accept changes to their job descriptions by adding innovative activities and special innovation assignments.

- Innovation management: Indian/Asian employees indicated the highest mean rank (140.25) and White employees the lowest (71.88). This section was completed only by employees in a supervisory role. The finding indicates that Indian/Asian managers felt that they had a great influence in the innovation management process, while White managers felt that they had a lesser influence.

- Innovative leadership: Indian/Asian employees indicated the highest mean rank (122.00) and White employees the lowest (82.91). This section was only completed by employees in a supervisory role. The results show that Indian/Asian managers regarded innovation leadership as important drivers of EDI and creativity. Indian/Asian managers also engaged more in innovative leadership than White managers.

- Team innovation: Indian/Asian employees indicated the highest mean rank (117.00) and White employees the lowest (83.17). This section was only completed by employees in a supervisory role. This finding indicates that Indian/Asian managers were more satisfied with the innovative efforts of their teams than White managers. This finding might be linked to the previous factor and may indicate that managers who engage in innovative leadership might have teams that pursue innovation.

6.7.3 Age

A one-way between-groups analysis of variance (ANOVA) with post-hoc tests was used to determine whether statistically significant differences existed between the employees' age and their perceptions of supervisory behaviour, internal work environment and supervisory behaviour (management factors), and the influence thereof on EDI and creativity.

The results of the ANOVA with regard to age are shown in table 6.20. The different age categories were classified as follows:

1 = 27 to 35 years
2 = 36 to 45 years
3 = 46 to 55 years
4 = 55 to 65 years

Table 6.20: ANOVA for age groups

		F	Sig.
Supervisory support	Between groups	0.435	0.728
	Within groups		
Organisational innovation culture	Between groups	2.442	0.063
	Within groups		
Innovation mechanisms	Between groups	2.353	0.071
	Within groups		
Innovation opportunities	Between groups	1.894	0.129
	Within groups		
Risk-taking tolerance	Between groups	0.599	0.616

		F	Sig.
	Within groups		
Dedication to innovation	Between groups	3.584	0.014
	Within groups		
Management support	Between groups	1.019	0.386
	Within groups		
Innovation management	Between groups	0.919	0.433
	Within groups		
Innovative leadership	Between groups	0.814	0.487
	Within groups		
Team innovation	Between groups	3.456	0.018
	Within groups		

The results indicate that no significant differences existed between employees' age and organisational innovation culture and innovation mechanisms. Dedication to innovation and team innovation showed a statistically significant difference between employees' age groups.

To determine how the groups differed from each other regarding the above factors, the Tukey HSD multiple comparison tests (generally used in conjunction with an ANOVA) were used. Table 6.21 shows the results indicating the age groups among which differences were found.

Table 6.21: Post-Hoc test for age groups

Dependent variable	Age group categories	Age group categories	Mean difference	Sig.
Dedication to innovation	2	4	0.291*	0.014
	3	4	0.258*	0.033
	4	2	-0.291*	0.014
		3	-0.258*	0.033
Team innovation	2	3	-0.573*	0.012
	3	2	0.573*	0.012

Note: ** $p \leq .01$, * $p \leq .05$

A statistically significant difference was found between the age groups with regard to the following variables:

- Dedication to innovation showed a statistically significant difference between age group category 2 (36 to 45 years) and age group category 4 (55 to 65 years)

(p = 0.014), and between age group category 3 (46 to 55 years) and age group category 4 (55 to 65 years) (p = 0.033). The results indicate that employees in categories 2 and 3 (aged between 36 and 55 years) were more dedicated to innovation than older employees in category 4 (aged 55 to 65 years). This finding can be as a result of the older employees nearing retirement age and showing less dedication to innovation. Many older employees prefer the status quo and might be resistant when changes are introduced. This finding may also be an indication that young employees are more optimistic and eager to innovate than older employees.

- Team innovation showed a statistically significant difference between age group category 3 (46 to 55 years) and age group category 2 (36 to 45 years) (p = 0.012). This section was only completed by employees in a supervisory role and showed that supervisors in category 3 (aged 46 to 55 years) were more satisfied with their teams' innovative efforts than supervisors in category 2 (aged 36 to 45 years). Younger leaders may be more eager and set higher goals than older leaders, and as a result, younger leaders may not be as easily satisfied by the innovation efforts of their teams as older leaders. Older leaders may, however, have more innovation management experience and as a result be more satisfied with their teams' innovative efforts.

6.7.4 Post level

The ANOVA test was used to determine whether a statistically significant relationship existed between employees on different post levels and the variables focusing on EDI and creativity. The post levels were classified as follows:

P5 (Professor/Director)
P6 (Associate professor/Manager)
P7 (Senior lecturer/Specialist)
P8 (Lecturer/Administrative support)
P9 (Junior lecturer/Administrative support)

It should be noted that a large number of job titles is linked to each post level at the institution. The job titles listed above are merely examples of job titles linked to the various post levels to clarify the level/seniority of the levels. The results of the ANOVA test for the post levels are provided in table 6.22.

Table 6.22: ANOVA for post levels

		F	Sig.
Supervisory support	Between groups	0.653	0.625
	Within groups		
Organisational innovation culture	Between groups	9.590	0.000
	Within groups		
Innovation mechanisms	Between groups	5.503	0.000
	Within groups		
Innovation opportunities	Between groups	0.988	0.413
	Within groups		
Risk-taking tolerance	Between groups	5.636	0.000
	Within groups		
Dedication to innovation	Between groups	4.566	0.001
	Within groups		
Management support	Between groups	1.285	0.277
	Within groups		
Innovation management	Between groups	0.566	0.688
	Within groups		
Innovative leadership	Between groups	1.808	0.129
	Within groups		
Team innovation	Between groups	1.331	0.260
	Within groups		

The results indicate that significant differences existed between the various job levels with regard to organisational innovation culture, innovation mechanisms, risk-taking tolerance, and dedication to innovation.

To determine the groups that differed from the others regarding the above factors, the Tukey HSD multiple comparison tests (generally used in conjunction with an ANOVA) were used. Table 6.23 shows the results, indicating among which post level groups differences were found.

Table 6.23: Post-hoc test for post levels

Dependent variable	Post level	Post level	Mean difference	Sig.
Organisational innovation culture	5	9	-0.726**	0.001
	6	8	-0.485**	0.002
		9	-0.791**	0.000
	7	9	-0.563**	0.000
	8	6	0.485**	0.002
	9	5	0.726**	0.001
		6	0.791**	0.000
		7	0.563**	0.000
Innovation mechanisms	6	8	-0.425**	0.009
		9	-0.589**	0.000
	7	9	-0.400*	0.018
	8	6	0.425**	0.009
	9	6	0.589**	0.000
		7	0.400*	0.018
Risk-taking tolerance	5	9	-0.755**	0.004
	6	8	-0.412*	0.049
		9	-0.682**	0.001
	7	9	-0.396	0.070
	8	6	0.412*	0.049
	9	5	0.755**	0.004
		6	0.682**	0.001
		7	0.396	0.070
Dedication to innovation	5	9	-0.524**	0.003
	6	9	-0.378*	0.010
	7	9	-0.345**	0.009
	8	9	-0.270	0.069
	9	5	0.524**	0.003
		6	0.378*	0.010
		7	0.345**	0.009
		8	0.270	0.069

Note: ** $p \leq .01$, * $p \leq .05$

Statistically significant differences were found among the various post levels with regard to the following variables:

▪ Organisational innovation culture: The results show a significant difference between P8 and P6 (p = 0.002) and among P9 and the following three post levels, P5 (p = 0.001), P6 (p = 0.000), and P7 (p = 0.000). This finding indicates that employees on the two lower post levels (P8 and P9) felt that the institution had many innovative employees, that management encouraged innovation from all levels in the institution, and they believe that the bureaucratic hierarchy of the institution made provision for innovation. Employees on higher post levels (P5, P6

and P7), however, believed that the institution did not have an innovative culture and that the current culture limited employees' creative abilities.

- Innovation mechanisms: A statistically significant difference was found between P9 and two higher post levels, P7 ($p = 0.018$) and P6 ($p = 0.000$). This finding indicates that employees on P9 were more in favour of innovation mechanisms, such as social interactions and team communication to generate ideas than employees on P6 and P7. The results further show a statistically significant difference between P8 and P6 ($p = 0.009$). These results indicate that employees employed on post level 6, who generally have subordinates reporting to them, were focused on setting innovation in motion among their subordinates, even with limited innovation tools. Managers can provide opportunities for social interactions, provide the required resources, and create an innovation task team in the department/unit. This might be the reason why employees on P9 and P8 indicated that the institution did provide the tools to enable innovation. Idea generation at a higher level (e.g. P6) may, however, have more strategic value, and for this reason it is important that senior management provide middle management with the required tools. Supervisors should not only set innovation in motion within the department/unit, but should also engage in innovative behaviour.

- Risk-taking tolerance: A statistically significant difference was found between P8 and P6 ($p = 0.049$), and between P9 and P5 ($p = 0.004$) and P6 ($p = 0.001$). The results indicate that employees on P8 and P9 believed that the institution tolerated risk and that no negative consequences will come from failed efforts. The findings further indicate that employees on higher post levels (P5 and P6) were of the opinion that the institution did not tolerate risk-taking and that negative consequences might resulting from failed efforts. They might feel that taking risks could negatively impact on their positions and careers.

- Dedication to innovation: The results show a significance difference among P9 and the following three post levels P5 ($p = 0.003$), P6 ($p = 0.010$), and P7 ($p = 0.009$). This finding indicates that employees on P9 were more dedicated to innovation than employees on higher post levels (P5, P6 and P7). Employees on P9 were more open to accept changes to their job descriptions, and to participate in special innovation assignments than employees on the higher post levels. The reason for this might be related to the type of work and the stimulation that innovation offers. Employees on P9 may be more dedicated and open to innovation due to their daily

functions not being as stimulating and challenging as the work of employees on higher post levels (P5, P6 and P7). Employees on higher post levels may also be less dedicated to innovation than employees on lower levels as a result of a high workload with more responsibilities.

6.7.5 Academic/administrative department/unit

To determine whether statistically significant differences with regard to EDI and creativity existed among employees from academic and administrative departments/units, the independent t-test for independent groups was used. The mean values per department/unit appear in table 6.24 and the results of the t-test appear in table 6.21.

Notes: 1 = Academic, 2 = Administrative

Table 6.24: Mean values per department/unit (academic/administrative)

Department/unit		N	Mean	Standard deviation
Supervisory support	1	246	4.10	1.17
	2	378	4.20	1.13
Organisational innovation culture	1	246	3.39	1.11
	2	378	3.62	1.10
Innovation mechanisms	1	246	2.11	1.01
	2	378	2.27	1.12
Innovation opportunities	1	246	3.72	1.04
	2	378	3.74	1.19
Risk-taking tolerance	1	246	3.17	1.25
	2	378	3.49	1.26
Dedication to innovation	1	246	4.70	0.92
	2	378	5.08	0.79
Management support	1	53	4.77	0.72
	2	137	4.91	0.72
Innovation management	1	53	3.35	1.15
	2	137	3.51	1.05
Innovative leadership	1	53	4.30	0.97
	2	137	4.43	1.02
Team innovation	1	53	4.12	1.01
	2	137	4.14	1.04

The results of the t-test are shown in table 6.25.

Table 6.25: Independent t-test results for departments/units (academic/administrative)

		Levene's test for equality of variances		t-test for equality of means		
		F	Sig.	t	df	Sig. (2-tailed)
Supervisory support	Equal variances assumed	1.239	0.266	**-1.081**	**622**	**0.280**
	Equal variances not assumed			-1.073	509.56	0.284
Organisational innovation culture	Equal variances assumed	0.003	0.955	**-2.540**	**622**	**0.011**
	Equal variances not assumed			-2.535	519.70	0.012
Innovation mechanisms	Equal variances assumed	5.971	0.015	-1.814	622	0.070
	Equal variances not assumed			**-1.853**	**559.70**	**0.064**
Innovation opportunities	Equal variances assumed	10.918	0.001	-0.229	622	0.819
	Equal variances not assumed			**-0.236**	**572.14**	**0.814**
Risk-taking tolerance	Equal variances assumed	0.021	0.886	**-3.114**	**622**	**0.002**
	Equal variances not assumed			-3.118	525.45	0.002
Dedication to innovation	Equal variances assumed	15.535	0.000	-5.585	622	0.000
	Equal variances not assumed			**-5.398**	**463.22**	**0.000**
Management support	Equal variances assumed	0.890	0.347	**-1.195**	**188**	**0.234**
	Equal variances not assumed			-1.194	94.45	0.235
Innovation management	Equal variances assumed	0.455	0.501	**-0.876**	**188**	**0.382**
	Equal variances not assumed			-0.840	87.18	0.403
Innovative leadership	Equal variances assumed	0.025	0.875	**-0.823**	**188**	**0.411**
	Equal variances not assumed			-0.845	99.78	0.400
Team innovation	Equal variances assumed	0.004	0.947	**-0.147**	**188**	**0.883**
	Equal variances not assumed			-0.149	97.14	0.882

The null hypothesis of equal variances assumed could not be rejected (p = 0.05) for supervisory support, organisational innovation culture, risk-taking tolerance, management support, innovation management, innovative leadership, and team innovation. Equal variance for each of these variables (p > 0.05) can, therefore, be assumed. In the case of innovation mechanisms, innovation opportunities, and dedication to innovation, equal variances could not be assumed (p < 0.05).

The t-test results indicate the following:

- No statistically significant difference was found between academic and administrative department/unit employees in terms of their perceptions of

supervisory support, innovation opportunities, innovation mechanisms, innovation management, innovative leadership, and team innovation.

- Organisational innovation culture: The results indicate that a statistically significant difference existed between academic and administrative departments/units with regard to organisational innovation culture (F = 0.003; t (622) = -2.540; p ≤ .05). The average mean score of academic departments/units was 3.39 and the average mean score of administrative departments/units was 3.62. This finding indicates that employees in administrative departments/units felt more strongly about the statement that the institution did have an innovative culture than employees in academic departments/units.

- Risk-taking tolerance: The results for risk-taking tolerance (F = 0.021; t (622) = -3.114; p ≤ .01), however, show that a statistically significant difference existed between academic and administrative departments/units in terms of their perceptions of risk-taking tolerance. The average mean score of academic employees was 3.17 and the average mean score of administrative staff was 3.49. This finding indicates that staff from administrative departments/units agreed more with the idea that the institution supported risk-taking, and that no negative consequences would follow for failed efforts than academic staff.

- Dedication to innovation: The results for dedication to innovation (F = 15.535; t (463.22) = -4.398; p ≤ .01) show that a statistically significant difference existed between academic and administrative departments/units in terms of their dedication to innovation. The average mean score for academic departments/units was 4.70 and the average mean score for administrative departments/units was 5.08, which could indicate that administrative staff were more dedicated to innovation, or that being innovative could be easier in administrative departments/units than in academic departments/units. One possible reason why academic staff seemed to be less dedicated to innovation could be a result of the educational environment in which they operate. Tuition is governed by institutional policies and procedures, which often leaves little room for changing the status quo. Academics might thus feel that innovation might cause disruptions and lead to non-compliance with their research-based strategies, policies, and teaching expectations.

6.7.6 Supervisory status

To determine whether statistically significant differences existed between supervisors and non-supervisors, the independent t-test for independent groups was used. The mean values per supervisory status group are shown in table 6.26.

Notes: Supervisor = Yes, Non-supervisor = No

Table 6.26: Mean values for supervisory status (Yes/No)

	Supervisory status (Yes / No)	N	Mean	Standard deviation
Supervisory support	Yes	190	4.29	1.11
	No	434	4.11	1.16
Organisational innovation culture	Yes	190	3.52	1.09
	No	434	3.53	1.12
Innovation mechanisms	Yes	190	2.26	1.15
	No	434	2.18	1.04
Innovation opportunities	Yes	190	3.85	1.17
	No	434	3.68	1.11
Risk-taking tolerance	Yes	190	3.40	1.30
	No	434	3.34	1.25
Dedication to innovation	Yes	190	5.06	0.83
	No	434	4.87	0.87

The results of the t-test are shown in table 6.27.

Table 6.27: Independent t-test results for supervisory status (Yes/No)

Independent samples test		Levene's test for equality of variances		t-test for equality of means		
		F	Sig.	t	df	Sig. (2-tailed)
Supervisory support	Equal variances assumed	0.589	0.443	**1.750**	**622**	**0.081**
	Equal variances not assumed			1.780	374.96	0.076
Organisational innovation culture	Equal variances assumed	0.118	0.731	**-0.135**	**622**	**0.892**
	Equal variances not assumed			-0.137	370.05	0.891
Innovation mechanisms	Equal variances assumed	3.998	0.046	0.810	622	0.418
	Equal variances not assumed			**0.780**	**331.82**	**0.436**
Innovation opportunities	Equal variances assumed	1.204	0.273	**1.656**	**622**	**0.098**
	Equal variances not assumed			1.621	343.60	0.106

Independent samples test						
		Levene's test for equality of variances		t-test for equality of means		
		F	Sig.	t	df	Sig. (2-tailed)
Risk-taking tolerance	Equal variances assumed	0.592	0.442	**0.560**	**622**	**0.576**
	Equal variances not assumed			0.552	348.30	0.582
Dedication to innovation	Equal variances assumed	0.310	0.578	**2.493**	**622**	**0.013**
	Equal variances not assumed			2.538	375.95	0.012

The null hypothesis of equal variances assumed could not be rejected (p = 0.05) for supervisory support, organisational innovation culture, innovation opportunities, risk-taking tolerance, and dedication to innovation. Equal variance for each of these variables (p > 0.05) can, therefore, be assumed. In the case of innovation mechanisms equal variances could not be assumed (p < 0.05).

The t-test results indicate the following:

- No statistically significant difference was found between supervisors and non-supervisors in terms of supervisory support, organisational innovation culture, innovation mechanisms, innovation opportunities, and risk-taking tolerance.

- Dedication to innovation (F = 0.310; t (622) = 2.493; p ≤ .05) was the only variable with a statistically significant difference between supervisors and non-supervisors. The average mean score was 5.06 for supervisors and 4.87 for non-supervisors. This finding suggests that supervisors were more dedicated to innovation than non-supervisors. Supervisors may be more dedicated to inspiring employees to engage in innovative behaviour than non-supervisors. Supervisors may also be more enthusiastic about innovation and its benefits and more actively participate in innovation than non-supervisors.

6.7.7 Qualifications

The ANOVA test was used to determine whether a statistically significant relationship existed between educational qualifications and the variables focusing on EDI and creativity. The results of the ANOVA test for educational qualification are provided in table 6.28.

Table 6.28: ANOVA for qualifications

		F	Sig.
Supervisory support	Between groups	0.931	0.472
	Within groups		
Organisational innovation culture	Between groups	4.331	0.000
	Within groups		
Innovation mechanisms	Between groups	2.865	0.009
	Within groups		
Innovation opportunities	Between groups	0.940	0.465
	Within groups		
Risk-taking tolerance	Between groups	5.587	0.000
	Within groups		
Dedication to innovation	Between groups	4.839	0.000
	Within groups		
Management support	Between groups	1.426	0.207
	Within groups		
Innovation management	Between groups	0.791	0.578
	Within groups		
Innovative leadership	Between groups	1.141	0.340
	Within groups		
Team innovation	Between groups	0.761	0.601
	Within groups		

The results indicate that for the internal environment variables, organisational innovation culture, risk-taking tolerance, and dedication to innovation, qualifications played a statistically significant role.

To determine which specific groups differed from the others with regard to the above findings, the Tukey HSD multiple comparison tests (generally used in conjunction with an ANOVA) were used. Table 6.29 shows the results, indicating between which of the qualifications groups the differences were found. The educational levels are classified as follows:

Grade 12 = Grade 12
HC = Higher certificate
Diploma = Diploma or advanced certificate
Degree = Degree
Honours = Honours degree

Masters = Master's degree

Doctoral = Doctoral degree

Table 6.29: Post-hoc test for qualifications

Dependent variable	Qualification	Qualification	Mean difference	Sig.
Organisational innovation culture	Grade 12	Doctoral	0.546	0.081
	HC	Masters	0.602	0.064
		Doctoral	0.902**	0.001
	Diploma	Doctoral	0.551*	0.022
	Degree	Doctoral	0.452	0.058
	Masters	HC	-0.602	0.064
	Doctoral	Grade 12	-0.546	0.081
		HC	-0.902**	0.001
		Diploma	-0.551*	0.022
		Degree	-0.452	0.058
Innovation mechanisms	Grade 12	Doctoral	0.531	0.085
	Diploma	Doctoral	0.540*	0.022
	Doctoral	Diploma	-0.540*	0.022
		Grade 12	-0.531	0.085
Risk-taking tolerance	Grade 12	HC	0.908*	0.033
		Masters	0.658*	0.041
		Doctoral	0.813**	0.005
	HC	Grade 12	-0.908*	0.033
		Degree	-0.820*	0.027
	Diploma	Doctoral	0.624*	0.023
	Degree	HC	0.819*	0.027
		Masters	0.569*	0.015
		Doctoral	0.724**	0.001
	Masters	Grade 12	-0.658*	0.041
		Degree	-0.569*	0.015
	Doctoral	Grade 12	-0.813**	0.005
		Diploma	-0.624*	0.023
		Degree	-0.724**	0.001
Dedication to innovation	Grade 12	Doctoral	0.480*	0.030
	HC	Doctoral	0.509*	0.039
	Diploma	Doctoral	0.541**	0.001
	Degree	Doctoral	0.397*	0.020
	Honours	Doctoral	0.454**	0.001
	Masters	Doctoral	0.333*	0.015
	Doctoral	Grade 12	-0.480*	0.030
		HC	-0.509*	0.039
		Diploma	-0.541**	0.001
		Degree	-0.397*	0.020
		Honours	-0.454**	0.001
		Masters	-0.333*	0.015

Note: ** p ≤ .01, * p ≤ .05

No statistically significant difference was found among the various qualifications and organisational innovation culture or innovation management. A statistically significant difference was found between the various qualifications with regard to the following variables:

- Organisational innovation culture: A statistically significant difference was found between the employees holding a diploma and employees holding a doctoral degree ($p = 0.022$) and between those employees holding a higher certificate and employees holding a doctoral degree ($p = 0.001$). This finding indicates that employees with a doctoral degree felt that the institution did not have a suitable innovative culture to stimulate EDI and creativity. The employees with a diploma or higher certificate, however, believed that the institution did have an innovative culture. This finding can perhaps be linked to the level of education and can indicate that employees holding doctoral degrees have a more formal education and know which factors contribute to and make up an innovative culture. The level of qualification can perhaps also be linked to the position of the employee in the organisation. An employee that holds a doctoral degree is on a higher level with subordinates reporting to the position. These positions deal with organisational goals on a more strategic level and these employees might feel that the culture is not beneficial to innovation or sufficient to achieve the strategic innovation goals of the institution.
- Innovation mechanisms: A statistically significant difference was found between employees holding a diploma and employees holding a doctoral degree ($p = 0.022$). This finding shows that employees who hold a diploma indicated that the institution provided the tools to be innovative, e.g. time for social interactions, available resources, and innovation tasks teams. Employees who hold a doctoral degree showed a less favourable response to the innovation mechanism statements. Doctoral employees engaged in fewer social interactions and suggested that the institution did not have the mechanisms in place to support innovation.
- Risk-taking tolerance: A statistically significant difference was found between employees holding a Grade 12 certificate and employees holding the following three qualifications; higher certificate ($p = 0.033$), master's degree ($p = 0.041$) and doctoral degree ($p = 0.005$). A statistically significant difference was found between

employees holding a diploma and those holding doctoral degrees (p = 0.023), and between employees holding a degree and those holding a higher certificate (p = 0.027), those holding master's degrees (p = 0.015), and those holding doctoral degrees (p = 0.001). This finding indicates that employees with lower qualifications (Grade 12, diploma and degree) felt that the institution tolerated risk-taking and that employees did not have to fear any negative consequences from failed efforts. Employees holding a higher certificate, a master's or a doctoral degree, on the other hand felt, that the risk-taking tolerance of the institution was low and that there were consequences for failed efforts. The general finding was that employees with higher qualifications (master's and doctoral degrees) felt that the institution was less in favour of taking risk compared to employees with lower qualifications. Employees holding higher certificates, however, fell in the same category as those holding master's and doctoral degrees, and when compared to employees with degrees, showed that the institution did not support risk-taking. This finding can further be linked to the position and level of responsibility. Failed innovation at a high level (doctoral employees in management positions), can be linked to greater risk as well as financial losses when compared to the risk of ideas generated at lower levels. Employees in higher position who hold higher qualifications may also believe that the negative consequences for high-risk innovations are greater.

- Dedication to innovation: A statistically significant result was found between employees holding doctoral degrees and those holding any of the other qualifications; Grade 12 certificate (p = 0.030), higher certificate (p = 0.039), diploma (p = 0.001), degree (p = 0.020), honours (p = 0.001) and master's degrees (p = 0.015). This finding shows that employees holding qualifications lower than doctoral degrees were more dedicated to innovation than employees with doctoral degrees. This finding can perhaps be linked to the level of qualification and age. Employees with a doctoral degree are generally older employees, who might be less dedicated to innovation and more resistant to changes that might cause disturbances in their daily functions. As more senior positions imply in a higher workload with less time for innovation, this finding van possible linked to workload as well.

6.8   ADDED COMMENTS BY RESPONDENTS

Respondents were provided with an opportunity to provide additional comments by completing a free-form text data field. The comments field was marked as an optional field (not mandatory) and 161 detailed comments were collected.

The analysis of the comments did not address any of the research aims, and for this reason the comments were not analysed in detail. A brief overview is provided although it is clear that a full analysis, focusing on themes and linking them to the demographic information, could provide useful information to institutions who wish to embark on innovation initiatives.

In the following sections the two methods used to briefly analyse and report on the free-form text data obtained are discussed.

6.8.1   Word cloud

The data were first analysed using a word cloud. A word cloud is a visualisation that displays key words in text. The words are written closely together in a word cloud and the font size is an indication of the occurrence at which the words appear in the text. A word cloud is the most simplistic, fastest, and cost-effective approach to analysing text data (Bock, 2019). Figure 6.4 illustrates the word cloud.

Note: The researcher understands the limitation of tools based on word frequencies. The visualisation was purely completed to create a fun visual from frequent text in the data and was not aimed at replacing qualitative analysis.

Figure 6.4: Word cloud of free-form text keywords

6.8.2 Manual text analysis

The data text was manually analysed, and a list of categories developed. Post-levels were selected from the demographic variables to report on as it would provide valuable insight into which factors employees in higher and lower post levels identified as having an impact on EDI and creativity. The data were analysed against the two highest post levels, P5 (Professor/Director) and P6 (Associate professor/Manager), and the lowest post level, P9 (Junior lecturer/Administrative support). The statements were divided according to the selected post levels and analysed against the identified categories. The results are presented in three tables.

a) Employees on P5

Table 6.30 indicates a brief overview of the responses received from employees on P5 (Professor/Director) in the free-form text field.

Table 6.30: Manual text analysis for employees on P5

	POST LEVEL 5 (PROFESSOR/DIRECTOR)
	SUMMARY OF COMMENTS
CATEGORY	**Organisational structure** ▪ Bureaucratic organisation has a negative impact on innovation ▪ Lengthy hierarchical approval structure **Management** ▪ Lack of management support for innovation ▪ Manager is not a role model and does not innovate ▪ Manager works independently and does not support staff ▪ Absenteeism misuse by management ▪ Managers feel intimidated by innovative suggestions ▪ Lack of leadership **Work environment** ▪ Work environment is not conducive to innovation ▪ Policies and procedures limit flexibility to be innovative ▪ Lack of interdepartmental teamwork ▪ Working with out-dated innovations ▪ Politics are killing the institution **Workload** ▪ High workload hampers innovation ▪ Staff are being outsourced resulting in high workloads **Resources: Systems** ▪ Lack of systems and technical issues ▪ Ineffective IT department **Risk-taking tolerance** ▪ Fear of taking risk ▪ Negative consequences linked to failed innovations **Unions** ▪ Unions restrain innovation ▪ Union and student actions stifle innovation

b) Employees on P6

Table 6.31 indicates a brief overview of the responses received from employees on P6 (Associate professor/Manager) in the free-form text field.

Table 6.31: Manual text analysis for employees in P6

POST LEVEL 6 (ASSOCIATE PROFESSOR/MANAGER)		
SUMMARY OF COMMENTS		

<table>
<tr><td rowspan="40">CATEGORY</td><td colspan="2">Organisational structure</td></tr>
<tr><td colspan="2">▪ Lengthy hierarchical approval structure resulting in outdated ideas
▪ The institution is too bureaucratic
▪ Heavy bureaucracy stifles creativity and innovation
▪ Too many levels of decision-making stifle new ideas</td></tr>
<tr><td colspan="2">Management</td></tr>
<tr><td colspan="2">▪ Lack of management support for innovation
▪ Manager and employees work independently from one another
▪ Lack of willingness from management to implement innovation
▪ Lack innovation. The institution is following, not leading
▪ The institution does not care about individual employees' innovation
▪ Management regard control as more important than innovation
▪ Management is not focused on innovation
▪ Management do not make or drive decisions about innovation and hide behind policies and procedures
▪ Too few executors (successfully implementing an idea) at the institution</td></tr>
<tr><td colspan="2">Work environment</td></tr>
<tr><td>▪ Employees are resistant to change
▪ Innovation is seen as a threat
▪ Conflict as a result of diversity
▪ Lack of teamwork
▪ Lack of interdepartmental teamwork
▪ Departments work in silos
▪ To many processes to follow
▪ Too many rules. Lack of flexibility
▪ Lack of time to be innovative
▪ Innovation is a by-product as a reaction to solving problems</td><td>▪ Red-tape is a stumbling block
▪ Workplace limits innovation
▪ More informal sessions to encourage creative and innovative ideas should be scheduled
▪ Policies, rules and regulations stall innovation
▪ Politics and blocked communication
▪ Ineffective processes
▪ Politics stifle institution</td></tr>
<tr><td colspan="2">Workload</td></tr>
<tr><td colspan="2">▪ High workload results in no dedicated time for innovation
▪ Daily functions are deadline-driven resulting in constant crisis management – no time for innovation</td></tr>
<tr><td colspan="2">Resources: People</td></tr>
<tr><td colspan="2">▪ Losing skilled personnel because of the contract system
▪ Lack of staff making it difficult to implement new ideas</td></tr>
<tr><td colspan="2">Resources: Systems</td></tr>
<tr><td colspan="2">▪ Lack of systems, integration and system limitations
▪ IT department unresponsive to innovative ideas
▪ Lack of online systems. Many manual processes</td></tr>
<tr><td colspan="2">Resources: Funding</td></tr>
<tr><td colspan="2">▪ Lack of funding hinders innovation
▪ Difficult to get funding for innovation</td></tr>
<tr><td colspan="2">Training and Development</td></tr>
<tr><td colspan="2">▪ More training should be provided on creativity and innovation
▪ Lack of formal innovation training
▪ Insufficient training funds provided
▪ Lack of training opportunities focused on innovation</td></tr>
<tr><td colspan="2">Unions</td></tr>
<tr><td colspan="2">▪ Innovation is not possible as the institution is managed by unions</td></tr>
</table>

c) Employees on P9

Table 6.32 indicates a brief overview of the responses received from employees on P9 (Junior lecturer/Administrative support) in the free-form text field.

Table 6.32: Manual text analysis for employees on P9

	POST LEVEL 9 (JUNIOR LECTURER/ADMINISTRATIVE SUPPORT)
	SUMMARY OF COMMENTS
CATEGORY	**Organisational structure**
	▪ Bureaucracy limits innovation
	Management
	▪ Supervisors are not open to change
	▪ Supervisors do not engage in discussion with subordinates
	▪ Management use their position and power to intimidate, influence and bully employees resulting in less innovation
	▪ Management does not involve lower level employees in the decision-making process
	▪ Lack of leaders in strategic positions
	▪ Management limits the growth of employees and interdepartmental exposure
	▪ Management turn down good innovative ideas to improve delivery
	Work environment
	▪ Diversity results in resistance to change
	▪ Communication breakdown in the entire institution
	▪ Ineffective processes
	▪ Policies guide innovation
	▪ Lack of promotional opportunities in the administrative department
	▪ Qualifications should be used as a basis for promotions for support staff
	▪ A good environment is required to be innovative
	▪ Lack of communication or sessions aimed at encouraging innovation
	▪ Resistance to change by older workers
	Workload
	▪ Innovation is limited due to high workloads
	▪ Large amount of administrative work in the academic departments results in less innovation
	Resources: People
	▪ Political appointment instead of qualified supervisors
	▪ Lack of innovative/creative workers
	Resources: Systems
	▪ Systems do not allow flexibility
	▪ Ineffective systems
	Training and development
	▪ Low-level employees denied training opportunities resulting in low self-esteem
	Unions
	▪ Institution is driven by unions

6.9 RESEARCH AIMS AND STATISTICAL PROCEDURES USED

Table 6.33 is a summary of the research aims and statistical procedures used in this study.

Table 6.33: Research aims and statistical procedures used

EMPIRICAL RESEARCH AIM	STATISTICAL PROCEDURE
Research aim 1: To determine the constructs of supervisory behaviour that influence EDI and creativity.	**DESCRIPTIVE STATISTICAL ANALYSIS** Exploratory factor analysis Cronbach's alpha Means Standard deviations Skewness Kurtosis Frequencies
Research aim 2: To determine the constructs of the internal work environment that influence EDI and creativity.	
Research aim 3: To determine the relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity.	**INFERENTIAL STATISTICS** Correlation analysis Structural equation modelling (SEM)
Research aim 4: To determine whether demographic characteristics have an influence on supervisory behaviour, internal work environment behaviour, and employees' innovation and creativity.	**INFERENTIAL STATISTICS** Tests for significant mean differences (ANOVA, t-test, Kruskal Wallis)
Research aim 5: To make recommendations regarding supervisory behaviour and creating enabling work environments to enhance and support EDI and creativity.	Interpretation and integration of research findings

6.10 SUMMARY

In this chapter the descriptive statistics, which included factor analysis, were discussed. Additional discussions focus on inferential statistics namely correlation analysis, tests for significant mean differences, and structural equation modelling. The statistics were used to integrate the findings in the literature review with the findings in the empirical research study. The results affirm that the empirical research aims of the study were reached. Chapter 7 covers the conclusion, contribution, recommendations, and limitations of the study and concludes this study.

CHAPTER 7 – FINDINGS AND RECOMMENDATIONS

In this chapter a conclusive and holistic view of the study are presented.

7.1 INTRODUCTION

This chapter starts with a brief review of the reasons for this study, followed by the conclusions based on the research findings of each research aim. Recommendations for future research are discussed as well as the contribution that the study has made to research in the field of human resource management. Specific contributions of the study towards understanding the influence of supervisory behaviour and the internal work environment on EDI and creativity at the ODeL institution in South Africa are also provided. The chapter concludes with a discussion of the limitations of the study and a summary of the chapter.

The empirical study concludes with the formulation of research conclusions and recommendations. In this chapter issues for future research based on the empirical research findings, and address research aim 5 are identified.

- **Research aim 5:** To make recommendations regarding supervisory behaviour and creating enabling work environments to enhance and support EDI and creativity.

7.2 REASONS FOR UNDERTAKING THE RESEARCH

The 21st century has brought many changes and new challenges. The need for innovative and creative problem-solving in response to all kinds of new problems are in high demand. Even though many organisations are focused on innovation, a large number of barriers within organisations still hamper EDI and creativity. Innovations created by employees are known as EDI and creativity. The study placed specific emphasis on the impact that supervisory behaviour and the internal work environment have on EDI and creativity.

The literature reveals that innovation is regarded as a key driver for innovative success. Organisations that do not prioritise innovation and creativity, and do not have a culture fostering innovative behaviour will find it difficult to survive in these turbulent times. The innovative ability of an organisation relies heavily on all its employees at all levels of the organisation. The employees within the organisation are best suited to present new or improved innovative ideas in response to their daily tasks and issues. These employees are also responsible for the implementation of such innovations and are vital in establishing an innovative culture. Supporting and encouraging a bottom-up approach to innovation will result in more empowered employees and less resistance to changes. Employees will feel more empowered when they are involved in the decision-making process and are offered more autonomy and freedom, and will engage in more innovative behaviour when provided with more complex tasks. Organisations should make innovation a central part of the culture and design processes, procedures, and guidelines that will enable and foster innovation. Communication is also vital for an innovative culture. Organisations that are too bureaucratic have long hierarchical approval processes, which may not only result in missed innovative opportunities because of delays and a lack of communication, but also to missing out on a potential competitive advantage. To survive, organisations should be able to respond to change faster, and organisations with a culture that fosters innovation will be able to respond with effective innovative ideas.

From the literature it is clear that any person has the ability to be creative and engage in innovative behaviour. Employees can be trained to further develop their creative ability. Investing in innovation training, not only for employees but also for managers, will further ensure that EDI and creativity are encouraged, supported, and promoted. Managers will then be able to develop the creative ability of their employees even further through coaching, acknowledgement, recognition, and rewards. Management should act as role models and encourage employees to engage in innovative behaviour and to work as a team towards the objectives and vision of the organisation. The literature discusses different leadership styles and their impacts, and identifies the best style that could assist organisations in enhancing the innovative ability of employees and promote the creation of an innovative culture.

Because innovation is linked to risk, many managers are resistant to the idea of innovation and prefer to adhere to the status quo and traditional ways of doing things. Management might also prefer to focus on short-term objectives, with less risk and quick returns, rather than to invest in the long-term objectives of innovation that might be linked to risk and possible failure. Managers might think that such failures can result in a loss of power, status or even their jobs. Innovative failures are, however, not always bad as can be seen from highly successful organisations, like Google, that not only regard failure as a learning opportunity, but even reward innovation failures. For them, rewarding failure provides wonderful learning opportunities, and will also lead to more innovation as employees will not be afraid to come up with new or even radical ideas. Organisations with solid innovation cultures will be able to create innovative ideas faster than their competition who do not have innovation cultures. Organisations with innovative cultures, where management supports and the internal work environment enables innovation, will provide a stimulating atmosphere for employees where a steady flow of ideas are encouraged, accepted, implemented, and rewarded. Without employees, innovation cannot take place and organisations will not be able to survive. Organisations should realise the importance of employee innovation and should work harder to retain innovative employees, as movement from one employer to another occurs without much consideration in the new world of work.

It is easy for competitors to copy new innovative products, but it is extremely difficult to copy an innovative culture. This indicates that an innovative organisational culture (which includes supervisory behaviour and the work environment), and innovative employees are perhaps the most important assets that an organisation can obtain, and such a culture should be fostered.

7.3   CONCLUSIONS BASED ON THE RESEARCH FINDINGS

The study was exploratory in nature and provides valuable insights into determining whether supervisory behaviour and the internal work environment had an impact on EDI and creativity in an ODeL institution in South Africa. This section focuses on the contributions drawn from the empirical study. The statistical results provide support for the research aims identified in chapter 1.

7.3.1 Conclusions drawn from research aim 1

Research aim 1: To determine the constructs of supervisory behaviour that influence EDI and creativity.

Research aim 1 focused on supervisory behaviour and its influence on EDI and creativity. The researcher believes that by accurately determining the factors that constitute supervisory behaviour, the institution where the study was conducted could incorporate these factors into their innovation strategies and provide the required innovation management training to supervisors. This could increase the innovative and creative efforts of supervisors and employees, assist the institution to achieve its strategic goals focused on innovation, and ultimately gain a competitive advantage. The questionnaire used comprised of two parts that addressed research aim 1. Section B: Supervisory behaviour, in the questionnaire was completed by all the respondents and focused on supervisory support. Section D: Supervisory behaviour (Management factors), was only completed by respondents in supervisory positions and focused on management factors. The factors identified in the study are shown in figure 7.1.

Figure 7.1: Supervisory behaviour factors
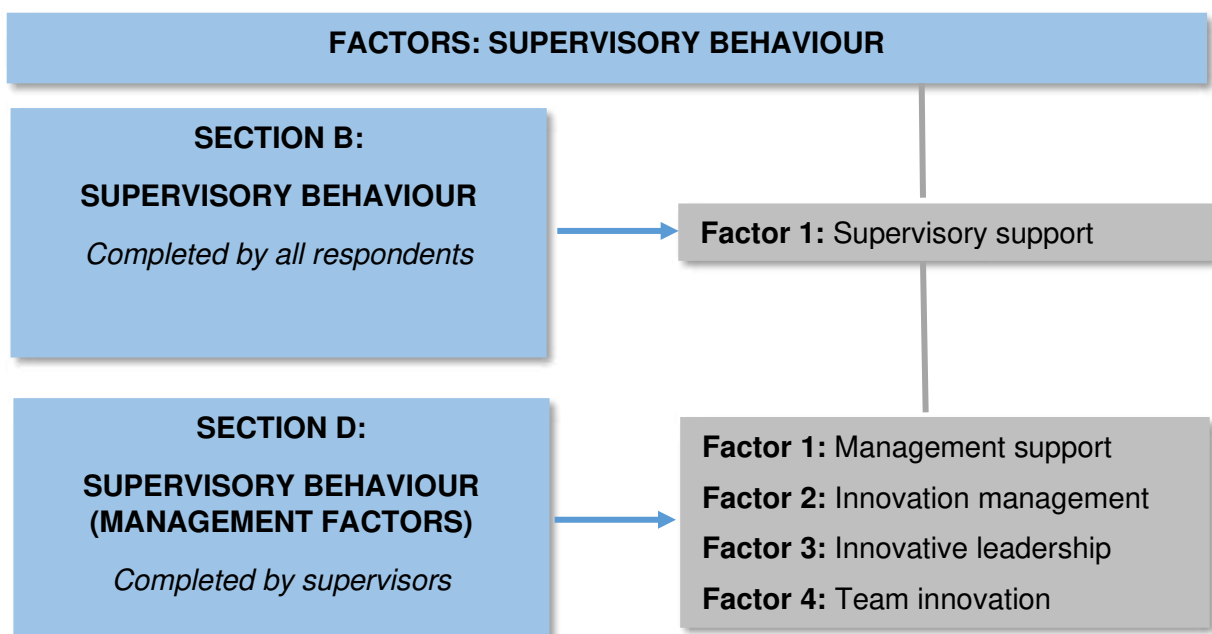
The findings from each category are discussed briefly in the section below.

- Supervisory support: Supervisory support refers to the perceived level of encouragement and support that employees receive from supervisors regarding their concerns, work performance, and innovation efforts (see 3.4 and 3.4.1). The results indicate that employees slightly agreed with the statement that supervisors provided support for innovation (see 3.4 and 6.4), but that this support could be improved. The institution should invest in providing supervisors with the necessary tools to support employees in their innovative efforts and to inspire their subordinates (see 3.4.3). Supervisors should act as role models (see 3.4.5) and be equipped with the necessary coaching and development skills to increase the innovative ability of employees (see 3.4.6). The institution should further focus on developing supervisors to provide the necessary acknowledgement and recognition, and a rewards programme should be put in place to further stimulate innovative behaviour from employees (see 3.4.7).

- Management support: Management support refers to the willingness of senior management to promote innovative behaviour and encourage employees to think in new, innovative ways (see 3.4.4 and 3.4.8). Of the five factors identified, the results for management support was the highest (see 6.4), which indicated that management did provide support (see 3.4.2), perhaps not enough, to optimise EDI and creativity. Management should provide more freedom to innovate and support failed innovative attempts (see 3.4.2) so that employees do not fear negative consequences as a result of failed efforts, but rather regard such as learning opportunities (see 4.4.6 and 4.4.8).

- Innovation management: Innovation management is a combination of the management of innovation processes and change management. It refers to the power of management to influence employees (see 3.6.1) and to implement innovations. The innovation management items, completed by supervisors, showed a slight agreement with the statements provided. This finding (see 6.4) indicates that supervisors were of the opinion that they did not have the required power to decrease the bureaucracy effects on innovation or to minimize the rules stifling innovation (see 3.6.2). Creating processes that support innovation (see 3.6.1) and providing sufficient resources to explore innovative ideas (see 3.6.3). also remained a challenge.

- Innovative leadership: Innovative leadership refers to the ability of leaders to think and influence others to create new and better ideas to move toward positive results (see 3.4.3). The results (see 6.4) indicate that supervisors slightly agreed with the statements provided. Supervisors did engage in innovative leadership, but with sufficient innovation leadership training, supervisors would equip themselves with the appropriate tools to inspire employees with an innovation vision (see 3.4.3) and model innovative behaviour for employees to emulate (see 3.4.5). Innovative leadership training will teach supervisors how important it is to provide employees with time, freedom and challenging tasks to increase their innovative behaviour (see 3.6.3). These supervisors will also gain the required skills to coach staff (3.4.6) and provide feedback on failed innovative efforts.

- Team innovation: Team innovation refers to an atmosphere that focuses on innovation, with a vision and shared goals, where participation and innovation support is provided. Of the five factors identified, the results for team innovation were the lowest (see 6.4), which indicate that teamwork was not grounded on an atmosphere focusing on innovation generation in line with a vision and shared goals (see 3.5.1 and 3.5.2). The institution should emphasise team innovation (including interdepartmental innovation) and create a sufficient atmosphere where team members are encouraged to move out of their comfort zones and are supported to participate in innovation (see 3.4.2). The institution's diverse workforce (see 3.3 and 3.5.2) is one of its biggest assets and encouraging teamwork focused on innovation should be prioritised as it will result in new or better ways of working.

Employees engaged in innovative and creative behaviour require encouragement and support from their supervisors as well as senior management. Employees should be able to share their innovation efforts and concerns with management. Management should encourage the involvement of employees in the innovation and decision-making process, which will not only result in reduced resistance to change, but also ensure faster response times to changes. For EDI and creativity to be successful, management should support and encourage innovative behaviour and provide the required resources. Supervisors should be trained to become role models who are actively involved in innovation. Supervisors should further be able to influence the decision-making process, alter and minimize rules and bureaucracy that hinder

innovation, and coach and encourage new ways of thinking. Teamwork should be encouraged as the benefits of innovation by a diverse workforce can lead to great innovations. Innovative efforts should be acknowledged and rewarded and failed innovative efforts should be treated as a learning opportunity.

Supervisory behaviour not only impacts the innovative ability and efforts of employees but has a direct impact on the success and competitiveness of an organisation. The fourth industrial revolution, which focusses on artificial intelligence, robotics, virtual reality, and the internet of things (IoT) is changing the way work is being done and management will need to make innovation in the workplace, by all employees, a top priority to survive. The five supervisory behaviour/management factors (supervisory support, management support, innovation management, innovative leadership, and team innovation) are important areas for the institution to improve on to ensure organisational growth and survival in a changing world.

7.3.2 Conclusions draws from research aim 2

Research aim 2: To determine the constructs of the internal work environment that influence EDI and creativity.

Research aim 2 focused on the internal work environment and its influence on EDI and creativity. The researcher believes that by accurately determining the innovative factors that constitute the internal work environment, the institution where the study was conducted could work towards creating an internal work environment more conducive to EDI and creativity.

The internal work environment section in the questionnaire was completed by all the respondents. The factors identified in the study are shown in figure 7.2.

Figure 7.2: Internal work environment

FACTORS: INTERNAL WORK ENVIRONMENT

| SECTION C: INTERNAL WORK ENVIRONMENT | → | **Factor 1:** Organisational innovation culture
Factor 2: Innovation mechanisms
Factor 3: Innovative opportunities
Factor 4: Risk-taking tolerance
Factor 5: Dedication to innovation |
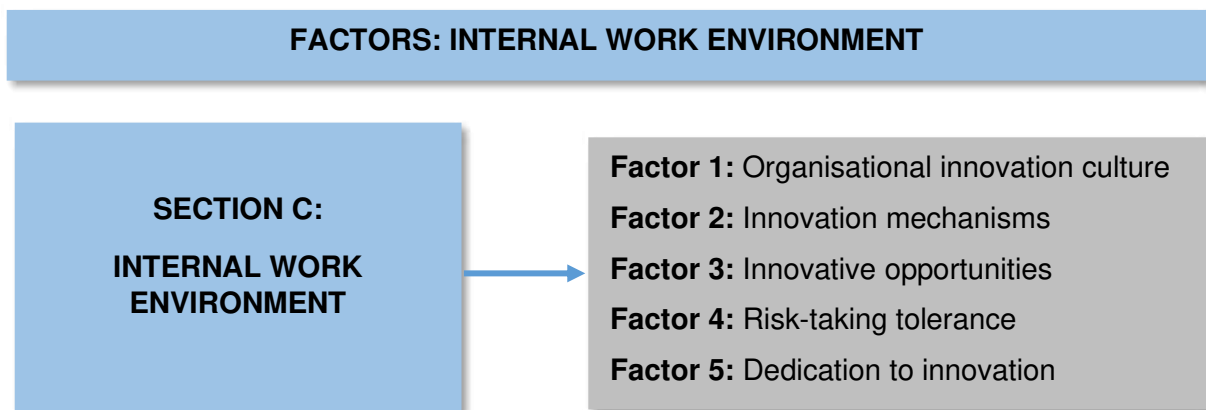
- Organisational innovation culture: An organisational innovation culture refers to different elements, such as aligning innovations to the organisational vision, mission, values, and objectives of the organisation (see 4.2). The results (see 6.4) indicate that employees slightly agreed that the institution had an innovative culture. The results also indicate that bureaucratic and hierarchical structures (see 4.3) hampered innovation through too many rigid policies, procedures, rules, and lengthy approval processes. Employees' enthusiasm for innovation and communication were thus hampered by the structure. The institution should focus on creating an innovation culture (see 4.4.1) which will result in more EDI and creativity. Communication (see 4.4.3) within teams and across departments/units (see 4.4.5) should be encouraged to exchange ideas and gain new perspectives. The institution should provide innovation training (see 4.4.6) to all employees to understand their roles in working towards achieving the objectives of the institution. The institution should also establish a recognition and reward system for EDI (see 4.4.8) to further stimulate innovative behaviour.

- Innovation mechanisms: Innovative mechanisms refers to elements setting innovations in motion with a specific focus on the social components of the innovation process. Of the five factors identified, the results for innovation mechanisms were the lowest (see 6.4), which indicates that the social components and active participation (see 4.4.4) in the innovation process were not present. Applying methods that encourage creative actions (see 4.5) such as internal competitions to encourage the generation of ideas, suggestion schemes, and

innovative task teams were not being utilised. The institution should aim to establish such innovation mechanisms to set innovation in motion.

- Innovative opportunities: Innovative opportunities refers to a set of different elements enabling employees to identify, act upon and realise new combinations of resources and needs, and try to benefit from their future potential. The results of the study indicate that employees slightly agreed with the statements related to innovative opportunities. To increase the innovative opportunities, supervisors should provide employees with more complex and stimulating work tasks as well as autonomy to make decisions (see 4.7), and more time to engage in innovative work (see 4.6). Employees should be provided with the necessary training to keep their knowledge up to date (see 4.4.6), and to learn creative thinking skills. Informal interaction between employees and between departments/units (see 4.4.3, 4.4.4 and 4.4.5) should be encouraged as this will lead to shared ideas and new perspectives.

- Risk-taking tolerance: Risk tolerance concerns both the probabilities of inherent risk occurrences and the resulting impact of those occurrences (see 4.4.2). The results of the study indicate that employees were afraid of taking risks and feared the consequences of failed ideas. They felt that the organisation did not tolerate errors and that conflict was not used constructively to promote creativity and innovation. The institution should create a culture that encourages risk-taking and tolerates errors where employees can learn from failed ideas (see 4.4.6 and 4.4.8). Employees should not fear any negative consequences when their ideas fail, as this will hamper new innovative behaviour (see 4.4.1).

- Dedication to innovation: Dedication to innovation refers to work practices aimed at encouraging employees at all levels of the organisation to welcome creativity and innovation into their daily functions, to be enthusiastic about innovation and its benefits, and to actively participate in innovation (see 4.8). From the five factors identified, dedication to innovation scored the highest. Employees agreed with the statements related to dedication to innovation. They were open to changes in their job descriptions to include innovation as an official task, and they would welcome assignments challenging them to be more creative. Employees who are allocated complex tasks, autonomy, and time will engage in more innovative activities and behaviour (see 4.7). Welcoming innovative ideas from employees and involving them in the decision-making process of innovation will lead to less resistance and

more dedication to innovation (see 4.4.7, 4.7 and 4.8). This finding is significant: it indicates that employees are dedicated to innovation, and that, with the correct changes to supervisory behaviour, a constant flow of ideas, which may have a direct impact on performance and the success of the organisation, may result.

To create an innovative culture the organisation should make employee-driven innovation and creativity a central part of the culture. Management should encourage employees' innovation, and negativity should be avoided. Teamwork and effective communication channels should be established, and employees should be encouraged to challenge the status quo and old traditional behaviour and attitudes. Risk-taking behaviour should be encouraged, and employees should not have to fear any negative consequences to failed ideas, as this would hamper future innovation. The culture should further provide freedom and flexibility to share ideas among teams and departments/units. Employees who are dedicated to innovation are a valuable resource to any organisation and should be fostered and developed to achieve organisation success. The five internal work environment factors (organisational innovation culture, innovation mechanisms, innovation opportunities, risk-taking tolerance, and dedication to innovation) are important areas for the institution to improve on to increase EDI and creativity, and to ensure organisational growth and survival.

7.3.3 Conclusions draws from research aim 3

Research aim 3: To determine the relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity.

Research aim 3 focused on determining the relationship between supervisory behaviour and the internal work environment with regard to EDI and creativity. This research aim was investigated using correlation statistics.

The factor of Section B: Supervisory behaviour, and Section D: Supervisory behaviour (Management factors), were correlated with Section C: Internal work environment, to determine the relationship between the various variables. All the relationships were significant (see 6.5) as shown in table 7.1.

Table 7.1: Significant statistical relationships (large effect)

Section B: Supervisory behaviour & Section D: Supervisory behaviour (Management factors)	Internal work environment	Correlation r-value
Management support	Dedication to innovation	.562**
Innovation management	Organisational innovation culture	.687**
	Innovation opportunities	.587**
	Risk-taking tolerance	.503**
Innovative leadership	Dedication to innovation	.549**
Team innovation	Organisational innovation culture	.535**

Note: N = 624, ** p ≤ .01, * p ≤ .05, r = .10 ≤ .29 are practically significant (small effect). r ≥ .30 ≤ .49 are practically significant (medium effect). **r = .50 ≤ 1.0 are practically significant (large effect).**

The findings indicate that management support had a significant statistical relationship (large effect) on dedication to innovation, which indicates that increased support from management, by encouraging new ways of thinking, providing staff with more freedom, challenging and supporting staff, can all lead to increased innovation. Innovation management also showed a significant statistical relationship (large effect) with organisational innovation culture, innovation opportunities, and risk-taking tolerance. This finding indicates that managing innovation effectively will result in a more innovative culture, with more innovation opportunities available to employees, and an organisation that is more open to risk-taking. Innovative leadership also showed a significant statistical relationship (large effect) with dedication to innovation, which suggests that supervisors with innovative leadership styles will inspire EDI and creativity. The last significant statistical relationship (large effect) was between team innovation and organisational innovation culture, which shows the important link between innovation culture and innovation in teams.

Although a regression analysis was considered, it was decided to use a structural equation model as it allowed for the combination of multiple regression and factor analysis. In addition, in normal multiple regression analysis, the measurement error is aggregated in a single residual error term. As the core aim was to test the simultaneous evaluation of model construct relationships, and to ensure that measurement error was taken into account for all structural paths, structural equation modelling (SEM) was the preferred choice.

The findings from the final SEM indicate that increased innovation within teams and support from management result in more innovation support from supervisors and increased risk-taking tolerance, which will set innovation in motion. Team innovation, support from management, innovation leadership, and a process to effectively manage innovation will result in higher levels of risk-taking. The results further suggest that innovative leaders that manage the innovation process will provide employees with the reassurance that risk-taking is permitted or even encouraged, and that no negative consequences will result from failed innovation efforts. The last finding indicates that a higher level of innovative management and leadership will result in a lower level of organisational innovation culture and innovation opportunities. This finding may indicate that employees were not ready for change and were of the opinion that increased management would result in a less innovative environment where employees would not be presented with opportunities and time to be creative. Change management is therefore vital to ensure that employees understand what is meant by managing innovation and how supervisors, trained to become innovative leaders, will contribute to more innovative opportunities.

7.3.4   Conclusions draws from research aim 4

Research aim 4: To determine whether demographic characteristics in terms of gender, ethnicity, age, post-level, department/unit, supervisory status, and qualifications influence supervisory behaviour, internal work environment, and employees' innovation and creativity.

- Gender: With regard to gender, it was found that female supervisors engaged more in innovative management and were more positive towards their roles and influence in effectively managing innovation compared with the responses from male supervisors. Female supervisors also engaged in more innovative leadership than male supervisors, by coaching and inspiring their subordinates, providing more time to engage in innovative behaviour, acting as role models, and providing subordinates with feedback on their innovative efforts.
- Ethnicity: The findings indicate that ethnicity played a role in all the variables, except management support. Black respondents were the most satisfied with the

internal work environment and the amount of supervisory support to engage in innovative behaviour received. Indian/Asian supervisors showed the most engagement in innovation management, providing innovative leadership, and creating an atmosphere for effective team innovation.

- Age: The findings indicate that age played a role in the internal work environment. Younger employees were more dedicated to innovation and less satisfied with team innovation than older employees.

- Post-level: The findings indicate that the respondents in more senior positions believed that the organisation did not have an innovative culture or the correct tools to set innovation in motion, and that the current culture limited the creative ability of employees. They were less open to risk-taking and were of the opinion that negative consequences may result from failed innovative efforts. For this reason, respondents in more senior positions also showed less dedication to innovation as changes to their job descriptions and more innovative tasks might be linked to failure and negative consequences.

- Department/unit (Academic/Administrative): The results indicate that respondents from the administrative departments/units agreed more with the statements about the institution having an innovative culture and was open to risk-taking than respondents from the academic environment. The findings further show that respondents in the administrative departments/units were more dedicated to innovation and accepting innovative activities than respondents from academic departments/units. This finding may be linked to the educational environment in which academic respondents operate. Tuition is governed by institutional policies and procedure, which often leaves little room for change, as it may cause disruptions and may lead to non-compliance to research-based strategies and teaching expectations.

- Supervisory status: The results indicate that supervisors and non-supervisors did not differ in terms of supervisory behaviour or the internal work environment, but only in terms of dedication to innovation. This finding may indicate that supervisors were more aware of the value of innovation, its benefits, and potential to achieve organisational objectives, hence supporting innovation initiatives.

- Qualifications: The general finding was that respondents with higher qualifications (master's and doctoral degrees) compared to respondents with lower qualifications (Grade 12, certificate, diploma, degree and honours degree) felt that the

organisational culture did not support innovation and that risk-taking was not tolerated. Respondents with higher qualifications showed less dedication to innovation in terms of changes to their job descriptions.

7.3.5 Conclusions draws from research aim 5

Research aim 5: To make recommendations regarding supervisory behaviour and creating enabling work environments to enhance and support EDI and creativity.

When developing organisational strategies aimed at innovation, the following recommendations should be considered for an ODeL institution in South Africa:

▪ The institution should strive to provide a culture that supports and encourages innovation. It should be established whether the rigid policies, procedures, and rules that exist within the intuition are still serving the purpose that they were intended to serve, and whether these are not unnecessarily hampering the innovative efforts of employees.

▪ The institution should make innovation a central part of the culture and design processes, procedures, and guidelines that will enable and foster innovation.

▪ The lengthy hierarchical approvals that exist within the institution should also be reviewed to speed up the response time to innovative ideas or change.

▪ The leadership styles of supervisors aimed at increasing EDI and creativity should be examined. The findings of the study indicate that to increase EDI and creativity, supervisors should display an innovative leadership style through which they can encourage innovative behaviour.

▪ Innovation training will assist supervisors to improve their innovation management skills and become innovative role-models. Supervisors need to be more involved in their teams' innovative work and should provide more coaching and support. Acknowledgement and recognition of innovative behaviour are also vital to stimulate further innovative behaviour.

▪ The institution should also invest in providing innovation-specific training to employees to further develop their creative ability, as the results of the study indicate that supervisors were more dedicated to innovation than non-supervisors.

- Supervisors should involve employees more in decision-making processes, offer more autonomy and freedom to engage in innovative behaviour, and provide more complex tasks to stimulate innovation.

- The institution should support and encourage a bottom-up approach to innovation as it will not only result in more empowered and encouraged employees but will also result in less resistance to change.

- The results of the study indicate that younger employees are more dedicated to innovation than older workers. The institution should encourage older, more mature employees to engage in more innovative behaviour. Older employees have experience and knowledge, which may result in significant improvement or new ideas in their area of work. The institution should take advantage of this excellent source of innovation.

- The institution should tolerate risk-taking. An innovation management process should be established to deal with new or improved ideas from employees, and negative consequences for failed innovative efforts should not be tolerated.

- Teamwork, combined with informal interactions between employees from different departments/units, should be encouraged to create new perspectives. Innovative teamwork will assist to break down the inter-departmental barriers that exist within the institution.

- The institution should provide employees in academic departments/units innovation training as it seems that academic employees are less dedicated to innovation than administrative employees. Training focusing on innovation in the teaching environment is vital as innovations in the academic section will directly affect the institution's core business, which is teaching and research.

- Communication within the institution should be improved. Effective two-way communication will ensure that employees are familiar with the objectives of the institution and can engage in innovative behaviour aimed at achieving those objectives.

- Finally, the institution should develop a recognition and rewards programme to encourage EDI and creativity.

7.4   RECOMMENDATIONS FOR FUTURE RESEARCH

Further research could be conducted to examine the top structure of the institution only. The findings in this study show that employees holding higher post levels, and more qualified employees felt differently about the institution's and its employees' innovative ability when compared to employees in lower positions with lower qualifications.

As a result of the difference between academic and administrative functions and positions, the academic/administrative environment could also be studied separately. The results of such a study could indicate how supervisory behaviour and internal work environment affect the innovative and creative ability of employees in the two environments.

Similar research could also be conducted at other higher education institutions in South Africa. This would allow the findings to be applied to a broader context to determine the level of EDI and creativity in other higher education institutions in South Africa. Similar research conducted at corporate companies across South Africa could establish the difference between higher education institutions and the private sector regarding EDI and creativity.

Further studies on developing training interventions and programmes to equip supervisors with the skills to become innovative leaders will benefit the institution. Developing a recognition and rewards programme to encourage employees to engage in innovative behaviour and create improvements or new ideas could also benefit the institution.

There is a need for more research on employee-driven innovation, specifically from a bureaucratic and hierarchical perspective in the South African context. Further studies would be beneficial to organisations with multiple hierarchical levels, lengthy approval processes and strict rules, and will provide recommendations on the correct supervisory behaviour and work environment conducive to EDI and creativity.

Further analysis could be carried out on the 161 comments that were provided in the optional (non-mandatory) comments field of the questionnaire. This should enable the institution to identify additional variables that could contribute to creative and innovative employee behaviour.

7.5 CONTRIBUTIONS

The conclusions drawn from each research aim are discussed above. The following section provides an overview of how the study contributed to research in the field of human resource management.

From an empirical point of view, the study made the following contributions. The study:

- identified the factors that constitute supervisory behaviour
- identified the factors that constitute the internal work environment in terms of innovation
- established a relationship between supervisory behaviour and the internal work environment in terms of EDI and creativity
- recognised that leadership styles are a predictor of EDI and creativity
- recognised that gender is a predictor of engaging in innovative leadership and in managing innovation
- recognised that ethnicity is a significant predictor in all of the variables identified
- recognised that age is a predictor of dedication to innovation and supervisor satisfaction with team innovation
- recognised that post level is a significant predictor in term of the satisfaction with the innovative culture of the organisation, innovation mechanisms to set innovation in motion, the risk-taking level of the institution, and dedication to innovation to welcome innovative tasks
- recognised that academic/administrative departments/units differ in terms of their satisfaction with the innovative culture of the organisation, the level of risk-taking, and dedication to innovation

From a general point of view, this study made the following contributions:

- The literature review provided great insights into various concepts examined in this study, such as supervisory behaviour, the internal work environment, and EDI and creativity.
- The findings from the empirical study provided a unique contribution in terms of supervisory behaviour and internal work environment factors from an EDI perspective.
- The findings from the literature review and the empirical study provide the institution with key factors that could be used to effectively increase EDI and creativity in the workplace.

7.6   LIMITATIONS

The study was conducted at an ODeL institution in South Africa and may not apply to other industries or in other countries.

The research focused mainly on supervisory behaviour and the internal environment from an organisational innovation perspective and did not include individual factors such as personality, cognition, or motivation that also influence EDI and creativity.

Respondents were asked to indicate their number of years' service at the institution and the number of years in their current positions (at the institution). The years in the current position were, however, incorrectly interpreted, and in some instances respondents provided years in their current service (at the institution) that exceeded the years of service. There was no misinterpretation during the pilot phase, but should the study be repeated elsewhere, this limitation should be addressed.

Finally, respondents were requested to provide any additional comments (marked as a non-mandatory field). The 161 comments received could have added value to the research aims of the study, but due to time restrictions, these comments were not analysed in detail. Further statistical analysis could be performed to interpret the comments received. Comparing the comments to the demographics from the study could present valuable information.

7.7   SUMMARY

This chapter is the final chapter and concludes the study, which examined the influence of supervisory behaviour and the internal work environment on EDI and creativity in an ODeL institution in South-Africa.

The chapter starts with a brief review of the reasons for the study to provide a holistic view of the study. The conclusions drawn from the researched findings are briefly discussed in line with the research aims of the study, and the contributions of the study are then provided. The recommendations for the field of human resource management, with specific reference to EDI and creativity, are discussed, followed by the recommendations for future research. The chapter concludes with the limitations of the study and a chapter summary.

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QUESTIONNAIRE

SECTION A: DEMOGRAPHICS

1   Gender:

Female	1
Male	2

2   Ethnicity:

African	1
Coloured	2
Indian or Asian	3
White	4
Other (Please specify): _____	5

3   Age:

4   Post Level:

P5	1
P6	2
P7	3
P8	4
P9	5

5   How many years have you been employed at <u>Unisa</u>?
(Part of a year is regarded as a year)

6   How many years have you been employed in your <u>current position (at Unisa)</u>?
(Part of a year is regarded as a year)

7   Do you work in an Academic or Administrative department/unit?

Academic	1
Administrative	2

8   Are you a supervisor: Do you have staff reporting to you?

Yes	1
No	2

9   Qualifications: What is your Highest Qualification?

Grade 12 (Matric/National Senior Certificate) (NQF level 4)	1
Higher Certificate (NQF level 5)	2
Diploma or Advanced Certificate (NQF level 6)	3
Bachelor's Degree or Advanced Certificate (NQF level 7)	4
Honours degree or Postgraduate Diploma or Professional Qualification (NQF level 8)	5
Master's Degree (NQF level 9)	6
Doctoral Degree (NQF level 10)	7
Other (Please specify): _____	8

THE FOLLOWING INFORMATION APPLIES TO YOUR DIRECT LINE SUPERVISOR

10   How would you rate your relationship with your SUPERVISOR?

Very poor	1
Poor	2
Fair	3
Good	4
Very good	5

11   Gender of your SUPERVISOR:

Female	1
Male	2

12   Ethnicity of your SUPERVISOR?

African	1
Coloured	2
Indian or Asian	3
White	4
Other (Please specify): _____	5

13   Estimated age group of your SUPERVISOR?

	18 to 29 years old	1
	30 to 39 years old	2
	40 to 49 years old	3
	50 to 59 years old	4
	60 to 65 years old	5

SECTION B:

INFLUENCE OF SUPERVISORY BEHAVIOUR ON EMPLOYEE-DRIVEN INNOVATION AND CREATIVITY (1)

DIRECTIONS ON HOW TO RATE THE ITEMS

The following items focus on supervisory behaviour and its influence on employee-driven innovation and creativity. Please indicate your level of agreement, using the 6-point scale to respond to the statement. Please tick

"1"   if you strongly disagree to the statement
"2"   if you disagree to the statement
"3"   if you slightly disagree with the statement
"4"   if you slightly agree with the statement
"5"   if you agree with the statement
"6"   if you strongly agree with the statement.

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1	My supervisor is prepared to implement new ideas received from staff	1	2	3	4	5	6
2	My supervisor is flexible about how I accomplish my work	1	2	3	4	5	6
3	My supervisor encourages informal communication, to support our innovation efforts	1	2	3	4	5	6
4	My supervisor promotes employee involvement in decision making	1	2	3	4	5	6
5	My supervisor supports training opportunities	1	2	3	4	5	6

	aimed at enhancing our innovation ability						
6	My supervisor encourages us to ask work related questions, in order to expose ourselves to new ideas or information	1	2	3	4	5	6
7	My supervisor communicates the vision of the institution	1	2	3	4	5	6
8	My supervisor is an innovative person	1	2	3	4	5	6
9	My supervisor will reject innovative ideas with valid reasons	1	2	3	4	5	6
10	My supervisor challenges me to come up with new creative ways to perform my job	1	2	3	4	5	6
11	My supervisor encourages teamwork for the generation of innovative ideas	1	2	3	4	5	6
12	My supervisor facilitates cooperation between different departments	1	2	3	4	5	6
13	My supervisor gives us exposure to higher level decision making	1	2	3	4	5	6
14	My supervisor relies heavily on current practices and procedures to guide his/her decisions	1	2	3	4	5	6
15	My supervisor makes time to consider my suggestions	1	2	3	4	5	6
16	My supervisor implements	1	2	3	4	5	6

	innovative ideas as far as possible						
17	My supervisor makes resources available to support me in doing my job	1	2	3	4	5	6
18	I am satisfied with my level of participation in our department's innovation initiatives	1	2	3	4	5	6
19	My supervisor gives me credit when I have a valuable idea	1	2	3	4	5	6
20	My supervisor shows me appreciation for a job well done	1	2	3	4	5	6
21	We have a departmental rewards/appraisal system (e.g. an afternoon off), for rewarding employee innovation/creative ideas	1	2	3	4	5	6

SECTION C:

INFLUENCE OF THE INTERNAL WORK ENVIRONMENT ON EMPLOYEE-DRIVEN INNOVATION AND CREATIVITY

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1	The institution's formal and multi-level structure makes provision for employee-driven innovation	1	2	3	4	5	6
2	My job requires me to be creative	1	2	3	4	5	6
3	I will welcome a change to my job description to include innovation activities as an "official" task	1	2	3	4	5	6

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4	I will welcome special assignments that will help me to be more creative	1	2	3	4	5	6
5	I utilise opportunities to come up with my own ideas to do my job more effectively	1	2	3	4	5	6
6	The institution has a reward system for employee-driven innovation ideas and creativity	1	2	3	4	5	6
7	I am too busy doing my job to pursue new ideas	1	2	3	4	5	6
8	The institution uses the information technology platform (e.g. intranet and internet) efficiently to communicate and exchange ideas	1	2	3	4	5	6
9	The institution has many creative employees	1	2	3	4	5	6
10	Employees are enthusiastic about generating winning ideas	1	2	3	4	5	6
11	We have an innovation task team in our department/unit	1	2	3	4	5	6
12	We have a suggestion scheme (suggestion box for ideas)	1	2	3	4	5	6
13	The institution encourages ideas from employees at all levels	1	2	3	4	5	6
14	We have internal competitions for generating innovative ideas	1	2	3	4	5	6
15	I do not have to fear negative consequences when an idea fails	1	2	3	4	5	6
16	We have an error tolerance culture	1	2	3	4	5	6

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
	(we learn from unsuccessful ideas)						
17	We use conflict constructively to promote creativity and innovation	1	2	3	4	5	6
18	We have regular informal sessions in the office to share ideas	1	2	3	4	5	6
19	We are encouraged to learn creative thinking skills	1	2	3	4	5	6
20	We are supported to keep our knowledge and skills up to date by attending training and development opportunities	1	2	3	4	5	6
21	The institution uses open communication to gain new perspectives	1	2	3	4	5	6

Any comments? *(e.g. innovation is not possible because we are bound by legislation etc.)*

SECTION D:

INFLUENCE OF SUPERVISORY BEHAVIOUR ON EMPLOYEE-DRIVEN INNOVATION AND CREATIVITY (2)

Please answer the following questions if you have <u>staff reporting to you</u>:

If answer is No: Respondent should be thanked and the survey should exit

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1	My staff is capable of recommending innovative ideas for implementation	1	2	3	4	5	6
2	I encourage new ways of thinking	1	2	3	4	5	6
3	I provide my staff the freedom to	1	2	3	4	5	6

	pursue innovative opportunities						
4	I deliberately stretch/build my staffs' competencies through their participation in new initiatives	1	2	3	4	5	6
5	I inspire my staff with a vision for the future	1	2	3	4	5	6
6	I model innovation behaviours for my staff to follow	1	2	3	4	5	6
7	I devote time to coach my staff on innovation	1	2	3	4	5	6
8	I devote time to provide feedback on my units' innovation efforts	1	2	3	4	5	6
9	I frequently challenge my staff to think in innovative / creative ways	1	2	3	4	5	6
10	I have notable influence over what happens in my unit	1	2	3	4	5	6
11	I have enough power to influence management decisions on the implementation of innovation	1	2	3	4	5	6
12	I support my staff after failed innovation efforts	1	2	3	4	5	6
13	We use failed innovation efforts as a learning opportunity	1	2	3	4	5	6
14	My unit works as a team to generate innovative ideas	1	2	3	4	5	6
15	I am able to minimize rules, policies, procedures, and bureaucracy to simplify work	1	2	3	4	5	6

#		1	2	3	4	5	6
16	My staff is prepared to move out of their comfort zones by placing efficiency above compliance with ineffective procedures	1	2	3	4	5	6
17	I know exactly how to get initiatives implemented	1	2	3	4	5	6
18	We have the right processes in place to support an innovative culture	1	2	3	4	5	6
19	I give my staff dedicated time to pursue innovative opportunities	1	2	3	4	5	6
20	The institution provides dedicated finances to my unit/department to explore innovative ideas	1	2	3	4	5	6
21	Our innovation efforts built capabilities that we did not have five years ago	1	2	3	4	5	6
22	I am satisfied with my units' level of participation in the institutions' innovation initiatives	1	2	3	4	5	6

Many thanks for sacrificing your time to complete this survey.

Kindest regards
Geraldine C. Leach

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To whom it may concern

This is to confirm that I, MJ de Jager, edited the language in the master's dissertation,

"The influence of supervisory behaviour and the internal work environment on employee-driven innovation and creativity in an open distance e-learning institution in South Africa", by Geraldine Christine Leach.

The onus is on the author to attend to all my suggested changes and queries. Furthermore, I do not take responsibility for any changes affected in the document after the fact.

MJ DE JAGER
27 January 2020