

**ENTREPRENEURIAL ORIENTATION AT NELSON  
MANDELA METROPOLITAN UNIVERSITY**

BY

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## **DEDICATION**

I dedicate this to God and to the memories of my late father Olujide Akanbi Fadairo. Miss you as always dad and thanks for giving us your all. "Love you and sleep well".

### **ACKNOWLEDGEMENTS AND DECLARATION**

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- My friends. You all were invaluable pillars of strength. Thank you all.

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March 2014

**DECLARATION**

I, **FEYISARA OLUFUNMILAYO FADAIRO (Student number 211208175)**, hereby declare that this dissertation for **MAGISTER TECHNOLOGIAE ENTREPRE-NEURSHIP** to be awarded is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another University or for another qualification.

**FEYISARA OLUFUNMILAYO FADAIRO**

## **ABSTRACT**

In the knowledge world into which mankind has progressed, universities are engines of economic growth. Their role has changed from producers of labour force to equal contributors - along with government and industry- in regional and national economic and social growth and development. Universities that will survive and succeed in this new climate must embrace entrepreneurship - become entrepreneurially oriented.

As in any other organisation corporate entrepreneurship processes explain how entrepreneurship is implemented and diffused throughout a university, and its members must perceive the internal organisational culture as innovation supporting for entrepreneurship to flourish. Hence, the importance of studying internal environmental conditions that influence / enable corporate entrepreneurship.

This study investigated NMMU's entrepreneurial orientation by first determining what an entrepreneurial university is and its key attributes. Next it identified the key structural factors influencing university entrepreneurship and enquired how these structural factors can be influenced to enhance entrepreneurship at NMMU. To this end, survey method was used to sample perception of the university middle managers. The study first determined the level of entrepreneurship in NMMU by measuring its entrepreneurial intensity and then attempted to locate its position on the entrepreneurial grid. Next the level of the university's internal environmental support for entrepreneurship was determined.

The university's culture was found to be the key factor influencing entrepreneurship with time availability and work discretion as key internal factors through which NMMU's entrepreneurial culture could be improved. Proactivity and frequency dimensions of entrepreneurship were found to lead to significant improvement in the university's entrepreneurial output and based on the outcome of the study; suggestions were made on ways of incorporating findings to better improve entrepreneurial orientation.

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## CHAPTER ONE

### INTRODUCTION AND BACKGROUND OF STUDY

#### 1.1 INTRODUCTION

In a globalised world driven by ideas, knowledge and information, universities are becoming key players and agents of economic development. Knowledge is increasingly becoming the main driver of economic growth among nations and is the foundation for individual prosperity. In addition to teaching and research, universities are now considered the source of new knowledge for building up knowledge society and this creates new goals for them. Serving the society is becoming a coherent domain of the universities (Mets, 2009:4).

Across the globe, universities now have an economic development goal - called the 3rd mission - added to their initial mission of teaching and research, which now requires them to act entrepreneurially (Etzkowitz, Ranga & Dzisah, 2012:145). Consequently this alignment of economic development with the research and teaching mission caused the academic structure and function of universities to be revised. A new university form called the entrepreneurial universities is evolving.

Evolution of universities into the entrepreneurial paradigm results from both internal developments of the university and external influences on academic structures associated with the emergence of knowledge-based innovations (Etzkowitz, Webster, Gebhardt, Regina & Terra, 2000:313).

By attempting to understand entrepreneurship as a university behaviour – the essence of the entrepreneurial universities concept - we are looking at universities' entrepreneurial orientation; a term described by Dess and Lumpkin (1996:136) as well as Morris, Webb and Franklin (2011:949) as *an organisation's behavioural orientation which describes how it undertakes entrepreneurship*. Kuratko, Morris and Covin (2011:73) called the degree of entrepreneurship in an organisation its entrepreneurial orientation while Dess and Lumpkin (1996:139) believed the study of an organisation's entrepreneurial orientation to be the same as the study of its entrepreneurial management. Entrepreneurial management can be considered as the process of replicating the individual strength of an entrepreneur in a group of people (Burns, 2005:13). It focuses on systems, processes, structures and styles of

entrepreneurship rather than on individual entrepreneurial behaviours (Burns, 2005:13; Dess and Lumpkin, 1996:139).

Guerrero, Kirby and Urbano (2006:5) defined an Entrepreneurial University as a university that has the ability to recognise and create opportunities; innovate; work in teams; take risks; respond to challenges and seek and work out a substantial shift in organisational character so as to arrive at a more promising posture in future. Etzkowitz *et al.* (2000:314) observed that all universities have the potential to be entrepreneurial through innovations in their undergraduate and continuing education. Gjerding, Wilderom, Cameron, Taylor and Scheunert (2006:18) stated that universities striving to be recognised as entrepreneurial need to ensure that entrepreneurship is ingrained within their identities.

Kirby (2006:599) disagrees that universities are not ideally entrepreneurial institutions, and gave seven reasons for his observations, six of which relate to the university environment. Guerrero and Urbano (2012:45) observed three groups of factors interrelating within the entrepreneurial university. The first group comprises the environmental factors, which they further classified into formal (such as governance structure) and informal (such as members attitude to entrepreneurship) factors. The next group comprises the internal factors, which according to them consist of the internal resources and capabilities of the university, and the third group of factors consists of the three missions of an entrepreneurial university, namely teaching, research and economic development. Etzkowitz and Zhou (2008:630) asserted that “The major factors in creating an entrepreneurial university are internal culture and external environment, especially the industrial environment.” Guerrero *et al.* (2006:2) also noted in an earlier work that, “University culture is central to the development of entrepreneurial activities within the university.” They further observed that “This area of study remains underdeveloped because the majority of studies follow other approaches, such as academic capitalism, commercialisation of knowledge and Triple Helix, but not considering the environmental factors”. This area according to them, needs further investigation.

The above thus leads to the main question of this study, namely “What is an entrepreneurial university?”



## 1.2 PROBLEM STATEMENT

In order to be successful, organisations need to adapt to their environment (Sporn, 1999:24). The university environment can be divided into two – the outside/ external and the inside/internal environment – and each of the environments are affected by different sets of factors. Scholars all agree on the importance of the environment in university entrepreneurial transformation (Clark, 1998, 2004; Etzkowitz *et al.*, 2000; Etzkowitz, Ranga, Benner, Guarany, Maculan and Kneller 2008; Guerrero and Urbano 2012; Woollard 2010).

Shattock (2003:27) noted that universities have changed greatly and that the most successful ones are those that have adapted best to their environment. Sporn (1999:7,262) further observed that new environmental demands are triggering internal responses such as restructuring, retrenchment, reengineering, total quality management, strategic planning and technology transfer amongst others, which has led to growth in administrative positions within universities. Rothaermel, Agung and Jiang (2007:209) postulated that the process of university entrepreneurship is influenced by both internal and external environmental factors and Guerrero and Urbano (2012:45) described entrepreneurial outcomes at universities as a function of both environmental factors and internal factors with the equation:

$$EU (\text{outcomes}) = f(EF, IF).$$

According to Sporn (1999:21) to be successful universities must create a fit between their structural variables (internal environment) and their (external) environment through adaptation. Morgan (1997:39) using the open systems theory classified the external environment into two, namely

- i. the task environment which he also called the immediate and business environment of organisations and according to him is defined by and organisation's interactions with governmental agencies, labour unions, customers (students) and competitors (other universities)
- ii. the contextual or general environment which is the broader environment enveloping the task environment. Kuratko and Hodgetts (2004:201) defined organisations' internal environment as consisting of variables that are within the organisation and forms the context within which work is done while Morgan (1997:42) conclude further that

organisations' internal environment consist of interrelated subsystems such as the strategic, human, structural, managerial and technological subsystems, and that they are systems existing within the organisational supra-system.

Katz and Khan (1966:30) observed that the open systems theory provides a viable model for understanding phenomena at their own level of analysis, while Sporn (1999:37) noted that the open systems theory is about the key relationship that exists between the environment and the internal functioning of an organisation and that it is characterised by a continuous cycle of input, internal transformation, output and feedback. Woollard (2010:419) stated that university entrepreneurship is an organisational process that can be depicted as an input –process – output model.

Katz and Kahn (1966:19, 20) further stated that input, process (also called through put), output and feedback are part of the defining characteristics of an open system. The authors further described input, process and output as follows:

- Input is the importation of energy such as financial and human resources as well as information (pertaining to the organisational output) from the environment into the organisation.
- Process/through-put is the conversion process by which inputs received by the organisation are transformed into products and services and it involves the reorganisation of inputs.
- Output is the outcome of the transformation process some of which is used within the organisation for maintenance and the rest of which is exported back into the environment.

In an entrepreneurial university output comprises the three missions on which the university is simultaneously focused on fulfilling, namely the teaching, research and entrepreneurial activities (Etzkowitz *et al.*, 2000:314). According to Forbes (2009), the term “entrepreneurial activities”, which refers to the third stream activities of an entrepreneurial university, is the same as community engagement, outreach, community service, knowledge transfer and public engagement and in some universities delivery of these activities may focus on industries rather than communities. Bishop (2006) stated that third stream activities, knowledge transfer

and community engagement are terms in frequent usage, and that they mean quite different things depending on whom you are talking to.

This depicts the role of context in determining the meaning of the word entrepreneurial activities. Although in South Africa and Australia community engagement is used to represent universities' interactions with their external environment.

According to Katz and Khan (1966:22), feedback is the informational output that furnishes signals to the structure about the environment and it's (the structures) functioning in relation to the environment.

Sporn (1999:74) advocated a direct link between the university structure and environmental factors in university entrepreneurial transformation. Woollard (2010:415) considered corporate entrepreneurship an important concept in understanding the transformational process, hence the importance of both open systems theory and the corporate entrepreneurship concept in understanding university entrepreneurial transformation.

### **1.3 SUB –PROBLEMS OF THE STUDY SUB–PROBLEMS OF THE RESEARCH**

Considering the different arguments and opinions regarding Entrepreneurial Universities, and the research question: "What is an Entrepreneurial University", the following sub-problems were identified and will be investigated in this study:

- The main characteristics of an entrepreneurial university.
- Key environmental factors influencing university entrepreneurialism.
- Internal factors influencing the increase in entrepreneurial output at NMMU.

### **1.4 OBJECTIVES OF STUDY**

The broad objective of this study is to clearly identify what an entrepreneurial university is and to investigate whether NMMU is an entrepreneurial university and how its internal environmental factors can be influenced to increase entrepreneurial output, while the specific objectives are:

- To identify critical internal and external environmental factors influencing university entrepreneurialism.
- To measure NMMU's entrepreneurial intensity.
- To identify and measure key internal environmental factors influencing entrepreneurship within NMMU.
- To understand the path of influence of the internal factors - ways in which the internal factors affect NMMU entrepreneurial output.
- To determine how these factors can be manipulated to make NMMU more entrepreneurial.
- To make policy recommendations based on the research findings.

## **1.5 DEFINITION OF CONCEPTS**

### **1.5.1 Entrepreneurial University**

This concept has been defined by scholars in different ways. Some of the definitions are:

- (i) Clark (1998:3) stated that "entrepreneurial" refers to the characteristics of the entire university - its departments, research centres, faculties and schools. It is the wilful effort in institution building that requires much special activity and energy. It involves risk-taking when initiating new practices whose outcome is in doubt and it can be seen as both process and outcome. It is an attempt by a university to "work out a substantial shift in organisation character so as to arrive at a more promising posture for the future and to become a stand up university that is significant on its own terms".
- (ii) Rinne & Koivula (2005:103) defined the entrepreneurial university concept as "Entrepreneurial culture, structure and attitude in a university".

### **1.5.2 Corporate Entrepreneurship**

This is entrepreneurship within an existing organisation. It refers to the process that takes place inside an existing organisation, regardless of its size, and leads not only to new business ventures but also to other innovative activities and orientations, such as development of new products, services, technologies, administrative techniques, strategies and competitive postures (Antoncic & Hisrich, 2001:498).

Woollard (2010:416) defined corporate entrepreneurship as an organisational process aimed at specific organisational objectives.

### **1.5.3 Corporate entrepreneurship strategy**

Corporate entrepreneurship strategy is a vision-directed and organisation-wide reliance on entrepreneurial behaviour that purposefully and continuously rejuvenates an organisation (Ireland, Covin and Kuratko, 2009:21).

### **1.5.4 Entrepreneurship**

Even though scholars are divided on the concept of entrepreneurship, this study adopts COM (2005) description of entrepreneurship as “An individual’s ability to turn ideas into action. It includes creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. It supports everyone in day-to-day life at home and in society, makes employees more aware of the context of their work and better able to seize opportunities. It provides a foundation for entrepreneurs establishing a social or commercial activity”.

### **1.5.5 Entrepreneurial orientation**

Entrepreneurial orientation is a behavioural orientation that describes how entrepreneurship is undertaken within an organisation (Morris, Webb and Franklin, 2011:949; Dess and Lumpkin, 1996:136).

Organisations respond to environmental turbulence by adopting entrepreneurial orientation when they engage in three key behaviours – innovativeness, risk-taking and pro-activity and they influence and are influenced by the environment through their entrepreneurial orientation (Covin and Slevin, 1991:11).

### **1.5.6 Entrepreneurial intensity**

Entrepreneurial intensity is the level of entrepreneurship in an organisation. It is measured by determining the degree of entrepreneurship in entrepreneurial events occurring within an organisation and combining this with the frequency of such events (Kuratko, Morris and Covin, 2011:73).

### **1.5.7 Entrepreneurial behaviour**

This comprises the actions performed by individuals or groups to find and evaluate opportunities; endorse, refine and shepherd opportunities, and identify, acquire, and deploy resources to exploit opportunities (Woollard, 2010:419).

### **1.5.8 Environment**

An organisation's environment is as the totality of physical and social factors that are taken directly into consideration in the decision-making behaviour of its members (Duncan, 1972:314). The environment can be divided into external and internal environments (Duncan, 1972:314; Kuratko, Morris and Covin, 2011:4). The internal environment is made up of relevant physical and social factors within the boundaries of the organisation that are taken directly into consideration in making decisions by organisational members while the external environment consists of relevant physical and social factors outside the boundaries of the organisation that are considered (Duncan, 1972:314).

### **1.5.9 Entrepreneurial process**

This is defined as the methods, practices and decision making styles used by organisations to act entrepreneurially (Dess and Lumpkin, 1996:136).

## **1.6 DELIMITATION OF STUDY**

### **1.6.1 Institution**

This study focuses on entrepreneurialism within the Nelson Mandela Metropolitan University at Port Elizabeth, Eastern Cape, South Africa.

### **1.6.2 Population of Study**

Ireland, Kuratko and Morris (2006b:22) observed the need to administer a measuring instrument on a large number of managers in different functional areas as a way of determining the level of entrepreneurship in an organisation. In line with these scholars' observation, this study will focus on academic staff, senior non-academic staff and students of Nelson Mandela Metropolitan University as the study population.

### **1.6.3 Entrepreneurial Factors**

Only the critical factors affecting entrepreneurial output at NMMU will be studied.

### **1.7 SIGNIFICANCE OF STUDY**

- The knowledge gained from this study will provide additional insights into internal and external factors affecting entrepreneurialism at NMMU and may also be useful in improving the work environment, as well as entrepreneurial mind-sets of university members;
- The study outcome could help to improve interdepartmental collaborations among academics and units within NMMU with attendant benefits to students' employability; and
- The findings could potentially help make NMMU a more entrepreneurial university;
- The findings could reveal hindrances to the development of multi-disciplinary entrepreneurship education - which is especially needed at the engineering faculty;
- The findings could lead to synergistic enhancement of the university's resources.
- Findings could also be useful for other African Universities intending to become more entrepreneurial.

### **1.8 ASSUMPTIONS**

The key assumptions made in this research comprise the following:

- That the NMMU to some extent is entrepreneurial.
- All the factors identified through the review of literature are already present within NMMU at varying degrees.
- That all participants involved in the study will express their true opinion when answering the questionnaires.

## **1.9 RESEARCH METHODOLOGY**

The research methodology for the study will comprise a literature review and an empirical investigation as detailed below:

### **1.9.1 Literature Review**

An extensive literature review will be conducted to describe key concepts of an entrepreneurial university and the corporate entrepreneurship concept.

### **1.9.2 Empirical Study**

The empirical study concerns the research paradigm, sampling, data collection, statistical analysis and an integrated model development as discussed in the following sections:

#### **1.9.2.1 Research paradigm**

The research paradigm for this study comprises quantitative research. Quantitative research is a research method that is used to seek out facts about social phenomena and it is well suited for providing factual descriptive information – the hard evidence (De Vaus, 2002).

#### **1.9.2.2 Sampling**

The unit of analysis for this study are the staff (academic and non academic) and students of NMMU. A non-probability judgemental sampling method is used to draw the sample population, which in this case are the middle managers at NMMU.

#### **1.9.2.3 Data collection**

Data for the study will be collected by survey method using questionnaires that will be hand delivered to participants on NMMU campuses and emailed to the George campus. The survey method as a means of data collection was chosen because it is characterised by a structured/systematic data set and its ability to effectively describe the unit of analysis.

#### **1.9.2.4 Statistical analysis**

Statistical analysis for this study will be determined in consultation with the statistician.



#### 1.9.2.5 Integrated model development

The results of the literature review and the empirical investigation will be used to identify key factors influencing the university's three missions of teaching, research and economic development - the entrepreneurial output and its path of influence will be examined.

### 1.10 PROPOSED PROGRAMME OF STUDY

This study has been planned to include the following chapters:

#### **Chapter One**

This chapter describes the scope of the study and comprise of an introduction, problem statement, study objectives, review of literature, definition of concepts, delimitation of the study, significance of the study, research methodology, and statement of assumptions and proposed programme of study.

#### **Chapter Two**

The chapter reviews literature on what an entrepreneurial university is, highlights how the entrepreneurial university concept have been variously defined and discusses the importance of entrepreneurship in universities. Also the attributes, facilitators, barriers and how to overcome barriers to university entrepreneurship is discussed.

#### **Chapter Three**

Chapter Three reviews literature on the corporate entrepreneurship concept, systems theory and ways of measuring university entrepreneurship. It provides background information on NMMU, establish theoretical framework for the study and operationalise key variables.

#### **Chapter Four**

This chapter describes the methodology used for the study. It is a quantitative descriptive study that uses survey method and questionnaires obtained from literature review for data collection.

#### **Chapter Five**

Chapter Five summarises the findings of all data collected from the measuring instrument.

**Chapter Six**

This chapter discusses the empirical results and findings from previous chapters. It presents conclusions and makes policy recommendations based on findings of the empirical study and the literature review.

## CHAPTER TWO

### UNDERSTANDING THE ENTREPRENEURIAL UNIVERSITY CONCEPT

#### 2.1 INTRODUCTION

The world has progressed from an industrial to a knowledge society, and nations that seek to achieve significant economic growth and value add, must develop their knowledge intensive and technology based industries (Etzkowitz *et al.*, 2012:144).

In the new world, knowledge is replacing traditional sources of wealth while businesses originating from, or that are closely related to universities and other knowledge producing institutions, are replacing multinational corporations as the central economic players of the future (Etzkowitz, 2003:109).

Universities, because of their role in research, education and innovation, as well as their student population, hold the key to the new society and economy. They are important in developing know how, cohesion and economic competitiveness (Etzkowitz, Dzisah, Ranga and Zhou, 2007:15; Rinne and Koivula, 2005:96).

Universities are unique organisations. They are professional bureaucracies with multiple functions and they lack absolute top down authority (Soares and Amaral, 1999: 13). Furthermore they are faced with the challenges of doing more and more with dwindling resources (Clark 1998:146). "Demand on universities outruns their capacity to respond" (Clark 1998:6) and the question thus arise: How can universities successfully cope with their dynamic environment and demand overload? They can do this only by embracing entrepreneurship at the institutional level and by becoming entrepreneurial universities. Drucker (as quoted in Brizek and Khan, 2008:225) defined entrepreneurship as "a process of purposeful change to individual/organisational economic or social direction".

Zaharia and Gibert (2005:31) described the entrepreneurial university as the transformational path for universities that will succeed in the knowledge economy. Guerrero and Urbano (2012:43) referred to entrepreneurial universities as survivors of competitive environments that have strategies to be the best in all their activities. Clark (1998b:5) claimed that it is the demand response imbalance in the

environment - university relationship that is increasingly putting pressure on universities to become entrepreneurial.

Etzkowitz (2003:110) postulated that universities have emerged as a collective entrepreneur and that transition to an entrepreneurial university encompasses transition from individual to collective and organisational entrepreneurship while Etzkowitz, Webster, Gebhardt, Regina and Terra (2000:314), as well as Etzkowitz (2003:109) concluded that universities now need to be entrepreneurial in their internal dynamics as well as in their dealings with external organisations; contribute to regional and national economic growth through translation of research into economic development as well as reinterpret traditional teaching roles by contributing to modernisation of low and mid-technological industries.

Woollard (2010:414), believed scholars have taken a contradictory stance on how entrepreneurial universities develop. Gjerding, Wilderom, Cameron, Taylor and Scheunert (2005:12) argued that being entrepreneurial is context dependent and that university entrepreneurialism must be defined within its context. Clark (1998:147) claimed that universities have multiple and diverse entrepreneurial responses to their environmental imbalance and implied diverse forms of university entrepreneurialism when he stated that “higher education is not one thing and it has no one future”.

The question once again is “What is an entrepreneurial university?” This question will be addressed in the following section, as well as a discussion of some of the various definitions of the concept. This is followed by a discussion on the key characteristics of an entrepreneurial university; the drivers of university entrepreneurialism; the key factors influencing university entrepreneurship; importance of university entrepreneurship; barriers to, and overcoming barriers to university entrepreneurship is examined. The chapter closes with a brief summary of the entrepreneurial university concept.

## **2.2 WHAT IS AN ENTREPRENEURIAL UNIVERSITY?**

An entrepreneurial university is a 21st century university model and according to scholars, the only sustainable university form (Shattock, 2009:146; Styhre and Lind, 2010:912; Suci and Platis: 596). University education has transformed from elitist to

universal without a corresponding adjustment in universities' internal systems and this "massification" along with the changing role of state in funding universities, shifting student demographics, globalisation, new technologies and economic restructuring has converged into demand overload in the university task environment (Clark, 1995:6; Clark, 1998:131; Shattock, 2003:18).

As the demands on universities outrun their capacity to respond, aggravated by the fact that the bulk of their resources go to maintenance rather than to encouraging change and innovation, universities fail to cope with their dynamic environment: institutional insufficiencies emerge, systemic crises sets in, and running universities the traditional way fails (Clark, 1995:6; Crow, 2008:17). It is the pressure arising from this imbalance in the relationship between the university and its environment that compels them to be entrepreneurial (Clark, 1998:5).

Entrepreneurial universities - also called the learning universities (Kriestensen, 1999:36), the focused universities (Crow, 2008; Clark, 1998:146) and adaptive universities (Armbruster, 2008:375; Sporn, 1999) are survivors. Etkowitz, Dzisah, Ranga and Zhou (2007:15) described them as universities that balance teaching, research and economic development functions in a creative manner. According to Woollard, Zhang and Jones (2007:2) and Woollard (2010:414), the term "entrepreneurial university" was first coined by Etkowitz (1983) but popularised by Clark (1998) to describe a new university paradigm that combine universities' traditional values and culture with market culture (Rinne and Koivula, 2005:92). Moroz, Hindle and Anderson (2010:4) referred to the university entrepreneurial transformation pathway as a continuum with different universities at different points while Gibbs, Haskins and Robertson (2009:3) as well as Suciú and Platis (:596) asserted that all universities are to some extent entrepreneurial. These claims are in line with Morris (1998:37) and Kuratko, Morris and Covin's (2011:58) observation that due to the variable nature of entrepreneurship all organisations are to some extent entrepreneurial.

The entrepreneurial university concept is about diversification of university funding bases and regional economic and social development through "third mission" activities (Clark 1998, 2004; Etkowitz 2000, 2003, 2012; Philpott, Dooley, Reilly and Lupton, 2011:163; Shattock, 2000, 2003) and has developed as a result of the

impact of both internal and external environmental factors on academic structures (Etkowitz *et al.*, 2000:313- 314).

Ropke (1998:2-3) declared that entrepreneurship at a university can refer to three things: (i) the institution has become entrepreneurial, (ii) its people – academics, non-academics and students are becoming entrepreneurial, and (iii) its interactions with the environment follows entrepreneurial patterns. Further stating that for a university to impact its environment positively its people must become entrepreneurial and that for its people to become entrepreneurial, the university as an institution, must first become entrepreneurial. According to him, all three conditions must be present for a university to be entrepreneurial.

Gibbs *et al.* (2009:8) also observed that university entrepreneurship is an intra-disciplinary concept, essential for the development of all academics and students. Moroz *et al.* (2010:150) stated that entrepreneurial capacity, the ability to turn research into wealth, is lacking at most universities. Ropke (1998:2) further observed that universities that do not become entrepreneurial hamper regional growth, national development and international competitiveness,

The entrepreneurial university concept is multidimensional and diverse, yet important viewpoints have been applied by scholars to explain the concept as follows:

- They are self-reliant, solution focused, institutions of excellence, access and impact; flexible in seizing opportunities; ambitious for advancement; able to chart distinctive courses; have modified structures and functions and conscious of their past while shaping their future without losing their main characteristics as universities (Crow, 2008; Etkowitz *et al.*, 2000; Soares and Amaral, 1999; Shattock, 2009).
- They have diversified income portfolios and through it have broken free of restrictive governmental funding formulae, doing more with their dwindling funds and engaging more in applied research (Guerrero, Kirby and Urbano, 2006:9; Shattock, 2000:1).
- They follow a strategy of being the best in all their activities, especially in formulating academic goals, encouraging innovative academic behaviors and

translating knowledge for economic and social benefit (Cargill 2007; Clark, 1998; Etzkowitz, 2003; Guerrero and Urbano, 2012; Shattock, 2000).

- They create a continuous stream of innovation – the creation and application of new knowledge in practical fields. They also create “evolution”, described as the building and creation of skills and competencies that are used for (i) knowledge transfer and (ii) for creating the “ability to innovate” by combining innovation and evolution (Sporn, 1999; Clark, 1998; Suciú and Platis, 1992; Ropke, 1998:3; Moroz *et al.*, 2010:148).
- They are institutions willing to adapt, innovate and rethink their identities and roles (Crow 2008:3).
- They are institutions that routinely scrutinise research results for commercial as well as scientific values, have the capability to translate results into intellectual property and valuable economic activities, and also reinterpret traditional teaching roles by modernising low and mid technology industries (Etzkowitz 2003:112; Etzkowitz *et al.* 2000:314).
- They are engaged in the process of permanent transformation (Zaharia and Gibert 2005:39); are situated at the crossroads of research, education and innovation; and are independent of political and economic factors (Guerrero and Urbano 2012:43; Guerrero *et al.* 2006:1; CEC 2003a).
- They are institutions where entrepreneurship is seen as taking innovative practices to a commercially profitable stage, and taking risks by introducing new practices is normal (Gjerding, Wilderom, Cameron, Taylor and Scheunert 2006:84).
- They are flexible and modern institutions with strong personalities in central administration to overcome departmental self-centeredness; they foster internal corporation among departments and develop an institutional entrepreneurial attitude that overcomes academic silos and lead to interdisciplinary, interdepartmental and inter-faculty works (Soares and Amaral 1999:15).
- They are institutions where entrepreneurship is a multi-level task that engages all academic disciplines (Crow, 2008:12), develop organically and occur bottom up but facilitated top down (Gjerding *et al.*, 2006:83).
- They are highly connected institutions – both internally and externally - which allow transformation of ideas from conception to actualisation (Crow, 2008:14).

- Through innovations in their teaching and research they produce new knowledge and students that are entrepreneurial and “inter-culturally” capable, of innovating, responding to change and integrating broad ranging disciplines that enhances economic development and national competitiveness (Crow, 2008:5; Etzkowitz *et al.*, 2012:143).

From the above it is understood that entrepreneurialism at universities are primarily about: (i) the integration of social and economic development mission – called the third mission - with universities’ existing missions, (ii) diversification of university income sources to reduce dependence on state funds, and (iii) enhanced university self-directed autonomy (Etkowitz *et al.*, 2000:313; Philpott *et al.*, 2011:169; Shattock, 2000:4).

In the two subsections that follow key concepts that are peculiar to entrepreneurial universities are discussed to further clarify the concept of an entrepreneurial university.

### **2.2.1 Universities’ Third Mission activities**

Traditional universities have two missions – teaching and research – but entrepreneurial universities have a “third mission”, which promotes innovation and entrepreneurship as well as supports economic and social development (Etkowitz *et al.* 2012:145). *Third mission* refers to universities’ interaction with the rest of society and is defined as “the generation, use, application and exploitation of universities’ knowledge and capabilities outside the academic environment” (Morlas-Gallart 2002:iii). Contrary to the beliefs among some academics, as argued by Etkowitz *et al.* (2000:314) and Philpott *et al.* (2011:164), third mission activities does not weaken or undermine universities’ other two missions. Instead it harnesses the synergy between the three missions, while leveraging the university’s capabilities to its full potential.

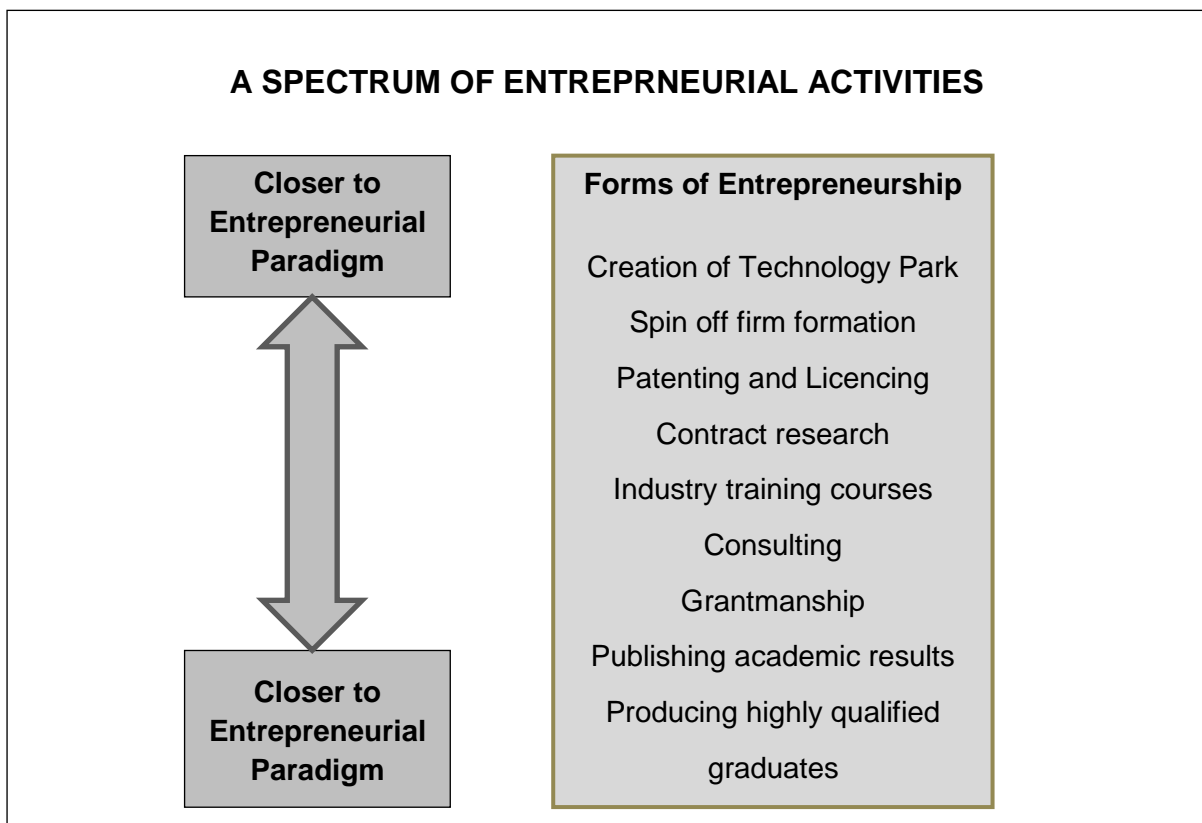
Philpott *et al.* (2011:162,163) believed that for universities’ activities to be entrepreneurial it must contribute to regional and/or national economic and/or social development in addition to benefiting the institution and those activities can be classified into soft and hard activities based on their level of sophistication. They describe hard entrepreneurial activities as the more tangible and sophisticated



activities such as university spin off companies, patenting and licensing activities largely found in matured entrepreneurial universities and often considered to be the only form of university entrepreneurship. Soft entrepreneurial activities they noted are less tangible and are the common form of knowledge dissemination in traditional universities, consulting, contract research and academic publishing. They further argued that much of the research on university entrepreneurialism focused on the hard activities with almost no attention paid to the economic value of the softer activities - a position they consider not healthy for universities.

Figure 2.1 depicts the different types of university entrepreneurial activities on a hard - soft continuum, while Table 2.1 shows the same entrepreneurial activities and their economic contribution to the university and the society.

**Figure 2.1: A spectrum of entrepreneurial university activities**



Source: Adapted from Philpott, Dooley, O'Reilly and Lupton (2011:162)

**TABLE 2.1: Entrepreneurial activities contribution**

<b>FORMS OF ACADEMIC ENTREPRENEURSHIP</b>	<b>DESCRIPTION</b>	<b>CONTRIBUTION TO ECONOMIC DEVELOPMENT</b>	<b>CONTRIBUTION TO FINANCIAL ADVANTAGE</b>
Creation of a technology park.	Supplying a formal site where businesses (normally of a high-tech nature) can locate and interact with the university itself.	Construction of a seed bed for the development of multiple new ventures that will contribute to regional cluster development and regional employment. The infrastructure contributes to their search capability of the university by attracting highly skilled individuals and technological resources to the region.	University may generate small income through its role as 'landlord'. However main financial contribution is indirect, where linkages with firms will lead to research and education opportunities, together with potential for licensing and technology transfer.
Spin-off firm formation.	The creation of firms based on university research.	The creation of new entrepreneurial ventures in an economy that transfer technology from the lab bench to the market, exploits IP and generates employment for the region.	University, though owning a share of the equity, will generate a revenue stream from the company's trading and eventual sale/IPO.
Patenting and licensing.	The securing of intellectual property rights on discoveries and know-how developed within the university.	The protection of intellectual property documents the knowledge contribution of the university and allows the controlled transfer of IP to suitable industrial partners that can exploit its novelty for competitive advantage and wealth generation.	Revenue stream generated directly through license deal and ongoing royalties. Securing IPR also provides the basis to form spin-out ventures. Also provides a 'shop window' for university research output, attracting industry attention.
Contract research.	Undertaking specific research projects with industry; many of these projects have a strong commercial focus.	Contract research facilitates industry by solving practical problems that enhance business performance. Engaging in contract research also contributes to stronger social relations between university and industry that can lead to deeper research interaction in the future.	Revenue stream generated by industry co-funding research. However, indirect financial support associated with contracts (inform of equipment, human resources, IP and materials from industry) can also advance research capability of university.
Industry training courses.	Teaching students from industry. These courses can	Up skilling the national or regional workforce regarding emerging state	Up skilling the national or regional workforce regarding emerging state of

	include executive education.	of the art practice and technology. This ensures that regional industry maintains its competitiveness by increasing its internal skill base.	the art practice and technology. This ensures that regional industry maintains its competitiveness by increasing its internal skill base. Revenue stream from industry or government for undertaking the training. Indirect benefit in industry linkages that may lead to opportunities for future entrepreneurial activities.
Consulting	Directly selling academic expertise to external organisations to solve practical problems.	The provision of personalized advice and mentoring that can improve enterprise performance. This can also develop linkages between university and industry that can be further exploited in the future.	Revenue streams from industry or government for undertaking the consultancy. Indirect benefit in industry linkages that may lead to opportunities for future entrepreneurial activities.
Grantsmanship	Obtaining large-scale research grants from external sources for basic research.	Enhances the reputation of the university, which attracts industry to the region and may lead to production of harder forms of academic entrepreneurship (Powers, 2004; Di Gregorio and Shane, 2003:222; Van Looy <i>et al.</i> 2004).	Financial benefit by external body funding research costs for university. Indirect benefit from contribution to other entrepreneurial activities (e.g. discovery from funded research may be patented and then become the basis of a licensing agreement or spin-out.)
Publishing academic results	Publishing books, chapters and articles.	Enhances the reputation of the university, which attracts industry to the region and may lead to production of harder forms of academic entrepreneurship (Powers 2004; Di Gregorio and Shane 2003; Van Looy <i>et al.</i> 2004).	Indirect financial benefit that establishes university as world class and attracts industry to interact with it (e.g. publishing alerts industry to the university's capability and may result in contract research and licensing.)
Producing highly qualified graduates	Providing the workforce with skilled undergraduates and postgraduates.	The production of suitably skilled graduates for the regional and national workforce, capable of meeting the current and future industry demands. Ensures national industry has the absorptive	Development of new and relevant programmes attracts students to the university generating fee income. Indirect benefit from network contacts as graduates enter industry and maintain links with

		capacity to engage with university as part of the triple helix model.	university.
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Source: Philpott, Dooley, O'Reilly and Lupton (2011:163)

### 2.2.2 Entrepreneurial university and the Triple Helix concept

Increased importance of knowledge and research to economic development led to the reevaluation of universities' purposes and roles in the society (Etzkowitz and Leydesdorf 2000:110) as well as governments making third mission a goal for universities (Philpott 2011:164). The implementation of third mission activities marks universities' transition from ivory towers to entrepreneurialism (Etzkowitz *et al.* 2012:145). University entrepreneurialism is an essential step in the formation of government-universities-industries interaction for economic development called the triple helix concept (Etzkowitz *et al.* 2012:145).

Triple helix is the concept of equal interrelating and interdependent institutional interaction between universities government and the industry and on which the success of the knowledge economy depends (Etzkowitz *et al.* 2007:15). Entrepreneurial universities are the base on which the triple helix concept rests (Etzkowitz, Ranga, Benner, Guarany, Maculan and Kneller 2008:681) and the concept is used to explain innovation systems in national and other social contexts (Etzkowitz and Leydesdorf 2000:109).

According to Etzkowitz *et al.* (2008:863) the triple helix concept is based on three key beliefs that:

- Innovation systems in the knowledge economy consist of three institutional groups, namely government, universities and industries that are equal contributors to the system;
- There is a collaborative relationship among the institutional elements in this concept and that the outcome of such collaborations is innovation policies which are a departure from how innovation policies were originated in the past where such policies originated strictly from government; and
- That in this new structure constituent institution performs each other's tasks in addition to their traditional tasks which make them potential sources of innovation.

According to Etzkowitz and Leydesdorf (2000:112) most countries are now trying to establish the triple helix arrangement in one form or the other.

The following section considers the different definitions of entrepreneurial universities.

### 2.3 DEFINING THE ENTREPRENEURIAL UNIVERSITY CONCEPT

The Entrepreneurial University concept is not very well defined (Armbruster 2008; Etzkowitz *et al.* 2000; Gjerding *et al.* 2005; Gjerding *et al.* 2006; Kirby 2006). Its context dependent nature makes it difficult to define it in a uniform way (Gjerding *et al.* 2005:12). Woollard (2010:414) believed that the concept has been defined under two broad themes, namely as organisational and as commercialisation of science. Table 2.2 summarises some of the definitions proposed by scholars and these definitions show that scholars' attention in defining the concept have centered more on commercialisation of university research which does not truly define the entrepreneurial university concept.

**Table 2.2: Definitions of the entrepreneurial university concept**

YEAR	AUTHOR	DEFINITION
1983	Etzkowitz	Universities that are considering a new source of funds like patents, research under contracts and enter into a private partnership with a private enterprise.
1995	Chrisman <i>et al.</i>	Entrepreneurial university involves "the creation of new ventures by university professors, technicians or students".
1995	Dill	A formal effort to capitalise on university research by bringing research outcomes to fruition through creating commercial ventures. Formal efforts are in turn defined as organisational units with explicit responsibility for promoting technology transfer.
1998	Clark	An entrepreneurial university on its own seeks to innovate in how it goes about its business. It seeks to work out a substantial shift in organisational character so as to arrive at a more promising posture in the future. Entrepreneurial universities seek to become stand up universities that are significant on their own terms.
1998	Ropke	An entrepreneurial university can mean three things: the university itself as an organisation becomes entrepreneurial, members of the university – faculty, student, employees – are turning themselves somehow into entrepreneurs, and the interaction of the university with the environment, the structural coupling between the university and the environment, follows an entrepreneurial pattern.
1999	Subotsky	The entrepreneurial university is characterised by a closer

		university business partnership by greater faculty and through responsibility for accessing external sources of funding and managerial ethos in institutional governance leadership and planning.
2002a	Kirby	As the heart of any entrepreneurial culture, entrepreneurial universities have the ability to innovate, recognize, create opportunities, work in teams, take risks and respond to challenges.
2003	Etzkowitz	Just as the university train individual students and send them out into the world the entrepreneurial university is a natural incubator providing support for the teachers and students to initiate new ventures: intellectual, commercial and conjoint.
2003	Jacob <i>et al.</i>	An entrepreneurial university is based on both commercialisation (custom made further education courses, consultancy services and extension activities) and commoditisation (patents, licenses and student owned startups).

Source: Guerrero, Urbano and Kirby (2006:4)

Due to the comprehensiveness of the definition of an entrepreneurial university, this study adopts the definition by Guerrero *et al.* (2006:5) which reads as follows: “A university that has the ability to recognise and create opportunity; innovate; work in teams; take risks; respond to challenges and seek and work out substantial shifts in organisational character so as to arrive at a more promising posture in future.”

## 2.4 CHARACTERISTICS OF AN ENTREPRENEURIAL UNIVERSITY

Entrepreneurship is not one thing and may have different meanings in different contexts, depending on the people involved (Gjerding *et al.* 2005:13). Different scholars have listed varying attributes of an entrepreneurial university. While Guerrero *et al.* (2006:4) and Woollard (2010:414) observed a lack of consistency in describing the characteristics of an entrepreneurial university they, at the same time, noted that similar attributes that depict important factors affecting these institutions can be identified.

Shattock (2000:96; 2003:21) identified excellence, relevance and reputation; strong organisational culture that makes ordinary people act in extraordinary ways; internal and external competitiveness; adaptation without changing fundamental identity; bold decisions; conservative financial approach and collegiality in decision making as some of the distinguishing characteristics of an entrepreneurial university. Etzkowitz (2004) listed capitalisation of knowledge; university-industry-government interde-

pendence; autonomy; creation of hybrid organisations; and continuous structural modification in response to changing industry and government relations, as standard characteristics of an entrepreneurial university and Zaharia and Gibert (2005:37) listed these characteristics as a dynamic and interactive attitude to society; educational mission; entrepreneurial management; harmonisation of scientific and managerial competencies and environmental influence.

Clark (1998:5,128; 2004:77) on the other hand listed five characteristics required by a university to be entrepreneurial and these five factors have been corroborated by other scholars (Gjerding *et al.* 2005; Shattock 2003; Sporn 1999; Vaught 1999) and can be considered a standard for characterising an entrepreneurial university. They are:

- **Strengthened steering core.** A university's steering core is its administrative back bone (Clark, 1998:137), and this characteristic describes universities' need to be quicker, more flexible and focused in responding to environmental demands as the demand becomes more complex and changes rapidly.

Clark (1998:5) defined a university's steering core as its central decision making body, its central managerial group and academic departments which according to him are usually weak with little ability to self-direct in traditional universities. To be an entrepreneurial university, its steering core must reconcile new managerial values with traditional academic orientation through a flatter organisational structure that reduces barriers between the centre and the academic units; increased authority and responsibilities at each organisational level and professionalised administration (Clark, 2004:83).

- **Expanded developmental periphery.** These are professionalised outreach offices that compliments and mediates between academic departments and the community. They comprise two forms within universities: administrative offices such as the technology transfer offices, and academic forms such as universities' centres of excellence which are usually multidisciplinary or trans-disciplinary units (Clark 2004:85). These offices cross traditional universities' boundaries to link the university to the community. The academic forms take on an externally defined research concept, consist of academics from different academic departments that

are formed into project groups and they generate income that helps the university to diversify its funding base, and are easy to set up and disband (Clark 2004:86). These offices promote knowledge transfer, industrial contacts, intellectual property development, continuing education, fund raising and alumni affairs. They are unique units and dynamic infrastructures set up by entrepreneurial universities to cope with societal demands – their third mission (Clark 1998:6).

- **Diversified funding base.** As universities' funding requirements increase due to high environmental demands, state funding of universities, their main funding source, has stagnated or has been on a steady decrease, putting their existence under great pressure. Universities have reacted by developing a pool of funds based on other more varied income sources called the "third stream", which consist of funds from research councils that are very competitive and gain from grants and contracts, income from intellectual properties, philanthropic foundations, industrial organisations, local governments, earnings from campus services, student fees and alumni fund raising (Clark 1998:6). These funding sources represent true financial diversification and provide discretionary funds for institutions. Entrepreneurial universities have learnt faster and reacted more quickly to diversify their funding base from the narrow support of state funds to a wide financial base of discretionary funds, thus ensuring their institutional autonomy.
- **Stimulated academic heartland.** University heartland is its academic departments and they are its most central and important part. They are where traditional academic values are most entrenched in addition to the faculties where most academic work is done (Clark1998:7). Change and innovations in universities are more likely to fail at this level if it is resisted or ignored. Hence their acceptance of major transformation is critical. Entrepreneurial universities are institutions that are able to have all their departments and faculties embrace entrepreneurship, engage in external collaborations through their programs and relationships, generate third stream income and participate in university's central decision making. Clark (1998:7) opined that, in entrepreneurial university the academic heartlands accept modified belief system.
- **Integrated entrepreneurial culture.** Entrepreneurial universities have developed a work culture that embraces entrepreneurship and their strong entrepreneurial



culture is rooted in strong practices. Their entrepreneurial culture is facilitated by the presence of the first four factors (Clark 1998:8).

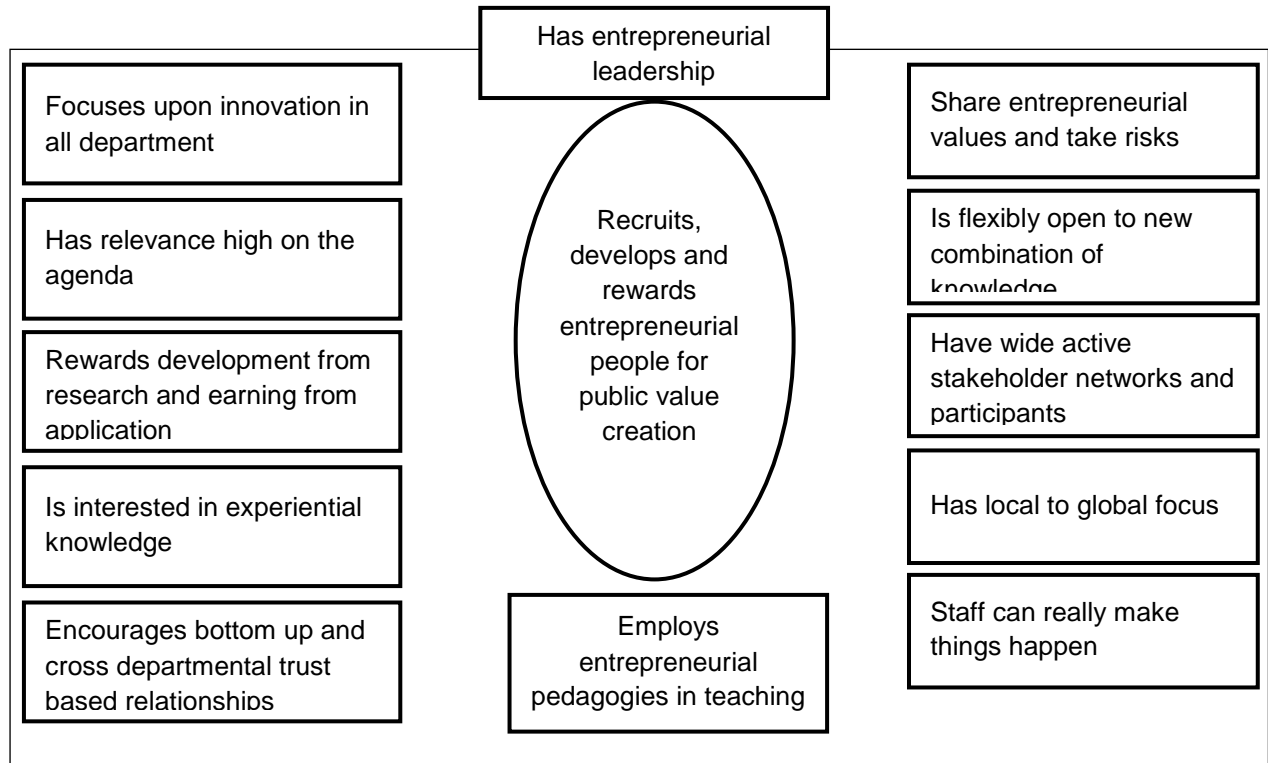
Gjerding *et al.* (2005:8) expanded the five characteristics discussed above by developing what they believe are twenty practices of entrepreneurial universities and they called this “the inventory of entrepreneurial organisational practices” The authors claimed that the twenty practices comprehensively characterise entrepreneurial universities. The twenty practices are:

- *Independence from governmental funding restrictions.* Due to the diversified nature of their funding base, entrepreneurial universities are less restricted by governmental approval in undertaking major investment.
- *Emphasis on a central steering core.* Entrepreneurial universities have a strong and decision-orientated senior management team.
- *Management quality of staff, especially in finance.* Entrepreneurial universities characteristically hire quality professionals which are then given sufficient staff development programmes to ensure their maximum contribution to the university as well as their retention.
- *Administrative and academic staffs have a culture of change rather than a rule-based orientation.* Staff of entrepreneurial universities prefers innovation and new idea realisation to rule-execution of their duties.
- *Lump-sum budgeting.* Entrepreneurial universities utilize governmental funding at their own discretion and freely retain annual unspent income by setting up strategic funds.
- *Output-orientated contracts with financiers.* Non-governmental financiers’ funding in entrepreneurial universities is calculated based on measurable outputs and outcomes and are monitored through regular reporting.
- *Flat structure.* Reporting barriers and hierarchies between the steering core and base units are minimised for quick decision-making in entrepreneurial universities.
- *Mission statement and strategic plan.* Entrepreneurial universities use concise and clearly written mission statements and strategic plans as a means of communicating guideline for all university’s strategic decisions and objectives.
- *Extensive alumni activities.* Extensive and appropriate alumni funding and support activities characterises entrepreneurial universities.

- *Cooperation with industry and other (excellent) universities.* Entrepreneurial university maximises its research infrastructure through synergistic activities with network of excellent individuals and institutions.
- *Competitiveness of campus infrastructure.* Attractive campus and environments for the recruitment and retention of excellent students characterises entrepreneurial universities.
- *Additional funding through 'cash cows'.* Entrepreneurial universities have well established third-stream income sources.
- *Focus on a limited range of teaching and researching fields.* Entrepreneurial universities do not over-stretch themselves by highly diversified activities in fields outside their core specialisation.
- *Monitoring future opportunities in teaching and research.* Entrepreneurial universities pay permanent attention to developments in their teaching and research environment and reserve resources for quick response to new environmental developments.
- *Attractiveness for endowments.* Entrepreneurial universities' reputation plans and alumni attract regular and substantial donations from funders.
- *Attractive environment for young researchers.* Successful young researchers are recruited and retained as a way to attract students and donors and to carry out innovative research in entrepreneurial universities.
- *Interdisciplinary research structure.* Entrepreneurial universities are characterised by an established organisational structure in research and teaching which supports intra-organisational cooperation.
- *Technology transfer.* There are well-established and structured technology transfer processes at entrepreneurial universities.
- *High share of master and post-graduate students* that provide new teaching income streams characterise entrepreneurial universities.
- *Service-offers for spin-off/out companies.* Support for accessing risk capital, consultation, office space, small production facilities, finding of guarantors, among others, are provided by the entrepreneurial universities to its community members.

Hannon (2012:3) also diagrammatically summarised major features of an entrepreneurial university with Figure 2.2.

**Figure 2.2: Entrepreneurial university – an organisation that:**



Source: Adapted from Hannon (2012:7)

This study, in addition to the five irreducible minimum attributes identified by Clark (1998, 2004), and the twenty practices suggested by Gjerding *et al.* (2005), also regards self-directed autonomy (Shattock, 2003:147), excellence (Shattock, 2003:21), university-industry-government interdependence (Etzkowitz *et al.*, 2007:15) and relevance (Shattock, 2003:21), as characteristics of an entrepreneurial university.

The following section discusses the external factors influencing university entrepreneurial transformation.

## 2.5 DRIVERS OF UNIVERSITY ENTREPRENEURIALISM

Drivers, defined as that which create and fuel activity or give force or impetus ([www.thefreedictionary.com](http://www.thefreedictionary.com)) of university entrepreneurialism are external environmental factors influencing universities' entrepreneurial transformation.

Duncan (1972:314) defined an organisation's environment as the totality of physical and social factors that are taken directly into consideration in the decision-making behaviour of its members and that the environment can be divided into internal and external (Duncan, 1972:314; Kuratko, Morris and Covin, 2011:4). According to Duncan (1972) the internal environment is made up of relevant physical and social factors within the boundaries of the organisation that are taken directly into consideration in making decisions by organisational members, while the external environment consists of relevant physical and social factors outside the boundaries of the organisation that are considered.

Cameron (1984:139) observed that universities' lack of awareness of critical environmental elements could lead to their demise and Clark (1998:129) stated that rapid changes in universities' task environment are pressuring them to be entrepreneurial.

Listed below are some of the key factors found in the literature to be drivers of university entrepreneurialism:

- **Massification of higher education.** University education has progressed from elite- to mass- and currently to universal education (Clark, 1995:6). The huge growth in demand for university education and the corresponding decrease in state funding have caused tension within universities between choice of academic excellence and the need for mass access to higher education. This is among the major problems leading to university entrepreneurialism (Soares and Amaral, 1999; Gibbs *et al.*, 2009; Sporn, 2001; Zaharia and Gibert, 2005).
- **Dwindling state funds.** Stagnating and sometimes a reduction in financial allocation from government as the number of students enrolling at universities exponentially increases put considerable strain on universities (Clark 1995, 1998; Philpott *et al.*, 2011; Kriestensen, 1999; Shattock, 2003; Sporn, 1999, 2001; Zaharia and Gibert, 2005).

- **Employability agenda.** Graduate unemployment is now a global concern. According to Gibbs *et al.* (2009:8) future employment in the labour market will be characterised by frequent job, occupation and location change in addition to periods of self-employment as well as contract employment. In addition the increasing labour market demand for graduates trained in varied and highly specialised fields; graduates that expect university academic programmes to guarantee employability and career success as well as the need to continuously retrain graduates throughout their careers, greatly increases the excessive demand on universities (Clark 1998; Zaharia and Gibert 2005).
- **Globalisation.** Globalisation is the outcome of years of interconnectedness between nations through trade and knowledge transfers and has led to internationalisation of university education and research. This has increased competition among and between universities for outstanding academics, students and other key resources (Crow 2008:17; Kriestensen 1999; Shattock 2003; Sporn 1999; Zaharia and Gibert 2005).
- **Knowledge outrunning resources.** Uncontrollable production, reformation and distribution of knowledge internationally are causing universities' academic departments' relentless demand for funding, personnel, students and space (Clark 1995:6, 1998: xiii).
- **New Technologies and Telecommunications.** Revolutionisation of university systems and education through information technology and modern telecommunications. In addition to competition from non-traditional forms of educational delivery, such as virtual universities as well as international research efforts have changed the character of teaching and research (Shattock 2003:182; Sporn 1999:24, 2001:12).
- **Shifting Demographics.** More students and different types of students now go to universities to be diversely and repeatedly educated in different fields of knowledge which in addition to other factors badly overload universities' ability to respond (Clark 1998; Kriestensen 1999; Sporn 1999; Zaharia and Gibert 2005).
- **Legitimisation of economic development as an academic function.** Governmental pressures on universities to contribute more to regional and national economic and social development; emergence of new social roles for

universities; development of closer and more efficient relationship with industry and the wider society all put pressure on universities (Clark 1998; Philpott *et al.* 2011; Kriestensen 1999; Sporn 1999; Zaharia and Gibert 2005).

- **Stakeholders demand.** Universities have different stakeholders who place different demands on universities in return for their support. This puts a lot of pressure on the universities (Clark 1998b:6).

Discussed next, are key internal factors influencing university entrepreneurialism.

## 2.6 INTERNAL FACTORS INFLUENCING UNIVERSITY ENTREPRENEURIALISM

Woollard (2010:415,418) observed that a robust discussion on an entrepreneurial university should not only mention its characteristics but must also indicate factors that create and sustain it, and that care must be taken in identifying these factors and understanding the relationships between them. Armbruster (2008:375) believed that conditions necessary for entrepreneurship as an institutional practice at universities have not been clarified by research.

University entrepreneurial transformation is driven by a combination of external and internal factors and Etzkowitz (2000:315) asserted that normative changes in universities are due not only to the emergence of entrepreneurial dynamics within them but also from the external influences on them. Cameron (1984:139) also believed that for equilibrium to occur in a university complexity in its external environment must be matched with the complexity in its internal environment. Factors listed under drivers of university entrepreneurship above are some of the complex activities occurring in universities task environment to which internal responses are needed. Discussed herein are key internal factors that influence university entrepreneurialism.

Guerrero *et al.* (2006:6), using institutional theory, classified internal factors influencing university entrepreneurialism into (a) the formal factors that consist of university governance, and (b) organisational structure; start-up support; entrepreneurship education, and informal factors comprising university attitude to entrepreneurship; entrepreneurship training programmes; entrepreneurial role

models and university reward systems. But Gjerding *et al.* (2005:20) in dealing with the same issue grouped these factors of influence into four, namely:

- **Organisational culture**, which they called the pervading spirit at a university.
- **Supporting organisational structure**, which they believed facilitates entrepreneurial activities.
- **Strategy in practice**, which they called the actual strategy executed by university leadership rather than those projected on paper and it's the one that actually determines the university's entrepreneurship.
- **External cooperation**, which is the relationship formed by a university through its alliances with its partners and they called this "a core feature of university entrepreneurialism".

Clark (1998:5) alluded to the five factors he claimed to characterise entrepreneurial universities as internal factors influencing university entrepreneurship by also referring to them as five irreducible transformation pathways. This study deduced from Clark's (1998) five factors and his explanation of them, five internal factors that could influence university entrepreneurialism namely:

- **Governance factor.** This factor is deduced from the factor Clark referred to as the "Strengthen Steering Core" and which he described as the central management group and the academic departments of a university.
- **Structural factor.** This factor is deduced from Clark's "Expanded Developmental Periphery" factor that he described as boundary crossing units within entrepreneurial universities as well as from his "Stimulated Academic Heartland" factor described by him as traditional academic departments formed around academic disciplines.
- **Financial factor.** The financial factor is derived from his "Diversified Funding Base" factor that is also called the *third stream income* and described as discretionary funds from diverse sources.
- **Cultural factor.** This factor is deduced from the "Integrated Entrepreneurial Culture" factor which Clark (1998) described as work culture that embraces change within a university.

- **Environment as a factor.** While not explicitly identified as a factor of influence, the environment is acknowledged as a factor of influence by Clark (1998:146) in his assertion that entrepreneurship at universities is their response to the growing imbalance in the environment-university relationship.
- **Autonomy.** Clark (1998:146) regarded this factor as important when he noted universities' self-directed autonomy as an important factor in its entrepreneurship.
- Etzkowitz and Zhou (2008:630-631) believed that the external environment and the university's internal culture are the two critical factors required for their entrepreneurial transformation but at the same time argued that the lack thereof does not necessarily impede universities' entrepreneurial transformation. The authors also alluded to strategy and structure as internal factors influencing university entrepreneurship by stating that "entrepreneurial university is realized at three levels:
  - *Policy dimensions* - how the university and its members may contribute to economic and social development as well as research and education; **a strategy factor.**
  - *The organisational structure* of the university and the extent to which it reconfigures itself to support entrepreneurship and innovation; **a structural factor.**
  - *Motivations and interests* of individual academics; **a values/cultural factor.**

Soares and Amaral (1999:17) questioned applicability of some of Clark's five characteristics of an entrepreneurial university to all universities, especially comprehensive universities, which according to them have a lot more students and academics. Although they agreed that the strengthening of a university's steering core, a *governance factor* and creation of expanded developmental periphery, a *structural factor*, are important characteristics of all universities. The authors further stated that *strategic thinking*, permeating the whole university (a strategic factor), the reduction in *departmental centrifugal forces* (a structural factor); achievement of *centralised decentralisation* (a structural factor), as well as the application of *third stream revenue* (a financial factor) to strategic decisions and to reinforcing a university's identity, as additional factors.



Sporn (1999:269; 2001:123) identified nine factors considered as critical influences on university entrepreneurialism, called adaptive factors. These are:

- **External environment.** Sporn argued that universities' external environment (which consist of factors listed under drivers of university entrepreneurialism) modifies its structure through governance, leadership and management activities and that how a university interprets its external environment is dependent on its history and current resources .
- **Mission and goals.** A clear mission guides universities' decision making and planning. The missions and goals also orientate the universities' communities as well as integrate their decentralised and loosely coupled academic organisations.
- **Culture.** Sporn (1999; 2001) argued that entrepreneurship dominated organisational culture. It is an important factor in an entrepreneurial university stating that organisational culture sustained by institutional vision and examples becomes a constant reminder of the benefits of entrepreneurship to a university.
- **Structure.** Universities differentiate their structures in response to different environmental demands and consist of various units that are relatively autonomous but accountable to central leadership.
- **Professionalised management.** Full-time professional managers are important as administrators to make decisions and implement strategies.
- **Governance.** Shared governance among diverse groups within the university is needed to reach agreement on chosen responses to environmental demands.
- **Leadership.** Leadership's commitment to entrepreneurialism demonstrates the importance, provides resources and can increase motivation and identification leading to a shared view of entrepreneurialism among university communities.
- **Institutional autonomy.** Institutional autonomy concerns a university's freedom to create programmes, admit chosen students, change its structure and design services without interference.
- **Diversified funding base.** This is the ability of a university to obtain income from different sources and that the more diversified the income base the less vulnerable, more proactive and entrepreneurial the university is. According to

Sporn (1999; 2001) this factor encourages institutional autonomy as well as ability to fund various entrepreneurial strategies.

Considering the opinion of the various scholars discussed above this study adopts and modifies factors identified by Sporn (2001) because of its comprehensiveness and simplicity. This study modifies the mission and goals factors to become strategy factors in line with Etzkowitz and Zhou's (2008); Gjerding *et al.* (2005); Shattock (2000:101) and Soares and Amaral (1999:18) assertions. The governance, management and leadership factors are condensed into **leadership** factor.

Table 2.3 summarises the key factors found in the literature that influence university entrepreneurialism. In addition, the factors are briefly discussed to highlight their unique attributes.

**Table 2.3: Integration of key factors influencing university entrepreneurship**

Author	Environment	Strategy	Structure	Culture	Governance	Finance	Autonomy
Sporn 2001	x	x	x	x	x	x	x
Clark 1998	x		x	x	x	x	x
Gjerding <i>et al.</i> 2005		x	x	x			
Guerrero <i>et al.</i> 2006			x	x	x	x	
Soares & Amaral 1999		x	x		x	x	
Etzkowitz & Zhou 2008		x	x	x			

Source: Researchers own construct.

### 2.6.1 Environment

An organization's environment is the totality of physical and social factors taken directly into consideration in the decision-making behaviour of its members. It can be classified into the external and internal environment and adequate information on both is required to understand modern organisations (Duncan, 1972:314; Kuratko *et al.*, 2011:4). Internal environment is made up of relevant physical and social factors within the boundaries of an organization such as its culture, structure, systems and

processes and is the internal climate members operate in. The external environment consists of relevant physical and social factors outside the boundaries of the organization that affect and are affected by the organisation's actions (Covin and Slevin, 1991:11; Duncan, 1972:314; Kuratko *et al.*, 2011:4).

Organisations' external environment consist of the task environment made up of external forces that directly affects it and are relevant for its goal setting and attainment (Duncan, 1972:314). The task environment can either be the objective environment – the real state of thing outside the organisation or the perceived environment – the environment as perceived by organisational members (Bourgeois, 1980:33). Three dimensions describes organisations task environment: dynamism that describes the degree of change exhibited by factors in it and also referred to as volatility, complexity or heterogeneity that describes the diversity of elements in the environment and uncertainty that describes lack of information and knowledge about decision outcome as well as the inability to estimate the effects of environment on organisational performance. (Duncan, 1972:316; Bourgeois, 1980:35). Task environment envelops an organisation. The general environment is the other aspect of the environment and it envelops the task environment. It constitutes the environment from which organisations could create new task environments in future (Bourgeois, 1980:35).

The external environment is a primary trigger and an important antecedent of entrepreneurship in an organisation (Burns, 2005:70; Schindehutte, Morris and Kuratko, 2000:22). It presents information in form of precipitating events to which organisations adapt their structures and cultures (Burn, 2007:473; Russell, 1999:69), is used to create sustainable competitive advantage and continuous improvement (Kuratko, et al 2011:4) and has deterministic effects on effect on the existence and effectiveness of entrepreneurial activities (Covin and Slevin, 1991:11).

A university environment exerts strong influence on its functions and is important in developing university cultures. The more dynamic university task environment becomes the more important the internal culture in its management (Sporn, 1996:42). Clark (1998:131) believed that it's the convergence of environmental demand – the demand overload – and universities limited response that caused their entrepreneurial transformation.

### 2.6.2 Strategy

Organizational strategy is the set of commitments and actions taken by management to develop, then exploit competitive advantages (Kuratko *et al.*, 2011: 222) and is influenced by leadership's beliefs, values and management philosophies (Covin and Slevin, 1991:14). Strategy process is made up of strategy formulation and implementation (Bourgeois, 1980:26). It is a linked pattern of actions (Burns, 2005:170) made up of strategy content and the decision making process giving rise to it (Bourgeois, 1980:26). Burn (2005:169) argued that the decision making process is more important than strategy content insisting that entrepreneurial organizations must not only strategise continuously but must do so at all levels.

There are two classes of organisational strategies - the domain defining strategies also called corporate level strategies and the domain navigating strategies or business level strategies (Bourgeois, 1980:25).

Entrepreneurial strategy is a process focused domain navigating strategy that is part of a corporate strategy. Its characterised by change in decision making patterns, it promotes persistent search for competitive advantage through innovation and may be a strategic thrust or a minor part of an organizational strategy (Murray, 1984:1; Russell and Russell, 1992:63641). Entrepreneurial strategies manages entrepreneurship context by creating innovation conducive organisational structures, stimulating innovation producing behaviours and to be successfully implemented the uncertain innovation processes must be effectively managed (Russell and Russell, 1992:641). Strategic decision making is a central activity in organisations adaptation to their environment (Bourgeois, 1980:25) and to Gjerding *et al* (2005:20) good strategies allow academics to take intellectual risks without risking their jobs or academic reputation.

### 2.6.3 Leadership

Hambrick (1989:6) described organisational leadership as people with overall responsibility for the organisation – its top management team or other governance bodies. Leadership's primary responsibility is to align the organisation with current and future environmental dynamics and to develop adaptive internal context that is aligned with the strategic thrust. According to Burn (2005:70,99) leadership in organisations set direction, communicates and motivates members and in an entrepreneurial institution can emerge at any organisational levels.

Covin and Slevin (1991:5) insisted that leadership should be at the centre of any behavioural model of organisations. The establishment and reinforcement of innovation supporting organisational culture is a key responsibility of organisational leaders (Russell 1999:73). To Sporn (1999:270) university leaders should demonstrate their commitment to entrepreneurship through financial support for entrepreneurial project and activities.

#### **2.6.4 Structure**

Organisational structure is the formal pattern of how people and jobs are grouped and how the activities of different people or functions are connected (Kuratko et al 2011:237). Structures are created to give order and logic to operations and can be classified into an organic and bureaucratic structure (Russell and Russell 1992:643). Organic structures support innovation due to its attributes of:

- Decentralization – Describes the degree to which decision making is decentralised in an organisation. It provides institutional context in which members have more autonomy and control over resources, produce more new ideas, participate more in innovation related decision making and are more committed to the innovation process and idea implementation.
- “Deformalisation” – Describes the degree of standardisation in organisational activities. Deformalisation increases institutional members’ access to needed information and skills in the innovation process.
- Complexity – Describes the degree of work and departmental differentiation in an organisation. It increases the potential for innovation but also increases the amount of control, coordination and communication required by an organisation. (Russell and Russell 1992:643).

Sporn (1999:269) opined that universities structures are their most common adaptive response to environmental triggers and can be grouped into academic, vocational and continuous educational structures. She argued that these differentiated units should be autonomous and accountable for steps taken in adapting to external demands and expectations.

### 2.6.5 Culture

Kuratko et al (2011:267) defined organisational culture as the basic beliefs and assumptions about an organisation, how its members should behave and how the organization defines itself in relation to its environment. Organizational culture affects and influences all that is done by its members, transcends its every aspects and describes what an organisation is made of. It is imprecise and intangible but is real.

Organizational cultures are built on leader's assumptions, values and beliefs and are created by behaviors, and cognitive processes (Burn, 2005:106). Kuratko *et al* (2011:275) called entrepreneurship a culture that infuses the values, symbols, vocabulary, myths and rules of conduct and methodology of an organization. According to them organizational culture consists of three elements:

- Values and Beliefs - these are the core element of an organisational culture (Burns, 2005:105), and are intimately connected with the morals and ethical codes of members. Value is an enduring belief that a specific behavior or end state is more preferable than the other. Attitude is a tendency to respond to things in a favorable or unfavorable way and it connects individuals values and beliefs with their feelings (Brown, 1995:22).
- Language - is an essential cultural element used in shaping beliefs as well as in transmitting the views of a group of people about its self and its perception of the world. Without language values and beliefs cannot be communicated (Burns, 2005:105). To successfully work together in an organization its members need to develop mutual understanding through the common use of language and conceptual categories (Brown, 1995:13).
- Norms – these are implicit rules of behavior that determines appropriate and inappropriate behavior and ways of attaining outcomes in an organisation (Brown, 1995:17; Kuratko *et al.*, 2011:269; Russell and Russell, 1992:644).

Organisational culture is positive when its elements aligns with its vision, mission and strategies as well as fit with its competitive environment.

University culture is central to its academic organisations and is characterised by: ambivalent goals and ambiguous decisions making processes; people orientation and multiple stakeholders that makes management difficult. Managing university culture builds institutional strength in turbulent times and as universities task environments becomes more and more dynamic the ability to understand and manage university culture becomes invaluable (Sporn, 1996:44).

#### **2.6.6 Autonomy**

Blasi (2006:404) defined university autonomy as the moral and intellectual independence from political authority and economic powers in their research and teaching activities in a bid to meet the needs of their immediate environments. According to him universities' autonomy and academic freedom is what makes them valuable to the society and must be preserved at all cost. He argued that for universities to adapt to the dynamic 21<sup>st</sup> century environment, protect and provide new knowledge for the knowledge world, they must be autonomous. Sporn (1999:271) agreed with this assertion insisting that universities' autonomy enhance their transformational structures. Clark (1998:169) viewed the entrepreneurial university concept as a model by which universities will increase their autonomy in the 21<sup>st</sup> century.

#### **2.6.7 Diversified Funding Base**

Public universities have become expensive to run and a major expense for governments who are failing to cope with their demands. In the turbulent 21<sup>st</sup> century dependence on this single source of income has become inadequate (Clark, 2004:83,140). Universities now have to develop discretionary funding sources - called diversified financial base – by constructing a portfolio of patrons to share their rising costs and to provide needed income in response to dwindling governmental funding (Clark, 1998:6,140).

These differently sourced monies increases universities' independence and speed in decision making, their discretion, capacity to cope with the environment, innovativeness and self directed autonomy. It also reduces financial vulnerability, improves their adaptive capabilities as well as the ability to cross subsidize academic departments' activities which enhance university integration (Clark, 1998:7,141; Sporn, 1999:271).

Clark (2004:77) declared that diversified financial base underpins the entrepreneurial university concept and that it consists of three classes of income sources:

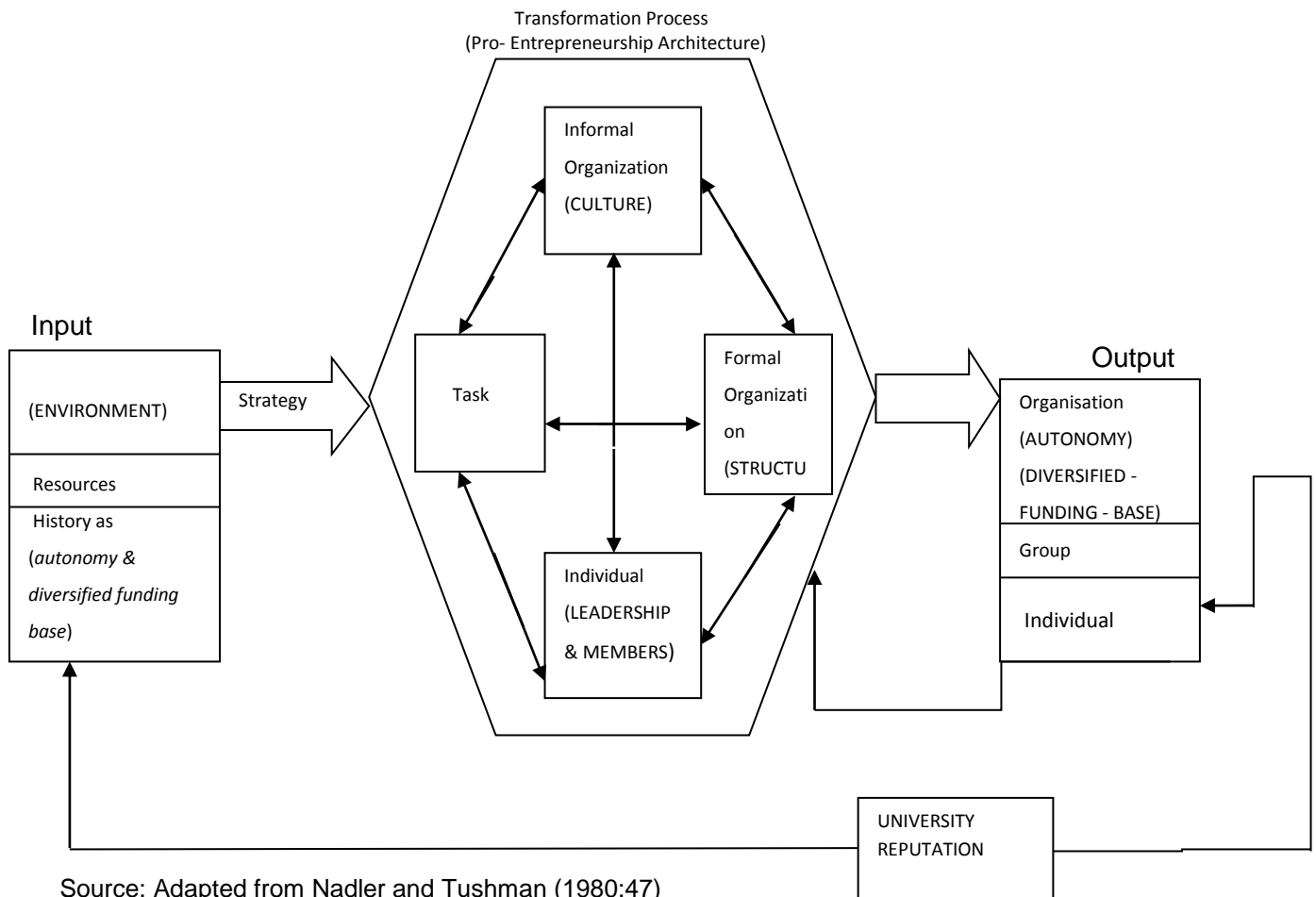
- Primary income sources- university traditional income sources that of income from ministries and governmental sources.
- Secondary income sources from research councils and which universities have to aggressively compete for.
- Third stream income sources, also called the “third mission income” can be further classified into funds from:
  - Other non traditional governmental sources - such as department of health, transport and defence among others.
  - Private organisational sources such as businesses, corporations and professional associations.
  - Philanthropic foundations locally and internationally.
  - University generated incomes like endowment, alumni fund, students tuition, income from campus operations, patented inventions, intellectual properties and university spin off companies.

Third stream income is universities’ most promising source of income because it can be directly developed and controlled (Clark 2004: 77). Woollard (2010:421) classified Diversified financial base and university autonomy as output factors that influence university entrepreneurship. Their path of influence is in form of university history that feedback as input (Nadler and Tushman 1980:41).

The identified factors of influence are located in a university in Figure 2.3.



**Figure 2.3: Congruence model for organisation analysis**



Source: Adapted from Nadler and Tushman (1980:47)

This section identifies the key internal factors influencing university entrepreneurship and locates them within a university. Section 2.7 discusses path of influence of these factors highlighting their interconnectedness and interactions in encouraging the entrepreneurial process.

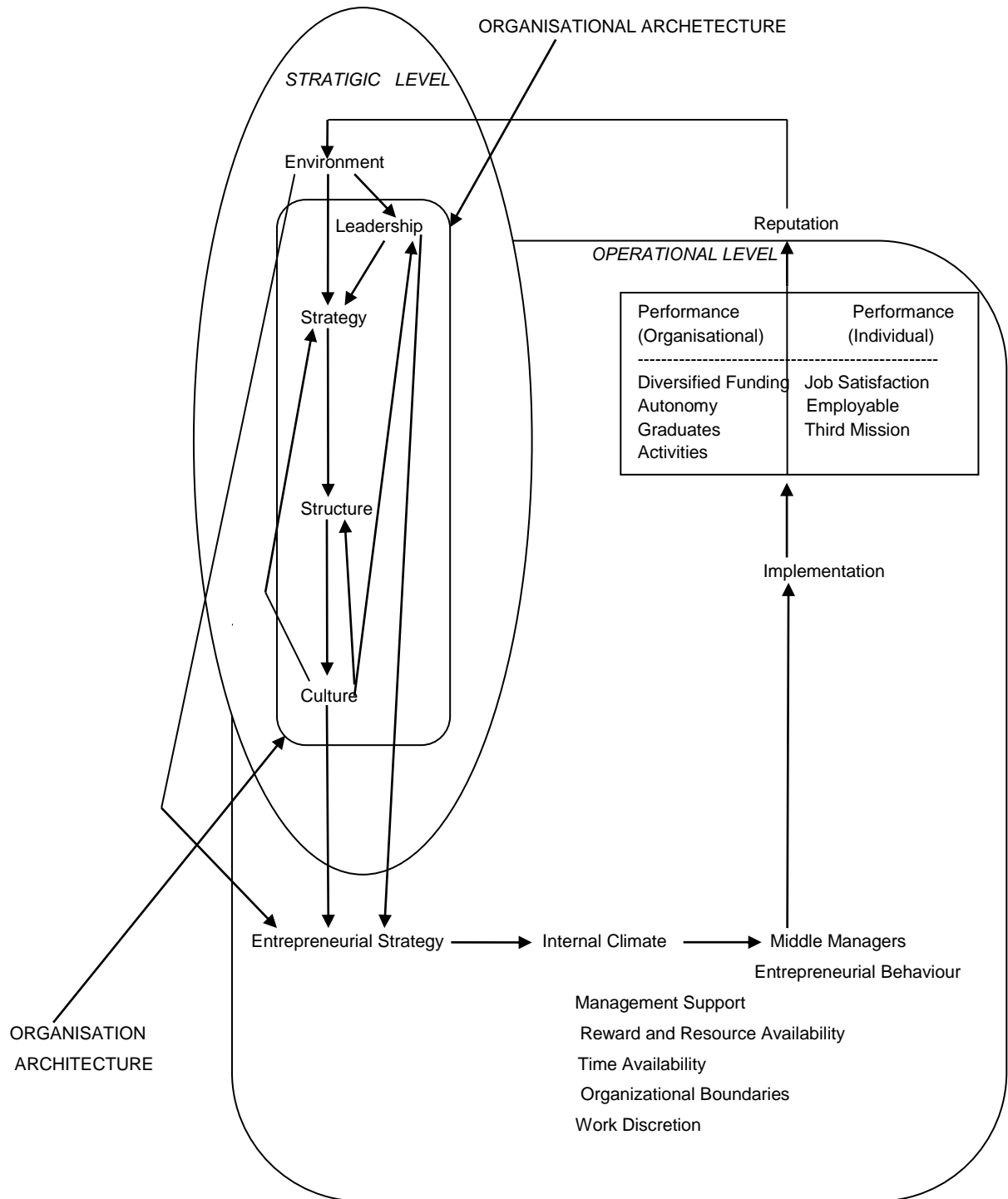
## 2.7 UNDERSTANDING PATH OF INFLUENCE OF ENVIRONMENTAL FACTORS ON UNIVERSITY ENTREPRENEURSHIP

To be effective, entrepreneurship must be woven into the “fabric” of an organisation and that requires a variety of integrative models that combined, help to understand critical factors that must come together for entrepreneurship to occur (Kuratko,

Morris and Covin, 2011:49). Aldrich and Martinez (2001:41) listed process, context and outcome as the three indispensable elements required to understand organisational entrepreneurial successes. Russell and Russell (1992:644) stated that an adequate model of entrepreneurship as an organisational process should fully explain how innovation beliefs and behaviours become valued and integrated into the activities of an entrepreneurial organisation. To Covin and Slevin (1991:9) an adequate model of entrepreneurship as organisational behaviour must be considered at three levels of variables - the environmental, organisational and individual levels.

In section 2.6, seven factors believed to influence university entrepreneurial transformation were identified. In this section the process by which these factors influence university entrepreneurship is described by examining their interrelationship and path of influence as depicted in Figure 2.4. For ease and clarity the discussion is divided into strategic level of influence and operational level of influence.

**Figure 2.4: Path of Influence of environmental factors influencing university entrepreneurship.**



Source: Researchers own construct.

At the strategic level, university-environment defined as the totality of physical and social factors that are directly taken into consideration in decision-making, is the source of events and changes that create opportunities and threats and can be separated into the internal and external environment (Bourgeois 1980:33; Duncan 1972:314). It is the interactions between these two environments that forces university managers to be innovative, as external complexities must be matched with the university's internal complexities (Hornsby *et al.* 2002:255; Mileti and Gillespie 1976:85; Morris, Coombes, Schindehutte and Allen 2007:17, and Sporn 1999:38).

Universities' external environments can be classified into the task environment that envelops a university and is critical to its goal setting and attainment and the general environment (Bourgeois 1980:33; Duncan 1972:314; Sporn 1999:38). It can also be described by using two dimensions: the complex dimension that describes the environmental attribute of having large numbers of dissimilar physical and social factors and the dynamic dimension that describes the rate of change in factors within it (Duncan 1972:315).

Changes in universities' task environment strongly affect them and this exerts a great influence on their functions and the development of specific cultures within them. Sporn (1996:41,42); Bourgeois (1980:32,34) and Morris, Coombes, Schindehutte and Allen (2007:17) argued that the external environment becomes known to a university through managerial perceptions (using their dominant logic) and when this environment is perceived as dynamic and uncertain they deploy strategies that are innovative, proactive and risk taking – the entrepreneurial strategies.

Universities deploy strategies to co-align their internal environment to the external environment (Bourgeois, 1980:24; Nadler and Tushman, 1980:38) and their strategies have two purposes:

- (i) The definition of the part of the environment in which to operate – the selection of their task environment - for which they deploy domain defining strategies (corporate strategies); and
- (ii) Guidance of goal directed activities within a selected task environment for which they deploy domain navigating strategies also called business level strategies or competitive strategies (Bourgeois, 1980:27).

According to Bourgeois (1980:27) universities' domain navigating strategies, are targeted at the general environment and results in the development of their mission

and vision statements, resource allocations, creation of organisational structures and other administrative decisions. Their domain navigating strategies are used to cope with pressures in their industry and entrepreneurial strategies, which will be discussed later in this section, are examples.

University organizational structure is described as its internal pattern of relationships, authority and communication (Thompson, 1964 as quoted by Fredrickson, 1996:282) and once designed becomes taken for granted (Bourgeois, 1980:31). It has a reciprocal causal relationship with strategies (Amburgey and Dacin, 1994:1428).

Structure is created by domain defining strategies (quickly) and once created becomes taken for granted and greatly influences (through culture) the creation of competitive or business level strategies - more slowly (Bourgeois 1980:31). The strategic fit between structure and strategy is critical as this affects both the efficiency and the effectiveness of goal attainment and poor fit between them leads to managerial inefficiencies and poor performance (Amburgey and Dacin, 1994:1433; Bourgeois 1980:31; Fredrickson 1996:280).

According to Fredrickson (1996:283) university structures have three main dimensions that critically impact their decision making:

- (i) Centralisation - this describes the degree to which the right to make decisions and evaluate activities are concentrated at the top, and this dimension impacts the internal climate by its influence on members' discretionary control over resources (Russell, 1999:72).
- (ii) Formalisation - which describes the level to which rules, regulations, procedures and standards guide university members' behaviour and when this dimension is high at a university it affects the internal climate by reducing members' work discretion, which in turn drives out creativity and proactivity among university members (Fredrickson, 1996:286). This happens because formalisation focuses university members' attention on problem solving rather than on opportunity seeking behaviours.
- (iii) Complexity dimension - describes the university's attribute of being highly differentiated and comprising many interrelated parts. This attribute determines the amount of coordination, communication and control required in an institution. In organisations where this attribute is high (e.g. universities) there will be a high level of specialisation, organisational boundaries as well as a wide span of control that

affects time availability. The three dimensions greatly affect institutions and the origin of the five factors influencing internal climate can be traced to these dimensions.

University culture originates from its structure. According to (Sporn, 1996:47) university culture originates from the influence of the external environment on its organisational structure. Green (1988:11) described culture as the means through which formal organisational structure gets translated into practice and called culture an informal organisational structure that compensates for the failure of formal structures to control all occasions.

Morris, Coombes, Schindehutte and Allen (2007:17), Russell (1999:71), Russell and Russell (1992:644) and Sporn (1996:42) all claimed that in uncertain environmental condition as found in the innovation processes, university culture (also called clan control) - using internalised values and informal rules - becomes the guide that controls organisational processes and appropriate and inappropriate actions.

Many scholars have argued for the primacy of the role of university culture in its entrepreneurial transformation. Clark (1998:8,128); Etzkowitz and Zhou (2008:630); Guerrero *et al.* (2006:2); Kirby (2006:13); Sporn (1996:44) and Russell (1999:71) believed that while entrepreneurial orientation describes the attitudes and beliefs of institutional leaders toward entrepreneurship, its culture describes the beliefs and attitudes of members toward entrepreneurship.

Culture is a critical and primary step in entrenching entrepreneurship in a university. It determines acceptable norms and gives clarity to management on structures and processes. The development and maintenance of entrepreneurial orientation also depend on it (Covin and Slevin, 1991:16).

In addition, culture explains universities' behaviours (Brown, 1995:251) and it indirectly influences its strategy, structure and operations. Dauber *et al.* (2012:8) in linking university strategies to their implementation highlighted the moderating role of culture in translating strategies into action.

Burns (2007:474) stated that the behaviour of members of an organisation is moulded by the type of systems, structure, culture, leadership and strategy in place within the organisation and referred to it as the entrepreneurial architecture. Burns further defined architecture as the non-legal long term and trust based relational contract entrepreneurial organisations has with their stakeholders. Burns (2005:62) and Urban (2012:522) termed it the context through which entrepreneurial strategic vision gets translated into specific processes and behaviours.

How university architecture gets deployed depends on its strategies, which in turn depend on the architecture for its development (Burns, 2005:75). Entrepreneurial architecture replicates the essence of the human entrepreneur in a university through the difficult to copy and complex network of relationships and dynamic capabilities that it builds (Burn, 2007:474). It embeds and replicates entrepreneurship throughout the university psyche and motivates organisational members to get things done without being told. It also acts as an entry barrier to competitors and is a source of competitive advantage. Any university that wants to be entrepreneurial must build its entrepreneurial architecture (Burns, 2005:75).

According to Burns (2007:474) all the factors that constitute entrepreneurial architecture are key to its formation but the existence of appropriate organisational culture is the most important factor in its creation.

The creation of university architecture is used in this study to mark the separation between the strategic level of influence and the operational level. Both levels are two parts of one fluid process that is in constant interaction and the distinction is only aimed at enhancing clarity in analysing a highly complex relationship. The operational level path of influence is discussed next.

At the operational level (there is no clear demarcations between these two levels) university culture is already in place and its strategies are created. Bourgeois (1980:27) stated that in dealing with organisational strategy there is a need to be explicit about the type of strategy in question.

Strategies are the overall orientation of an organisation for reaching its goals and objectives. It is a cultural artefact that influences university activities and a process that is inseparable from the university structure, behaviour and culture (Brown, 1995:250; Dauber *et al.*, 2012:7).

Entrepreneurial strategies are domain navigating business level strategies. Their formation is influenced by organisational culture through selective perception of the environment by university managers. Culture also affects the interpretation and implementation of entrepreneurial strategies through its influence on organisational members' behaviours (Brown, 1995:249). Entrepreneurial strategy represents universities' leadership's policy decision to pursue innovation as a continuous source of competitive advantage (Russell, 1999:70).

The value of entrepreneurial strategies at a university is in its ability to manage innovation processes. Innovation processes are uncertain, chaotic, difficult to plan

and control. They occur in organisations as independent activities of its members and cannot be controlled by leadership but are only managed (effectively) by the deployment of entrepreneurial strategies (Russell and Russell, 1992:641). Entrepreneurial strategies are process orientated and focus on managing the internal climate for entrepreneurship of a university and the stimulation of innovation producing behaviours.

Brown (1995:2) and Russell and Russell (1992:644) explained a university's internal climate as an aspect of its culture describing it as lasting beliefs and attitudes of all members about the university that influences their behaviour. It impacts on members through the various socialisation processes and is the means by which relationships are managed.

Russell (1999:71) asserted that organisational culture and structure combines to create the internal environmental context that determines interest and support for entrepreneurial activities. Dauber Fink, and Yolles, (2012:5) in explaining how structure, strategy and culture combine to form this internal climate stated that organisational culture - the unobservable assumptions that manifest in institutions as values, rules, norms and regulations are set (established) by the university structure and are guided by its strategy.

Managerial support, reward, work discretion, time availability and organisational boundaries are aspects of the organisational structure, culture, control and human resources management systems (Ireland *et al.*, 2006b:27). They are factors that influence the effectiveness of a university's internal climate (university culture). These factors encourage middle managers to initiate entrepreneurial activities and are key factors that must be managed by organisational leaders if entrepreneurship is to be encouraged throughout a university (Holt *et al.*, 2007:44).

Hornsby *et al.* (2002:255) declared that promoting entrepreneurship within an institution is challenging and demands a thorough knowledge of the prevailing internal environment which shapes organisational middle managers' views and interests in entrepreneurship as well as the extent of their support for entrepreneurship.

Middle managers stimulate interest in entrepreneurship by reconciling top managements perspectives and lower-level managers' implementation issues. They help influence their subordinates' commitments to entrepreneurship and they determine the use of competencies that affect performance. University performance



can be organisational such as collegiality, multidisciplinary studies, university spin off, diversified funding base, autonomy and regional and national economic development or individual, such as job satisfaction and employable graduates (Hornsby *et al.* 2002:255; Kuratko. Ireland Covin and Hornsby, 2005:699).

Dauber *et al.* (2012:7) regarded behaviour and performance as observable manifestations of institutional strategies and (Russell, 1999:73) noted the positive correlation between entrepreneurship and institutional performance.

University performance is an output that is sent into their task environment and according to Nadler and Tushman (1980:41) it becomes part of their history and along with other factors forms the university's reputation. Universities are reputation maximising institutions and the type of staff, students and funding they attract largely depends on their reputation.

University reputation is information on the success of its performance and the outcome of its activities as perceived by its stakeholders and its environment. It serves as a control factor in this path of influence. Reputation will adjust up or down the level of future available input into a university and this will eventually affect not only the internal environment and culture but also the future output and impact of a university on its environment. Briefly highlighted is the interconnectedness between the factors of influence. The next section discusses the importance of university entrepreneurship.

## **2.8 IMPORTANCE OF UNIVERSITY ENTREPRENEURIALISM**

Entrepreneurial universities now play a leading role in national economic and social development and in countries (like in most African countries) where there are little or no knowledge based industries. Entrepreneurial university and government interactions can help jump-start their creation (Etkowitz *et al.*, 2007:15).

Policy makers and scholars agree on the importance of universities in economic and social development. Ropke (1998:2) declared that for regional and national economic growth to be enhanced, knowledge generated within universities needs to be transferred. Noting the difficulties involved in knowledge transfer even where diffusion costs are low, he further asserted that to ensure continuous knowledge transfer from universities to society there is a need to train students and scientists -

being carriers of innovation - in skills and competencies of setting up companies (which is an evolutionary function of entrepreneurship within an entrepreneurial university).

Shattock (2000:3) contended that entrepreneurship at universities stimulates external collaboration with industry and commerce, and that this reinforces universities' academic performance through additional resources and widening research agenda that such collaboration attracts. Schulte (2004:188) claimed that the importance of university entrepreneurship is reflected in three key goals entrepreneurial universities fulfill, namely:

- The production of graduates that are job creators as opposed to jobseekers.
- Production of research outcomes that become a source of innovation and ideas for new businesses as well as for publication.
- Engagement in multi-disciplinary research that produces entrepreneurial teams that are especially skilled in solving problems associated with early stages of new business creation.
- Etzkowitz *et al.* (2000:313) stated that graduate employability; financial and non-financial benefits to universities and its academics and economic and social development are some of the benefits of university entrepreneurship.
- Clark (1998:146,147) contended that the following are the importance of entrepreneurialism in universities:
  - *It builds coherence* – a togetherness that makes universities able to cope with complexity and uncertainty. This gives them confidence to assert their difference and distinction to the world as well as an opportunity to raise money and to recruit quality staff and students.
  - *It develops universities' unique character* and future within their peculiar contexts and in line with their unique strengths and weaknesses and diversified capabilities.
  - *It unifies the universities internally* and helps them build a sense of community.
  - *It helps departments and faculties to be assertive* and to see themselves in common situations, with common problems, that need common actions, which lead to the growth of a common culture and identity.

- Etkowitz and Zhou (2008:630) postulated that entrepreneurial universities contribute to industry in many ways through:
  - technology patenting and licensing;
  - consultation for industry which promotes existing industries;
  - spin-off or high-technology firm formation by the university;
  - entrepreneurship education that trains top level work force; and
  - provision of rare facilities for research and development.

Ropke (1998:2) believed that knowledge production and diffusion is the engine for economic and social progress in the knowledge economy and that making universities entrepreneurial has a strong positive impact on local and regional development because in the process of applying the new knowledge created by them benefits accrue to the region in which the universities are located.

Kirby (2006:13) contended that entrepreneurship at universities is important and stated that universities that fail to transform to institutional entrepreneurship will not be able to fully contribute to their regions' economic development or as compete in the turbulent market place.

The next section discusses the barriers to university entrepreneurialism.

## **2.9 BARRIERS TO UNIVERSITY ENTREPRENEURIALISM**

Universities are not naturally entrepreneurial institution because they are inherently large organisations (Kirby, 2006:599). The type of barriers faced by universities in becoming entrepreneurial depends on its social context.

Rothaermel *et al.* (2007:737) observed that in western countries the major obstacles to university entrepreneurialism is internal and external stakeholders' insistence on universities' adherence to their historic commitment of making knowledge openly accessible to all members of the society while in eastern countries the critical obstacle appears to be the lack of complementary and intermediary institutions that can facilitate entrepreneurial activities. In Africa this lack of complimentary and intermediary institutions to facilitate entrepreneurial activities also appears to be one of the barriers to university entrepreneurialism.

Gjerding *et al.* (2005:21) stated that the absence of key internal factors that facilitate entrepreneurialism is a major barrier to university entrepreneurship while Shattock (2003:155) believed that a university will not be entrepreneurial without its own self-imposed internal resource allocation criteria and creative and strategic use of third stream income.

Listed below are some of the key factors found in literature to be barriers to university entrepreneurialism:

- The government, which through its use of state funding mechanisms and third stream funding incentives, micro manage universities and limits the freedom of developmental peripheral institutions, reduces initiatives, increases overheads and make universities inefficient in the long run (Shattock, 2003:154).
- Weak, ineffective and risk averse central management teams, especially in respect of the allocation of resources to new initiatives (Gjerding *et al.*, 2005:21; Shattock, 2003:155).
- Rigid internal administration and regulation that causes tension between the need for rule guided behaviour and flexibility required for entrepreneurial activities (Gjerding *et al.*, 2005:21; Kirby, 2006:599).
- Short term focus in resource allocation and research groups that operate as silos hence making broad based external research cooperation difficult. (Gjerding *et al.*, 2005:21; Kirby, 2006:599).
- Conservative university culture and tradition that lacks unified entrepreneurialism (Philpott *et al.*, 2011:169; Shattock, 2003:154; Kirby, 2006:599).
- Inappropriate reward systems that reward only academic publications while penalising entrepreneurial activities (Philpott *et al.*, 2011:169; Kirby, 2003:155).
- Lack of understanding of the entrepreneurial university concept within academic departments (Philpott *et al.*, 2011:169; Kirby, 2006:599).
- Impersonal relationships and the lack of entrepreneurial academic role models within the university (Philpott *et al.*, 2011:169; Kirby, 2006:599).
- The difficulty in getting external cooperation and support for university entrepreneurial activities (Gjerding *et al.*, 2005:21).
- Lack or insufficient support for the creation of university spin-off companies due to education systems that are more focused on operation and management than on entrepreneurship (Gjerding *et al.*, 2005:21).

- Hierarchical organisational structures and multiple levels of approval between the strategic centre and the academic and administrative units that distance the centres, impose bureaucracies and slow down decision making (Kirby, 2006:599; Shattock, 2003:155).

The following section discusses ways of overcoming these barriers.

## **2.10 OVERCOMING BARRIERS TO UNIVERSITY ENTREPRENEURIALISM**

For universities to overcome barriers to entrepreneurship to be addressed, a conducive and supportive environment must be created (Kirby, 2006:11). Some of the ways of overcoming barriers to university entrepreneurship suggested by Shattock (2003:19,156) are:

- The use of central administration that consist of both academics and administrators to maintain close communication with departments as well as reconcile external environmental pressures with internal initiatives.
- Flat organisational structures - to bring the central management teams closer to the operating units.
- Strong organisational culture built around entrepreneurial core ideology.
- Good sense of purpose and willingness to make exceptionally bold commitments.

According to Philpott *et al.* (2011:169) overcoming these barriers require:

- University management to establish communication and training programmes on the value of the entrepreneurial university concept.
- Universities should consider their existing capabilities and unique operational context in determining their unique form of entrepreneurship.
- Academics to engage in entrepreneurial activities which complement their unique academic norms so as to ensure synergy between third mission activities and traditional academic values rather than submit to industry dominated objectives.
- Universities to develop a more robust metrics for measuring third stream activities rather than the current measures which use hard entrepreneurial activities as this could be counterproductive.

## **2.11 SUMMARY**

Nations now know that combining science with local resources is the basis of their future economic and social development and that the contribution of science to economic development has become a competitive instrument (Etzkowitz and Leydesdorf, 2000:117). They also now know that universities are cost effective means of technology and knowledge creation and transmission (Etzkowitz *et al.*, 2000:314) and that entrepreneurialism of universities make them more powerful and better able to compete and overcome environmental pressures (Bratianu and Stanciu, 2010:133).

This chapter discussed some of the key features and controversies of the entrepreneurial university concept to gain a better understanding of the concept and its benefits. The following chapter discusses corporate entrepreneurship, systems theory and their role in university entrepreneurialism.

## CHAPTER THREE

### THE CORPORATE ENTREPRENEURSHIP CONCEPT AND THE UNIVERSITY ENTREPRENEURIAL TRANSFORMATION PROCESS

#### 3.1 INTRODUCTION

The twenty-first century can be described in terms of four Cs – change, chaos, contradiction and complexity, and no organisation is immune to the effect of these four forces (Kuratko and Audretsch (2009:1). As discussed in Chapter Two, university entrepreneurial transformation is the product of these four Cs.

To survive in a hostile and dynamic environment Stopford and Badenfuller (1994:522) urged organisations to change their past behaviours and embrace entrepreneurship which must be initiated by its leadership and spread throughout the organisation. Guth and Ginsberg (1990:5) argued that organisational survival requires renewal of key ideas on which it was built - a corporate entrepreneurship process.

Corporate entrepreneurship is entrepreneurship that exists within an organisation and is influenced by the internal organisational context – “the organisational climate”, and the external environment (Sathe, 1988:391). Corporate entrepreneurship can be found at the corporate, business, project and/or individual levels within an organisation. Effectively used, it can be a source of competitive advantage and improved corporate performance (Ireland *et al.*, 2006:11).

Organisations with an entrepreneurial mindset, a pattern of thinking about opportunities in an environment as well as the commitments, decisions and actions needed to pursue them, are the ones that are successful at nurturing and implementing both corporate entrepreneurship and corporate entrepreneurship strategies (Ireland *et al.*, 2006:16).

This chapter considers the definition of entrepreneurship, how it relates to the environment and the systems theory. It also considers how the corporate entrepreneurship concept relates to the entrepreneurial university concept and justifies its use in understanding university entrepreneurial transformation. It introduces the *Entrepreneurial Health Audit* as a tool for measuring organisational entrepreneurship as well as operationalises its key indicators. The chapter concludes

with a brief introduction of the Nelson Mandela Metropolitan University. The following section discusses the entrepreneurship concept.

### **3.2 THE ENTREPRENEURSHIP CONCEPT**

The entrepreneurship concept has been defined in various ways by scholars and this study adopts the COM (2005 as quoted by Baur, 2012:6) definition of the concept as “an entity’s ability to turn ideas into action. It includes creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives.” Entrepreneurship supports everyone daily. In addition to providing a foundation for entrepreneurs to establish new ventures, it enables employees to be more aware of the context of their work and better able to seize opportunities. According to (Gibb,6), entrepreneurship provides people and organisations opportunities to cope with, provoke and enjoy an increasingly complex and uncertain globalised world”.

Entrepreneurship can be an individual or organisational level process of emergence (Antoncicand and Hisrich, 2003:8). It is a universal concept whose definition, process, nature and underlining dimensions remains unchanged irrespective of context (Kuratko, Morris and Covin, 2011:143; Morris and Sexton, 1996:6). Entrepreneurship is both a behavioural and cognitive process and as a behavioural process it is an opportunity driven, logical set of steps that occurs mostly in a chaotic and ambiguous environment (Morris and Sexton, 1996:6).

The entrepreneurial process is made up of the entrepreneurial event, consisting of an object created, such as a new process, product or service and the entrepreneurial agent. In addition the process includes the individuals or groups responsible for bringing the entrepreneurial event to fruition and is a value creating process that combines unique resources in exploiting opportunities (Morris, 1995:32; Kuratko, Morris and Covin, 2011:114). The entrepreneurship concept has three key dimensions, innovativeness, proactivity and risk taking (Morris and Lewis, 1995:32; Morris, Lewis and Sexton, 1994:2) and is an outcome based behaviour that can be observed in small as well as major activities (Antoncic and Hisrich, 2003:9).

The following section discusses the entrepreneurship-environment interactions.



### **3.2.1 Entrepreneurship concept and the environment**

Nadler and Tushman (1980:39, 40) regarded all factors outside the organisation that can affect its performance and are critical to its functioning as the “external environment”. They stated that this environment affects the organisation in three ways:

- (i) Through placing demand on it by requiring certain products or services;
- (ii) Constraining it by limiting its activities through regulations and resource availability, and
- (iii) By providing opportunities for it through unmet needs.

According to Zahra (1991:290) successful organisations must adapt to their environment and the environment of an organisation’s core business is the dominant focus for its corporate level decisions.

The external environment has a deterministic influence on organisations’ entrepreneurship (Covin and Slevin, 1991:11), and while being a threat to organisations it also offers opportunities which they can harness through corporate entrepreneurship (Morris and Lewis, 1995:38; Zahra, 1991:282). The environment is inseparable from the entrepreneurial process. Covin and Slevin (1991:11) and Morris and Lewis (1995:38) stated that entrepreneurship is more than organisational response to the environment and that rather it is a source of institutionalised societal change that can enhance organisational performance in a dynamic, turbulent and hostile environment by deploying corporate entrepreneurship strategies (Ireland *et al.* 2006:10). The external environment therefore, is critical to university entrepreneurial transformation.

Sporn (2001:122) stated the immediate link between an organisation and its environment, and in respect of universities, their structure and environmental forces are connected. This relationship is shaped by and adapted through certain models of governance, management and leadership. Clark (1998b:5), observed that the demand - response imbalance and the environmental relationship of the university compels it to be entrepreneurial. Cameron (1984:132) suggested that to understand

how higher education should adapt, it is necessary to understand the external environmental conditions perpetuating imbalances in them.

The observations above lead to the following subsection, which examines the systems theory for a holistic view of organisational and environmental interaction.

### **3.3 SYSTEMS THEORY: A HOLISTIC VIEW OF ORGANIZATION ENVIRONMENT INTERACTION**

Morris, Lewis and Sexton (1994:23) stated that for a true understanding of the entrepreneurship concept two things should happen:

- (i) Focus should be on entrepreneurial processes rather than on individuals while at the same time recognising the indispensable role played by individuals.
- (ii) Entrepreneurship should be viewed from the systems theory perspective with the process components separated into *inputs*, which are fairly definite, and *outputs*, which may or may not occur.

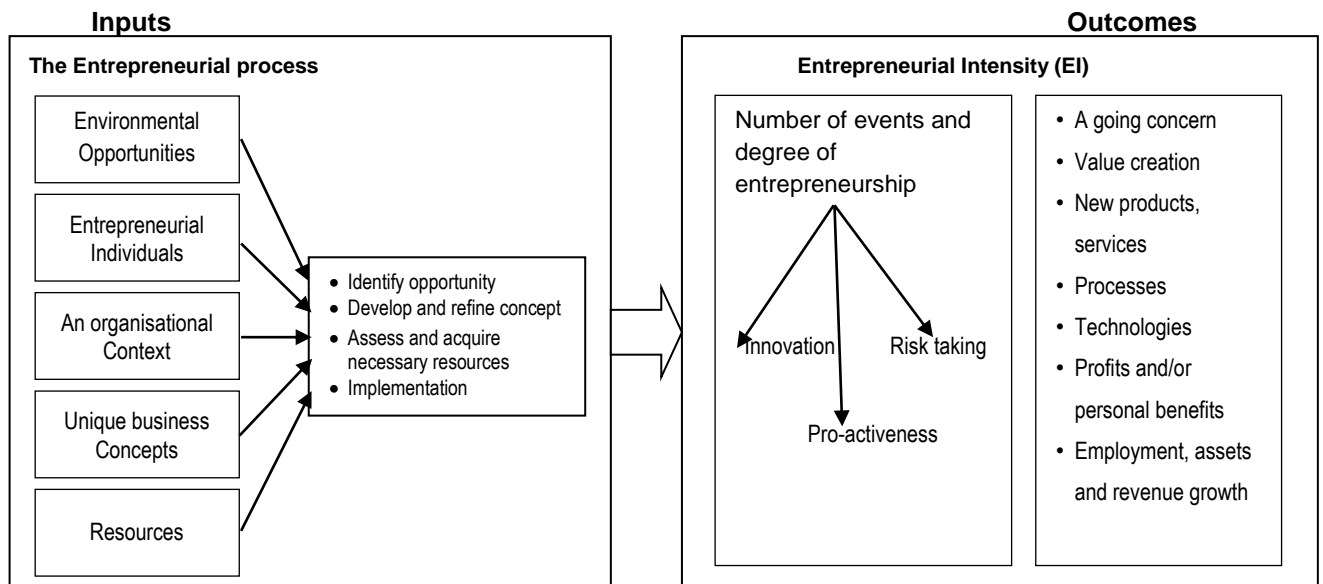
Guerrero (2012:45) described university entrepreneurial transformation using an input/output model, while Woollard (2010:418) suggested the use of the input and the output model in representing university entrepreneurship. Sporn (1999:37) stated that the open systems theory is an important prerequisite for understanding higher education's adaptation to their environment. The opinions of these scholars confirm the importance of the open systems theory in understanding university entrepreneurship.

Guth and Ginsberg (1990:7) referred to organisations as systems, stating that entrepreneurship in them is affected by changes in their task environment. Morris, Lewis and Sexton (1994:30) postulated that the system theory approach to entrepreneurship allows us to focus on the process nature of entrepreneurship and to distinguish the entrepreneur from the entrepreneurial process. Nadler and Tushman (1980:36) described the systems theory as a general model of organisations that provides a holistic framework for thinking about and understanding organisations and that they are better understood if considered as a set of

interrelated elements that interacts with its environment by taking inputs from the environment and transforming this to output.

Morris and Sexton (1996:6) underscored the importance of the systems theory in understanding entrepreneurship by using the concept to explain the entrepreneurial process. Morris, Lewis and Sexton (1994:24,29) defined entrepreneurship as a process that involves taking input in the form of opportunities, one or more entrepreneurial individuals, organisational context, resources and a business concept and giving output that may consist of a new venture or enterprise, value, new products or process, growth and/or failure. The authors further explained that the inputs are fed into the entrepreneurial process made up of opportunity identification, concept development and identification, resource acquisition and implementation steps which then transform them into entrepreneurial output. The output consists of entrepreneurial intensity which manifests in the form of varying amounts of entrepreneurial events with different degrees of entrepreneurship. Figure 3.1 below depicts this relationship.

**Figure 3.1: An integrative model of entrepreneurial input and output**



Source: Adapted from Morris, Lewis & Sexton (1994:29)

The next section discusses the use of the corporate entrepreneurship concept in understanding university entrepreneurialism.

### **3.4 JUSTIFYING THE USE OF CORPORATE ENTREPRENEURSHIP CONCEPT IN UNDERSTANDING UNIVERSITY ENTREPRENEURIALISM**

Corporate entrepreneurship is “entrepreneurship within an organisation” and is interchangeably referred to as intrapreneurship (Antoncic & Hisrich 2001:496).

Various scholars have argued for its importance in university entrepreneurial transformation: Shattock (2005:18) stated that university entrepreneurship goes beyond institutional characteristics to embrace intrapreneurship, while Brennan and McGowan (2006:146,158) mentioned that the inclusion of social and economic development as the university’s third mission automatically suggests the need for a corporate entrepreneurship view of university entrepreneurship and that in order to understand a university’s competitive advantage one must understand its capacity for academic intrapreneurship.

Kirby (2006:600) argued that the corporate entrepreneurship concept gives clarity to the process of university entrepreneurial transformation and that it is a better tool for understanding university entrepreneurship because it clarifies the dynamic nature of the entrepreneurship concept and the university institutional setting.

Gjerding, Wilderom, Cameron, Taylor and Scheunert (2006:89) argued that the bottom up nature of entrepreneurship at universities means we are not dealing with entrepreneurship but the corporate entrepreneurship concept. Etzkowitz *et al.* (2000:326) while calling the concept “Schumpeter’s model of entrepreneurship” noted its applicability to universities.

Lui and Dubinsky (2000:1316) stated that insightful academics will engage in corporate entrepreneurship and Chung and Gibson (1997), Clark (1998, 2004), Guerrero, Urbano and Kirby (2010), Kirby (2006), Liu and Durbinsky (2000), Ropke (1998) and Woollard (2010) all suggested the concept as the basis for university entrepreneurial development.

The above scholars’ arguments convincingly prove that the corporate entrepreneurship concept is useful in understanding university entrepreneurialism. The following section discusses the corporate entrepreneurship concept.

### **3.5 CORPORATE ENTREPRENEURSHIP CONCEPT**

The study of corporate entrepreneurship is the study of organisation's entrepreneurialism; its ability to act entrepreneurially (Stevenson and Jarillo, 1990:23). The literature offers varying definitions for corporate entrepreneurship, examples of which include: entrepreneurial posture, entrepreneurial orientation, entrepreneurial management, firm level entrepreneurship, and pioneering-innovative management. They all refer to organisations acting in an entrepreneurial manner (Covin and Miles, 1999:48).

Covin and Slevin (1991:8) stated that behaviour rather than attributes give meaning to the entrepreneurial process and the organisations' actions make them entrepreneurial.

As an organisational behaviour, entrepreneurship can be both formal, i.e. induced and sanctioned by senior executives in line with strategic direction; and informal comprising autonomous efforts undertaken by individuals within the organisation (sometimes called intrapreneurship) (Zahra, 1993:6). Ireland, Kuratko and Covin (2003:L2) observed that entrepreneurial behaviors are new activities used by the organisation to exploit opportunities that are not yet noticed by competitors. Covin and Slevin (1991:7) believed that organisations as an entity can be entrepreneurial and those that embrace entrepreneurship on the long run outperform those that don't (Kuratko and Audretsch, 2009:6).

The next section discusses some of the different definitions of corporate entrepreneurship.

#### **3.5.1 Definitions of corporate entrepreneurship**

Holt, Rutherford and Clohessy (2007:42) believed that the review of the definitions of the corporate entrepreneurship concept is an important step in its study. While there are different definitions of the concept, there is agreement among scholars on its core idea - entrepreneurship within an organisation. Considered below are a few definitions relevant to this study.

Ireland *et al.* (2006:10) defined corporate entrepreneurship as a process through which individuals in an established firm pursue entrepreneurial opportunities to innovate without regard to the level and nature of currently available resources.

Sharma and Chrisman (1999:18) defined it as the process by which an individual or groups of individuals, in association with an existing organisation create a new organisation or instigate renewal or innovation within that organisation.

Antoncic and Hisrich (2001:496) referred to corporate entrepreneurship as “Entrepreneurship within an existing organisation”. They further explained that it refers to the process that goes on inside an existing organisation regardless of its size, and that it leads not only to new business ventures but also to other innovative activities and orientations such as development of new products, services, technologies, administrative techniques, strategies and competitive postures.

Guth and Ginsberg (1990:5) defined the concept as encompassing two types of phenomena and the processes surrounding them: the birth of new businesses within existing organisations, internal innovation or venturing; and the transformation of organisations through renewal of the key ideas on which they are built - strategic renewal. Baxter and Toombs (2005:1) also defined the concept as the entrepreneurial behaviour of individuals within large organisations that are linked to innovation.

This study adopts Guths and Ginsberg’s (1990) definition for its robustness and adequacy. In the following section forms in which corporate entrepreneurship manifest in an organisation are considered.

### **3.5.2 Forms of corporate entrepreneurship**

Different combinations of individual, organisational and environmental factors influence form, the how and why of entrepreneurship within an organisation (Dess & Lumpkin 1996:135).

Covin and Miles (1999:48) observed that the term corporate entrepreneurship has been used to describe multiple and sometimes distinct organisational phenomena which according to them are not mutually exclusive but sometimes co-exist as separate dimensions of entrepreneurial activity in an organisation.

Holt, Rutherford and Chlohesy (2007:41) identified sustained regeneration, organisational rejuvenation, strategic renewal and domain redefinition as the key type of corporate entrepreneurship in an organisation.

Vesper (1984) in Hornsby, Kuratko and Zahra (2000:254) stated that corporate entrepreneurship can either be new strategic direction, initiative from below, autonomous business creation, all three together or any combination thereof and Kuratko and Hogett (2007:55) listed innovation, strategic renewal and corporate venturing as the three forms of corporate entrepreneurship in an organisation while Zahra (1991:281) said the concept is about internal venturing and organisational renewal.

For Sharma and Chrisman (1999:20) the key forms of corporate entrepreneurship are corporate venturing, strategic renewal and innovation. Table 3.1 below illustrates the link in the key attributes of entrepreneurship, corporate entrepreneurship and its different forms (Sharma and Chrisman, 1999:20).

**Table 3.1: Unique features of corporate entrepreneurship terminology**

<b>TERMINOLOGY</b>	<b>UNIQUE CRITERIA</b>
Entrepreneurship	Organisational creation renewal or innovation within or outside existing organisation
Independent Entrepreneurship	Organisation creation by individuals not associated with existing corporate entity
Corporate Entrepreneurship	Organisation creation, renewal or innovation initiated by an existing organisation
Strategic Renewal	Organisational renewal involving major strategic and/or structural change initiated by an existing organisation
Corporate Venturing	Organisation creation started by an existing organisation that is treated as new business
Innovation	Introduction of something new to the marketplace with the potential to transform the competitive environment and the organisation. It usually occurs together with corporate venturing or strategic renewal
External Corporate Venturing	Organisation creation instigated by existing organisation that is treated as new business and resides outside the organisational domain
Internal Corporate Venture	Organisation creation initiated by an existing organisation that is treated as new business and resides within the organisational domain

Source: Adapted from Sharma and Chrisman (1999:9)

Kuratko, Morris and Covin (2011:85) explained the manifestation of entrepreneurship in an organisation by viewing the concept in two ways:

- (i) *As corporate venturing.* This according to them is the creation of new business within an existing organisation and can be implemented through internal corporate venture, cooperative corporate venture or external corporate venture.
- (ii) *As strategic entrepreneurship.* Large scale adoption of innovation by an organisation in pursuit of competitive advantage. This according to the authors is the simultaneous opportunity and advantage seeking behaviour of organisations and they believe that strategic entrepreneurship innovation may manifest in organisational strategy, product offering, served market, internal organisation or a business model which may or may not result in new business.

In summary Hornsby *et al.* (2002:25), Antoncic and Hisrich (2001:496) believed corporate entrepreneurship to be about re-energising and enhancement of organisations ability to acquire innovative skills and capabilities and according to them it is an important factor in organisational survival, growth and profitability and also a key requirement for innovation.

This study adopts Kuratko, Morris and Covin's (2011:85) conception of the manifestation of entrepreneurship in an organisation with specific focus on their strategic entrepreneurship conception.

The next section discusses dimensions of corporate entrepreneurship.

### **3.5.3 Dimensions of Corporate Entrepreneurship.**

Like the entrepreneurship concept, Miller (1983:77), Morris and Kuratko (2002) and Covin and Slevin (1991) conceptualised corporate entrepreneurship using the three dimensions of proactivity, innovation and risk taking – also called the entrepreneurial orientation. But Dess and Lumpkin (1996:139) conceptualised the same concept using five dimensions of Innovation, Proactivity, risk taking, autonomy and Competitive Aggressiveness. These are the two categories along which corporate entrepreneurship has been characterised and this study adopts the three dimensional conception of corporate entrepreneurship. The dimensions are fully discussed in subsequent sections.



### 3.6 CORPORATE ENTREPRENEURSHIP MODELS

Scholars have presented various models to depict the corporate entrepreneurship process but this study focuses on the following three models due to their relevance to this study.

#### 3.6.1 Guth and Ginsberg's (1990) corporate entrepreneurship Model

The salient points of this model are:

- It argued that organisational survival depends on renewal of key ideas on which the organisation is built and on leaderships' management of discontinuous change and transformation.
- It stated that in organisations, entrepreneurship results in two things: internal innovation called corporate venturing and organisational transformation through renewal of key ideas. It asserts that organisational transformation results in new wealth creation due to new resource combination and entrepreneurial organisations embrace change and make it an overriding goal.
- It stated that entrepreneurial activities in an organisation result in internal innovation: corporate venturing or corporate renewal.
- It believes that decisions and actions in corporate entrepreneurship should result in a change strategy that alters patterns rather than magnitude of resource deployment.
- It noted the importance of the independent behaviour of middle managers in organisations' entrepreneurial transformation.
- It listed the investigation of the following four relationships as a means of understanding corporate entrepreneurship process:
  - (i) *Environmental influence on corporate entrepreneurship.* Here the impact of changes in the environment on organisational strategy is noted and that the more dynamic an organisation's environment the more entrepreneurial the organisation is likely to be. This view ties in with this study's identification of university environment and strategy (in chapter two) as key factors in university entrepreneurial transformation.
  - (ii) *Strategic leaders' influence on corporate entrepreneurship.* This highlights that the entrepreneurial behaviour of an organisation is dependent on the

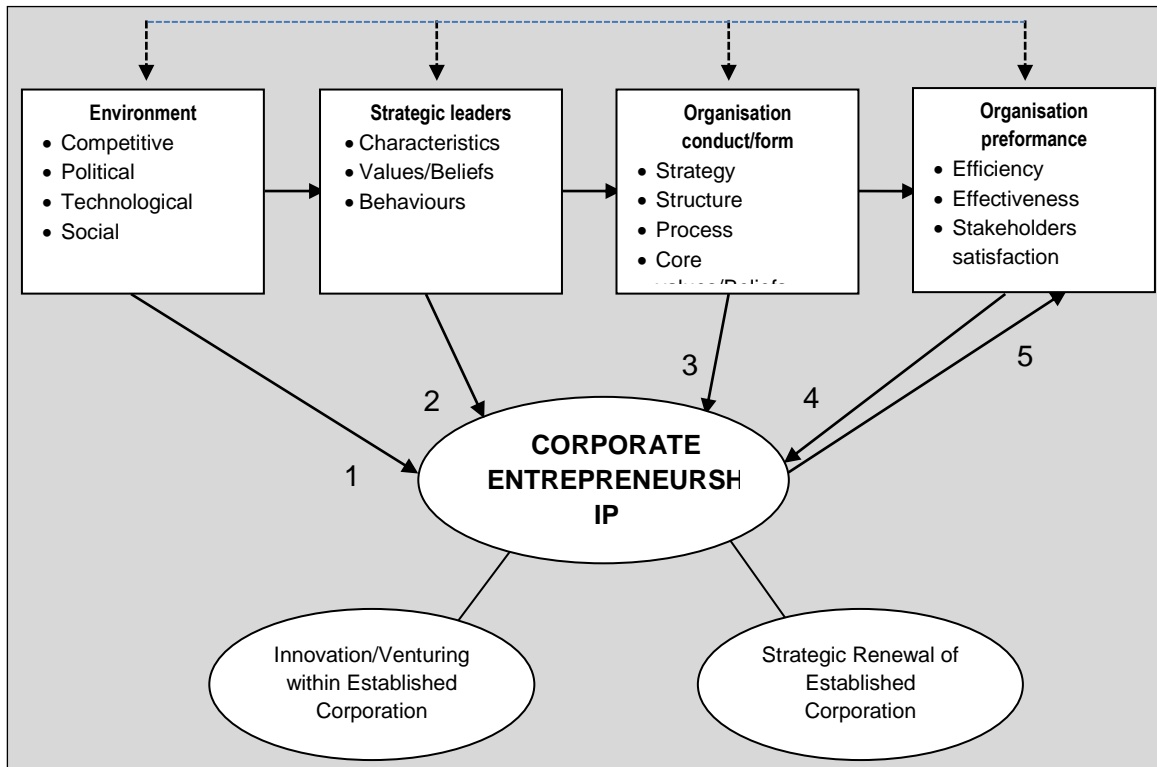
characteristics, values and beliefs, as well as the visions of its strategic leadership.

This observation is also in line with the identification of organisational leadership and culture as key factors for university entrepreneurial transformation in chapter two.

- (iii) *Organisational form/conduct influences corporate entrepreneurship.* This highlights the effect of organisation's structure whether bureaucratic or organic on corporate entrepreneurship. This relationship also supports identification of the university's organisational structure (chapter two) as a factor influencing its entrepreneurial transformation.
- (iv) *Organisations performance influences corporate entrepreneurship.* This relationship highlights how organisations' performance influences its innovation and renewal process. The relationship confirms Nadler and Turshman's (1980:41) argument that the organisations history is a form of environmental factor that affects its output. Autonomy and diversified financial base as identified in Chapter Two as that factors influence university entrepreneurship are confirmed by this group of relationships.
- (v) *Corporate entrepreneurship influences performance.* This group of relationships highlight the fact that success or failure of corporate entrepreneurship events influences organisational performance.

Figure 3.2 below illustrates these relationships.

**Figure 3.2: Fitting corporate entrepreneurship into strategic management**



Source: Adapted from Guth and Ginsberg (1990:7)

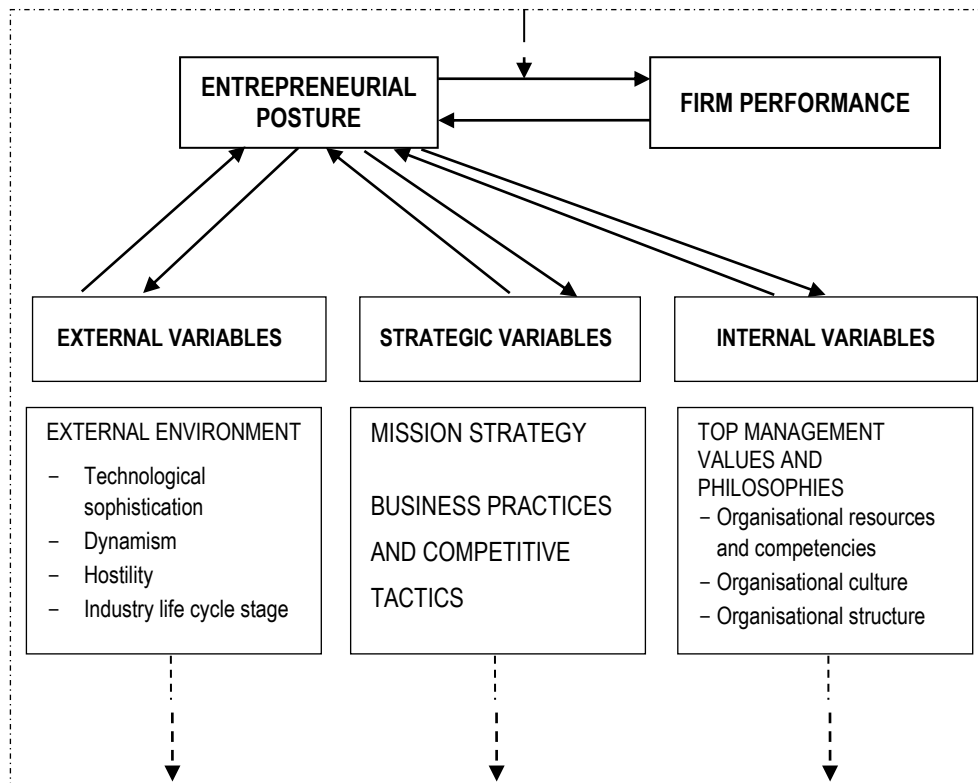
### 3.6.2 Covin and Slevin (1991) corporate entrepreneurship model

This model identified elements similar to those identified by Guth and Ginsberg (1990) although they classified them differently. The salient points of the model are:

- It locates entrepreneurship as an organisational behaviour which was called entrepreneurial posture.
- It depicts entrepreneurship as an organisational behaviour that is measurable.
- It identifies proactivity, innovation and risk taking as dimensions of entrepreneurship (the independent variables) and organisational performance (the dependent variable).

Figure 3.3 below depicts Covin and Slevin's 1991 model.

**Figure 3.3: A conceptual model of entrepreneurship as firm behaviour**



Source : Adapted from Covin and Slevin (1991:10)

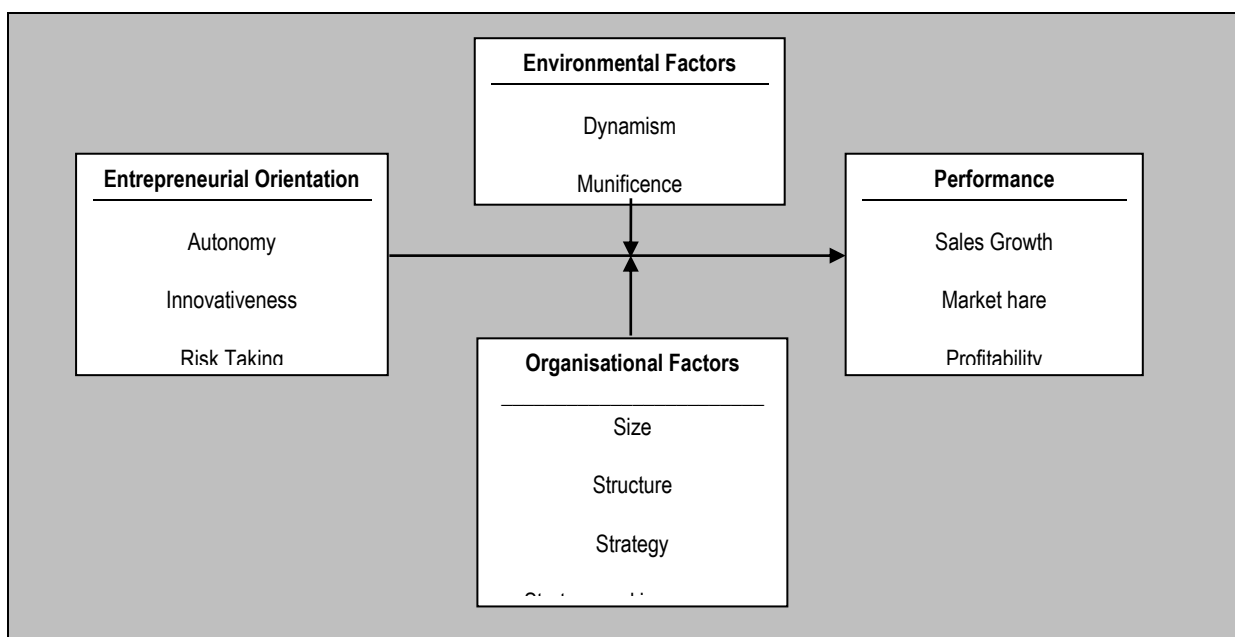
### 3.6.3 Dess and Lumpkin (1996) corporate entrepreneurship model

Similar to the other two models discussed above, this model also identified key factors influencing organisational entrepreneurialism. Its salient points are:

- It refers to what Covin and Slevin (1991) called strategic posture as entrepreneurial orientation.
- It develops a five dimensional model of entrepreneurship by identifying autonomy and competitive aggressiveness as additional dimensions.
- It depicts entrepreneurial orientation as a multi-dimensional concept whereas Miller (1983), Covin and Slevin (1991) regarded it as a uni-dimensional concept (Antoncic and Hisrich 2003:16).
- It depicts entrepreneurial orientation phenomena as domain focused concepts that show where to look for entrepreneurship in an organisation. Covin and Slevin's (1991) model depicted of the concept as a phenomenon focused concept that explains what entrepreneurial orientation looks like (Covin and Wales, 2011:681).

This study adopts Covin and Slevin's conception of entrepreneurial orientation. Furthermore, this study does not consider autonomy, as portrayed by Dess and Lumpkin's (1996) model and their explanation that it is freedom granted by the organisation to its members and teams to exercise creativity, to be the same as entrepreneurial universities' self-derived autonomy. Shattock (2003:148) described such self-derived autonomy as the university's freedom to act as critiques of the society. Figure 3.4 depicts Dess and Lumpkin's 1996 model and the section following this discusses the entrepreneurial orientation concept.

**Figure 3.4: Conceptual framework of entrepreneurial orientation**



Source: Adapted from Dess & Lumpkin (1996:152)

### 3.7 ENTREPRENEURIAL ORIENTATION CONCEPT

The study of entrepreneurial orientation in an organisation is analogous to the concept of entrepreneurial management because it shows the processes, methods and styles used by organisations to be entrepreneurial (Dess and Lumpkin, 1996:139).

Entrepreneurial orientation is established in an organisation by strategic leadership and depends on members' activities to become embedded in the organisational culture (Covin and Slevin, 1991:17; Holt, Rutherford and Chlohesy, 2007:43). It is a

behavioural orientation (Morris, Webb and Franklin, 2011:949) that describes how entrepreneurship is undertaken within the organisation (Dess and Lumpkin, 1996:136).

According to Morris, Webb and Franklin (2011:949, 956) the concept not only captures the essence of entrepreneurship in an organisation but also measures its degree and the extent of top management support for entrepreneurship.

Covin and Slevin (1991:11) observed that organisations respond to environmental turbulence by adopting entrepreneurial orientation which is displayed when they engage in three key behaviours – innovativeness, risk taking and pro-activity, and that through their entrepreneurial orientation they have a bidirectional relationship with the environment in that they influence and are influenced by the environment.

The entrepreneurial orientation concept can be characterised by three dimensional models, namely that of Covin and Slevin (1991); Dess and Lumpkin (1996) and Miller (1983), or five models such as that of Morris and Kuratko (2002); Morris, Webb and Franklin (2011) which comprises three key elements – strategic vision, pro entrepreneurial architecture, and entrepreneurial behaviour and process (Ireland, Covin and Kuratko, 2009:30) and manifest as strategic entrepreneurship and corporate venturing (Kuratko, Morris and Covin, 2011:187).

Entrepreneurial orientation is an effective tool for capturing evidence of entrepreneurial decision processes in an organisation as well as what it means for it to be entrepreneurial; it can be managed through unique strategies, structure, culture and systems (Covin and Slevin, 1991:8; George and Marino 2011:990; Lumpkin, Moss, Gras and Amezcau, 2013:769) and is a critical factor in organisational success (Dess and Lumpkin, 1996:151).

This study is conducted using the three dimensional conception of entrepreneurial orientation.

Ireland et al. (2006b:21) noted that it is important to understand not only the “what” and “why” of corporate entrepreneurship but also the “how”. Therefore the “how” of corporate entrepreneurship strategy is explained in the following section of this chapter.

### 3.8 CORPORATE ENTREPRENEURSHIP STRATEGY

Nadler and Tushman (1980:36) observed that we need tools to unravel mysteries, paradoxes and contradictions that are ever present in organisations and that a conceptual model or framework is one such tool. The authors defined a model as a theory that indicates crucial and important organisational factors and the relationships among such factors. They called models roadmaps that can be used to make sense of organisational behaviours and are critical because they guide our analysis and action.

Understanding entrepreneurial success requires consideration of three key elements: entrepreneurial process, also called strategy; context, called environment, and the outcome (Aldrich and Martinez 2001:41). Holt, Rutherford and Chlohesy (2007:43) stated that corporate entrepreneurship process – how corporate entrepreneurship is implemented and diffused in an organisation – is facilitated by the corporate entrepreneurship strategy which Ireland et al. (2006b:21) described as a key path deployed by organisations in order to develop and encourage entrepreneurship in their members.

Ireland, Covin and Kuratko (2009:21) also described corporate entrepreneurship strategy as vision-directed and organisation-wide reliance on entrepreneurial behaviour which purposefully and continuously rejuvenates the organisation.

It is a set of commitments and actions framed around entrepreneurial behaviour and processes which organisations design and use to develop current and future competitive advantages (Ireland, Kuratko and Covin, 2003:L1). It works by creating organisational context that encourages entrepreneurial behaviour in employees (Ireland, Kuratko and Morris, 2006:10) and shape organisations' scope of operations through recognition and exploitation of entrepreneurial opportunity (Ireland, Covin and Kuratko, 2009:21).

Corporate entrepreneurship strategy is a distinct and identifiable strategy (Ireland, Covin and Kuratko, 2009:21) that enhances organisations' ability to recognise and exploit entrepreneurial opportunities and create an environment that encourages entrepreneurial behaviour (Ireland *et al.*, 2006:11). It is the organisation's means of developing key success capabilities - its source of competitive advantage (Ireland,

Covin and Kuratko, 2009:20) and a critical requirement for organisations that want to survive the turbulence of the knowledge (Urban, 2011:519).

According to Ireland *et al.* (2003:L2) corporate entrepreneurship strategy arises in entrepreneurial organisations as a result of environmental triggers and then manifest as entrepreneurial strategic vision, a pro-entrepreneurship organisational architecture, and entrepreneurial behaviour and processes among top, middle, and first level managers to produce competitive capability and strategic repositioning.

Ireland *et al.* (2006:16) further noted that the deployment of corporate entrepreneurship strategy in an organisation is a critical step in encouraging entrepreneurial behaviour in the organisations' members.

The following section discusses the measuring of entrepreneurship.

### **3.9 MEASURING ENTREPRENEURSHIP IN AN ORGANISATION**

For entrepreneurship to be sustainable in an organisation it must be measured – its entrepreneurial processes, experiences and outcomes must be assessed (Morris and Kuratko, 2002: 288).

Kuratko *et al.* (2011:348) observed that assessment of entrepreneurship is complex despite its value in assisting top management to examine and refine its leadership style as well as its importance as a critical component of the organisation's culture, but entrepreneurship in an organisation can be measured (Morris and Kuratko 2002:290).

Kuratko, Morris and Covin (2011:348, 350) suggested the use of an Entrepreneurial Health Audit tool to measure organisational entrepreneurship, claiming that the cognitive and behavioural nature of entrepreneurship influences its measurement. The tool consists of the Entrepreneurial Performance Index Instrument that measures organisations' entrepreneurial intensity and the Corporate Entrepreneurship Climate Instrument that measures the level of organisations' internal environment (organisations' climate) support for entrepreneurship.



Ireland *et al.* (2006:11) developed the tool to determine organisations' ability to develop and nurture entrepreneurial behaviour as bases for improving performance.

The Entrepreneurship Health Audit tool is a three step assessment instrument (Ireland *et al.* 2006b:22; Kuratko, Morris and Covin, 2011:351):

- (i) It assesses the level of entrepreneurship in an organisation using entrepreneurial then intensity instrument.
- (ii) It diagnoses organisations' internal environment for corporate entrepreneurship using the corporate entrepreneurship climate instrument, and
- (iii) It creates an understanding of processes that lead to a successful corporate entrepreneurship strategy implementation in an organisation.

The following sections of this study discuss the first two steps of the assessment instrument while the third step is discussed in Chapter Six. Due to its uniqueness as an organisational form the next section discusses entrepreneurial measurement at universities.

### **3.9.1 Measuring entrepreneurship in a university**

Public universities are nonprofit organisations (Kuratko, Morris and Covin, 2011:113) that have some unique characteristics:

- They are created to fulfill social purpose;
- They have multiple stakeholders; and
- They do not distribute their profits (Morris, Webb and Franklin, 2011:950).

Public universities because of their nonprofit status are institutions with double bottom-lines – they simultaneously pursue financial and social returns on investments by engaging in income generating activities that are focused more on social benefits, but at the same time generate profit ( Peredo and McLean, 2006:13).

Morris, Webb and Franklin (2011:948, 956) and Kuratko, Morris and Covin (2011:114) found entrepreneurship in nonprofit and public organisations to be the same as entrepreneurship in for profit organisations despite the focus on social mission. They also found the entrepreneurship dimensions of innovation, proactivity and risk taking to be the same in both contexts though differently manifested. According to them in not for profit organisations, innovation may manifest as new

organisational forms, methods, processes or services while proactivity could be creative rule interpretation, high level persistence and patience in executing change, networking and resource leveraging, action orientation, problem anticipation and prevention skills. Risk taking could manifest as engaging in projects that have calculated chances of loss or failure or loss of financial resources or stakeholders support.

Lumpkin, Moss, Gras and Amezcau (2013:761) noted that while antecedents and outcome of corporate entrepreneurship may differ in nonprofits the process is essentially the same as that of for profit organisations.

The type of entrepreneurship that will occur in an organisation, how it will occur and why it is occurring is dependent on how individual, organisational and environmental factors get combined (Dess and Lumpkin, 1996:135).

Guerrero and Urbano (2012:47) stated that university managers and academics are the “key actors” responsible for the internal transformation of traditional universities into entrepreneurial universities. Rothaermel, Agung and Jiang (2007:709) observed that university entrepreneurial process (strategy) is influenced by both internal and external factors while Brennan and McGowan (2006:160) argued that the use of the corporate entrepreneurship concept shows the importance of university structures and processes as barriers or facilitators of its entrepreneurship.

Rothaermel *et al.* (2007:738) further indicated that university entrepreneurial transformation requires the adaptation of its culture and mission as well as changes in its organisational infrastructure. Brennan and McGowan (2006:146) not only confirmed the importance of university internal environmental context but also asserted that the dynamic process view, although complex is a better way of assessing university entrepreneurship.

The opinions and observations of these scholars highlight the importance of university internal environmental climate and the entrepreneurial process in university entrepreneurial transformation.

The next two sections discuss and operationalise the entrepreneurial intensity and organisational climate concepts as measures of organisational entrepreneurialism.

### 3.9.2 Entrepreneurial intensity concept

Entrepreneurship is a variable concept (Morris, 1998). It exists in all organisations and is a question of “how much exist” and not of “whether it exist”. It is this variable nature of entrepreneurship that makes it necessary to determine the “how much” – the degree of entrepreneurship (also called its entrepreneurial orientation) and how often – the frequency of entrepreneurship within an organisation. Entrepreneurial intensity is the combination of the “how much” and the “how often” of entrepreneurship within an organisation (Kuratko *et al.*, 2011:58, 73). An organisation’s entrepreneurial orientation is made up of its entrepreneurial events. Entrepreneurial events vary in terms of their degree of entrepreneurship - the amount of innovation, proactivity and risk taking a given event contains. Dess and Lumpkin (1996:150) argued that while all the dimensions of entrepreneurship are important in understanding the entrepreneurial process they occur in different combinations. Kuratko *et al.* (2011:73) asserted that at any given point in an organisation there will be a specified number of entrepreneurial events occurring called frequency of entrepreneurship. Kuratko *et al.* (2011:74) further stated that to assess the overall level of entrepreneurship in an organisation, its degree of entrepreneurship - its entrepreneurial orientation and frequency of entrepreneurship must be considered together, and that combining these two concepts yields the concept of entrepreneurial intensity.

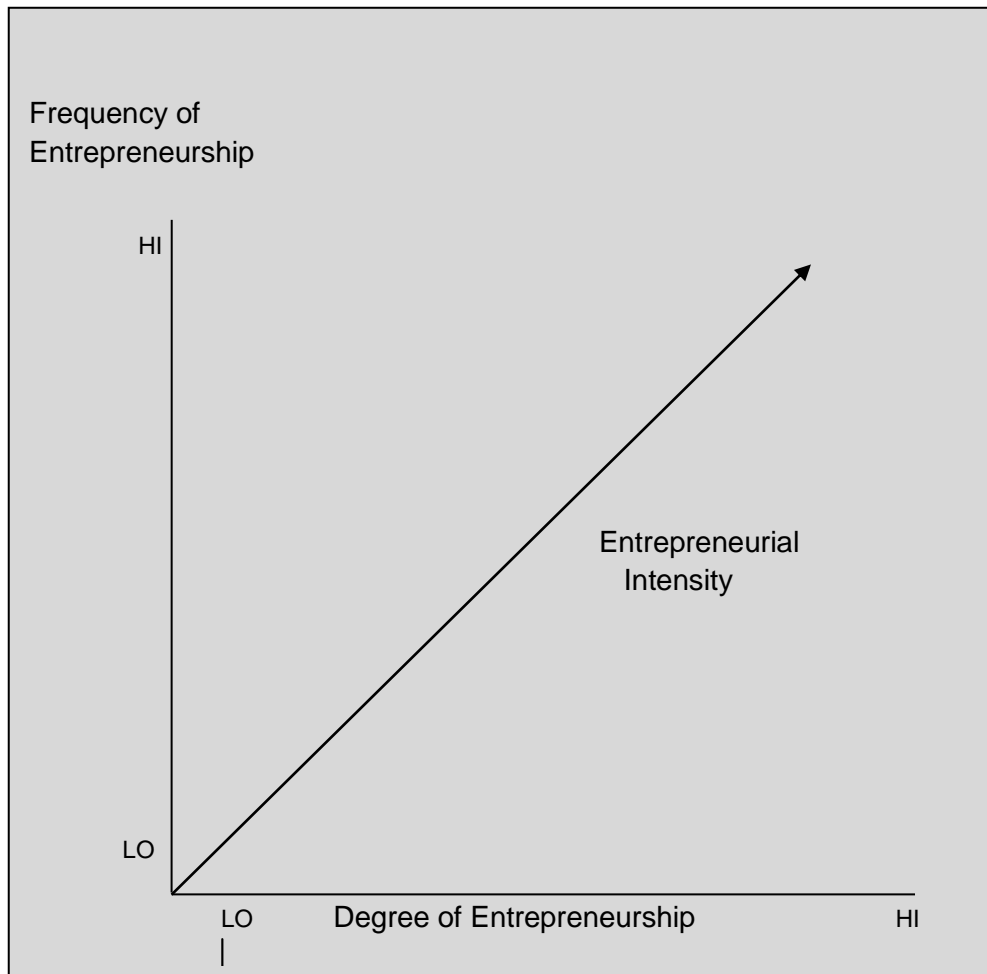
The entrepreneurial intensity concept not only measures entrepreneurship but also describes the entrepreneurship concept both at micro and macro levels. It has as its dimensions frequency of entrepreneurship – the “how often” – and degree of entrepreneurship – the “to what extent” which also is the same as entrepreneurial orientation with the dimension of proactivity, risk taking and innovation (Ireland, Kuratko and Morris, 2006b:22; Morris, Lewis and Sexton, 1994:24; Morris and Sexton, 1995:32; 1996:6). Morris *et al.* (1994:30) also referred to the concept as a measure of organisations’ entrepreneurial activities which vary according to the organisations’ internal environment and industry. Insight gained from applying the concept to an organisation can enhance its competitive advantage in a dynamic environment (Ireland *et al.* 2006b:30). Entrepreneurial events embody some amount of proactivity, risk taking and innovation and the person or organisation behind it is

an entrepreneur (Morris & Sexton, 1995:32; 1996:6). The three dimensions of the degree of entrepreneurship are discussed below:

- Innovativeness (I) is the activity of seeking creative, unusual and novel ways of meeting needs and solving problems. It is a departure from what is currently available and can be in the form of new a product, service or process. It is the finding of new and better ways of accomplishing a task or function (Kuratko *et al.*, 2011:66; Morris & Sexton, 1996:6; Lyon *et al.*, 2000: 1056). Innovation is an important part of an organisation's entrepreneurial orientation because it depicts a key method they use in pursuing new opportunities (Dess and Lumpkin, 1996:143).
- Risk Taking (R) is organisations' controlled and calculated willingness to undertake projects that has a reasonable possibility of failing, producing a loss or with significant performance discrepancies (Kuratko *et al.* 2011:66; Morris and Sexton 1996:6).
- Proactivity (P) is activities directed at realising entrepreneurial ideas and opportunities. It is the "acting on their environment" by organisations rather than reacting to it and its about implementation, doing whatever needs to be done to bring entrepreneurial concept to fruition as well as taking responsibility (Kuratko *et al.* 2011:66; Morris and Sexton, 1996:6; Lyon *et al.*, 2000:1056).

Figure 3.5 illustrates the variable nature of entrepreneurship.

**Figure 3.5: The Variable Nature of Entrepreneurship**



Source: Adapted from Morris, Lewis & Sexton (1994:26)

### 3.9.3 Organisational climate concept

To understand modern organisations it is necessary to consider their internal and external environments. Organisations' internal environment consists of structures, processes, systems and cultures that make up the climate within which its members operate (Kuratko *et al.*, 2011:7). Turbulence in organisations' external environment forces changes in their internal climate (Kuratko *et al.*, 2011:7) and it is strategic leadership's responsibility to use organisational design elements to create an entrepreneurially conducive internal climate (Ireland *et al.*, 2006:14).

Varying organisational conditions influence its entrepreneurship and corporate entrepreneurship will not occur in an organisation with unsupportive internal climate (Kuratko, Montagno and Hornsby, 1990:50, 51).

Measuring organisation climate gives insight into the reasons for the given level of entrepreneurship in an organisation and must be managed by the leadership (Holt, Rutherford and Chalhessy, 2007:44; Kuratko Morris and Covin, 2011:354).

The five key dimensions of organisational climate considered are (Holt, Rutherford and Chalhessy, 2007; Hornsby, Naffziger, Kuratko and Montagno, 1993; Ireland *et al.*, 2006; Kuratko *et al.*, 2011):

- (i) *Management support.* This is top managements willingness to facilitate and support entrepreneurial behaviour. It is the extent to which management structures encourage members to believe innovation is part of every one job specification and it is reflected in how quickly they adopt members' ideas, how people who come up with ideas are recognised, the nature of organisational support for small experimental projects and seed funding provided for projects.
- (ii) *Autonomy/work discretion.* The freedom of organisational members to take decisions on performing their work in ways they consider most effective and without criticism when they make mistakes in the bid to be innovative. Scholars also called it top management's commitment to tolerate failure and to delegate authority and responsibility to its managers.
- (iii) *Rewards/reinforcement.* The organisation's system of relating reward to performance, recognising innovative people throughout the organisation, providing challenge for members and increasing members' responsibility. These are all aimed at motivating members to engage in innovation.
- (iv) *Time availability.* The organisational system of allowing time slacks for their members to get involved in innovation, moderating their work load, and allowing them to work together on long term problem solving projects.
- (v) *Organisational boundaries.* The organisational system that encourages people to look beyond their own jobs to a broader perspective of the organisation. This is achieved by the use of less rigid performance standards, avoidance of standardised operating procedures and narrow job descriptions as well as clearly explaining to members the outcomes expected from organisational work (Kuratko *et al.*, 2011:355).

A universities internal organisation climate is critical to its entrepreneurship. It can be a facilitator or barrier to entrepreneurship and there has been a relative lack of attention to it in the study of university entrepreneurship (Brennan and McGowan, 2006:146, 152), hence the need to understand it.

The next chapter discusses its measurement, but before then the Nelson Mandela Metropolitan University is briefly discussed.

### **3.10 NELSON MANDELA METROPOLITAN UNIVERSITY (NMMU)**

The Nelson Mandela Metropolitan University (NMMU) came about on 1 January 2005, through the merging of three institutions - the PE Technikon, the University of Port Elizabeth and the Port Elizabeth campus of Vista University. The university has six campuses at various locations in Port Elizabeth and George in the Eastern Cape of South Africa. NMMU has a population of over 25,000 students and over 2,500 staff members. It is a comprehensive university that offers both theoretically and vocationally orientated degrees.

There are seven faculties at NMMU, namely Arts, Business and Economic Science, Education, Built Environment and Information Technology, Health Science, Law, and Science. In addition it has a Business School as well as two satellite campuses in George and Missionvale, Port Elizabeth.

Within these faculties and satellite campuses are various departments that offer different courses and award different degrees and qualifications.

Noteworthy here is the Entrepreneurship programmes which are offered from three locations - Department of Management and Entrepreneurship; Department of Business Management and the Business School - all within the Faculty of Business and Economic Sciences but each operating almost totally independent of the other.

#### **Mission & Vision**

NMMU's stated vision is "a value-driven university to be the leader in optimising the potential of our communities towards sustainable development in Africa".

Having attained the vision it is possible to:

- Contribute to the transformation and development of our communities in terms of the full spectrum of their needs;

- Empower our institution, staff, graduates and communities to contribute and compete, both locally and internationally; and
- Continue to make a major contribution to sustainable development in Africa and a mission of “an engaged and people-centered university that serves the needs of its diverse communities by contributing to sustainable development through excellent academic programmes, research and service delivery”.

NMMU is a resource rich university and some of the university's resources are:

- Internationally distinguished and respected academics.
- Highly respected academics especially in Engineering, Business and Law.
- Nationally and internationally distinguished and respected Engineering Faculty.
- Award Winning Business School.
- Two incubators (Chemin and Seda) almost at the door step of the university as well as other projects such as Innovention and the Wool Testing Lab which ideally should be a training lab for NMMU students to develop their employability skills and to acquire experience.
- World class infrastructures.
- Entrepreneurship programmes offered from 3 separate parts of the university.
- Vibrant student population.
- Fully staffed technology transfer office that for years has served the whole of the Eastern Cape.

Considering the quality of resources available to the university as well as its vision and mission it can be seen that NMMU intends to be an Entrepreneurial University. What then are the reasons for the seeming lack of synergy among these rich resources?

- (i) Is NMMU in reality an Entrepreneurial University?
- (ii) Can it be said that the vision and mission of the university is being fulfilled?
- (iii) All the resources available to the university, are they being maximised?
- (iv) If any of the answers to these questions is no then why?

In addition to the questions above this study found that:

- Academics still operate in silos with little or no interdepartmental collaboration.
- Entrepreneurship as a course of study is offered in three different units within the same faculty independent of each other.



- Despite having an internationally acclaimed and respected Engineering Faculty and the drive of the nation to encourage entrepreneurship and make South Africa a High Tech Nation there is no entrepreneurship programme of study for students in the Engineering Faculty.
- When asked, fellow students will three out of five times have no knowledge of entrepreneurship as a course of study at the university - especially the non-business students who often voiced their wish to know more about “such programmes”.

Clark (2001:17) postulated that developing entrepreneurial character is much easier at smaller universities (15,000 or less students) than at larger universities, and in specialised universities compared to comprehensive universities. NMMU is not only a large university (25,000 students) but also a comprehensive university. The task of the university is to build an entrepreneurial spirit within its departments, faculties and the university as a whole.

Could the observed gaps be the impact of internal environmental factors on the university and its systems? This is what this study proposes to find out.

### **3.11 SUMMARY**

Changes in the external environment are challenging traditional universities to become entrepreneurial. Entrepreneurial universities are institutions that have created a fit between their internal structural variables and their external environment (Sporn, 1999:23, 24).

The external environment is inseparable from the entrepreneurial process and has a strong if not deterministic influence on the existence and effectiveness of entrepreneurial activity. It also plays a seminal role in entrepreneurship theory and research (Covin and Slevin, 1991:11).

To successfully adapt to their environment, organisations must thoroughly, rapidly and frequently analyse their internal and external environment. They must also have a fairly short planning horizon and develop flexible plans which they can adjust as needed (Morris & Lewis, 1995:38). Aldrich and Martinez (2001:41) believed that

there are three indispensable elements in understanding entrepreneurial success: the process – strategy; the context – environment, and the outcome. Kuratko, Montagno and Hornsby (1990:50) argued that understanding organisations' entrepreneurialism demands a technique for assessing and describing the organisation.

Stevenson and Jarillo (1990:23) asserted that the crucial point in the study of entrepreneurship is how to foster the entrepreneurial concept by learning the nature of the entrepreneurial process. Ireland *et al.* (2006b:30) agreed with this assertion and stated further that corporate entrepreneurship and corporate entrepreneurship strategy are important means of doing this.

This chapter discussed the key features of the corporate entrepreneurship concept by first considering the entrepreneurship concept; the systems theory; how these concepts are related to the entrepreneurial university concept; and later discussed how entrepreneurship is measured in an organisation.

The following chapter discusses the research design and methodology for this study to measure university entrepreneurship at NMMU.

## **CHAPTER FOUR**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **4.1 INTRODUCTION**

Entrepreneurship is a complex process to assess and before a strategy for entrepreneurship can be formulated or the supportive internal environment designed there is a need to accurately determine the organisation's level of entrepreneurship. (Kuratko *et al.* 2011:148, 350).

Research is a way of thinking (Kumar 2011:1) and Amaratunga, Baldry, Sarshar, and Newton (2002:18) stated that a functional research should be an orderly investigation of a defined problem; use appropriate scientific methods; gather adequate and representative evidence; deploy unbiased and logical reasoning in arriving at conclusions based on evidence gathered; be able to demonstrate the validity of its conclusions; and that cumulative research result in a given field should lead to general principles or laws that can be applied with confidence under similar conditions in future. The authors defined research methodology as a procedural framework within which research studies are conducted.

This chapter discusses research methodology used in answering research questions and objectives posed by this study.

The next section discusses research design and paradigm used.

#### **4.2 RESEARCH DESIGN**

Research design should be determined by the research question asked and choosing appropriate design is critical to the success of a research study (Bono & McNamara, 2011:657).

This study set out to investigate the entrepreneurial university concept by asking the questions:

- What is an entrepreneurial university?
- What are the main characteristics of an entrepreneurial university?
- What key environmental factors influence university entrepreneurialism, and
- How can these factors be influenced to increase entrepreneurial output at NMMU?

and the objectives of:

- Measuring NMMU's level of entrepreneurship.
- Making policy recommendations based on findings.

In answering the research questions, Chapter Two of this study explained what an entrepreneurial university is and identified the main characteristics of an entrepreneurial university, as well as the internal factors influencing university entrepreneurialism. However, to answer the research question: "How can these factors be influenced to increase entrepreneurial output at NMMU?" requires a three step approach.

Before discussing the three step approach to answering this question there is a need to clarify the perception of the concept "environment" in this study.

Universities are vulnerable to their environment (Sporn, 1996:42) and Duncan (1972:314) defined organisations' environment as the totality of physical and social factors that are taken directly into consideration in the decision-making behaviour of its members. The authors asserted that any organisation's environment can be divided into the external and internal environment and that the external environment consists of relevant physical and social factors outside the boundaries of the organisation that are taken directly into consideration in decision making. Kuratko *et al.* (2011:4) considered this to be all the factors outside the organisation that could influence and be influenced by the organisation, while the internal environment is defined as consisting of those relevant physical and social factors within the boundaries of the organisation that are taken directly into consideration in the decision making process of individuals within the organisation (Duncan, 1972:314).

Kuratko *et al.* (2011:4) further argued that to understand modern organisations their external and internal environments must be considered. Schindehutte, Morris and Kuratko (2000:22) regarded the external environment as a major trigger in any organisation's entrepreneurial transformation. However, apart from selecting which part of the external environment they intend to operate in - their task environment - and develop as well as deploy suitable strategies, universities, just as any other organisation have no control over their external environment, except through indirect modification, as a result of modification in the competitive environment. Due to this

lack of control over the external environment, this study chose to focus on the internal university environmental factors as the key factors that can be influenced by increased university entrepreneurial output. The three steps necessary to answer research question (iii) above will be discussed next.

- Firstly, the need to determine the actual level of entrepreneurship at NMMU. This is necessary because attempts to improve entrepreneurship in any organisation can only occur after the level of entrepreneurship has been determined (Kuratko *et al.* 2011:350). In chapter three, corporate entrepreneurship was established as a concept that explains entrepreneurship as an organisational behaviour as well as entrepreneurship as the behaviour of members of an organisation, and it was shown to be an adequate theoretical framework for understanding organisational entrepreneurialism.

The entrepreneurial intensity concept was also identified as a measure of the level of entrepreneurship in an entity (NMMU in this context) and Chapter Five will measure this concept at NMMU using the Entrepreneurial Performance Index instrument.

- Secondly, it is necessary to identify and measure internal environmental factors that influence entrepreneurship at NMMU. This step is important because it helps to understand reasons for the level of entrepreneurship that exists at the university. In chapter two the internal factors influencing entrepreneurial universities, as well as the external factors and the outcome or feedback factors of influence were identified. Chapter The internal factors further were examined in chapter three to highlight the core organisational climate factors that influence entrepreneurship and how they can be measured, using the corporate entrepreneurship climate instrument. According to (Ireland *et al.* 2006:24) measuring these factors provides insight into why a university has developed its current level of entrepreneurship as well as an understanding of which factors facilitate or inhibit entrepreneurship. Using the corporate entrepreneurship climate instrument. Chapter Five will measure internal factors that influence the level of entrepreneurship at the university.

- The final step in answering the question involves discussing ways in which the identified and measured internal factors can be influenced to increase entrepreneurial output at NMMU, which will also be discussed in Chapter Five.

In summary this research question (iii) does three things:

- Measures entrepreneurial intensity or level of entrepreneurship at NMMU;
- Identifies and measures key internal factors influencing NMMU entrepreneurialism; and
- Identifies the path of influence of the internal factors.

The following section discusses the research paradigm adopted by this study and justifications for the approach.

#### **4.2.1 Research Paradigm**

The choice and adequacy of a research method is a manifestation of a variety of assumptions on the nature of knowledge and the methods by which it can be obtained in addition to representing foundational assumptions about the nature of the phenomena to be investigated. Hence, methodology choice, whether qualitative or quantitative should not be considered or presented in abstract format (Morgan & Smircich, 1980:491).

Amaratunga *et al.* (2002:18, 19) noted that a discussion of research philosophy is necessary before embarking on a research study and that different research methodologies are appropriate for different situations. In addition, the authors observed that the key focus of a good study design should be on making the right choices of method, in line with the purpose of a study, its research question and resource availability.

Holden and Lynch (2004:2,12) stated that decisions on research methods should not be methodology led but rather arise from the study's philosophical stand and nature of phenomena being investigated. They believed that there is no right or wrong philosophical stance but rather a matching of research philosophy and methodology to the research problem being investigated.

Research methodology is the "how" to research and there are two main philosophical approaches to this: the *subjective* approach and the *objective* approach (Holden & Lynch, 2004:2, 3). According to Morgan and Smircich

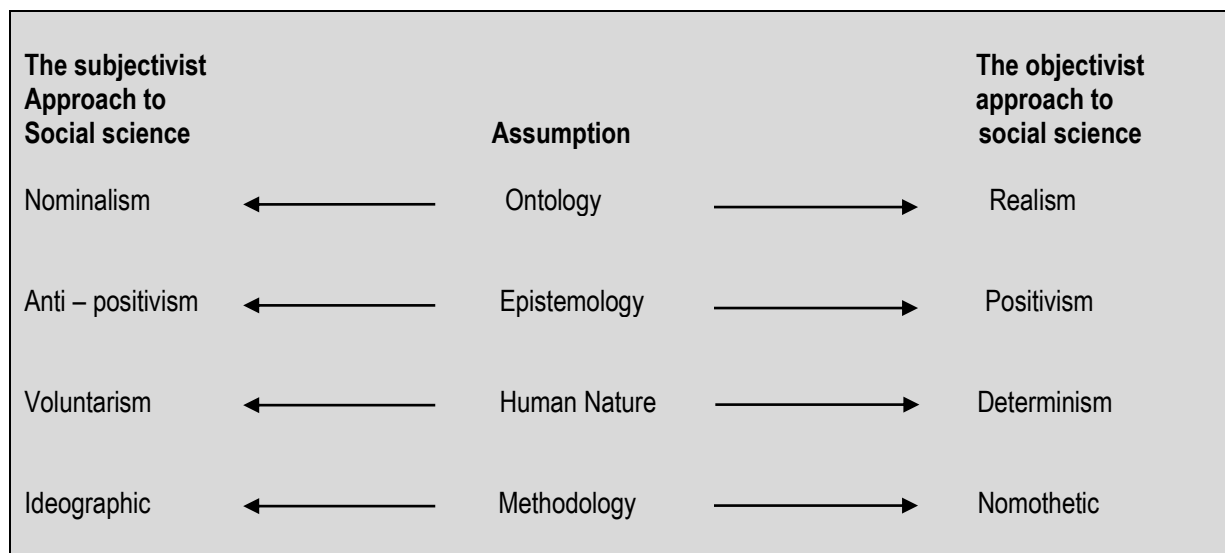
(1980:491) the correct choice of research methodology cannot be made without examining and understanding the various assumptions on which they are based.

The *subjective* approach is referred to as a qualitative, phenomenological, humanistic, or interpretivist approach, while the *objective* approach is called the quantitative, positivist, scientific, experimentalist, traditionalist or functionalist approach (Holden and Lynch, 2004:4) and both paradigms have their weaknesses and strengths (Amaratunga *et al.*, 2002:20).

Subjectivism and objectivism are two extremes on the research philosophy continuum. They have opposing assumptions. These two approaches are based on three key assumptions - ontological (nature of reality), epistemological (nature of knowledge), and human nature (Holden and Lynch, 2004:5; Morgan and Smircich, 1980:491). These assumptions all have consequential effects on each other in addition to their effect on the choice of a research study.

Figure 4.1 depicts the two opposing philosophical approaches and assumptions upon which they are based, as well as their associated terminologies.

**Figure 4.1: The subjectivist – objectivist dimension**



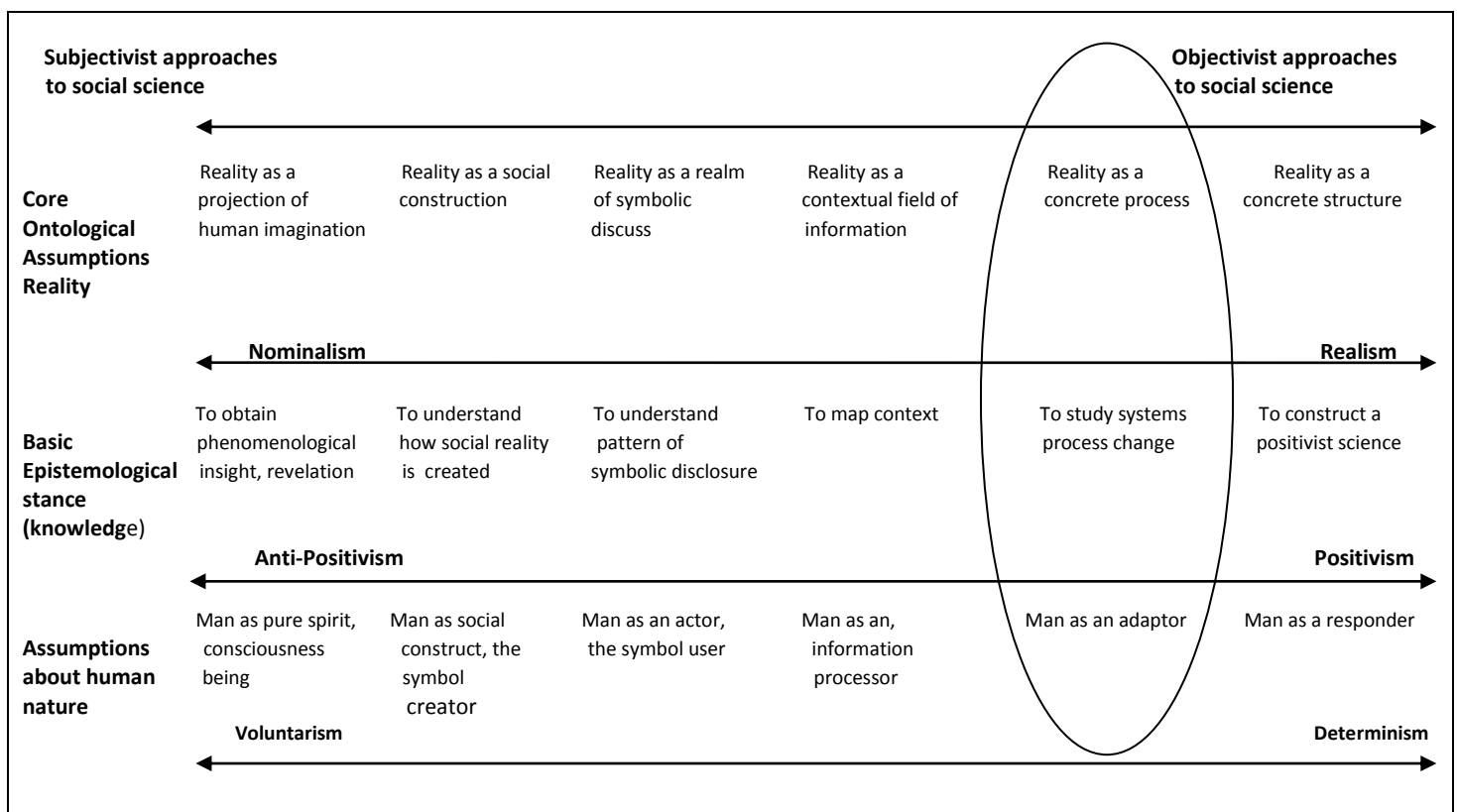
Source: Adapted from Holden & Lynch (2004:5)

A study's ontological stance – its assumptions on nature of reality - is foundational and influences its other core assumptions (Holden and Lynch, 2004:6). The subjectivist ontological assumption is that reality does not exist outside oneself and that it is imagined. Their epistemological assumption is that knowledge cannot be

discovered rather only subjectively acquired and their human nature assumption is that the relationship between man and the society is voluntary and that man has freewill and is autonomous (Holden and Lynch 2004:7)

On the other hand the objectivists ontologically believe that reality exist and predate man and that the world is an external reality that will continue to exist as an empirical entity. Epistemologically they believe that valid knowledge about reality can only be discovered through observation and measurement and on human nature they argue that the relationship between man and society is deterministic, and that the world consist of causal laws that explain the patterns of man's social behaviour (Holden and Lynch, 2004:7). Figure 4.2 depicts these arguments on a continuum of six major philosophical research perspectives.

**Figure 4.2: Network of Basic Assumptions Characterising the Subjective - Objective debate within Social Science**



Source: Adapted from Holden & Lynch (2004:6)

In line with Holden and Lynch's (2004:2, 12) assertion that decisions on research methods should arise from a study's philosophical stand and nature of phenomenon



being investigated, the phenomenon investigated in this study is the entrepreneurial university concept which Clark (1998:4) referred to as a continuous process by which modern universities measurably change themselves and he called it both a process and an outcome.

Corporate entrepreneurship concept was found to be an adequate theoretical framework to investigate this concept (Kirby 2006:600). Corporate entrepreneurship is described as a process of entrepreneurship in an existing organisation (Ireland, Kuratko and Morris, 2006:10; Sharma and Chrisman, 1999:18) and Kuratko, Morris and Covin (2011: x) and Lui and Durbinsky (2000: 1317) described entrepreneurship as a “process” while Stevenson and Jarillo (1990:23) defined entrepreneurship also as “a process by which individuals—either on their own or inside organizations—pursue opportunities without regard to the resources they currently control.

According to Miller (1983:770) organisations can be entrepreneurial and he opined that what is important in organisation’s entrepreneurialism is not the critical actor (the organisation) but the process of entrepreneurship and organisational factors which foster and impede it.

Morgan (1997:38) described organisations as a socio-technical system, while Nadler and Tushman (1980:37) described organisations as dynamic and open social systems.

Based on the opinions of the various scholars mentioned above, two key attributes of the entrepreneurial university concept investigated in this study are:

- The concept being investigated is a process, and
- The concept is occurring within a social system – the university.

Mapping these two attributes against the continuum of six major philosophical perspectives depicted in Figure 4.2, the phenomenon investigated in this study can be located on column five (enclosed with a circle in Figure 4.2) **which indicates that the objectivist approach is an adequate philosophical approach.** A quantitative study approach is thus adopted.

Based on the main research question of “what is an entrepreneurial university?” this study adopts a descriptive study design in order to systematically describe the entrepreneurial phenomenon (Kumar 2011:10).

This study is also designed as a cross sectional study because it aims to identify internal factors influencing entrepreneurship at NMMU as well as to measure the level of entrepreneurship within NMMU at the time of study in order to understand the entrepreneurial university concept (Kumar 2011:107). However, according to Russell (1999:66), while a cross-sectional study approach can provide valuable insights into the types of variables that may be antecedent to or associated with entrepreneurial processes, it cannot capture the dynamics of the entrepreneurial process. **The reason why a cross sectional approach was chosen is that this study only aims to gain insight into, as well as measure the variables that are antecedent to the entrepreneurial process and not necessarily to capture the dynamics of the entrepreneurial process.**

In summary the research design for this study is a quantitative, descriptive and cross sectional study.

The next section discusses the sampling process.

### **4.3 SAMPLING PROCESS**

Sampling is the process of selecting units of study from a population of interest (Trochim, 2006). This section discusses sampling activities related to this study.

#### **4.3.1 Unit of Analysis**

Trochim (2006) defined unit of analysis as the major entity a research study is analysing. This study's unit of analysis is the staff of Nelson Mandela Metropolitan University. This choice is justified firstly by Philpott, Dooley, Reilly, and Lupton, (2011:164) assertion that in comprehensive universities - with autonomous faculties and schools - entrepreneurial culture is difficult to develop and also by Clark (1998:135; 2001:17) observations that university entrepreneurial transformation is a lot easier in smaller universities with student population below 15,000, in private universities as well as in specialised universities than it is in larger, comprehensive and public universities.

NMMU has a student population of over 25,000 and it is a public as well as a comprehensive university with seven faculties and twenty three academic schools in subjects ranging from arts, humanities and law to business, science and technology.

Because of these attributes, NMMU appears to be an appropriate university choice for this study.

#### **4.3.2 Study Population**

The definition of study population is the first critical step in the sampling process. Kumar (2011:194) defined study population as a class of objects from which we select our sample. Trochim (2006) described the concept as the group a research study wants to generalise to, and from which the sample population is drawn. Banerjee and Chaudhury (2010) proposed that it is the entire group about which information is required; it is indicated by the research question or the purpose of study and it must have a clear inclusion and exclusion criteria for it to be well defined. The study population is statistically represented by the letter N.

Mainardes, Alves and Raposo (2011:136) posed the question “who are the participants in higher education” and in answering they identified the academics that are responsible for the teaching/learning processes, research and services to society; the students who, they think should be responsible for their own learning, and the non-academic staff as the key participants in higher educational institutions.

Clark (1998:4) found that the collective action of academics, administrators (non-academic staff) and students is responsible for university entrepreneurial transformation. Lui (1998:20) argued that it is the combined efforts of a university’s academics, non-academic staff and students that produce its output.

Guided by the observations and opinions of these scholars, the study population of this research, consists of all staff – academic and non-academic staff – currently employed by Nelson Mandela Metropolitan University, on all its campuses, as well as all registered students of the university at the time of study.

#### **4.3.3 Sampling Frame**

This is the listing of the study population from which the sample population is drawn (Trochim, 2006), and according to Kumar (2011:194), all elements in a sample population must be present in a sample frame for it to be effective. For this study the sample frame is the “division and department” section as listed under “on campus” in NMMU home page ([www.nmmu.ac.za](http://www.nmmu.ac.za)).

#### **4.3.4 Sampling Method**

This is the way information for a study is selected (Kumar, 2011:194), and there are two sampling methods: (i) The probability sampling method, which is a form of random sampling in which every member of a population has a known non zero opportunity of being selected described (Trochim, 2006) and (ii) the non-probability sampling method which does not use a random selection process and has five types of sampling, namely quota sampling, accidental sampling, judgemental sampling, expert sampling and snowball sampling (Kumar, 2011:207).

In this study the non-probability, judgemental sampling method was used. This method is described by Kumar (2011:207) as a sampling method that is based on judgement as to who can provide the best information for achieving the objective of a study. The author also observed that this sampling method is effective for studies that describe a phenomenon of which not much is known. Justification for the use of this sampling method in this study is based on assertions that middle managers in organisations are appropriate for determining its level of entrepreneurship (Kuratko *et al.*, 2011:323; Hornsby, Kuratko and Zahra, (2002:255) and Schofield's (1996:4) definition of university middle managers. These scholars' opinions are discussed below under sample population. Also this sampling method has been found to be affordable, quick and easy to administer (Kumar, 2011:207).

#### **4.3.5 Sample Population**

Entrepreneurship is both cognitive and behavioural in nature and this impacts its measurement; hence the need to collect data on organisation members' perception as a way of understanding and measuring the corporate entrepreneurship concept (Kuratko *et al.*, 2011:349).

Kumar (2011:193) described sample population as any part of a well-defined population. He called it a representation of the population from which inferences is drawn about the population. According to Kumar (2011), a sample population correctly chosen will be statistically identical to the population and conclusions can be drawn from it about the study population. Research studies are usually carried out on sample populations from which generalisations are then made about the entire population.

The sample population for this study are the middle managers at NMMU. This study defines this group as consisting of:

- *Academic middle managers.* These are heads of academic schools, heads of academic departments, heads of centres of excellence, heads of academic institutes and research units.
- *Non-academic middle managers.* These are heads of non-academic departments below the level of registrar.
- *Student middle managers.* Student middle managers are elected student representative council (SRC) members.

#### **4.3.6 Justification for sample population choice**

The discussion on justification for the choice of the sample population is dealt with in two parts as discussed below:

##### **4.3.6.1 Justification for the choice of middle managers**

While all members of an organisation need to be actively involved in entrepreneurship for the organisation to be entrepreneurial, the process cannot happen in an organisation without its “leadership” (Kuratko *et al.*, 2011:323). The authors classified organisational leadership into three levels: the top, middle and lower level managers and declared middle managers as particularly critical to the development of entrepreneurship in an organisation. This view is also supported by Hornsby, Kuratko and Zahra (2002:255) who asserted that middle managers’ views, interest and support for corporate entrepreneurship determines whether it’s embraced or not in an organisation.

Kuratko, Morris and Covin (2011:330) referred to the critical role of middle managers in corporate entrepreneurship as the “linchpin” of entrepreneurship within an organisation; the conduit between top management and the operational level management that synthesises and disseminates information between the two management levels. In addition, middle managers initiate projects that create newness as well as enabling and helping to shape individual entrepreneurial actions.

Ireland *et al.* (2006b:22) stated that to measure entrepreneurship in organisations there is a need to administer measuring instrument on a large number of managers in different functional areas to determine the level of entrepreneurship in an

organisation. Gjerding *et al.*, 2006:89 contended that the perceptions and opinions of key individuals are valid images of policies and practices pursued by a university. Clark (1998:3) described entrepreneurship in the university environment as the characteristics of the entire university's internal departments, its research centres, faculties and schools.

Although the arguments above established the importance of middle managers in university entrepreneurship the question of who are middle managers at a university arises?

#### 4.3.6.2 University middle managers

Schofield (1996:4) maintained that in commonwealth higher education systems the term university middle managers is used in two ways to:

- (i) describe non-academic staff holding responsible administrative and managerial positions below the level of registrar or chief administrative officer; and
- (ii) describe academic staff at the level of heads of, departments, heads of subject areas or research units who may formally report to either a faculty dean or direct to the vice-chancellor depending upon the decision making structure.

The definitions above justify the choice of academic and non-academic middle managers by this study.

Guerrero, Urbano and Kirby (2006:4) stated that the entrepreneurial activities of all university members - academic and non-academic staff and students - are key characteristics of an entrepreneurial university. It can thus be concluded from these opinions that the students of a university contribute to its entrepreneurship.

This study considers the Student Representative Council (SRC) members as middle managers and this consideration is based on the following:

- They are elected student representatives and they perform some of the middle managers' activities identified by Kuratko, Morris and Covin (2011:330) above.
- Two of the aims and objectives they undertake to pursue on behalf of the students on assumption of office are:
  - (i) To be a catalyst in the transformation process of the Nelson Mandela Metropolitan University, and

- (ii) To encourage all parties involved in the Nelson Mandela Metropolitan University to create a climate conducive to research, learning and teaching.

#### 4.3.6.3 Sample population bias.

Bias introduced by this choice of sample population is that researchers have found that middle and top managers tend to report a higher level of entrepreneurship than the lower level members. Hornsby *et al.* (2002:256, 257) insisted that middle managers play an invaluable role in fostering entrepreneurial activities in organisations and, quoting Nonaka and Takeuchi (1995) further contended that most innovations in an organisation emanates from the middle management. This observation corroborates Gjerding, Wilderom, Cameron, Taylor and Scheunert's (2006:89) claim that the perceptions and opinions of key individuals are valid images of policies and practices pursued by a university. These arguments prove that the perception of middle managers (as described in section 4.3.7) at NMMU is adequate for a study on its entrepreneurship, despite the bias introduced.

#### 4.3.7 Sample size

According to Kumar (2011:194) a sample size is made up of people from whom the required information for a study is obtained and it is represented by the letter (N). The sample size for this study was determined in three ways:

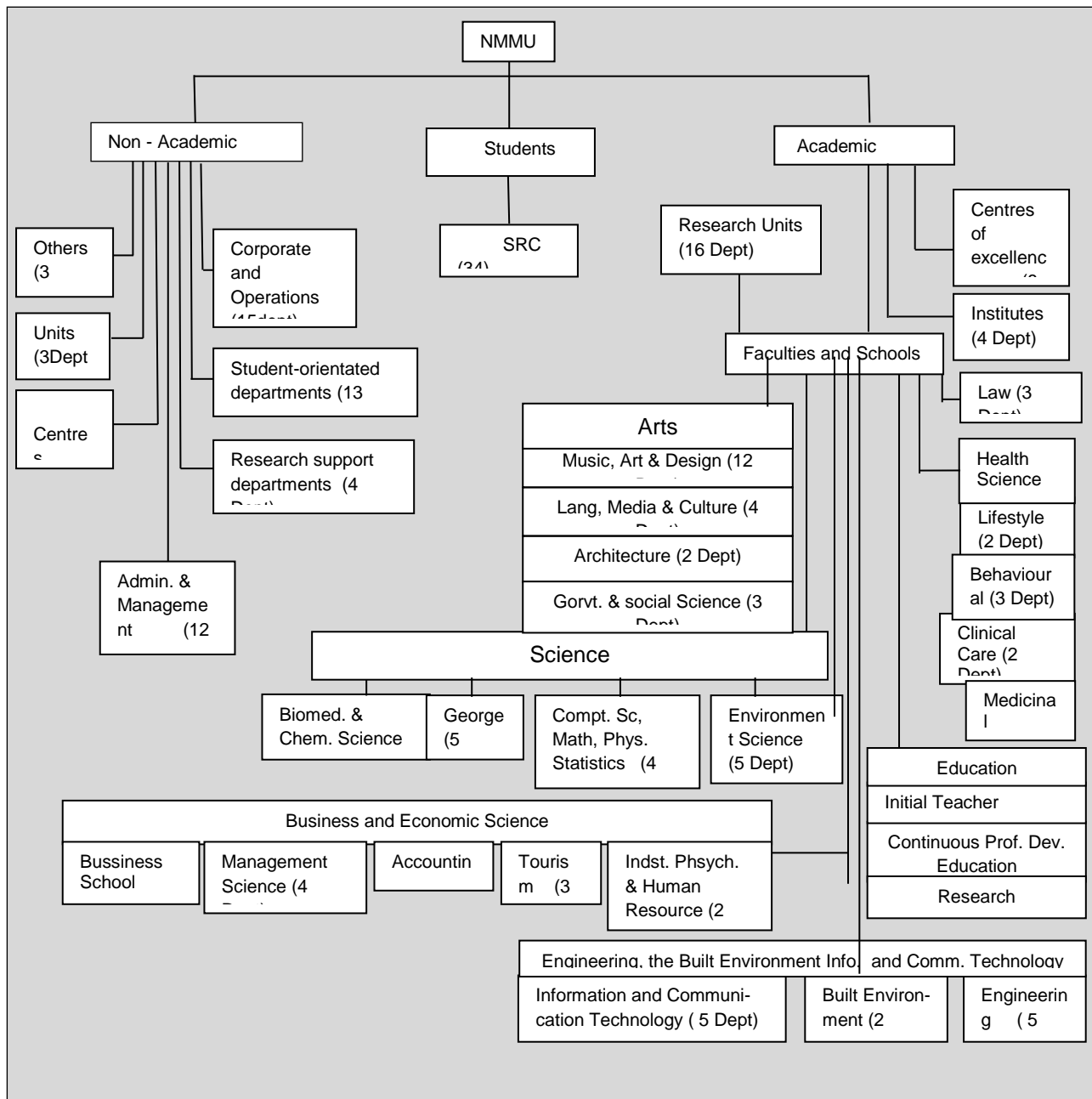
- Sample population from academic entities. This consists of:
  - Heads of schools, 23 people;
  - Heads of academic departments, 72 people;
  - Heads of academic institutes, 4 people;
  - Heads of centres of excellence, 8 people; and
  - Heads of research units, 16 people.
  - Total = 123 people.
- Sample population from non-academic entities and support services:
  - Heads of divisions, 7 people; and
  - Heads of departments, 57 people.
  - Total = 64 people.
- Sample population from Student population

- SRC representatives on all the campuses, 37 people.
  - Total = 37 people.
- (N) = 123 + 64 + 37 = 224 people

The sample size for this study consists of a total of 234 people.

Figure 4.3 depicts the sample size structure for this study.

**Figure 4.3: Sample size structure (Nelson Mandela Metropolitan University)**



Source: Author's own construct (2013)

The following section discusses the data collection methods.



#### **4.4 DATA COLLECTION METHOD**

This is the process of finding information on a research study through primary and/or secondary means of data collection.

The primary data collection method is a process of collecting new original primary data and assembling such data for a research study through observation, surveys, focus group, and interviews among others, while the secondary data collection method is the process of extracting historical and other forms of information from sources such as articles, journals, books and magazines (Kumar, 2011:139). In secondary methods data used would have been previously collected for other purposes outside the current research study.

For this study the secondary data collection method was deployed in Chapters Two and in Chapter Three to identify theory for testing university entrepreneurialism as well as to identify internal organisational factors of influence.

Details of the measuring instrument used for data collection are discussed in the next section.

#### **4.5 THE MEASURING INSTRUMENT**

Measurement is central to any research study (Kumar, 2011:74) and it is the process of observing and recording information collected as part of a research study. What needs to be measured in a study are the variables, and measurability, is what differentiates a variable from a concept (Kumar, 2011:63). There are two key issues to be considered in measuring variables: (i) the levels or scale of measurement and its reliability and validity and (ii) the types of measures used (Trochim, 2006). The next sub-section discusses the measurement scale while the reliability concept is discussed under the section describing validity and reliability. The measurement type used in this study is the survey method.

##### **4.5.1 Levels of Measurement**

This is the relationship between values assigned to attributes of a variable. A variable is a quality or quantity that varies across elements of a study population and can be classified into independent variables (such as innovativeness, proactivity and

risk taken) and dependent variables (such as entrepreneurial intensity) while attribute is the characteristics of a variable (Trochim, 2006). They are things we measure, manipulate or control in research ([www.statsoft.com/Textbook/Elementary-Statistics-Concepts/button/1](http://www.statsoft.com/Textbook/Elementary-Statistics-Concepts/button/1)). To analyse variables in a study their attributes are assigned values which are measured.

There are four types of levels of measurement:

- **Nominal Level:** - this is a qualitative classification of categories or attributes of variables in no particular order. Attributes are only listed but not classified and this level is the weakest level of measurement and it is at the bases of the other levels (Trochim, 2006).
- **Ordinal level.** While this level of measurement embodies all the characteristics of the nominal level it, in addition, provides more information than the nominal level. It allows us to rank order questions by stating how much less or more of attributes there is but it does not allow us to be categorical in how much more is there in the “more” or “less” ranking since intervals between ranked items cannot be interpreted ([www.statsoft.com/Textbook/Elementary-Statistics-Concepts/button/1](http://www.statsoft.com/Textbook/Elementary-Statistics-Concepts/button/1)).
- **Interval measures.** This level allows us to list, rank order, quantify and compare size differences between attributes in an item being measured ([www.statsoft.com/Textbook/Elementary-Statistics-Concepts/button/1](http://www.statsoft.com/Textbook/Elementary-Statistics-Concepts/button/1)) and distance between attributes at this level of measurement are meaningful and interpretable (Trochim, 2006).
- **Ratio level.** This level embodies all the properties of the interval level, and in addition features an identifiable absolute zero point. It thus allows for formulating statements such as attribute x is two times more than attribute y. This level of measurement is at the top of the measurement scale and often referred to as the absolute zero scale.

The next section discusses the instrument used in this study.

#### 4.5.2 Entrepreneurship health audit instrument

Entrepreneurial organisations are difficult to assess using traditional management theories and this is because assessing the cognitive and behavioural nature of

entrepreneurship is complex (Kuratko *et al.* 2011:348). Despite this difficulty it is essential to measure entrepreneurship in organisations as it leads to improvements and recognition of problems relating to the organisational processes. It also facilitates an understanding of how entrepreneurship works in an organisation (Kuratko *et al.* 2011:347, 354).

There are two aspects to measuring entrepreneurship in an organisation: (i) measurement of the actual level of entrepreneurship and (ii) measurement of the climate or environmental factors to determine their level of support for entrepreneurship. Both of these are systematically measured using the entrepreneurial health audit tool (Kuratko *et al.* 2011:351).

The entrepreneurial Health Audit Instrument or tool is a diagnostic instrument developed by Ireland *et al.* (2006). It consists of two sets of instruments: the entrepreneurial performance index instrument that measures the level of entrepreneurship in an organisation, and the corporate entrepreneurship climate instrument which measures internal organisational factors affecting entrepreneurship. Each of the two instruments is based on a 5 point Likert scale. Kuratko *et al.* 2011:347, 349) described the instrument as an integrative framework for logically measuring organisation level entrepreneurship as well as for assessing both the cognitive and behavioural nature of entrepreneurship in an organisation.

As used in this study the instrument consists of three sections:

Section A measures the level of entrepreneurship at NMMU using the Entrepreneurial Performance Index instrument. It consists of seventeen questions, the first twelve of which measure the degree of entrepreneurship by determining how proactive, innovative and risk bearing the university's activities are, and the remaining five questions measure the frequency of such entrepreneurial activities at the university.

Section B measures the internal climate factors and their support for entrepreneurship within NMMU using the Corporate Entrepreneurship Climate Instrument. This section consists of 78 Likert type questions while Section C collects demographic data.

Both the Entrepreneurial Performance Index instrument and Corporate Entrepreneurship Climate Instrument are discussed below.

#### 4.5.2.1 The entrepreneurial performance instrument

The entrepreneurial performance or level of entrepreneurship of an organisation can be gauged by determining its entrepreneurial intensity scores and this is carried out using the entrepreneurial performance index instrument. According to Ireland *et al.* (2006:22); Kuratko *et al.* (2011:351) and Morris and Sexton (1996:9) the instrument is valid and a reliable means of measuring entrepreneurship in an organisation. The instrument has two sections, the first of which measures the degree of entrepreneurship and is assigned a weight of 0.7 while the second section that measures the frequency of entrepreneurship is assigned a weight of 0.3.

The entrepreneurial performance index instrument is a scale that measures members' perception of the level of proactivity, innovativeness, and risk taking in an organisation's activities and the frequency of occurrence of such activities. These four variables are discussed below.

- **Pro-activity.** This variable is concerned with anticipating and then acting in light of a recognised entrepreneurial opportunity. It requires an organisation to be able to tolerate failure. This variable also describes how organisations encourage their member to persevere in their efforts to exploit opportunities that can be the source of innovation, competitive advantage, and first-mover advantage in the marketplace (Ireland *et al.* 2006:27; Kuratko *et al.* 2011:354; Morris 1998:41).
- **Innovativeness.** This variable refers to the seeking of creative, unusual or novel solutions to problems and needs by an organisation in the form of new products, goods, services, technologies and processes. It is about how much organisations activities depart from what is currently available (Ireland *et al.* 2006:27; Kuratko *et al.* 2011:351; Morris 1998:37).
- **Risk-taking.** This variable refers to an organisation's willingness to commit significant resources to opportunities that have a reasonable chance of failure as well as success. But these risks are usually carefully calculated, for a good understanding of potential gains and potential losses that may be associated

with the opportunities (Ireland *et al.* 2006:27; Kuratko *et al.* 2011:354; Morris 1998:38).

- **Frequency of entrepreneurship.** This variable measures the number of new products and/or services as well as new processes introduced by an organisation within a given period (Kuratko *et al.* 2011:351).

The next section discusses the corporate entrepreneurship climate instrument.

#### 4.5.2.2 Corporate entrepreneurship climate instrument

Guerrero and Urbano (2008:5) highlighted the need for universities to create favourable internal environments for entrepreneurship and Brennan and McGowan (2006:146) asserted that the university's internal organisational context is critical to its entrepreneurship. Kirby (2006:5) stated that if universities are to be more entrepreneurial then more attention needs to be paid to their internal organisational climate which according to Brennan and McGowan (2006:152) and Scheepers, Hough and Bloom (2008:54) can act as barriers or facilitators of its entrepreneurship.

Internal organisational climate is an effective way to manage, facilitate and improve corporate entrepreneurship (Holt, Rutherford and Clohessy, 2007:40). The organisation's internal environment's support for entrepreneurship is measured using the Corporate Entrepreneurship Climate Instrument - a diagnostic tool for assessing, evaluating and managing internal work environment so that it can support entrepreneurial behaviour as well as the use of corporate entrepreneurship strategy (Ireland *et al.* 2006:24).

According to Ireland *et al.* (2006:28) the key characteristics of the instrument are:

- It gives insight into why the organisation has developed its current level of entrepreneurship;
- It helps to understand how organisation's internal environment support or inhibits entrepreneurship;
- It indicates an organisation's success in the use of corporate entrepreneurship strategy;
- It highlights areas within the internal organisational environment that need attention;
- It consists of 78 Likert type questions;

- It is a psychometrically sound means of assessing organisational internal environment's support for corporate entrepreneurship; and
- It is an appropriate instrument to use along with other instruments to explore questions about organisations' entrepreneurial behaviour.

The corporate entrepreneurship climate instrument consists of five key variables that measure an organisations' internal climate (Ireland *et al.*, 2006:27) namely:

- **Management support.** This variable is the willingness of top-level managers to facilitate and promote entrepreneurial behaviour, encourage innovative ideas and provide resources needed by people to behave entrepreneurially (Ireland *et al.*, 2006:27; Kuratko *et al.*, 2011:354).
- **Work discretion/autonomy.** This variable is about the willingness of top-level managers' to tolerate failure, give decision-making latitude and freedom from excessive oversight, as well as to delegate authority and responsibility to middle and lower-level managers (Ireland *et al.* 2006:27; Kuratko *et al.*, 2011:354).
- **Reinforcement.** This is the variable that allows for the development and use of systems that reinforce entrepreneurial behaviour, systems that highlight significant achievements and which encourages the pursuit of challenging work (Ireland *et al.*, 2006:27; Kuratko *et al.*, 2011:354).
- **Time availability.** This variable evaluates workloads to ensure that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short and long-term organisational goals (Ireland *et al.*, 2006:28; Kuratko *et al.*, 2011:354).
- **Organisational boundaries.** This variable involves the precise explanations of outcomes expected from organisational work and the development of mechanisms for evaluating, selecting and using innovations (Ireland *et al.*, 2006:28; Kuratko *et al.*, 2011:354).

The entrepreneurial health audit tool will be used to measure entrepreneurship and internal organisational environment at NMMU and its outcome will be discussed in Chapter Five.

The following section discusses modifications made to the entrepreneurial performance instrument in this study.

## 4.6 MODIFICATION OF INSTRUMENT

This section discusses modifications made to the entrepreneurial performance instrument by this study.

### 4.6.1 Universities' as Non-profit organisation.

Universities are non-profit organisations (Lui & Durbinsky, 2000:1319) and like other non-profit organisations have multiple stakeholders and no profit motive. These two key features differentiate non profits from for profit organisations and they affect how performance in them is measured (Kuratko *et al.*, 2011:119).

While antecedents and outcomes of corporate entrepreneurship may differ between for profit and non-profit organisations the process is essentially the same (Lumpkin, Moss, Gras and Amezcau, 2013:761). Lui and Durbinsky (2000:1319) and Kuratko *et al.* (2011:114) also confirmed this assertion and further argued that non-profit organisations meet the divergent needs of their multiple stakeholders through the entrepreneurial processes.

Since this study seeks to understand university entrepreneurial transformation by attempting to understand factors influencing the process and their path of influence – a process study – the measurement process used in for profit organisations based on the arguments above can be applied in this study, with modifications in terms to reflect the non-profit status of a public university.

Some of the questions in the entrepreneurship performance index instrument measures “products” or “services” produced by organisations. These terms are replaced in the instrument with the term customer values. The need to replace the terms arose from the challenges faced in answering the question: **What does a university produce - products or services?**

There is an intense controversy around this question. While some scholars argued that universities produce products (Lui 1998:18 quoted Doyle and Newbould1980;

Kotler and Murphy 1981 and Cope and Delaney as some of the scholars that define university output as products) others argued that it is services that is produced (Canterbury 1999:15). Some scholar such as Lui (1998:20) still argued that it is quasi products that are produced. A major problem observed by this study with the product- service model of representing university output is that whichever position is taken within the model, none is a comprehensive representation of the total value delivered by a university to its stakeholders.

Morris (1998:18) in describing the entrepreneurial process within an organisation noted entrepreneurial intensity as the output of this process and proposed eight possible forms in which entrepreneurial intensity can manifest as organisational outcome namely: as products and/or services, profit, value creation, new technologies, process, profit and personal benefits, employment, assets and revenue growth and a going concern.

Since this study aims at measuring entrepreneurial intensity of a university and going by the observations made above by Morris (1998) it is believed that the words products/services in the measuring instrument can be successfully substituted with “customer value” - a term it considers as a more embracing representation of entrepreneurial outcome at universities in view of its multiple stakeholders.

#### **4.6.2 Customer Value**

Kuratko *et al.* (2011:9) referred to entrepreneurship as the value creating process within organisations. Stevenson, Roberts and Grousbeck (1989) quoted by Erasmus and Scheepers (2008:232) also confirmed entrepreneurship as a value creating process asserting that it brings together a unique combination of resources to exploit opportunities.

Universities have multiple stakeholders of which Mainardes, Alves and Raposo (2010:82) mentioned the students (current and prospective), government, academic and non-academic staff, researchers, corporate entities, nongovernmental organisations and donors, organisations, professional associations, other universities, former students, student families, the media and the local and regional community as some of its key stakeholders. These stakeholders can be classified into internal university customers – academic and non-academic staff and current students for example, and external university customers – prospective students, their



families, government and corporate entities and this classification connotes a simultaneous focus on value creation for both internal and external university stakeholders.

Zeithaml (1988 as quoted by Ravald and Gronroos, 1996:19,22) defined customer value as consumer's overall assessment of the utility of a product (service) based on a perception of what is received and what is given. Ravald and Gronroos (1996:19, 22) described provision of customer values by organisations as a means of differentiation and a source of sustainable competitive advantage. According to them, customers' satisfaction depends on customer values produced and loyalty to and bonding with an organisation is achieved through customer satisfaction and they asserted that organisations' products or services - its offerings – are nothing but customer value carriers.

Kaplan and Norton (1996:73) defined customer value as attributes that organisations provide through their products and services to create loyalty and satisfaction for a target group of customers. They argued that it is a key concept for understanding customer satisfaction, acquisition and retention as well as for the understanding of the share of market concept. They believe customer value to consist of three key attributes:

- *Product/service attributes.* This attribute encompasses the product or service's functionality, its price and its quality.
- *Customer relations attribute.* This attribute considers delivery of product/service to the customer, response and delivery time and customer feelings about the transaction.
- *Image and reputation attribute.* This dimension focuses on the intangible factors that attract a customer to an organisation.

From the observations of the different scholars above, it appears logical that the customer value concept can be used as a substitute for the words "products/services". In addition, it is also a more embracing term to use in explaining the exchange relationship between a university and its stakeholders; hence the substitution of terms in the instrument.

## **4.7 VALIDITY AND RELIABILITY OF THE MEASURING INSTRUMENT**

Social sciences measure abstract, intangible and unobservable constructs whose meanings can only be deduced (Knight, 1997:216) and this makes reliability and validity of measuring instruments an important consideration in such research studies (Thanasegaran, 2009:40). Roberts and Priest (2006:41) considered reliability and validity as ways of communicating and demonstrating rigour in the process and trustworthiness of a research study. The two subsections that follow discuss the reliability and validity concept.

### **4.7.1 Reliability**

Reliability of a measuring instrument is its ability to produce similar results in different circumstances, assuming nothing is changed (Roberts and Priest, 2006:41). It measures the degree to which measuring instruments are free from error and thus give consistently accurate measures of a construct. This attribute is called the internal consistency of the instrument (Knight 1997:216; Roberts & Priest, 2006:41).

Internal consistency of an instrument is the relationship between all its results in a single test and it is measured statistically either by the split half test or the Cronbach alpha coefficient.

Cronbach's alpha is an estimate of the average of all split-half estimates of reliability (Roberts & Priest, 2006:41) and will be used to determine the reliability of measurement scores for this study.

Knight (1997:216) and Roberts and Priest (2006:41) observed reliability to be a necessary but insufficient condition for a valid research study. The validity concept is examined next.

### **4.7.2 Validity**

Validity of a research instrument determines whether the instrument truly measures that which it intends to measure, the truthfulness of the research results obtained, and how well the instrument used allows a study to truly answer the research questions asked.

Roberts and Priest (2006:41) defined validity as the ability of measuring instruments to measure what it intends to be measure while Downing (2003:831) called validity

the evidence presented to support or refute the meaning or interpretation assigned to assessment results of a research study. The author further explained validity to be the proof of the reasonableness of a proposed interpretation of a research study and that all validity is 'construct' validity that requires multiple sources of evidence. Downing (2003) claimed that there are five sources of validity evidence – the content, response process, internal structure, relationship to other variables and consequences or impact of assessment on the study population.

According to Downing (2003:830) validity should be approached as a proposition that uses theory, logic and scientific method to collect and assemble data that either supports or fail to support a proposed measurement score interpretations, at a given point in time. Collected data and logic should be assembled into arguments that either support or refute a specific interpretation of the assessment data while asserting that study assessments have no meaning without evidence of validity. In a specific research assessment, validity relates to theory, predicted relationships and empirical evidence in ways that suggest which particular interpretative meanings are reasonable and which are not reasonable (Downing, 2003:830, 831).

Traditionally validity is classified into three groups: the criterion validity that is further divided into concurrent and predictive validity, content validity and constructs validity. Downing (2003:831) believed that construct validity is the most important of them all because all assessments in social science uses construct - an intangible collection of abstract concepts and principles that are inferred from behaviour and explained by theory. Trochim (2006) agreed with this beliefs and claimed that construct validity is the approximate truth of the conclusion that operationalisation of a variable accurately reflects its construct.

Knight (1997:216) suggested that construct validity is the most important indicator for measuring validity and that it consists of two forms: the convergent and discriminant validity. He defined convergent validity as the degree to which multiple independent attempts to measure the same construct are in agreement and discriminant validity as the extent to which measures of two or more different constructs are distinct.

Roberts and Priest (2006:43) believed that construct validity demonstrates the relationships between a construct under investigation and the relevant theory arguing that assessments are meaningless without evidence of validity. Downing

(2003:831) explained that study assessments in research “is never said to be ‘valid’ or ‘invalid’ but rather scientifically sound evidence are presented to either support or refute a proposed interpretation of the assessment scores, at the particular time in which the validity evidence was collected.

Instruments used in this study – the entrepreneurial performance index instrument and corporate entrepreneurship climate instrument - have been proven to be psychometrically strong (Ireland *et al.* 2006b:22, 28; and Kuratko *et al.* 2011:351, 355). Other studies that utilised these instruments found them to be both reliable and valid (Morris & Sexton, 1996; Covin and Slevin, 1989; Knight 1997; Hornsby, Kuratko and Zahra, 2002; Hornsby, Kuratko, Shepherd and Bott 2009).

The following section discusses analysis of data collected in this study.

#### 4.8 DATA ANALYSIS

According to Trochim (2006) three major steps are involved in data analysis namely:

- **Data Preparation.** This is the process of cleaning, organising and checking collected data for accuracy after which the data is entered into the computer where they are coded in a database structure that will integrate the various measures developed (Trochim, 2006).
- **Descriptive statistics.** This is the use of statistics to describe the basic features of data collected in a study as well as to explain what is going on with the data. According to Trochim (2006) descriptive statistics provide simple summaries of the sample population, its various measures and is the basis of all quantitative data analyses. Trochim (2006) conclude further that descriptive statistics simplifies and summarises large volumes of data into a manageable and meaningful form; describe the basic features of the study data; provides a summary that can allow comparison across units as well as used to make inferences and judgements about a study population from its sample population.

Due to the fact that this study uses interval level of measurement, descriptive statistics to be utilised will be the mean, median, standard deviation and coefficient of variance.

- **Inferential Statistics.** This investigates research questions, models and hypotheses of a study in order that conclusions derived at can usually be extended beyond the sample population to a study population. Furthermore, inferential statistics can be used to make judgments about the probability that an observed difference between groups is dependable or is an error (Trochim, 2006).

For this study the assistance of a qualified statistician was obtained to provide guidance on the appropriate inferential statistics to be deployed.

#### **4.9 SUMMARY**

This chapter discussed the research design and methodology used for this study, and provided an extensive discussion on the questionnaire to be used as well as the modifications of terms used. The following chapter discusses the results obtained from the data collection, its analysis and interpretations.

## **CHAPTER FIVE**

### **EMPIRICAL RESULTS**

#### **5.1 INTRODUCTION**

Corporate entrepreneurship processes are deployed by organizations to take advantage of opportunities in their environment through innovation, and organisational members engaged in entrepreneurial behaviours are the foundation of such innovations (Ireland et al 2006:11). For organizational members to continuously engage in entrepreneurial behaviour, management need to create entrepreneurship supporting internal environment, which should be regularly assessed for its effectiveness.

Entrepreneurial Health Audit is an assessment tool that helps top management understand the entrepreneurial status and capability of their organisation (Ireland *et al.* 2006b:21). It assesses the effectiveness of an organisation's internal environment in supporting entrepreneurship and is a two part diagnostic instrument. The first part called the Entrepreneurial Performance Instrument determines the level of entrepreneurship within an organisation and the second called the Corporate Entrepreneurship Climate Instrument is used to understand why an organisation has developed its current level of entrepreneurship and to measure the level of its internal environment's support of entrepreneurship.

A survey was conducted at NMMU among the academic and non-academic middle managers using the two instruments to determine key internal environmental factors influencing Entrepreneurship. Multiple regression analysis technique was used with Entrepreneurship as the dependent variable, and management support, work discretion, reward, time availability, organisational boundaries as the independent variables.

This chapter discusses the outcome of the empirical study. The next section discusses modifications to sample population and this is followed by discussions on socio-demographic information obtained. The section thereafter briefly recap discussions on the reliability and internal consistency of instruments used and this is followed by the empirical result of the study. The chapter closes with a brief conclusion. Statistical analyses for this study were conducted using the Statistical Package for the Social Sciences (SPSS) version 20.

#### **5.2 MODIFICATIONS IN SAMPLE POPULATION**

To conduct of this study at NMMU required the university's ethics Committee's Approval before commencement which was granted on the 6<sup>th</sup> December 2013. At the time of this approval the university students had commenced the December year-end holiday. By that date the tenor of serving student representative council members had ended and the incoming representatives (newly elected) had not taken office.

Data from this population group could not be collected and the projected thirty seven (37) participants from this population group had to be eliminated. Hence the study was conducted amongst academic and non-academic staff members of NMMU.

The choice of middle managers as the sample population for this study was based on their contribution to decision making and management of the university and Guerrero and Urbano (2012:47) asserted that university managers and academics are the key actors responsible for university entrepreneurial transformation. Student representative council members play a peripheral role in university administration and management, thus eliminating this population group had no significant effect on the outcome of this study.

During data collection an overlap in the role of Head of Department (HOD) was observed among the academic entities which affected the projected sample size of the study.

From the university's site [www.departments.nmmu.ac.za/](http://www.departments.nmmu.ac.za/) the following observations were made:

- The school of Natural Resource Management has one head of school and one coordinator (HOD) for its five departments. Hence a reduction in participants from six to two.
- The HOD of the Physics department was also found to be the HOD for the Centre for Energy Research.
- The head of school for Lifestyle Sciences is also the HOD of Human Movement Science.
- The HOD of Group Dynamics and Postgraduate Programmes is also the HOD for Sociology and Anthropology.
- The HOD of Friction Processing Research Institute is the HOD of the eNtsa – Innovation through Engineering Unit.
- The head of school for Industrial Psychology and Human Resources is also the HOD for Human Resources Management as well as the HOD of the Labour Relations Unit.
- The HOD of the Cyclic Peptides Research unit is also the HOD of the Drugs utilisation Unit.
- Information on HODs of some departments could not be obtained from the site.

Adjusting for all the issues above reduced the sample size of the study from two hundred and twenty four participants (224) to one hundred and sixty seven participants (167) and from this new sample size a total of thirty four (N=34) useable questionnaires were received.

This gives a response rate of 20.36% which proved comparable to similar studies in the past (Morris & Sexton 1996:9).

### 5.3 DEMOGRAPHIC INFORMATION

Tables 5.1 to 5.7 summaries among others, demographic data collected for this study on information such as respondents' gender, nature of work (academic or non-academic), academic qualification, number of years at NMMU, number of years in current position. The field survey results pertaining to the above are briefly illustrated below.

**Table 5.1: Gender**

Gender					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
	Male	22	64.7	64.7	64.7
	Female	12	35.3	35.3	100.0
	Total	34	100.0	100.0	

Source: Field Survey, 2013

As shown in table 5.1 above approximately two thirds – 64.7% of the respondents in this study are male while 35.3% are female.

**Table 5.2: Age group**

Age Group					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
	31 - 35 years	2	5.9	5.9	5.9
	36 - 40 years	1	2.9	2.9	8.8
	41 - 45 years	5	14.7	14.7	23.5
	46 - 50 years	8	23.5	23.5	47.1
	51 - 55 years	6	17.6	17.6	64.7
	56 - 60 years	4	11.8	11.8	76.5
	Over 60 years	8	23.5	23.5	100.0
	Total	34	100.0	100.0	

Source: Field Survey, 2013



Most of the respondents are in the 46 to 50 years and those over 60 years age brackets at 23.5% each and accounted for 47% of the population. The average age of respondents in the study is 51.7 years.

**Table 5.3: Academic qualifications**

Academic Qualifications					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
	Honours	4	11.8	11.8	11.8
	Masters	8	23.5	23.5	35.3
	Doctorate	19	55.9	55.9	91.2
	Post Doctorate	3	8.8	8.8	100.0
	Total	34	100.0	100.0	

Source: Field Survey, 2013

Approximately 64% of respondents in this study are holders of a PHD degree and 88.2% at least hold a Masters Degree. With this high level of academic qualification among respondents it can be assumed that participants in this study are quite knowledgeable regarding the issues and concerns of this study.

**Table 5.4: Number of years at NMMU**

Number of years at NMMU					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
	0 - 9 years	7	20.6	20.6	20.6
	10 - 19 years	15	44.1	44.1	64.7
	20 - 29 years	5	14.7	14.7	79.4
	30 - 39 years	7	20.6	20.6	100.0
	Total	34	100.0	100.0	

Source: Field Survey, 2013

Nearly 44% of respondents in this study have been employed at NMMU for between 10 to 19 years and the average number of years at NMMU of respondents is 17.7 years. It appears that a large proportion of academic and non-academic staff at NMMU has been with the institution for more than 10 years. Considering the fact that the merging of three institutions to create NMMU as we know it, occurred less than ten years ago, this could have implications for the culture subsisting within the university, as many of the academic and non-academic staff of the university could have been socialised into the culture of their prior

institutions. This may possibly have had implications for the existing culture within the university.

**Table 5.5: Number of years in current position**

Number of years in current position					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
	0 - 4 years	21	61.8	61.8	61.8
	5 - 9 years	9	26.5	26.5	88.2
	10 - 14 years	2	5.9	5.9	94.1
	15 - 19 years	2	5.9	5.9	100.0
	Total	34	100.0	100.0	

Source: Field Survey, 2013

The majority of the respondents (61.8%) have spent less than 5 years in their current position. The average number of years that the respondents in this study served in their current position is five years.

**Table 5.6: Academic and non-academic entities**

Academic and non-academic entities					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
	Academic Entities	25	73.5	73.5	73.5
	Non-academic Entities	9	26.5	26.5	100.0
	Total	34	100.0	100.0	

Source: Field Survey, 2013

The percentage of respondents in this study equals 73.5% academic and 26.5% non-academic staff at NMMU as shown in table 5.7 below. Of the academic staff respondents, one indicated being the HOD of an academic department and an institute while one failed to indicate a faculty. Majority of academic staff respondents (40%), are from the Science faculty while 12.0% are from Health Science and 8% from Engineering, Built Environment and Information Technology Faculty. In all 64% of academic respondents (including respondent from the institute) are from science oriented faculties while 16% are from Business and Art Faculties, 4% from education Faculty and no respondent from the Law Faculty.

**Table 5.7: Academic faculties**

Academic faculties					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
	Arts	4	16.0	16.0	16.0
	Business and Economics Science	4	16.0	16.0	32.0
	Education	1	4.0	4.0	36.0
	Engineering, Built Environment, Information and Communication Technology	2	8.0	8.0	44.0
	Health Science	3	12.0	12.0	56.0
	Law	-----	-----	-----	56.0
	Science	10	40	40	96.0
	Institutes	1	4.0	4.0	100.0
	Centres of Excellence	-----	-----	-----	100.0
	Total	25	100.0	100.0	

Source: Field Survey, 2013

#### **5.4 RELIABILITY AND INTERNAL CONSISTENCY OF RESEARCH INSTRUMENT**

Validity is the ability of a measuring instrument to measure that which it intends to measure while reliability is an instrument's ability to produce similar result under the same circumstances assuming nothing changes (Robert and Priest, 2006:41).

Questionnaire used in this study comprised three sections incorporating two instruments: the Entrepreneurial Performance Instrument and the Corporate Entrepreneurship Climate Instrument. Section one, measured entrepreneurial intensity, section two middle managers' perceptions of the internal organisational environment's support for entrepreneurship and section three collected respondents' demographic data.

Prior studies have successfully tested construct validity of items in these two instruments using both exploratory and confirmatory factor analysis and have found them to be valid (Hornsby Kuratko and Zahra, 2002; Hornsby Holt and Kuratko, 2008; Knight, 1997; Morris and Sexton, 1996;).

Presented below is the outcome of reliability and internal consistency test for the two instruments: (i) Entrepreneurial performance instrument

(ii) Corporate entrepreneurship climate instrument

#### 5.4.1 Entrepreneurial performance instrument

This instrument measured the university's entrepreneurial intensity by determining the level of innovation, proactivity, risk taking and frequency of entrepreneurship within NMMU. The Likert type of measurement scale for this section ranged from Strongly Agree (1), Agree (2), Neutral (3), Disagree (4) and Strongly Disagree (5). The first twelve questions measured the degree of entrepreneurship and the last five, frequency of entrepreneurship. Table 5.8 shows respondents rating of items in this section. Viewed together with Table 5.9, it appears that respondents agreed that entrepreneurship in NMMU is influenced by Innovation at a mean score of 2.65, Proactivity at 2.62, Risk taking at 2.88 and Frequency at 2.86. It is observed from Table 5.8 that respondents did not answer many of the questions on frequency of entrepreneurship which may indicate a level of discomfort or uncertainty in answering those questions.

As shown in Table 5.9 Cronbach alpha of 0.760 was obtained for Innovation, 0.740 for Proactivity, 0.735 for Risk Taking and 0.820 for Frequency. The overall Cronbach alpha value of 0.874 was obtained for the Degree of Entrepreneurship and 0.837 for the Entrepreneurial Performance Instrument. All Cronbach alpha values in this section of the questionnaire are above 0.70 which indicates a reliable instrument (Nunnally 1978).

**Table 5.8: Entrepreneurial performance instrument percentage score**

		Strongly agree	agree	neutral	disagree	Strongly Disagree	Missing	Total
No		%	%	%	%	%	%	%
1	A high rate of new "customer value" introductions compared to our competitors (including new features and improvements	---	41.2	35.3	17.6	2.9	2.9	100
2	An emphasis on continuous improvement in methods of customer value production and/or delivery.	5.9	35.3	23.5	26.5	---	8.8	100
3	Risk taking by key executives in seizing and exploring chancy growth opportunities.	2.9	38.2	32.5	14.7	2.9	8.8	100
4	A live and let live philosophy in dealing with competitors	8.8	32.4	23.5	20.6	2.9	11.8	100
5	Seeking of unusual novel solutions by senior executives to problems via the use of "idea people", brainstorming etc.	8.8	38.2	32.4	8.8	2.9	8.8	100
6	A top management philosophy that emphasizes proven "customer value" and the avoidance of heavy new "customer value" development (or creation) cost.	---	35.3	38.2	17.6	---	8.8	100
7	Cautious, pragmatic step at a time adjustments to problems	17.6	35.3	20.6	8.9	5.9	11.8	100
8	Active search for big opportunities	11.8	47.1	20.6	11.8	---	8.8	100

9	Rapid growth as the dominant goal.			17.6	29.4	23.5	20.6	2.9	5.9	100
10	Large bold decisions despite uncertainties of the outcomes.			5.9	20.6	32.4	23.5	8.8	8.8	100
11	Compromises among the conflicting demands of stake holders- government management, students, parents, employees, community, suppliers, etc			2.9	50.0	20.6	8.8	5.9	11.8	100
12	Steady growth and stability as primary concerns			14.7	47.1	11.8	8.8	8.8	8.8	100
13	What is the number of new "Customer Value" NMMU introduction during the past two years (please give a figure)	I don't know = 30 = 88.2%	5 values = 1 = 2.9%	6 values = 1 = 2.9%		8 values = 2 = 5.9%		Total = 34 = 100%		
				Less Significantly	Less	Same	More	Significantly more	Missing	Total
No				%	%	%	%	%	%	%
14	How many "Customer Value" improvements or revision did you introduce during the past two years			2.9	---	26.5	26.5	8.8	35.5	100
15	How does the number of new "Customer Value" introduction in NMMU compare with those of our major competitors			5.9	14.7	23.5	23.5	---	32.4	100
16	To what degree did these new "Customer Value" introduction include "Customer Value" that did not previously exist in the market ("new to the market")			2.9	14.7	29.4	20.6	2.9	29.4	100
17	Please estimate the number of significant new methods or operational processes NMMU implemented during the past two years example of process innovations include			---	5.9	35.3	26.5	5.9	26.5	100

Source: Field Survey, 2013

**Table 5.9: Reliability test result of instruments**

Instrument	Scale Statistics				Reliability Statistics	Validity Statistics (ANOVA)	
	N of Items	Mean	SD	CV			
Source	4	2.65	0.225	0.08	Cronbach's Alpha	F-value	P-value
Innovation	4	2.65	0.225	0.08	0.760	3.794	0.011
Proactivity	4	2.62	0.129	0.05	0.740	3.772	0.013
Risk taking	4	2.88	0.283	0.10	0.735	3.738	0.014
Degree of Entrepreneurship at NMMU	12	2.75	0.220	0.08	0.874	2.213	0.014
Frequency	5	2.86	0.882	0.31	0.820	7.365	0.000
Entrepreneurial Intensity at NMMU	17	2.69	0.597	0.22	0.837	8.088	0.000
Management Support	27	3.24	0.242	0.07	0.922	1.770	0.011

Work Discretion	17	3.25	0.285	0.09	0.806	2.602	0.001
Organisational Boundaries	15	3.31	0.272	0.08	0.695	2.028	0.015
Time Availability	6	3.02	0.421	0.14	0.713	3.640	0.004
Reward	13	3.31	0.376	0.11	0.757	2.955	0.001
Internal Factors	78	3.25	0.297	0.09	0.937	2.138	0.000
Pooled Data	95	3.15	0.423	0.13	0.942	2.722	0.000

Source: Field Survey, 2013

#### 5.4.2 Corporate entrepreneurship climate instrument

This instrument measured the university's middle managers' perception of the internal environment's support for entrepreneurship and this was assessed using five independent variables namely management support, work discretion, reward, time availability and organisation boundaries. Table 5.10 shows respondents rating of items in this instrument and viewed in conjunction with Table 5.9 earlier, it appears that respondents were undecided about the level of entrepreneurial support provided by NMMU's internal environment. At a mean score of 3.24 and standard deviation (SD) of 0.242 for Management Support, 3.31 and SD of 0.272 for Organisational Boundaries, 3.25 and SD of 0.285 for Work Discretion, 3.02 and SD of 0.421 for Time Availability and 3.31 and SD of 0.376 for Reward, Table 5.9 indicates that middle managers in NMMU are not sure if the university's internal environment support its entrepreneurial vision.

Also at Cronbach alpha value 0.922 for Management Support, 0.806 for Work Discretion, 0.695 for Organisational Boundaries, 0.713 for Time Availability and 0.757 for Reward it can be concluded that this section of the questionnaire is reliable (Hair, Black, Babin, Anderson and Tatham 2006:137; Nunnally 1978).

**Table 5.10: Corporate entrepreneurship climate instrument percentage score**

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly agree	Missing data	Total
		%	%	%	%	%	%	%
1	NMMU is quick to improve work methods	8.8%	5.9	17.6	44.1	11.8	11.8	100
2	NMMU is quick to improve work methods that are developed by its members.	2.9	11.8	26.5	35.3	11.8	11.8	100
3	In NMMU developing one's own ideas is encouraged for the improvement of the university	2.9	11.8	11.8	52.9	8.8	11.8	100
4	Top management is aware and very receptive to my ideas and suggestion	5.9	5.9	20.6	47.1	8.8	11.8	100

5	A promotion usually follows from the development of new and innovative ideas	11.8	17.6	35.3	20.6	8.8	5.9	100
6	Those members who come up with new innovative ideas on their own often receive management's encouragement for their activities.	-----	11.8	32.4	38.2	8.8	8.8	100
7	The doers on projects are allowed to make decisions without going through elaborate justification and approval procedures	2.9	26.5	32.4	26.5	---	11.8	100
8	Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.	5.9	38.2	23.5	23.5	---	8.8%	100
9	Many top managers have been known for their experience with the innovation process.	5.9	20.6	29.4	23.5	11.8	8.8	100
10	Money is often available to get new project ideas off the ground	5.9	11.8	26.5	38.2	5.9	11.8	100
11	Individuals with successful innovative projects receive additional rewards and compensation beyond the standard reward system for their ideas and effort	14.7	20.6	20.6	32.4	2.9	8.8	100
12	There several options within the organisation for individuals to get financial support for their innovative project idea and effort.	8.8	20.6	11.8	38.2	11.8	8.8	100
13	People are often encouraged take calculated risks with new ideas in this university	8.8	2.9	50.0	26.5	---	11.8	100
14	Individual risk takers are often recognised for their willingness to champion new projects, whether eventually successful or not.	5.9	17.6	26.5	29.4	8.8	11.8	100
15	The term " Risk Takers" is considered positive for people in my work area,	5.9	11.8	29.4	32.4	8.8	11.8	100
16	This university support many small and experimental projects realizing that some will undoubtedly fail.	8.8	17.6	17.6	29.4	8.8	17.6	100
17	People with a good idea are often given free time to develop that idea.	5.9	14.7	32.4	26.5	8.8	11.8	100
18	There is considerable desire among members of the university for generating new ideas without regard to crossing departmental or functional boundaries	8.8	11.8	17.6	47.1	2.9	11.8	100
19	Members are encouraged to talk to people in other departments of this university about ideas for new projects	5.9	5.9	23.8	47.6	5.9	11.8	100
20	I feel that I am my own boss and do not have to double check all of my decisions with someone else.	11.8	11.8	8.8	50	5.9	11.8	100
21	Harsh criticism and punishment result from mistake made on the job	11.8	26.5	35.3	14.7	--	11.8	100
22	This university provides me with the chance to be creative and try my own methods of doing the job.	2.9	11.8	14.7	44.1	14.7	11.8	100
23	This university provides freedom to use my own judgment	2.9	17.6	14.7	38.2	11.8	14.7	100
24	This university provides the chance to do something that makes use of my abilities.	5.9	2.9	11.8	55.9	11.8	11.8	100
25	I have the freedom to decision on what I do on the job.	2.9	17.6	11.8	44.1	11.8	11.8	100
26	It is basically my own responsibility to decide on how my job gets done	8.8	8.8	11.8	52.9	5.9	11.8	100
27	I almost always get to decide on what i do on my job.	8.8	17.6	17.6	35.3	8.8	11.8	100
28	I have much autonomy on my job and am left on my own work	2.9	14.7	17.6	44.1	8.8	11.8	100

29	I seldom have to follow the same work methods or steps for doing my major tasks from day to day.	11.8	14.7	14.7	32.4	11.8	14.7	100
30	My boss helps me to get my work done by removing obstacles.	5.9	17.6	20.6	35.3	8.8	11.8	100
31	The rewards I receive are dependent upon my innovation on the job.	17.6	17.6	17.6	29.4	5.9	11.8	100
32	My boss will increase my job responsibilities if I am performing well in my job.	8.8	20.6	20.6	35.3	2.9	11.8	100
33	My boss will give me special recognition if my work performance is especially good	5.9	8.8	14.7	41.7	11.8	17.4	100
34	My boss will tell his boss if my work was outstanding.	11.8	11.8	17.6	38.7	5.9	14.7	100
35	There is a lot of challenge in my job.	11.8	2.9	2.9	20.6	47.1	14.7	100
36	During the past three months, my work load kept me from spending time on developing new ideas	8.8	17.6	2.9	44.1	11.8	14.7	100
37	I always seem to have plenty of time to get everything done	26.5	23.5	17.6	11.8	5.9	14.7	100
38	I have just the right amount of time and work load to d everything well.	17.6	14.7	26.5	20.6	5.9	14.7	100
39	My job is structured so that I have very little time to think about wider operational problems	2.9	35.3	8.8	38.2	2.9	11.8	100
40	I feel that I am always working with time constraints on my job	2.9	14.7	14.7	44.1	11.8	11.8	100
41	My colleagues and I always find time for long- time solving problems.	5.9	38.2	17.6	23.5	2.9	11.8	100
42	In the past three months, I have always follow standard procedures or practices to do my major tasks	2.9	26.5	17.6	35.3	5.9	11.8	100
43	There are many written rules and procedures that exist for doing my major tasks.	2.9	17.6	17.6	38.2	11.8	11.8	100
44	On my job I have no doubt of what is expected of me.	8.8	8.8	26.5	38.2	5.9	11.8	100
45	There is little uncertainty in my job.	11.8	20.6	23.5	29.4	2.9	11.8	100
46	During the past year, my immediate boss discussed my work performance with me frequently.	14.7	26.5	17.6	20.6	8.8	11.8	100
47	My job description clearly specifies the standards of performance on which my job is evaluated	17.6	17.6	11.8	23.5	17.6	14.7	100
48	I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	5.9	11.8	14.7	41.2	14.7	11.8	100
49	This university definitely rewards university members who takes calculated risk and innovate.	11.8	20.6	20.6	26.5	5.9	14.7	100
50	Jobs in this university tend to be broadly defined with considerable discretion in how task are performed.	11.8	2.9	17.6	44.1	5.9	14.7	100
51	In this university members can pursue multiple career paths	5.9	17.6	14.7	38.2	8.8	14.7	100
52	This university tries hard to develop creative potentials of its members.	5.9	11.8	17.6	44.1	5.9	14.7	100
53	Performance appraisal in this university includes an evaluation of members' innovativeness.	11.8	11.8	20.6	32.4	8.8	14.7	100
54	Around here it seems that there is more concern with process than with performance.	2.9	20.6	23.5	29.4	8.8	14.7	100
55	This university does a good job of balancing incentives for individual initiative with incentive for team collaboration.	8.8	11.8	29.4	23.5	11.8	14.7	100
56	If you are not innovative on the job you cannot get ahead in this university.	8.8	32.4	26.5	20.6	2.9	8.8	100



57	An overly bureaucratic structure takes away from our ability to be entrepreneurial in this university	2.9	23.5	29.4	23.5	11.8	8.8	100
58	Our university is organized in a way that encourages superiors to micromanage subordinates and projects	2.9	29.4	20.6	29.4	8.8	8.8	100
59	We have too many levels of management in this university.	2.9	23.5	23.5	23.6	20.6	8.8	100
60	I would characterize the university structure as being highly flexible	11.8	20.6	23.5	23.5	11.8	8.8	100
61	A rigid chain of command limits our ability to experiment new ideas.	2.9	29.4	23.5	23.5	11.8	8.8	100
62	Red tape and slow approval cycles are problems in this university	2.9	20.6	17.6	29.4	20.6	8.8	100
63	Supervisors in this university strongly believe in delegating decision making responsibility	11.8	14.7	20.6	41.2	2.9	8.8	100
64	Controls are very tight in this university s we tend to count every rand and every hour.	11.8	23.5	26.5	26.5	5.9	8.8	100
65	Senior management focuses on eliminating slack within the budget.	-----	5.9	38.2	35.3	8.8	11.8	100
66	Once budget are finalized and accepted they are difficult to revise.	-----	11.8	17.6	35.3	26.5	8.8	100
67	The lines of commands clearly allocate authority and responsibility to each department.	-----	17.6	8.8	52.9	11.8	8.8	100
68	The organisational structure is very clearly defined ad delineated.	8.8	8.8	11.8	41.2	20.6	8.8	100
69	In this university members have a lot of say in how things are done	8.8	11.8	35.3	29.4	5.9	8.8	100
70	Ours is a culture that rewards the tried and the true.	5.9	14.7	20.6	47.1	2.9	8.8	100
71	This is a university that celebrates innovative achievements.	5.9	11.8	17.6	44.1	14.7	8.8	100
72	We have a culture that strongly discourages failure.	----	11.8	26.5	41.2	11.8	8.8	100
73	There is a sense of urgency in the university regarding the importance of change and innovation.	2.9	17.6	26.5	35.3	8.8	8.8	100
74	This university subscribe to the motto if it is not bad do nothing about it.	8.8	8.8	32.4	26.5	11.8	11.8	100
75	Innovation and risk taking are core values in this university	2.9	17.6	23.5	38.2	8.8	8.8	100
76	Lines of command clearly allocate authority and responsibility to each.	----	8.8	17.6	55.9	8.8	8.8	100
77	New ideas tend to receive quick approval from management in this university.	14.7	20.6	26.5	20.6	8.8	8.8	100
78	The university environment encourages people to talk openly with other about ways to improve the university's operations	8.8	2.9	26.5	47.1	5.9	8.8	100

Source: Field Survey, 2013

With standardised Chronbach alpha, reliability test on all 95-items of the questionnaire produced a value of 0.942 (94.2%), a mean response value of 3.15 and SD of 0.423 which confirms the internal consistency and reliability of this questionnaire.

Analysis of variance (ANOVA) was used to further validate reliability of results and to test for significant variation in responses to the items on the instruments. Results suggest that there is no significance variation in rating the items of the instruments at f-values = 2.722, and p-

values =  $0.000 < 0.05$ . This result is supported by the coefficient of variation (CV) =  $0.13 < 0.5$  threshold, which suggests a strong homogeneity in how the respondents rated the items. With these values the questionnaire is considered reliable and adequate.

## 5.5 EMPIRICAL RESULTS AND INTERPRETATIONS

In Chapter One this study posed the research questions and stated some objectives that were both qualitative and quantitative.

Chapters Two and Three answered the qualitative questions and objectives using secondary data. This section answers and interprets the quantitative research questions and objectives.

### 5.5.1 Research Objective 4: To measure entrepreneurial Intensity (level of entrepreneurship at NMMU)

Entrepreneurship is a variable concept and it will be wrong to regard it as present or absent in an organisation (Morris 1998:43; Morris *et al.* 1994:24; Morris, Lewis & Sexton 1994:26). According to these authors all organisations are to some extent entrepreneurial but the key question centres on the level of entrepreneurship contained in them - “the how often and how much” questions which are the essence of the entrepreneurial intensity concept.

Entrepreneurial intensity depicts the variable nature of entrepreneurship and captures the combined effect of both the degree and frequency of entrepreneurship. Degree of entrepreneurship refers to how innovative, proactive and risky an activity is - the “how much” question and frequency is about how often such entrepreneurial activities occur (Morris *et al.* 1994:24). This section will determine how entrepreneurially intense NMMU is.

Before determining the entrepreneurial intensity at NMMU, the results of both descriptive and inferential statistics for entrepreneurship are first presented.

#### 5.5.1.1 Statistical result for determining the level of entrepreneurship at NMMU.

Based on Pearson’s correlation matrix (results shown in Table 5.11) it can be observed that respondents agreed with the level of innovation, proactivity and risk taking at NMMU - mean response values below 3.0. However, they were undecided on frequency of entrepreneurship at a value of 3.3365. The results also indicate a significant positive correlation between Entrepreneurship and its four factors - innovation, proactivity, risk taking and frequency - with  $p < 0.05$  each.

This result implies that continuous improvement in the dimensions of entrepreneurship at NMMU will improve the level of entrepreneurship at the university.

This opinion is further supported by a multiple correlation result of  $r = 0.770$ , that indicates the existence of a positive relationship in the model, especially with information variability at 0.592 (59.2%). The information variability value indicates that the independent variables innovation, proactivity risk taking and frequency, together accounted for 59.2% of the information on the dependent variable – entrepreneurship in this analysis.

**Table 5.11: Correlation matrix results for the level of entrepreneurship at NMMU:**

**descriptive and correlation analysis**

Variables	Entre-preneurship	Innovation	Pro-activity	Risk Taking	Frequency	Mean	Std. Deviation	N
Entrepreneurship	1.00					3.0293	.31931	34
Innovation	.487*	1.00				2.5884	.76488	33
Proactivity	.625*	.770*	1.00			2.5699	.78501	31
Risk Taking	.513*	.722*	.695*	1.00		2.7727	.68664	33
Frequency	.489*	-.026	.079	.238	1.00	3.3365	.71199	26
* Correlation is significant at the 0.05 level. $R = 0.770$ , $R^2 = 0.592$								

Source: Field Survey, 2013

Variation of the dependent variable and adequacy of the model above was further tested using ANOVA. Results are presented in Table 5.12.

**Table 5.12: Analysis of variance (ANOVA) for level of entrepreneurship at NMMU**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.449	4	.362	7.261	0.001
Residual	.998	20	.050		
Total	2.447	24			
a. Dependent Variable: Entrepreneurship					
b. Predictors: (Constant), Frequency, Innovation, Risk Taking, Proactivity					

Source: Field Survey, 2013

The ANOVA results in Table 5.12 indicates that the variation in the dependent variable is adequate and is accounted for by the model at  $f = 7.261$ ,  $p < 0.05$ . Hence the model is acceptable for the utilisation and further analysis of the results.

#### 5.5.1.2 Determining NMMU's level of entrepreneurship.

The level of an organisation's entrepreneurial intensity, while not a sufficient indicator for concluding on its success, can reflect its performance since entrepreneurially intense organisations have been found to be successful and high performers (Burns 2005:60, Kuratko, Morris & Covin, 2011:80).

Morris *et al.* (1994:26), Morris and Sexton (1996:9) and Ireland *et al.* (2006b:22) together provide guidance on computing organisations' entrepreneurial intensity by stating that composite mean scores for innovation, proactivity and risk taking should be calculated to arrive at a value for the degree of entrepreneurship which should then be multiplied by 0.7. They advised that the normalised value of the product of multiplying the degree of entrepreneurship by 0.7 should then be linearly combined with 0.3 of the normalised mean value of frequency to arrive at the entrepreneurial intensity for an organisation. The value for entrepreneurial intensity can then be deduced using a straight line equation with frequency value on the y-axis (vertical axis) and degree of entrepreneurship on the x-axis (the horizontal axis). Entrepreneurial intensity is the gradient of the line they form when its intersection is at zero.

Based on these explanations the relationships between entrepreneurial intensity, degree of entrepreneurship and the frequency of entrepreneurship can be represented by the equation:

$$y = mx + b \dots\dots\dots \text{where:}$$

y = frequency of entrepreneurship

m = entrepreneurial intensity

x = degree of Entrepreneurship

b = zero.

Entrepreneurial Intensity at NMMU is calculated using mean values obtained in Table 5.11 as:

$$0.3(3.3365) = \{m \times 0.7[(2.5884+2.5699+2.7727)/3]\} + 0$$

$$1.00095 = m (1.85057)$$

$$m = 1.00095/1.85057$$

$$m = 0.5409$$

$$m = 54.09\%$$

Therefore entrepreneurial intensity at NMMU is approximately 54.09%, which is slightly above the mid-range level.

#### **Interpretation of results:**

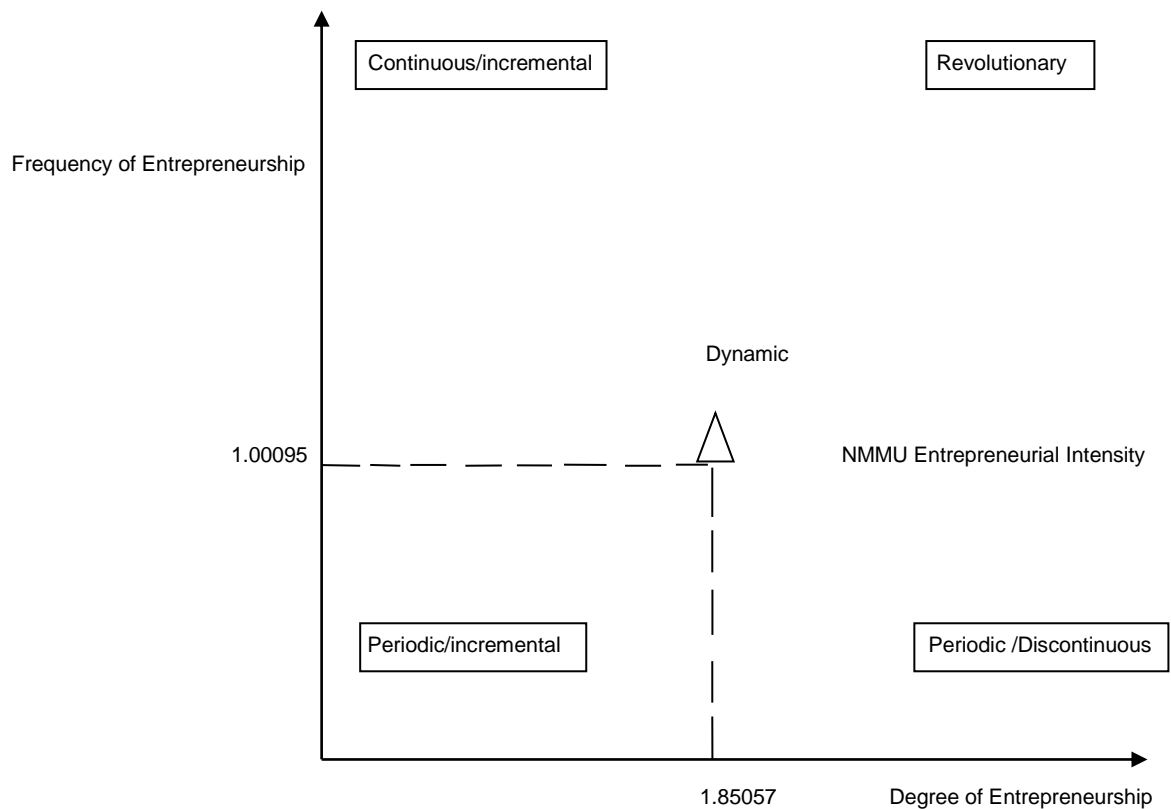
While the absolute score for entrepreneurial intensity at NMMU is found to be about 54.09%, which appears to be a slightly above mid-range score, it is difficult to correctly interpret the meanings of this result.

As a guide to interpreting an entrepreneurial intensity score, Ireland *et al.* (2006b:22) advised that Entrepreneurial intensity be determined in relative rather than in absolute terms. Noting the need to take into consideration the Entrepreneurial intensity norm of the industry to which the institution belongs as well as the time at which the measurement is taken since no organisation is uniformly entrepreneurial over time. But as far as can be ascertained in this study there is no known standard of Entrepreneurial Intensity in the South African Higher Education Sector with which to compare this result.

**However, the level of entrepreneurship at NMMU could not be determined conclusively.**

As noted by Burns (2005:60) locating an organisation on the entrepreneurial grid helps to describe its entrepreneurial strategy. For additional information and a more robust view on how entrepreneurially intense NMMU is, (the entrepreneurial intensity grid) a two dimensional matrix with five arbitrarily determined possible scenarios of entrepreneurship (Morris and Sexton 1996:7) was used to indicate NMMU's entrepreneurial intensity as shown in Figure 5.1.

On this grid the entrepreneurship level at NMMU appears to be below but close to the dynamic level (mid-range level) and this could be an indication that the entrepreneurial intensity level at the university may be composed of an almost equal level of degree and frequency of entrepreneurship.

**Figure 5.1: Location of NMMU on the Entrepreneurial Grid**

Source: Adapted from Morris & Sexton (1996:8)

**5.5.2 Research Objective 5: Investigate if NMMU is an entrepreneurial university by identifying and measuring key internal environmental factors influencing entrepreneurship within the university.**

Internal factors influencing the level of entrepreneurship in any organisation can be classified into (a) the dimensions of entrepreneurship - proactivity, innovation risk taking and frequency and (b) factors influencing the internal climate's support for entrepreneurship namely management support, work discretion, organisational boundary, reward and time availability. Based on the work of Ireland *et al.* (2006b) the theorised relationship between the two factors is shown in Figure 5.2.



This analysis shows that proactivity and frequency are significant at  $t = 2.216$  and  $3.038$  respectively and  $p < 0.05$ . With this result it appears that Proactivity and Frequency are the two significant dimensions influencing Entrepreneurship at NMMU. Adequacy of these results is supported by Variance Inflation factor (VIF), which shows no significant multi co-linearity with all values below 5.

Using multiple regression analysis with Entrepreneurship as the dependent variable, and Innovation, Proactivity, Risk taking and Frequency as the independent variables, the results of the regression analysis in Table 5.13 above were further analysed as shown in Table 5.14. This resulted in the model shown below:

$$\text{Entrepreneurship} = 1.750 + 0.240 \text{ Proactivity} + 0.199 \text{ Frequency.}$$

From this model it appears that Proactivity and Frequency are the key factors influencing entrepreneurship at NMMU and that Proactivity has a higher influence on entrepreneurship than Frequency in the university.

**Table 5.14: Stepwise regression coefficients for level of entrepreneurship at NMMU**

Stepwise regression coefficients								
Model		Un-standardised Coefficients		Standardised Coefficients	t	Sig.	Co-linearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.376	.178		13.379	.000		
	Proactivity	.254	.066	.625	3.841	.001	1.000	1.000
2	(Constant)	1.750	.246		7.125	.000		
	Proactivity	.240	.056	.590	4.286	.000	.994	1.006
	Frequency	.199	.062	.443	3.217	.004	.994	1.006
Dependent Variable: Entrepreneurship								

Source: Field Survey, 2013

Following this, it was necessary to determine the key internal environmental factors and their significance in influencing entrepreneurship at NMMU by firstly obtaining the descriptive statistics.

The descriptive statistics for internal environmental factors at NMMU indicate that respondents are undecided in respect of the impact of management support, work discretion, reward, time availability and organisational boundaries on entrepreneurship as mean response values are just slightly below or above the 3.0 threshold, as shown in Table 5.15.



**Table 5.15: Pearson correlation result for internal organisational factors influencing entrepreneurship at NMMU Analysis**

Variables	Entrepreneurship	Management Support	Work Discretion	Reward	Time Availability	Organisational Boundaries	Mean	Std. Dev.	N
Entrepreneurship	1.00						3.0293	0.31931	34
Management Support	0.318*	1.00					3.2461	0.58411	33
Work Discretion	0.565*	0.782*	1.00				3.3292	0.59615	31
Reward	0.512*	0.712*	0.732*	1.00			3.2992	0.55142	31
Time Availability	0.622*	0.077	0.231	0.288	1.00		2.9516	0.52386	31
Organisational Boundaries	0.403*	0.418*	0.279	0.490*	0.447*	1.00	3.2989	0.47977	31
* Correlation is significant at the 0.05 level. R = 0.779, R <sup>2</sup> = 0.607									

Source: Field Survey, 2013

Inferential statistical result indicates a significantly positive correlation between Entrepreneurship and internal environmental factors of influence - Management Support, Work Discretion, Reward, Time Availability and Organisational Boundaries - at  $p < 0.05$  for all the factors. This finding is supported by a multiple correlation value of  $r = 0.779$ , that confirms the positive relationship existing in the model and by information variability value of 0.607 (60.7%) indicating that independent variables accounted for 60.7% of information on the dependent variable. Variation in the dependent variable and adequacy of the model was tested using analysis of variance (ANOVA) and the result is presented in Table 5.16.

**Table 5.16: Analysis of variance table (ANOVA)**

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	1.857	5	0.371	7.727	0.000
	Residual	1.202	25	0.048		
	Total	3.059	30			
a. Dependent Variable: Entrepreneurship						
b. Predictors: (Constant): Organisational boundaries, Work discretion, Time availability, Reward, Management support						

Source: Field Survey, 2013

The ANOVA results in Table 5.16 show that variation of the dependent variable accounted for is adequate at  $f = 7.727$ ,  $p < 0.05$ . Hence the model is acceptable for result utilisation and further analysis.

The Result of the analysis revealed Work Discretion and Time Availability as significant at  $t = 2.503$ ,  $2.765$  respectively at  $p < 0.05$  as shown in Table 5.17.

This implies that work discretion and time availability are the major internal factors influencing entrepreneurship at NMMU. The adequacy of these results is supported by Variance inflation factor (VIF) that shows no significant multi co-linearity since the values are all below five.

The unexpected result in this study is the negative relationship between management support and entrepreneurship which appears to mean that as entrepreneurship increases management support decreases at the university. This is difficult to account for and calls for future investigation.

**Table 5.17: Regression analysis coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.278	0.334		3.826	0.001		
Management Support	-0.173	0.128	-0.317	-1.350	0.189	0.285	3.510
Work Discretion	0.316	0.126	0.590	2.503	0.019	0.283	3.538
Reward	0.073	0.122	0.126	0.601	0.553	0.356	2.812
Time Availability	0.256	0.092	0.419	2.765	0.011	0.683	1.465
Organisational Boundaries	0.081	0.111	0.121	0.724	0.476	0.563	1.777
a. Dependent Variable: Entrepreneurship							

Source: Field Survey, 2013

The result of the regression analysis in Table 5.17 was modified using stepwise regression analysis to show the relationship between the two factors identified and entrepreneurship (Table 5.18), and the model of the relationship is given as:

$$\text{Entrepreneurship} = 1.302 + 0.316 \text{ Time Availability} + 0.239 \text{ Work Discretion}.$$

It can be deduced from the standardised coefficients that Time Availability has a higher (0.519) significance direct effect on Entrepreneurship than Work Discretion (0.445).

**Table 5.18: Stepwise regression coefficients**

Stepwise regression coefficients								
Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.	Co-linearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.911	0.266		7.194	0.000		
	Time Availability	0.379	0.089	0.622	4.274	0.000	1.000	1.000
2	(Constant)	1.302	0.284		4.581	0.000		
	Time Availability	0.316	0.077	0.519	4.094	0.000	0.947	1.056
	Work Discretion	0.239	0.068	0.445	3.515	0.002	0.947	1.056

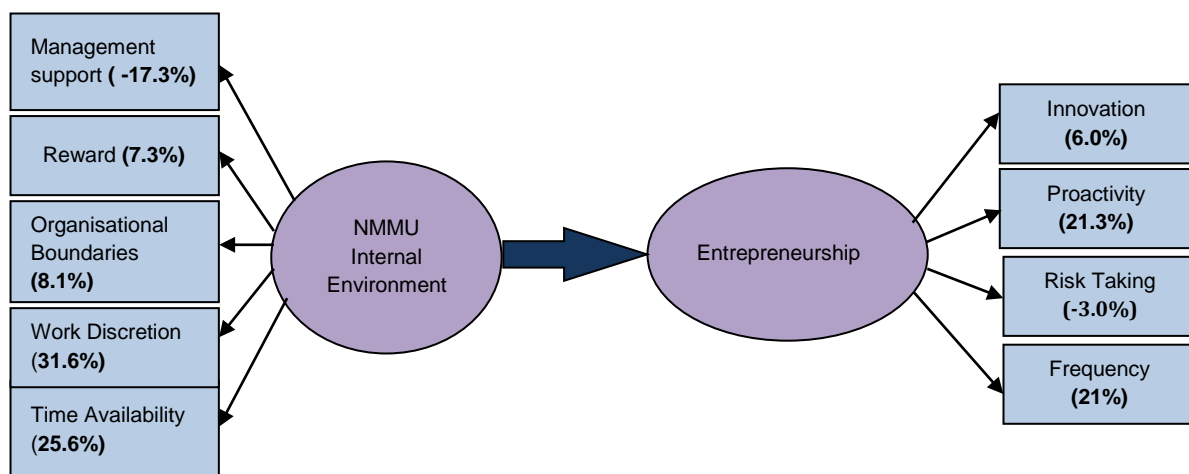
Dependent Variable: Entrepreneurship

Source: Field Survey, 2013

### **Interpretation of results:**

Based on the outcome of regression analysis shown in table 5.13 and 5.17 the relationship as theorised by Ireland *et al.* (2006b) is found to be true at NMMU as shown in figure 5.3.

**Figure 5.3: Internal factors influencing entrepreneurship at NMMU and their Significance**



Source: Developed based on Ireland Kuratko and Morris (2006b:22-28); Scheepers, Hough and Bloom (2008:64)

From Figure 5.3 and Table 5.17 it appears that Work Discretion and Time Availability are the two key internal environmental factors influencing entrepreneurship at NMMU at 31.6% and 25.6% respectively. Reward appears to be the least significant factor of influence and is followed by Organisational Boundaries both of which appear to have a weak influence on entrepreneurship within the university.

Managerial Support's inverse relationship with the level of entrepreneurship is unexpected and difficult to explain. But this may be due to the complex nature of the university in which different areas of the university place different and unique entrepreneurial requirements on the management that may crowd out other important issues needing attention. To cope, management may have to give much support to entrepreneurially related issues at the beginning in order to encourage entrepreneurship but as entrepreneurship becomes sustained they begin to reduce their support in order for them to focus on other equally or more important issues.

The model below explains the relationship between the two significant internal factors and entrepreneurship at NMMU:

$$\textbf{Entrepreneurship} = 1.302 + 0.316 \textbf{ Time Availability} + 0.239 \textbf{ Work Discretion}.$$

The implication of this equation is that:

- Of the five internal environmental factors that influence the level of entrepreneurship at NMMU, time availability and work discretion have the most significant impact;
- There is a linear relationship between entrepreneurship, time availability and work discretion;
- Improving time availability by one base point leads to a 31.6% increase in entrepreneurship at NMMU;
- Improving work discretion by one base point will lead to an almost 24% increase in the level of entrepreneurship at NMMU; and
- Time availability is the most significant factor of influence and improving it will have the most significant impact on entrepreneurship at NMMU.

Of the dimensions of entrepreneurship shown in Figure 5.3, proactivity and frequency appears to be the two most significant factors influencing entrepreneurship at NMMU - 21.3% and 21% respectively. Risk taking not only is the least significant factor but is also negatively correlated (inversely related) to entrepreneurship. This means that as the level of entrepreneurship at the university increases, risk taking slightly decreases, which is probably a good thing as successful entrepreneurs are slightly risk averse. Innovation is significant at six percent (6%).

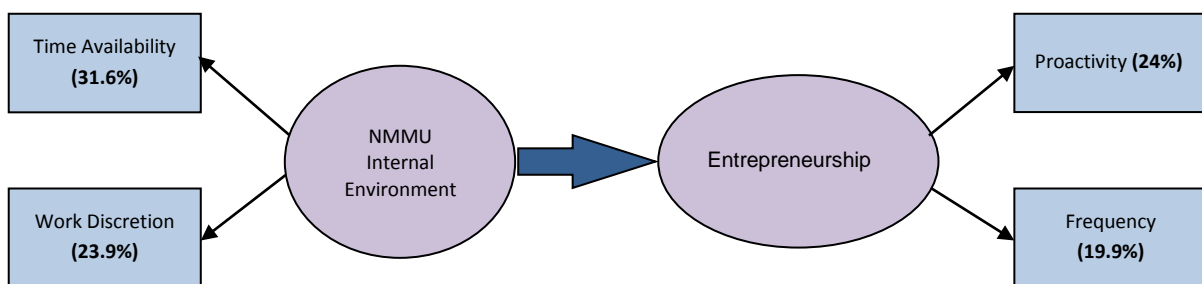
Multiple regression analysis further highlighted the relationship between these dimensions and entrepreneurship in the model:

$$\textbf{Entrepreneurship} = 1.750 + 0.240 \textbf{ Proactivity} + 0.199 \textbf{ Frequency}.$$

The implication of this equation is the following:

- When proactivity and frequency are at the zero level entrepreneurship at NMMU will be at 175%;
- When proactivity increases by one base point entrepreneurship will increase by 24%;
- When frequency increases by one base point entrepreneurship will increase by 20%;
- Proactivity is the most significant dimension of entrepreneurship at NMMU and improving it will have the most significant impact on entrepreneurship. Figure 5.4 depicts this final relationship.

**Figure 5.4: Four key internal factors influencing entrepreneurship at NMMU**



Source: Developed based on Ireland Kuratko and Morris (2006b:22-28); Scheepers, Hough and Bloom (2008:64)

### **5.5.3 Research Objective 6: Determine how the identified and measured internal factors can be influenced to increase NMMU entrepreneurial output.**

Before discussing how the four key factors of influence identified above can be improved to enhance entrepreneurship at NMMU, it is necessary to know what they are and to understand their inter-connectedness.

**Time Availability** describes the structuring of university members' work load in a way that allows time for engaging in innovative and creative activities while at the same time achieving both short and long term work goals (Ireland *et al.* 2006b:28). As observed by Hornsby *et al.* 2002:259) availability of slack resources such as time, encourages experimentation and risk taking behaviours amongst institutional members. Time availability is a precursor for innovation as it allows people to be creative and to pursue new opportunities, ideas and innovation, and it is limited by a wide span of control (which at universities equates to large class sizes).

**Work Discretion** is explained by Frederickson (1986:283) as an attribute of formalisation dimension of organisational structure which describes the level at which activities of organisational members are guided by rule, regulations, standards and procedures. Ireland *et al.* (2006b:27) described it as top management's tolerance for failure, provision of decision making latitude, freedom from excessive oversight, delegation of authority and responsibility.

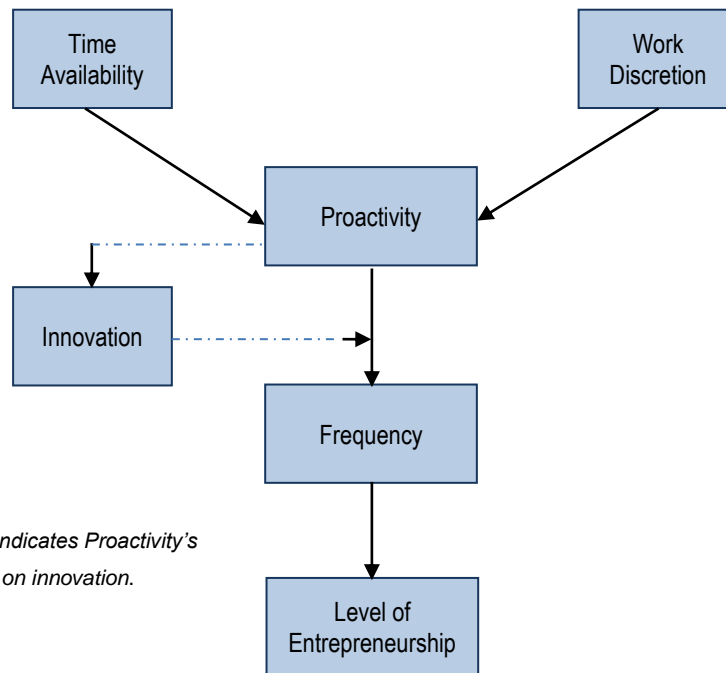
**Proactivity** as a dimension of entrepreneurship is defined as the process of anticipating and acting on future needs by seeking new opportunities (Dess and Lumpkin 1996:146). It is an opportunity seeking and identification process that precedes innovation and it requires persistence, adaptability, perseverance and tolerance of failure (Russel 1999:73).

**Frequency** is the dimension of entrepreneurship that describes the quantity or amount of entrepreneurial events existing in an organisation at any point in time (Ireland *et al.* 2006b:22).

Universities being professional bureaucracies are characterised by a wide span of control and standardised behaviours (Fredrickson 1986:293; Ireland *et al.* 2006:27). A wide span of control means there will be a lot of people to supervise and little time available to university staff members.

With high delegated authority and high decision making latitude (as found in professional bureaucracies) come rules and regulations to guide such freedom and this added to professional standards of behaviour guiding members' conduct, means that behaviour is highly standardised (and failure averse) at universities. Work discretion is thus reduced. The combined effect of these two factors means that university staff members' behaviours are conservative and reactive; focused on problem solving and crisis management rather than being proactive and searching for new ideas and opportunities (Frederickson 1986:293). The lack of proactivity affects the level of innovation, as opportunity identification and tenacious pursuit is the foundational behaviour required for innovativeness, and in turn affects the amount of entrepreneurial events occurring at the university – the frequency of entrepreneurship. This finally impacts on the universities entrepreneurial intensity as shown in Figure 5.4.

**Figure 5.5: Interconnectedness among key factors influencing entrepreneurship at NMMU**



Source: Author's own construct

The four factors of influence discussed above may be improved upon at NMMU in the following ways:

Time Availability by:

- The conduct of job analysis to determine the adequate work load and span of control for staff of the university; and
- Giving time management training to university members.

Work discretion by:

- Reviewing the university's rules, regulations and procedures to eliminate those that are outdated and that are hindering creativity and innovation; and
- University management should be more tolerant of failure.

Proactivity by:

- Improvement in the first two factors will improve proactivity at the university.
- Providing entrepreneurship training for staff. This could increase proactivity and decrease fear of failure; and
- Creating informal entrepreneurial social gatherings to promote informal crossbreeding ideas and bonding.

Frequency by:

- Improving university members' sense of proactivity;
- Frequent entrepreneurially related communication may improve its frequency;
- Top managements entrepreneurial acts and the selection of entrepreneurial champions within the departments; and
- Stating entrepreneurship as a university goal may improve its frequency.

## **5.6 SUMMARY**

This chapter presented the empirical results of this study. Descriptive and inferential statistical results for the study were presented.

The following four factors - Proactivity and Frequency (the dimensions of entrepreneurship) and Time Availability and Work Discretion (internal factors of influence), were found to be the significant factors influencing entrepreneurship at NMMU.

The next chapter concludes the study.



## CHAPTER SIX

### SUMMARY CONCLUSION AND RECOMMENDATIONS

#### 6.1 INTRODUCTION

To understand modern organisations it is necessary to consider their internal and external environments (Kuratko, Morris and Covin, 2011:4). **Universities** are environmentally vulnerable institutions. Their external environment which has and is still undergoing significant changes influences their internal environment (Burns, 2005:70). Shattock (2003:41) believes that when universities fail it is usually because of their failure to recognise and understand changes in their environment.

In discussing the entrepreneurial university concept, Hannon (2012) argued that these university forms are about four key attributes:

- the university's internal architecture - its culture, structure and leadership;
- the university staff – the support available to them and how they are rewarded;
- the students - the learning experience and opportunities they are given and the network and forms of engagement made available to them and
- the university community – the impact of universities on its external stakeholders and region.

The Department of Employment (1989 as quoted by Kirby, 2006:3) maintained that university entrepreneurialism is beyond being business-like or commercially market orientated but instead is about universities' ability to innovate, recognise and create opportunities, work in teams, take risks and respond to challenges.

Holt *et al.* (2007:42, 43) argued that corporate entrepreneurship is the strategy to deploy if a university desires to encourage and improve its ability to innovatively create value in its members. According to these authors the strategy explains how entrepreneurship is implemented and diffused throughout an organisation. Burns (2005:59) called it a concept that transplants the strategic entrepreneurial attributes of successful individual entrepreneurs – the entrepreneurial DNA - into large established organisations.

A university's internal environmental factors – its leadership, strategy, culture and structure affect its ability to engage in corporate entrepreneurship (Covin and Slevin, 1991:9). For them to build entrepreneurship as an organisational behaviour they must systematically coordinate their strategy, structure and culture (Gjerding *et al.* 2005:3).

Previous chapters in this study have endeavoured to understand entrepreneurship as a university behaviour and to identify its key internal factors of influence at NMMU. This final chapter answers outstanding research questions, discusses the entrepreneurial orientation concept as used in this study, provides overview of previous chapters, highlights the study limitations and contributions to knowledge, interprets key research findings and make recommendations for future research.

## **6.2 ENTREPRENEURIAL ORIENTATION CONCEPT AS APPLIED IN THIS STUDY**

Entrepreneurial orientation or posture is an organisation's top management strategic philosophy on the role and function of innovation in its corporate strategy. It highlights organisational leaders' roles in supporting members' entrepreneurial efforts and the provision of resources and entrepreneurship supporting the internal organisational context (Russell, 1999:71). It is a strategy making practice - a frame of mind and perspective about entrepreneurship that is reflected in an organisation's ongoing processes and culture (Dess and Lumpkin, 2005:147). For a university to successfully engage in entrepreneurship as an organisational behaviour it must be entrepreneurially orientated.

Entrepreneurial orientation creates new value and growth through entrepreneurial behaviour of all university members and it keeps a university alert to its environment and ensures its outstanding performance (Lumpkin, Cogliser and Schneider, 2009:48).

A university's environment - its dynamic and complex nature; its strategies; structure; culture; leaders' values; resources and competencies all influence its entrepreneurial orientation (Russell, 1999:65). This in turn influences and modifies the university's environment through the reaction of other universities to its entrepreneurial strategies and innovations (Covin and Slevin, 1991:11).

The above describes this study's perception of the meaning of the entrepreneurial orientation concept and how it is viewed throughout the study.

## **6.3 OVERVIEW OF STUDY**

From the beginning, this study sets out to better understand the entrepreneurial university concept, the key factors influencing university entrepreneurship and its path of influence.

Chapter One described the context and research questions and objectives that forms the basis of this study. Chapters Two and Three reviewed literature on previous publications to

answer the qualitative research questions and objectives, to describe the path of influence of key environmental factors influencing university entrepreneurship and to develop a theoretical frame-work for answering the quantitative questions. Chapter Four discussed in detail the research design and paradigm for answering the quantitative research questions, factors that guided the choice of research paradigm and the data collection processes. Chapter Five presented the empirical results of the study. This chapter reviews the way in which the study answered research questions and objectives set at the beginning of this study, the contribution of the study to knowledge and makes policy recommendations.

#### **6.4 RESEARCH QUESTIONS AND OBJECTIVES REVISITED**

The research questions and objectives for this study are revisited with a brief summary of the findings.

##### **Research question 1: What is an entrepreneurial university?**

This question being the main research question upon which other questions and objectives in this study are based.

Chapter Two section 2.2 described entrepreneurial universities as 21<sup>st</sup> century university forms and the only sustainable university form in the knowledge world. Stating that they are institutions that have successfully combined traditional academic values with market value and that diversification of funding based on regional economic and social development through “third mission” activities as the core concept on which these university types are based.

##### **Research question 2: What are the main characteristics of an entrepreneurial university?**

Chapter Two, section 2.4 listed and explained the five characteristics of entrepreneurial universities of Clark (1998) as a strength steering core, expanded developmental periphery, diversified funding base stimulated academic heartland and integrated entrepreneurial culture. The section also discussed the list of twenty practices that characterise entrepreneurial universities (Gjerding *et al.*, 2005).

##### **Research question 3: What key environmental factors influence university entrepreneurialism?**

This question was dealt with in Sections 2.5 and 2.6. Section 2.5 identified the external environment which it called “drivers” as a major factor of influence in university entrepreneurial transformation. The section discussed changes in the external environment

such as globalisation, massification of university education, new technology and telecommunications, dwindling state funding, shifting demographics as some of the factors within the external environment distorting the university's environmental balance. This causes university entrepreneurial transformation. Section 2.6 listed some of the factors within the university's internal environment that influence its entrepreneurial transformation. Seven factors – strategy, culture, structure, leadership autonomy and diversified funding – were identified. Using the Nadler and Tushman's (1980) model of systems theory, these factors were classified as input factors – the external environment and strategy. According to Burns (2005) these process factors can also be called organisational architecture and consist of structure, culture and leadership as well as output/feedback factors that comprise a diversified funding base and autonomy.

**Research question 4: How can these factors be influenced to increase entrepreneurial output at NMMU?**

The answer to this research question required a three step approach that consists of answers to research objectives 4, 5 and 6.

**Step 1:** This step requires that the level of entrepreneurship at NMMU be determined in line with the observation that to improve the level of entrepreneurship in any institution the current level must first be determined (Kuratko *et al.*, 2011:350). This step also answers the "is NMMU an entrepreneurial university" question.

In Chapter Five, section 5.5.1, based on Research Objective 4, the level of entrepreneurship in NMMU was determined. Firstly, the degree, then the frequency of entrepreneurship was calculated before the entrepreneurial intensity of the university was determined and an absolute value of 54.1% arrived at. Since entrepreneurial intensity is a relative concept that requires industry comparison for its determination and since no such standard exists in the South African Higher Education Sector, entrepreneurial intensity at NMMU could not be determined conclusively.

An attempt was made to locate the university's entrepreneurial intensity on the entrepreneurial grid since (Burns, 2005:60) asserted that by locating an organisation on the entrepreneurial grid its entrepreneurial strategy can be described. On the entrepreneurial grid NMMU appears to be slightly below the dynamic region, which indicates that an equal level of degree and frequency of entrepreneurship is being deployed - and this could mean that entrepreneurial strategy at NMMU consists of almost equal levels of degree and frequency of entrepreneurship.

In response to the question “Is NMMU an entrepreneurial university?” this study answers - **Yes!** But the comparative level of entrepreneurship in the university relative to other South African universities cannot be determined.

**Step 2:** The second step required the identification and measurement of internal environmental factors influencing entrepreneurship as stated by Ireland *et al.* (2006b:24). Research Objective 5 highlighted management support, work discretion, reward, time availability and organisational boundaries were highlighted as key internal environmental factors of influence (Chapter Five, section 5.5.2). In combination with entrepreneurial dimensions identified in Section 5.5.1, multiple regression analysis was carried out and four factors: two entrepreneurship dimensions of proactivity and frequency, and two internal environmental factors of time availability and work discretion were identified as the key factors influencing entrepreneurship at NMMU.

**Step 3:** Research Objective 6 (in Chapter 5, section 5.5.3) stated that the interconnectedness between the factors had first to be considered before suggestions on how they can be improved were made.

**Research Objective 7: Understanding the path of influence of the environmental factors - ways in which the internal and external environmental factors interrelate to affect a universities' entrepreneurial output.**

This objective was attained in Chapter Two section 2.7 where the relationship among the environmental factors of influence identified in section 2.5 and 2.6 was depicted.

**Research Objective 8: Make policy recommendations based on the findings.**

This objective was reached in section 6.7 of this chapter.

## 6.5 CONTRIBUTION TO KNOWLEDGE

This study contributes to existing knowledge in the following ways:

- A comprehensive theoretical framework of entrepreneurship should describe variables and how they interrelate (Russell & Russell 1992:640). This is the first time – as far as can be ascertained by this study – that the key factors influencing university entrepreneurship are being comprehensively identified and their path of influence in an entrepreneurial process highlighted.
- Morris and Sexton (1996: 12) called for a study on the application of the entrepreneurial intensity concept in a non-profit context and the definition of what constitute new products and services in such a context. Consequently this study endeavoured to

develop (based on the literature review) the concept of “new value creation” to replace the new product and services concept.

- This was also the first attempt (as far as could be established by this study) to empirically test the entrepreneurial university concept using corporate entrepreneurship theory at a South African university and probably in an African university.
- 

## 6.6 LIMITATIONS OF THE STUDY

A number of limitations to this study should be taken into consideration in interpreting its outcome. Some of these are:

- Smallness of the sample size that limits the generalisability of findings. Future studies should use a larger sample size that involves more universities to test this concept.
- The impact of the sampling technique used. The use of a non-probability judgmental sampling method constitutes a limitation. While middle managers have been found to be critical to university entrepreneurship and scholars advocate measuring the perceptions of these groups to determine entrepreneurial orientation in an organisation (Gjerding *et al.*, 2006:89; Hornsby *et al.*, 2002:255 and Kuratko *et al.*, 2011:323) Measuring the perceptions of only this group at a university may be inadequate to determine the true level of entrepreneurship and the role of internal organisational factors. Future studies should collect data from all university members.
- The use of the survey method and self-reporting of data collection is a further limitation. Future studies could combine survey and interview methods for data collection.
- The inability to collect data from student representatives is a limitation as all the categories of middle managers at NMMU cannot be said to be fully represented.

## 6.7 POLICY RECOMMENDATION

Based on the outcomes of this study the following policy recommendations are suggested:

### *Time Availability*

There seems to be a need for the university to review its staff workload to allow free time for the pursuit of innovative ideas (Ireland, 2006b:28). From the outcome of this study it appears that reducing the workload of academic and non-academic staff (which increases the slack time available to them) could significantly increase creativity and innovativeness which in turn lead to improvement in the level of entrepreneurship within the university.

*Work discretion*

There appears to be a need for a reduction in rules, regulations, standards and procedures-based and conservative behaviour among the staff of the university as this appears to be stifling opportunity seeking behaviours (proactivity) required for entrepreneurship at the university. The current attitude appears to encourage problem solving behaviour that deals with “yesterday’s” problems which are known and not the attitude of “where and what are the future problems” required for entrepreneurship.

*Vision and mission statement*

While NMMU’s vision and mission statement as well as vision 2020 strategy documents allude to entrepreneurship as an organisational value, these documents do not explicitly state entrepreneurship as an organisational goal within the university. According to Kirby (2006:603) and Sporn (1999:270) universities need to be explicit about the role of entrepreneurship in their vision and mission statements as this provides guidance for innovative and entrepreneurial behaviour among members.

*Top management support for entrepreneurship*

To improve the entrepreneurial orientation at NMMU there is need for a more visible display of support for entrepreneurial values and action by the university leadership. A university’s top management should set up identifiable processes for administering and evaluating entrepreneurial projects and a system for rewarding university members’ entrepreneurial achievements in financial and non-financial ways (Kirby, 2006: 600).

*Communication and training*

The university should engage in more entrepreneurially related communication. Furthermore, there is a need for formal and informal training on entrepreneurship and its benefits as university behaviour for middle managers and the university at large. Such training programme should encourage university members to engage in entrepreneurial activities that are complimentary to their traditional academic norms, and not allow industry objectives to diminish their traditional academic goals (Philpott, 2011:168,169).

*Entrepreneurial champions*

While academic departments are usually more focused on defending their departmental spaces than on innovation, responsibility for innovation and change still reside in them, hence the university needs to identify and encourage entrepreneurship champions within the various departments. These groups of individuals become the needed critical mass of entrepreneurial role models that will encourage others to engage in entrepreneurship (Philpott, 2011:167; Gibbs *et al.*, 2009:18).

### *Entrepreneurial culture*

The university should create internal environmental context that encourages independent generation of entrepreneurial ideas and activities among organisational members by making the university culture more supportive of entrepreneurship. Doing this will increase university members' ability to spot entrepreneurial opportunities and their innovativeness.

Although Shattock (2003:32) argued that no university can be successful without concentrating and prioritising its resources, there is a need for NMMU to provide more slack resources such as time and small financial grants to fund members' innovative processes and also to provide adequate and frequent information on such provisions. This will ensure that entrepreneurial ideas within the university receive the needed resources for their transition through the innovation development process (Russell & Russell, 1999:68).

### *University supported entrepreneurial social club*

As suggested by a professor in the course of this study, university supported entrepreneurial social clubs can be created where university members meet to informally socialise and discuss their entrepreneurial ideas.

## **6.8 RECOMMENDATION FOR FUTURE RESEARCH**

Hornsby, Kuratko, Shepherd and Bott (2009:237) observed that different groups within an organisation react to entrepreneurial antecedents in its internal environment differently. This study investigated how NMMU's internal environment supports its middle managers' entrepreneurial behaviour. Future studies should engage all managerial levels within the university for a balanced view on the impact of these internal environmental antecedents.

While this study identified and traced the path of influence of key factors affecting entrepreneurship at NMMU, future studies should assess NMMU's entrepreneurial culture more closely to determine which of the university values, norms and beliefs support or inhibit entrepreneurship.

Also in the course of collecting data for the study, it was observed that most participants were uncomfortable answering questions on frequency of entrepreneurship. To overcome this challenge future study should use both survey and interview as data collection methods.

Future studies could develop entrepreneurial intensity standards for South African universities. This will fill a gap in the industry as there is currently no known standard for



comparing universities' entrepreneurial performance. Establishment of such a standard could contribute to an improved university ranking process.

## **6.9 CONCLUDING REMARKS**

It cannot be claimed that the result obtained from this study holds for all universities. However, due to the extensive review of literature and the validity of the instrument used, it can be concluded that the factors identified – environment, leadership, strategy, structure, culture, diversified funding base and university autonomy - are the key factors influencing university entrepreneurial transformation.

Knowledge gained from this study provides additional insight into the internal and environmental factors affecting entrepreneurship at NMMU and may be useful to other African universities aiming to become more entrepreneurial.

It is hoped that some value could be derived from this study and that it will contribute to the eradication of poverty and reduction of graduate unemployment in the African sub-region by improvement in university entrepreneurship.

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## **ANNEXURE A**

### **QUESTIONNAIRE**

December 2013

Dear Respondent

THE ENTREPRENEURIAL ORIENTATION AT NELSON MANDELA METROPOLITAN UNIVERSITY

Thank you for your support in this study.

The world has transited from industrial economy to the knowledge economy and knowledge is replacing traditional sources of wealth. Businesses originating from or closely related to universities and other knowledge producing institutions are replacing multinational corporations as the central economic actors of the future.

Universities, because of their role in research, education and innovation, in addition to their ever renewing student population have now become critical to this new world. As a result, they now face dynamic and turbulent environment. They are caught in the grand contradictions of doing more and more with less and less resources. To survive they now need to embrace entrepreneurship - become entrepreneurial universities.

Entrepreneurship is a philosophy that governs approach to problems and opportunities. It is a way of thinking and acting. Entrepreneurial university is the transformational path for universities' that will survive in the knowledge world. They have in addition to teaching and research missions, a third mission of regional economic and social development. This requires them to translate knowledge to direct social benefits.

One of the greatest challenge facing universities in Africa as well as the world is the limited capacity to convert scientific discoveries to regional social and economic developments. Entrepreneurial universities bridge this gap. They also create financial and non financial advantages for the university as an entity, as well as its members.

Entrepreneurship can only be sustainably maintained in a university when its actual level is tracked.

As a step towards making our university (NMMU) more entrepreneurial as well as to better understand the entrepreneurial university concept this study aim to assess the perception of NMMU middle managers and Student Representative Council (SRC) members on the level of entrepreneurship within the university as well as on internal organisational factors influencing entrepreneurship within our university.

Kindly assist by completing the attached questionnaire. It consists of statements related to your perception and comprises of three sections:

Section A: Measures the level of entrepreneurship within NMMU. Section B: Assesses internal organisational factors influencing entrepreneurship in NMMU and Section C: consist of demographic data.

Kindly indicate the extent of your agreement with these statements by placing a cross (X) in the appropriate column. There is no right or wrong answers only your perception.

Please note that by completing this form:

- That respondent's anonymity and confidentiality is assured.
- That data supplied will be used only for research purposes.
- That participation is voluntary and can be withdrawn at any time.

The questionnaire should take about twenty minutes to complete.

Should you **be interested** in the outcome of this study, a copy of the findings will be made available to you. If so kindly give your contact details in the space provided on the questionnaire.

**Thank you for your kind support in this study.**

Yours faithfully,

FEYISARA FADAIRO (MASTERS CANDIDATE)

(073 - 142 - 3123)

Prof NORMAN KEMP (SUPERVISOR)



## SECTION A

**MEASURING NMMU ENTREPRENEURIAL INTENSITY.**

This section measures the level of entrepreneurship in NMMU (How entrepreneurial NMMU is).

**INSTRUCTIONS:**

1. In a university **outcome of entrepreneurial activities** maybe any or a combination of: production of high quality graduate, publishing academic results, new technologies, employment, consulting, industrial training, winning research grants, contract research, new process, asset and revenue growth, patenting and licensing spin off formation, incubation facilities and creation of technology parks, community engagement, profit and personal benefits (Philpott et al 2011:162; Morris 1998:19). These outcomes in the following questions are **referred to as CUSTOMER VALUE**.
2. For the statements below please indicate your degree of agreement using the following five point scales by boldly marking "X" on the number that best corresponds with your level of agreement with each statement. If you strongly agree place a cross (X) on "5". If you strongly disagree place a cross (X) on "1".

**UNIVERSITY ORIENTATION**

		Level of Agreement				
	<b>Our university is characterised by:</b>	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.1	A high rate of new "customer value" introductions compared to our competitors (including new features and improvements).	1	2	3	4	5
1.2	An emphasis on continuous improvement in methods of customer value production and /or delivery.	1	2	3	4	5
1.3	Risk taking by key executives in seizing and exploring chancy growth opportunities.	1	2	3	4	5
1.4	A live and let live philosophy in dealing with competitors.	1	2	3	4	5

1.5	Seeking of unusual novel solutions by senior executives to problems via the use of "idea people", brainstorming etc.	1	2	3	4	5
1.6	A top management philosophy that emphasises proven "customer value" and the avoidance of heavy new "customer value" development (or creation) cost.	1	2	3	4	5
	<b>In our university top level decision making is characterised by:</b>	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.7	Cautious, pragmatic step at a time adjustments to problems.	1	2	3	4	5
1.8	Active search for big opportunities.	1	2	3	4	5
1.9	Rapid growth as the dominant goal.	1	2	3	4	5
1.10	Large bold decisions despite uncertainties of the outcomes.	1	2	3	4	5
1.11	Compromises among the conflicting demands of stake holders - government management, students, parents, employees, community, suppliers, etc	1	2	3	4	5
1.12	Steady growth and stability as primary concerns.	1	2	3	4	5
	<b>New "Customer Value" Introduction</b> If you don't have knowledge of new customer value creation within the university kindly write "I don't know"					
1.13	What is the number of new "customer value" NMMU introduced during the past two years ( <b>Please give a figure</b> )	_____				
		Significantly Less	Less	Same	More	Significantly More
1.14	How many "customer value" improvements or revision did you introduce during the past two years	1	2	3	4	5
	How does the number of new "customer value" introduction in NMMU					

1.15	compare with those of our major competitors	1	2	3	4	5
1.16	To what degree did these new “customer value” introductions include “customer value” that did not previously exist in the market (“new to the market”)	1	2	3	4	5
	<b>New Process Introduction</b> Examples of new methods or operational process introduction can be new course design, new program delivery methods, new internal customer service delivery method, and new research approach among other.					
1.17	Please estimate the number of significant new methods or operational processes NMMU implemented during the past two years example of process innovations include	1	2	3	4	5

## SECTION B:

## PERCEPTION OF NMMU AND NMMU'S INTERNAL ENVIRONMENT

	<b>We are interested in how you perceive NMMU's internal environment and NMMU as an institution. Please read the following items. Using the scale below please indicate how much you agree or disagree with each statement. If you strongly agree place a cross (X) on “5”. If you strongly disagree place a cross (X) on “1”. There is no right or wrong answer to these questions so please be as truthful and thoughtful as possible in your responses. All responses will be kept strictly confidential. Thank you for your cooperation.</b>					
	<b>Management support for entrepreneurship</b> In the following questions <b>members</b> means <b>academic, non academic and students members of NMMU</b>					
		Strongly Disagree	Disagree	Not Sure	Agree	Strongly agree
2.1	NMMU is quick to use improved work methods.	1	2	3	4	5
2.2	NMMU is quick to use improved work methods that are developed by its members.	1	2	3	4	5
2.3	In NMMU developing one's own ideas is encouraged for the improvement of the university.	1	2	3	4	5
2.4	Top management is aware and very receptive to my ideas and suggestions.	1	2	3	4	5
2.5	A promotion usually follows from the development of new and innovative	1	2	3	4	5

	ideas.					
2.6	Those members who come up with innovative ideas on their own often receive managements encouragement for their activities.	1	2	3	4	5
2.7	The “doers on projects are allowed to make decisions without going through elaborate justification and approval procedures.	1	2	3	4	5
2.8	Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.	1	2	3	4	5
2.9	Many top managers have been known for their experience with the innovation process.	1	2	3	4	5
2.10	Money is often available to get new project ideas off the ground.	1	2	3	4	5
2.11	Individuals with successful innovative projects receive additional rewards and compensation beyond the standard reward system for their idea and effort.	1	2	3	4	5
2.12	There are several options within the organisation for individuals to get financial support for their innovative projects ideas and efforts.	1	2	3	4	5
2.13	People are often encouraged to take calculated risks with new ideas in this university.	1	2	3	4	5
2.14	Individual risk takers are often recognized for their willingness to champion new projects, whether eventually successful or not.	1	2	3	4	5
2.15	The term “risk taker” is considered a positive attribute for people in my work area.	1	2	3	4	5
2.16	This university supports many small and experimental projects realizing that some will undoubtedly fail.	1	2	3	4	5
2.17	People with a good idea are often given free time to develop that idea.	1	2	3	4	5
2.18	There is considerable desire among members of the university for generating new ideas without regard to crossing departmental or functional boundaries.	1	2	3	4	5
2.19	Members are encouraged to talk to people in other departments of this university about ideas for new projects.	1	2	3	4	5
	<b>Work discretion</b>					
2.20	I feel that I am my own boss and do not have to double check all of my decisions with someone else.	1	2	3	4	5
2.21	Harsh criticism and punishment result from mistakes made on the job.					

		1	2	3	4	5
2.22	This university provides me with the chance to be creative and try my own methods of doing the job.	1	2	3	4	5
2.23	This university provides freedom to use my own judgment.	1	2	3	4	5
2.24	This university provides the chance to do something that makes use of my abilities.	1	2	3	4	5
2.25	I have the freedom to decide what I do on the job.	1	2	3	4	5
2.26	It is basically my own responsibility to decide how my job gets done.	1	2	3	4	5
2.27	I almost always get to decide what I do on my job.	1	2	3	4	5
2.28	I have much autonomy on my job and am left on my own to do my own work.	1	2	3	4	5
2.29	I seldom have to follow the same work methods or steps for doing my major tasks from day to day.	1	2	3	4	5
	<b>Rewards/Reinforcement</b>					
2.30	My boss helps me get my work done by removing obstacles.	1	2	3	4	5
2.31	The rewards I receive are dependent upon my innovation on the job.	1	2	3	4	5
2.32	My boss will increase my job responsibilities if I am performing well in my job.	1	2	3	4	5
2.33	My boss will give me special recognition if my work performance is especially good.	1	2	3	4	5
2.34	My boss would tell his boss if my work was outstanding.	1	2	3	4	5
2.35	There is a lot of challenge in my job	1	2	3	4	5
	<b>Time Availability</b>					
2.36	During the past three months, my work load kept me from spending time on developing new ideas.	1	2	3	4	5
2.37	I always seem to have plenty of time to get everything done.	1	2	3	4	5
2.38	I have just the right amount of time and work load to do everything well.	1	2	3	4	5

2.39	My job is structured so that I have very little time to think about wider organisational problems.	1	2	3	4	5
2.40	I feel that I am always working with time constraints on my job.	1	2	3	4	5
2.41	My colleagues and I always find time for long-term problem solving.	1	2	3	4	5
<b>Organisational Boundaries</b>						
2.42	In the past three months, I have always followed standard operating procedures or practices to do my major tasks.	1	2	3	4	5
2.43	There are many written rules and procedures that exist for doing my major tasks.	1	2	3	4	5
2.44	On my job I have no doubt of what is expected of me.	1	2	3	4	5
2.45	There is little uncertainty in my job.	1	2	3	4	5
2.46	During the past year, my immediate boss discussed my work performance with me frequently.	1	2	3	4	5
2.47	My job description clearly specifies the standards of performance on which my job is evaluated.	1	2	3	4	5
2.48	I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	1	2	3	4	5
<b>Specific Climate Variables</b> In the following questions <b>members</b> means <b>academic, non academic and students members of NMMU</b>						
2.49	This university definitely rewards university members who take calculated risk and innovate.	1	2	3	4	5
2.50	Jobs in this university tend to be broadly defined with considerable discretion in how tasks are performed.	1	2	3	4	5
2.51	In this university members can pursue multiple career paths.	1	2	3	4	5
2.52	This university tries hard to develop the creative potentials of its members.	1	2	3	4	5
2.53	Performance appraisal in this university includes an evaluation of members innovativeness.	1	2	3	4	5
2.54	Around here it seems like there is more concern with process than with performance.	1	2	3	4	5
2.55	This university does a good job of balancing incentives for individual initiative with incentive for team collaboration.	1	2	3	4	5
2.56	If you are not innovating on the job you cannot get ahead in this university.					

		1	2	3	4	5
2.57	An overly bureaucratic structure takes away from our ability to be entrepreneurial in this university.	1	2	3	4	5
2.58	Our university is organised in a way that encourages superiors to micromanage subordinates and projects.	1	2	3	4	5
2.59	We have too many levels of management in this university.	1	2	3	4	5
2.60	I would characterise the university structure as being highly flexible.	1	2	3	4	5
2.61	A rigid chain of command limits our ability to experiment with new ideas.	1	2	3	4	5
2.62	Red tape and slow approval cycles are problems in this university.	1	2	3	4	5
2.63	Supervisors in this university strongly believes in delegating decision making responsibility.	1	2	3	4	5
2.64	Controls are very tight in this university as we tend to count every rand and every hour.	1	2	3	4	5
2.65	Senior management focuses on eliminating any slack within the budget.	1	2	3	4	5
2.66	Once budgets are finalised and accepted they are difficult to revise.	1	2	3	4	5
2.67	The lines of command clearly allocate authority and responsibility to each department.	1	2	3	4	5
2.68	The organisational structure is very clearly defined and delineated.	1	2	3	4	5
2.69	In this university members have a lot of say in how things are done.	1	2	3	4	5
2.70	Ours is a culture that rewards the tried and the true.	1	2	3	4	5
2.71	This is a university that celebrates innovative achievements.	1	2	3	4	5
2.72	We have a culture that strongly discourages failure.	1	2	3	4	5
2.73	There is a sense of urgency in the university regarding the importance of change and innovation.	1	2	3	4	5
2.74	This university subscribe to the motto "if ain't broke don't fix it"	1	2	3	4	5
2.75	Innovation and risk taking are core values in this university.	1	2	3	4	5
2.76	Lines of command clearly allocate authority and responsibility to each.	1	2	3	4	5

	Department.					
2.77	New ideas tend to receive quick approval from management in this university.	1	2	3	4	5
2.78	The university environment encourages people to talk openly with other about ways to improve the university's operations.	1	2	3	4	5

SECTION C: **Demographic Information**

Kindly read the following questions and make a cross (X) as appropriate in the numbered boxes.

1. Please indicate your gender

Male	1
Female	2

2. Please indicate your age

Under 20 years	1
20 – 25 years	2
26 – 30 years	3
31 – 35 years	4
36 – 40 years	5
41 – 45 years	6
46 – 50 years	7
51 – 55 years	8
56 – 60 years	9
Over 60 years	10

3. Please indicate your academic qualification

Matric .	1
Diploma/ Degree	2
Honours	3
Masters	4
Doctorate	5
Post Doctorate	6
Others:	



4. Please indicate number of years at NMMU -----

5. Please indicate number of years in current position -----

6. Which of these groups do you belong to within NMMU

Academic Entities	1
Non academic Entities	2
Students	3
Others:	

7. If you mark Academic Entities or Student above, which of the following faculties do you belong (kindly check as it relates to you)

Arts	1
Business and Economic Science	2
Education	3
Engineering, the Built Environment	4
Info. and Comm. Technology	
Health Science	5
Law	6
Science	7
Institutes	8
Centres of Excellence	9
Research Units	10

8. Research Findings

If you will like the finding of this study to be made available to you, kindly complete the information below.

Name and Surname: \_\_\_\_\_

Telephone number: \_\_\_\_\_ Email address: \_\_\_\_\_

Postal address: \_\_\_\_\_

THANK YOU FOR YOUR TIME AND COOPERATION

## Reference

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