Corporate Entrepreneurship in Development Finance Institutions:

An experimental case study design

By

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Thanks be to God, who I believe is the only source of complete knowledge and wisdom.

"The heart of the discerning, acquires knowledge, and
The ears of the wise, seek it out".

Abstract

This study examines innovation and corporate entrepreneurship (I&CE) thinking and acting in Development Finance Institutions (DFIs). Based on the reviewed literature, the study supports the proposition that entrepreneurship is not limited to new ventures and that established organisations, both commercial and non-commercial, such as DFIs, can benefit from entrepreneurship principles. To demonstrate that I&CE can be fostered in DFIs, the study employed a Pre-test-Post-test Control Group True Experimental Design (OXO / Control Group), in which I&CE climate was diagnosed in an experimental DFI (O_1) and in a number of control group DFIs (O_3); a training intervention was conducted (X) on managers and senior professionals of the experimental DFI; and a post-intervention diagnosis was made to determine the effect of the training intervention (O_2). The diagnostic observations were conducted using a modification of the CEAI developed by Hornsby et al. (1990). The measurement properties of the modified instrument, herein called the ICEAI, including a factor analysis and reliability assessment, were determined. Results confirmed that five distinct *corporate entrepreneurship* internal organisational factors, similar to those suggested in the literature, and two additional *innovation* internal organisational factors, do exist. Based on how the items loaded on each factor, the CE factors were entitled: management support; work discretion; rewards/reinforcement; time availability; and organisational boundaries. The innovation factors were entitled: innovation organisational support; and innovation portfolio management.

From a DFI managerial perspective, the results of the experiment indicate: that the ICEAI can be a useful tool in diagnosing the innovation and corporate entrepreneurship environment in DFIs; that the training intervention used in the study yields overall statistically significant improvements in all but two constructs of I&CE; that ICEAI can be a useful tool in identifying categories of employees (i.e. those with 'longer' experience and 'higher' education) with whom I&CE training is less likely to succeed, or should be applied in a more focused way or using different strategies; that after the training intervention of the leadership group in the experimental DFI, there was a notable increase in developed and approved new venture plans, indicating that organisational leaders can be change agents for I&CE.

Brief Table of Contents

Corporate Entrepreneurship in Development Finance Institutions:

An experimental case study design

Table of Contents

Corporate Entrepreneurship in Development Finance Institutions:

An experimental case study design

List of Figures

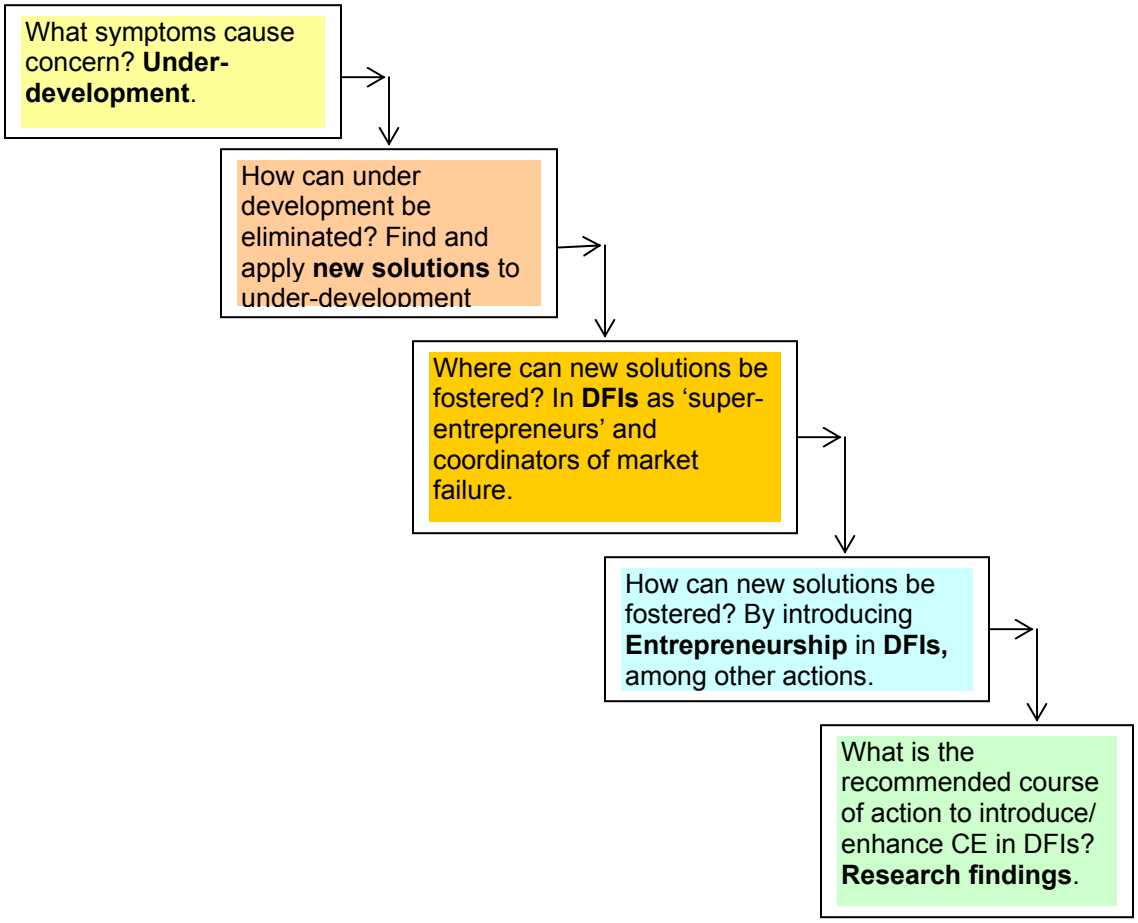
List of Tables

Glossary of Abbreviations

AfDB	African Development Bank
ANOVA	Analysis of Variance
CE	Corporate Entrepreneurship
CEFMO	Corporate Entrepreneurship Flexibility Market Orientation
DBSA	Development Bank of Southern Africa
DFIs	Development Finance Institutions
EI	Entrepreneurial Intensity
EO	Entrepreneurial Orientation
Exco	Executive Committee
GDP	Gross Domestic Product
GBEs	Government Business Enterprises
I&CE	Innovation and Corporate Entrepreneurship
ICEAI	Innovation Corporate Entrepreneurship Assessment Instrument
KM	Knowledge Management
MDGs	Millennium Development Goals
Nepad	New Partnership for Africa's Development
OECD	Organisation for Economic Co-Operation and Development
OXO	Observation Experimentation Observation
O_1	Pre-Intervention Observation
O_2	Post-Intervention Observation
O_3	Control Group Observation
NVEC	New Venture Evaluation Committee
Post-	Post-Intervention Observation Group
Pre-	Pre-Intervention Observation Group

SADC	Southern African Development Community
SNI	Siemens-Nixdorf Information

Management-Research Question Hierarchy



PART I

RESEARCH ORIENTATION SECTION

Chapter 1: Introduction

1.1 Introducing the Corporate Entrepreneurship construct

Corporate entrepreneurship (CE) is a holistic view of the organisation that infuses creative strategic processes throughout the organisation (Morris, Lewis, & Sexton, 1994). In literature, the corporate entrepreneurship label has been given to multiple and sometimes distinct organisational phenomena such as entrepreneurial management (Stevenson & Jarillo, 1990); entrepreneurial orientation; firm-level entrepreneurship; entrepreneurial posture (Covin, 1996); and pioneering-innovative management (Khandwalla, 1987). Schindehutte, Morris and Kuratko (2000) refer to a concept of 'entrepreneurial thinking' in organisations and suggest infusing 'the institution with innovative behaviours' as a mechanism to achieve such thinking. Morris and Kuratko (2002) refer to this infusion as corporate entrepreneurship. Simon, Houghton and Gurney (1999) call it a managerial approach that will stimulate innovation and 're-energise employees'.

According to Covin (1999), the following three phenomena are among the most common situations that can be viewed as examples of corporate entrepreneurship: an established organisation entering a new business; an individual or individuals championing new product or service ideas within an established organisation and an 'entrepreneurial' philosophy that permeates the entire organisation's outlook and operations. The last example is a situation where entire firms, rather than individuals or parts of firms, act in ways that generally would be described as entrepreneurial.

1.2 The importance of corporate entrepreneurship

Conventional wisdom indicates that corporate entrepreneurship leads to superior firm performance. In literature, it has long been established that corporate entrepreneurship is a potentially viable means of promoting and sustaining

corporate competitiveness. Schollhammer (1982), Miller (1983), Khandwalla (1987), Guth and Ginsberg (1990), Naman and Slevin (1993), and Lumpkin and Dess (1996) have all noted that corporate entrepreneurship can be used to improve competitive positioning and transform corporations, their markets, and industries, as opportunities for value-creating innovation are developed and exploited. According to Zahra and Covin (1995), empirical evidence exists to justify the proposition that corporate entrepreneurship leads to superior organisational performance. However, it still remains something of a mystery why such a causal relationship exists, and whether or not corporate entrepreneurship can yield similar results when applied to socio-economic development institutions (Covin, 1999).

Consequently, there is an increasing interest in understanding the antecedents and consequences of the entrepreneurial orientation (EO) in established organisations. There is also considerable theory to be found concerning EO causal relationships, but few empirical studies have been done on the 'corporate entrepreneurship-performance' relationship in development finance institutions.

1.3 Problem statement

The recent performance of the African economy has been impressive. Real GDP in Africa as a whole exhibited the following real growth rates: 3.7 percent in 1997-2003; 5.3 percent in 2004; and 4.9 (estimate) in 2005 (AfDB/OECD, 2006). The AfDB/OECF (2006) report, projects an acceleration of Africa's growth to averages of 5.8 percent in 2006 and 5.5 percent in 2007.

However, this impressive continent-wide average economic growth outlook masks considerable disparities among individual countries, particularly stark differences between oil and mineral exporting countries on the one hand and other African countries on the other.

Despite the recent gains on the economic front, the general consensus today, in 2006, is that Africa is still lagging behind other continents in its progress towards

the Millennium Development Goals (AfDB/OECF 2006: 35). Africa faces a multidimensional socio-economic crisis; it is the poorest continent on earth, with half its population living on less than US$1 per day (DBSA, 2003**)**. Todaro and Smith (2003) in their definition of development, begin to explain why. They posit that economic growth is a necessary but not a sufficient condition for development. They go on to assert that development encompasses shelter, education, health, culture, basic human rights and freedoms, etc.

Among the key agents of development as defined, the Development Finance Institutions (DFIs) could play a pivotal role as they have a reputation of being knowledge, finance and partnership brokers for development (DBSA Vision 2004, 2014). From their individual and collective extensive knowledge base, innovative solutions to the challenges of underdevelopment and poverty are expected. In fact, they are generally regarded as super entrepreneurs or catalysts for development. They are seen as key to addressing both the market failure and the public failure that result in underdevelopment. Market failure is a situation where private sector players or agents would act in a manner that minimises positive externalities or that produces negative externalities. Public failure on the other hand, occurs when neither the market nor public sector provides goods and services required to provide basic needs.

The persistence of development challenges in Africa is a clear indication of the market and public failure that continues and, by implication, the failure of DFIs to be the super entrepreneurs that they are supposed to be. It can therefore be hypothesised that there is a dearth of entrepreneurial orientation and innovation, or simply 'entrepreneurial thinking', in DFIs, which partly accounts for their failure to meet expectations.

Thus, there is a need for an improved understanding of what the current state of entrepreneurial orientation is within these *catalysts of development*, the DFIs. There is also a need to determine the extent to which efforts to infuse

entrepreneurial culture and behaviours can positively influence DFI entrepreneurial orientation and new venture creation.

1.4 Management question

The resultant management question is: 'How can corporate entrepreneurship be introduced within DFIs?' The management dilemma of underdevelopment and the apparent under-performance of DFIs, as described in the problem statement, demand 'ground-breaking disequilibrating actions' (Schumpeter, 1934; 1942) or continuous innovative actions by DFIs to enhance their effectiveness in delivering on their developmental mandates.

1.5 Research questions

The study will deal with the following research questions:

- Why is corporate entrepreneurship (CE) important for DFI performance?
- What is the status quo of corporate entrepreneurship and innovation in DFIs?
- What are the barriers to corporate entrepreneurship in DFIs?
- What differences exist within and between DFIs regarding entrepreneurship and innovation orientation?
- How successful can corporate entrepreneurship training be in DFIs?

Of relevance to finding answers to these research questions will be Zahra's (1991) integrated approach, which stresses the importance of formal and informal activities in established organisations aimed at enhancing corporate performance and creating new business through product and process innovations and market developments, as well as strategic renewal. These activities can take place at the corporate, divisional, unit, functional, or project level, with the unifying objective of improving an organisation's effectiveness, competitive position and business performance.

1.6 Aim and importance of the research

It is of crucial importance that an 'entrepreneurial mindset' (McGrath & Macmillan, 2000) should be fostered in development corporations in order for them to enhance their contribution to the financing for development in this 'African' millennium. This study draws from the existing body of knowledge on entrepreneurship, and captures and applies from it what is of relevance for corporate entrepreneurship in DFIs. The success stories of entrepreneurs and the passionate innovation and creativity that are embedded in the entrepreneurial approach can also be a performance driving force in DFIs.

The aim of the study is to create entrepreneurially-minded managers and senior professionals to act as the leadership group in an experimental initiative in a DFI; they would be more attuned to new development market opportunities and would stimulate a more innovative and risk-taking culture. The hope is that the resultant change in the leadership group's behaviours and entrepreneurial orientation would eventually cascade to the rest of their respective business units.

The approach is to teach the leadership group to be corporate venturers themselves, and also to spur more opportunity focus and orientation within the rest of the DFI environment. Therefore, the goal was for these leaders to act as catalysts and coaches for more entrepreneurial thinking and acting. This approach is supported by a study by Pearce II, Kramer and Robbins (1997), which has shown that managers who adopt more entrepreneurially-focused behaviours, such as encouraging the destruction of red tape or encouraging staff to try new ways of doing their work, can have an impact on employee satisfaction as well as the company's bottom line.

The aim and importance of the literature section of this thesis is to collect from the entrepreneurship and corporate entrepreneurship literature those principles and concepts that could be refined, developed and used in DFIs to foster a new entrepreneurial organisational climate aimed at finding innovative solutions to the persistent problem of underdevelopment.

The empirical research uses a South African DFI as an experimental case study to assess the entrepreneurial orientation of DFIs; establish whether or not there are statistically significant differences between entrepreneurial factors within and between DFIs; and to demonstrate the success or failure of targeted interventions to promote entrepreneurship in DFIs. Using a diagnostic instrument and an experimental research design, key entrepreneurial factors and areas that require attention if DFIs are to encourage entrepreneurial activities are identified and fostered.

Recommendations are made on how to enhance DFI performance through the infusion of an entrepreneurial spirit.

1.7 Propositions

A. For the literature part of the study (Part II, chapters 3 and 4), the following proposition is formulated:

H_0:A1 Entrepreneurship and corporate entrepreneurship principles are **not** applicable to organisations that pursue non-profit motives, such as DFIs; and **cannot** enhance their performance.

B. For the pre-intervention empirical part (O_1) of the study (Part III, Chapter 6), the following propositions are formulated:

There **is not** a significant difference between the pre-intervention corporate entrepreneurship opinions of the following experimental DFI employee categories:

1. *Managers* (executives, middle managers and project managers) and *other staff* (specialist or professional staff and other staff);
2. *Male* and *female*;
3. Age category ranges *20 to 30* and *31 to 40* and *41 to 50* and *51 to >61*;

4. Service years ranges *0 to 4* and *5 to 9* and *10 to 14* and *15 to >20*;

5. Education levels *less than matric* and *matric* and *post matric* and *graduate* and *post graduate*

regarding the following Corporate Entrepreneurship Constructs:

H_0:B1 Management support for CE

H_0: B2 Work discretion.

H_0: B3 Rewards / Reinforcement

H_0: B4 Time availability

H_0: B5 Organisational barriers

H_0: B6 Innovation organisational support

H_0: B7 Innovation portfolio management

C. For the true-experiment (O X O Control groups) part of the study (Part III, chapter 8), the following propositions are formulated:

H_0: C1-C7 There **is not** a significant difference between the corporate entrepreneurship opinions of the study observation groups (pre-, post-, and control groups) regarding the *above-mentioned Corporate Entrepreneurship constructs.*

H_0: C8-C14 There **is not** a significant change in the corporate entrepreneurship opinions of the above-mentioned employee stratification groups from the pre- to post-intervention groups regarding the *above mentioned Corporate Entrepreneurship constructs.*

D. After the corporate venturing and entrepreneurship training intervention,

H_0: D1 There **is not** a significant increase in the number of new ventures that are indicative of a corporate entrepreneurship culture**.**

All the propositions (null hypotheses) set out above state that there **is not** a real (as opposed to random) difference between the opinions of the various employee stratification groups of the DBSA, or that there is **no** real change due to the effect of the CE training intervention on the CE perceptions and practices.

The alternative proposition, also known as the research hypothesis, states that there **is** a real difference or a real change in the opinions or practices of the underlying population.

The basic strategy of the study is therefore to try to support the alternative proposition by showing that the results of the empirical research are highly unlikely assuming the propositions; and more likely assuming the alternative propositions (Hildebrand & Ott, 1996: 248).

Chapter 2: Research design and methodology

2.1 Research design classification

This research is designed as a formal case study (Cooper & Schindler, 2003). This is supported by the researcher's more than ten years of practical experience and insights gathered during his employ in national and international development finance institutions. Such insights are complemented by pre-PhD exploratory studies comprising graduate level coursework on entrepreneurship, development economics, innovation and creativity, international business and research methodology. The exploratory studies culminated in an academic research paper entitled: *Identifying entrepreneurship concepts for private and public sector development corporations to enhance their effectiveness*. The academic research paper was presented at a colloquium hosted by the School of Economic and Management Sciences, Department of Business Management, the University of Pretoria on 1 July, 2004. Some of the findings of the exploratory studies and insights, especially those that pertain to DFIs and development effectiveness, were also presented and debated at a World Bank Seminar hosted by the Carleton University in Canada on 7 July 2004, under the title: 'Raising the stakes in evaluation: A key to Africa's Renaissance?: A DBSA perspective" (Gantsho, 2004).

This formal study is designed to answer scientifically the research questions raised under section 1.4, and to test the corporate entrepreneurship hypotheses/propositions listed under section 1.7 in Chapter 1.

2.2 Purpose of the study

For many years DFIs have been run according to bureaucratic principles, as extensions of the civil-service machinery. Corporate entrepreneurship in DFIs is a new phenomenon that must first be validated with a literature study on entrepreneurship in corporates generally, and in public and quasi-government

organisations in particular. The aim and importance of the literature section are to collect from the entrepreneurship and corporate entrepreneurship literature those principles, concepts and constructs that could be refined, developed and experimentally applied to DFIs for the enhancement of their corporate culture and internal capacity to find new solutions for development challenges.

The empirical study section seeks to answer the questions of *who, what, when, where or how much* of entrepreneurship in DFIs. It is aimed at measuring selected entrepreneurial factors or constructs, and demonstrating statistically significant relationships between such entrepreneurial factors within and between DFIs. This aspect of the study is therefore *descriptive* in nature (Cooper & Schindler, 2003: 149)

Furthermore, the study has involved interventions by the researcher beyond those required for measurement. The interventions were made at a national DFI and were in the form of a corporate-wide change management programme that included entrepreneurship communication, leadership, corporate entrepreneurship training and innovation management system redesign. The corporate entrepreneurship training component was designed to manipulate the following factors or constructs as independent variables: managerial support for CE; work discretion; rewards/reinforcement; time availability; organisational boundaries, barriers and bureaucracies; innovation organisational support; and innovation portfolio management. It was then observed how the interventions affected the perceptions and practices of managers, professionals and staff on corporate entrepreneurship and innovation as dependent variables.

This research approach follows prior research that 'examined the determinants of firm-level entrepreneurship by uncovering those variables that enhanced companies' willingness to be entrepreneurial' (Kuratko & Welsch 2001: 369).

The extent of the existence of statistically significant relationships between perceptions of stratification groups of development workers, and between entrepreneurship training and an entrepreneurially supportive environment and

new venture creation was observed, tested and documented. This aspect of the study is still descriptive, and not *causal*, in nature, as only correlational relationships were proved by inductive reasoning and inferences drawn (Cooper & Schindler, 2003: 149)

Conclusions and recommendations are drawn from: the results of statistical significance tests of relationships between perceptions of DFI different staff groups regarding entrepreneurship and innovation factors; and on how entrepreneurship training is a statistically significant correlate of new venture creation (Kuratko & Welsch, 2001).

2.3 Method of data collection

For the empirical study the method of data collection was interrogative or communicative. The researcher questioned the subjects and collected their responses by means of an **I**nnovation and **C**orporate **E**ntrepreneurial **A**ssessment **I**nstrument (**ICEAI**) questionnaire instrument adapted from the Corporate Entrepreneurial Assessment Instrument of Hornsby, Ireland & Kuratko (1990). The questionnaire was designed to diagnose the supportiveness of the DFI corporate culture and capture the degree of entrepreneurship, and also the underlying organisational dimensions of corporate entrepreneurship and innovation in DFIs. Statistically significant differences of CE orientation within and between DFIs were assessed (refer to chapters 6 and 8).

Evidence of entrepreneurial *acting* was secured through assessing items such as completed new venture plans; new product ideas; paper selections; presentations and the like (refer to Chapter 7).

2.4 Topical scope (breadth and depth) of study

The study is a hybrid of *statistical* and *experimental case* study designs.

The statistical design aspects capture the DFI entrepreneurial characteristics by drawing inferences from the characteristics of the population elements at a local

DFI, and from a sample drawn from comparative international DFIs. Hypotheses are tested quantitatively, and generalisations about the findings are presented based on the strength of the instrument factor analysis, the statistical significance of the relationships, and the validity of the design (Cooper & Schindler, 2003: 150).

The experimental case design aspect of the study is an in-depth contextual analysis and synthesis of conditions in a local DFI and their interrelations. While the administering of the ICEAI questionnaire has characteristics of an *ex post facto* research design, where a researcher interviews respondents to determine what is or what has been (Cooper & Schindler, 2003: 424), an experimentation design was added to allow the researcher to administer a *stimulus* (in the form of entrepreneurial skills development) and then test for changes in attitudes and behaviours and the resultant statistical significance of the observed differences, if any.

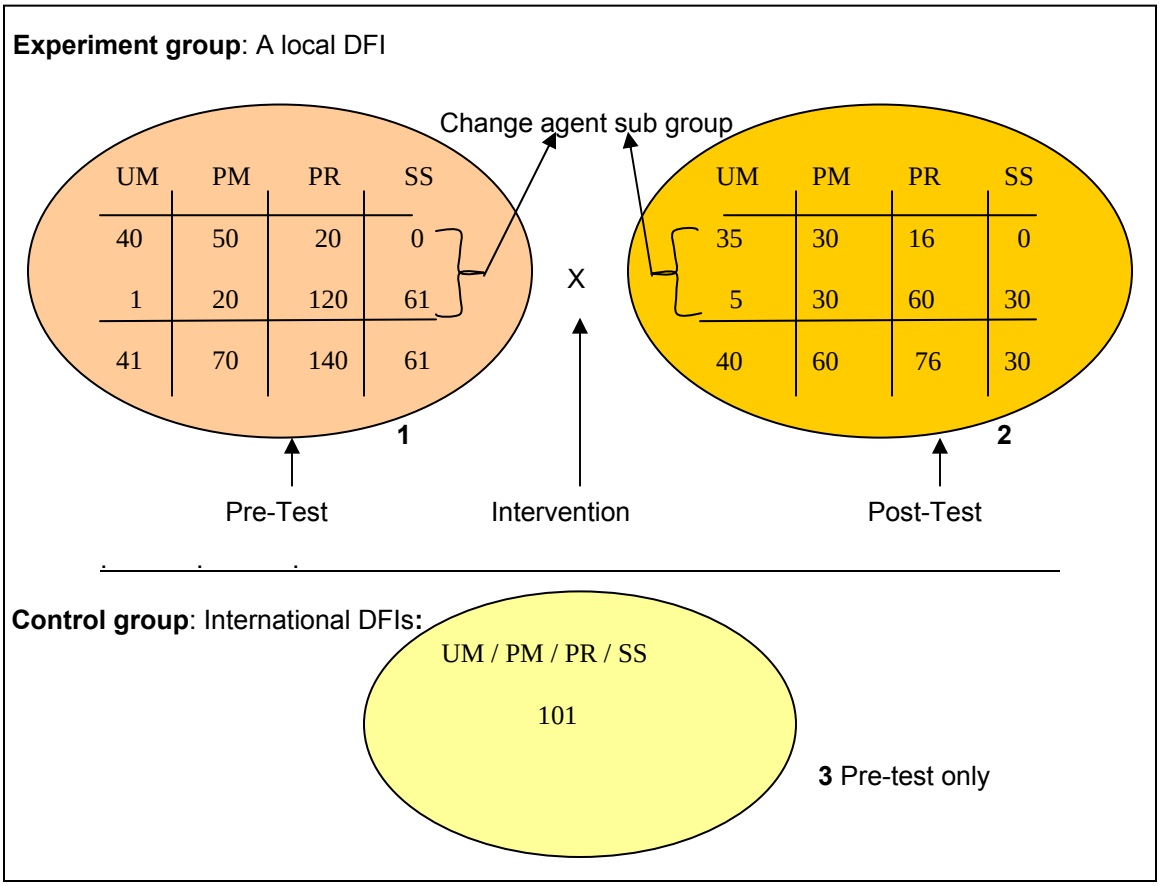
The experimental design used is analogous to a *True Experimental Design* (Cooper & Schindler, 2003), in which two groups of participants are sampled. The first group sampled in this study is an experimental group whose participants consisted of the staff population of a local DFI. More than 60% of this group's population was pre-tested; and then more than 40% of the same group's population was post-tested. A substratum of the first group, the 'change agent' sub-group, comprising management and senior professionals, was given a higher-level stimulus than the rest of the experimental group. The second group in the study is a comparative control group of participants chosen from ten international DFIs, and pre-tested only.

After the initial pre-test measurement of entrepreneurship in both groups, the local DFI was subjected to an organisation-wide change management programme for almost a year. The change management programme entailed an intensive formal 'innovation and corporate entrepreneurship' training intervention for the 'change agent' subgroup of the experimental group, venturing exercises,

organisation-wide workshops, innovation circles, CEO innovation awards, quick wins celebrations, and constant communication about corporate entrepreneurship. The experimental group was then post-tested after the training intervention period. This type of design is analogous to a *Pre-test – Post-test Control Group Design* (Cooper & Schindler, 2003: 438). The use of a control group enhances the design by achieving true equivalence of groups. Maturation, testing and regression can also be handled well, as it can be expected that these would be felt equally in both the experimental and comparative control groups. Figure 2.1 depicts this experimental design.

The purpose of the experiment is not necessarily to prove *causal relationships* but to determine if the variables: corporate entrepreneurship training; the corporate entrepreneurial climate; and corporate venturing, are independent of (unrelated to) one another, and if they are not, then to determine the strength or magnitude of the relationship (Cooper & Schindler, 2003: 162).

Figure 2.1: Pre-test post-test control group design



Sample size for **O_1 and O_3**

- O_1 (Local DFI) Sample size = 312

  (Unit Managers = 41; Project Managers = 70; Professionals = 140; Support staff = 61)

- O_3 (International DFIs) Sample size = 101

Sample size for **O_2** *(size and breakdown are near accurate estimations)*

- O_1 (Local DFI) Sample size = 206

  (Unit Managers = 40; Project Managers = 60; Professionals = 76; Support staff = 30)

Key:

O_1 = Pre-testing (or pre-measurement), and **before X,** of knowledge, practice and climate of entrepreneurship concepts and constructs on Experimental Group participants (Observation 1). This will also serve as baseline research data;

X = Launch of innovation and corporate entrepreneurship change management programme, including training and imparting of entrepreneurial knowledge and practice (treatment or experiment), on Experimental Group participants.

O_2 = Post-testing (or post-measurement), and **after X,** of knowledge, practice and climate of entrepreneurship concepts and constructs on Experimental Group participants (Observation 2);

O_3 = Testing (or measurement) of knowledge, practice and climate of entrepreneurship concepts and constructs on other DFIs' Control Group participants, on which **no X** is performed.

UM = Unit Mangers

PM = Project Managers

PR = Professionals

SS = Support Staff

For the purposes of this study, the staff of the Development Bank of Southern Africa (DBSA), a South African DFI with international operations, formed the Experimental Group, while staff of the International Finance Corporation, a member of the World Bank Group, together with nine African development finance institutions, constituted the Control Group.

The questionnaire was administered to the entire population of the experimental DFI elements (540 elements). A 60% (312) response constituted a good sample and can be said to represent the characteristics of the population it purports to represent.

Regarding the control group, the represented organisations are in the same development finance industry. Questionnaires were administered to 28 (twenty eight) delegates attending a conference from nine African DFIs, then each delegate was asked to take back three more questionnaires for completion by colleagues in the respective organisations. Questionnaires were also administered to the entire local office of an international DFI. While responses from each organisation were small and cannot be regarded as representative of the perceptions of the populations in each DFI, the total response from all control group DFIs was acceptably large, at 101 (one hundred and one), for the design purposes of the present study.

2.5 Data analysis

For the analysis of the quantitative data aspects of the questionnaires, the Statistical Analysis Systems (SAS. 1988) of the University of Pretoria's Statistics Department has been used. For comparative purposes, comparative statistical tools such as the Analysis of Variance (ANOVA), and Scheffe's S Test have been used to test the propositions made and to make statistical significance comparisons within the *pre-test - post-test group* and between it and the *comparative control group*, and wherever else possible (Cooper & Schindler, 2003).

2.6 Findings

The findings are reported in this doctoral thesis as prescribed by the University of Pretoria. The main conclusions will be discussed with the relevant DFIs, their stakeholders and the development finance fraternity in general. It is also envisaged that the findings and conclusions will be reported in publications on entrepreneurship, development economics, innovation, development finance, and the like.

2.7 Recommendations

The main conclusions of the research are about the acceptance or the non-acceptance of the propositions listed under section 1.7 in Chapter 1. The recommendations offer empirically tested ideas on how to foster corporate entrepreneurship, innovation, and new venture creation within DFIs in order to find new solutions for the challenges of underdevelopment.

2.8 Budget

In view of the potential benefits of the study to the cause of development, some aspects of the research, such as the sourcing of the training service providers, were commissioned officially by the experimental DFI as part of its change programme. The researcher controlled the research design; data collection and

preparation; data analysis and interpretation; and the final research report writing. The monetary cost of the research to the researcher was negligible.

2.9 Future research

For future research, it is suggested that corporate entrepreneurship constructs and their interrelations, within and between DFIs, should be assessed against DFIs' **k**ey **d**evelopment **p**erformance **i**ndicators (KDPIs), such as poverty reduction, wealth creation, and job creation. The intention may not necessarily be to prove causal relationships, but mainly to determine whether the variables, corporate entrepreneurship constructs and development effectiveness, are independent of one another, and if they are not, then to determine the strength or magnitude of the relationship (Cooper & Schindler, 2003: 162).

2.10 Conclusion

This chapter presented the present study's research design and methodology and concludes a two chapter research orientation section. The experimental case study design of the study allows for in-depth contextual analysis and synthesis of conditions in a chosen development finance institution. This entails the pre-testing of subjects' opinions, the administration of a stimulus, the post testing of subjects' opinions and behaviours and the testing for statistical significance of the observed differences if any.

The next section, part II, is made up of chapters 3 and 4 presenting an overview of the literature on entrepreneurship and corporate entrepreneurship respectively.

PART II

ENTREPRENEURSHIP LITERATURE

REVIEW SECTION

Chapter 3: Entrepreneurship theory

3.1 Introduction

Good science begins with good definitions (Bygrave & Hofer, 1991: 13). Prevailing definitions of entrepreneurship have made it a clear target for scientific research by academics and practitioners alike. Such research has refined the understanding of entrepreneurship and its related constructs and concepts, thus facilitating better communication of research recommendations to policy makers. (Carton, Hofer & Meeks, 1998: 2).

The review of entrepreneurship literature indicates that there are two types of definitions: dictionary definitions and operational definitions. In a dictionary definition sense, the word *entrepreneur* derives from the French verb *entreprendre* and the German word *unternehmen,* both of which translate to 'undertake' (Carton et al., 1998: 3; Jennings, 1994: 11). This dictionary definition of entrepreneurship may be adequate for general communication but not for research and policy formulation. Operational definitions, on the other hand, specify characteristics of physical objects (e.g. a machine tool) or highly abstract objects (e.g. achievement motivation) and how such characteristics are to be observed, and are therefore more useful in research (Cooper & Schindler, 2003: 45).

This chapter presents a literature review of the approaches to defining entrepreneurship in the operational sense, and covers some of the concepts that are frequently used and are considered useful in describing the notion of entrepreneurship. Chief among such concepts is the 'innovation' construct; hence an interrelationship between innovation and entrepreneurship is accorded a dedicated section. The chapter ends with a synthesis of the most relevant and useful entrepreneurship concepts for promoting entrepreneurial activity in existing organisations, which is the subject of Chapter 4.

3.2 Entrepreneurship definition

Whereas there are numerous operational definitions of entrepreneurship in literature, in a broad sense there are two plausible approaches to defining it operationally: (i) the *psychological approach* and (ii) the *behavioural approach*.

The *psychological (or sociological) approach* is: to ask the question who the entrepreneurs are; to observe them; and then to define entrepreneurship inductively based on their *characteristics* as persons and on what they do as entrepreneurs (Carton et al., 1998: 7). This approach is also referred to as the 'trait approach', and it tries to establish a causal link between the characteristics and the actions of entrepreneurs.

Past empirical research and literature cite the following characteristics of entrepreneurs, among others: the *need for independence*; *locus of control*; *propensity for taking risk*; c*reativity and innovation* (Dollinger, 2003; Nieman & Bennett, 2002).These characteristics have to do with the individual's mindset and include self-confidence, persistence, passion, and the desire to achieve (UCT GEM Report, 2001: 7). According to the UCT GEM report (2001: 7), these characteristics are dependent on the business opportunity, the society and the individual's background; entrepreneurs are not necessarily born with these characteristics, but can acquire them through life experiences.

The psychological approach often raises questions such as: Are entrepreneurs made or born; Is there a gene for running a successful business; Is it about nurture or nature? Answers to these questions abound in the literature, including: 'You don't need a "name" to succeed'; 'Entrepreneurialism is a classless thing'; 'Entrepreneurs come from different backgrounds and have different qualities'; 'It is one thing to have the determination to succeed; you also need the technical backup as well'; 'The psychology is only part of the process; you also need the skills and the environment' (Smith, 2000: 48).

The psychological approach is useful in bringing to the fore the pertinent point that entrepreneurial abilities can be directly developed by education, training, and experience. These interventions result in the accumulation of the entrepreneurial competencies, knowledge and skills required to carry out all or part of the entrepreneurial process (Block & MacMillan, 1995: 7; Smith, 2000: 48).

The training intervention component of the present study, reported herein in Chapter 7, finds its theoretical underpinnings in the psychological approach of defining entrepreneurship.

The *second* approach, the behavioural approach, is: to ask what the entrepreneurial activity is, and then to define entrepreneurs as those who engage in such an activity. This approach focuses on the entrepreneurial process and not on the characteristics of the entrepreneur (Carton et al., 1998). Following the entrepreneurial process approach, Bygrave and Hofer (1991: 14) define entrepreneurship as involving 'actions associated with the perceiving of opportunities and the creation of organisations to pursue them'. For Nieman, Hough and Nieuwenhuizen (2003:9), entrepreneurship is about the actions of people who perceive opportunities in the market, take risks, gather or combine resources, and establish and grow organisations to meet such market needs for a profit as reward.

Early pioneers in the discipline of entrepreneurship appear to have looked at what entrepreneurs did as opposed to what traits they possessed. Richard Cantillon (1755) and Jean-Baptiste Say (1803; 1815; 1816; 1839) viewed entrepreneurship from the perspective of the related fields of Economics and Business Management (Nieman et al., 2003). Cantillon highlighted the role of an entrepreneur as taking risks such as the uncertainty of buying goods at certain prices and selling them at uncertain prices, and bringing about equilibrium of supply and demand. Say broadened Cantillon's definition to include the concept of combining factors of production.

More than a century later, Kirzner (1973; 1992; 1997) agreed with Cantillon's 'equilibrating' thesis of entrepreneurship, and provided the perspective that entrepreneurship is the process by which markets are brought from a state of disequilibrium toward a state of equilibrium through the opportunistic actions of individuals. From this perspective, entrepreneurial actions are equilibrating actions entailing the reallocation of resources and the introduction of new information into the marketplace, thus moving the market closer to equilibrium (Smith & Di Gregorio, 2002).

A contrasting but complementary school of entrepreneurship, based on the work of Schumpeter (1934; 1942), focuses instead on actions that move markets away from, rather than towards, equilibrium (Di Gregorio, 2005: 216). This school of entrepreneurship adopts a process approach, emphasising innovative actions that generate and disseminate new economic and business knowledge. Schumpeter (1939), considered to be the modern father of entrepreneurship, explained economic growth through entrepreneurship. He claimed that there were ratchet effects in innovation, such that entrepreneurial-driven spurts of economic activity led to progressively higher levels of income. Schumpeter (1934) insisted that *innovation* was the key driver of 'development', and that innovation involved discontinuous punctuated changes in the economic environment, which were brought about by a variety of things, such as sudden discoveries of new factors or supplies, but in particular entrepreneurial innovation. Schumpeter (1934: 74) asserted that one is an entrepreneur only when one actually 'carries out new combinations', and loses that status as soon as the establishment phase is complete and when one settles down to run one's business routinely.

Thus, the Kirznerian equilibrating actions and the Schumpeterian disequilibrating actions are distinct and yet mutually dependent parts of the same entrepreneurial process. At equilibrium, an entrepreneur could still undertake ground-breaking actions that move the market away from equilibrium. But these disequilibrating actions occur with much less frequency than equilibrating ones, and opportunities

to undertake them may not be available to all firms or entrepreneurs. Furthermore, it is unclear from existing research whether opportunities to undertake disequilibrating actions are greatest when equilibrium or disequilibrium conditions exist (Smith & Di Gregorio, 2002).

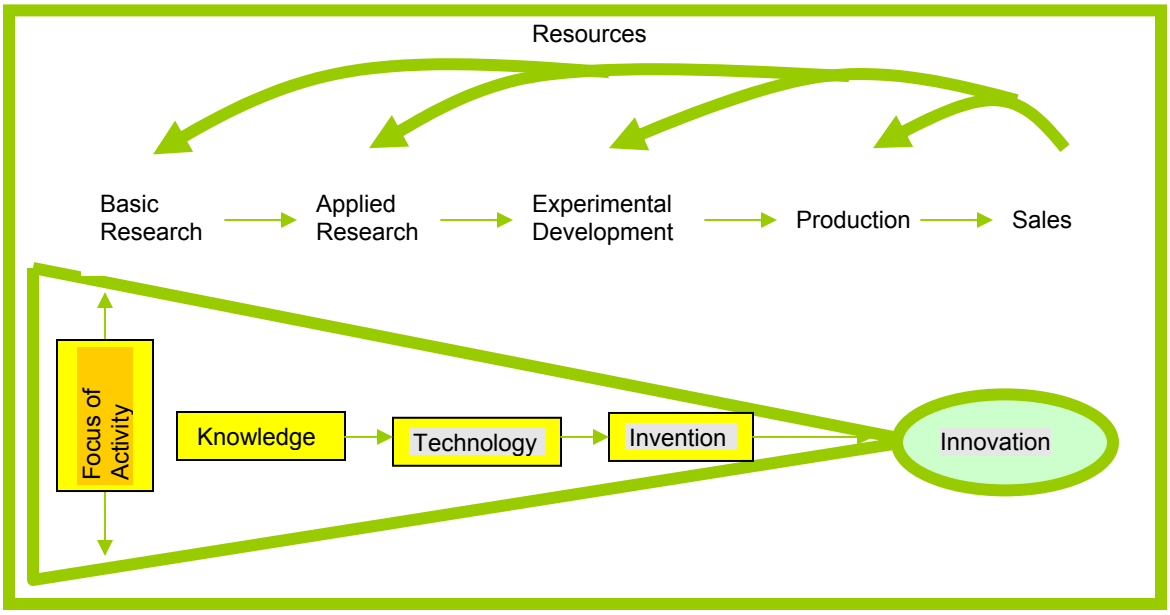
It is noteworthy that a Markinor survey, sponsored by the 'experimental DFI' of the present study to assess the competitiveness of the financial sector in financing development, found that the DFI was 'doing business as usual' and consequently losing market share to the more innovative commercial banks (Markinor, 2005). This finding contributed to the choice of the experimental DFI, and the new venture creation results of the experimental intervention are reported in Chapter 7 hereunder.

3.3 The innovation process and entrepreneurship

As can be seen from the above literature review, innovation is a critically important component of entrepreneurship. The innovation process comprises a series of distinct and apparently sequential phases in the realisation and transformation of new knowledge into new products and processes. Broadly, the phases can be named as '*pure research*' and '*applied research*'. Alternatively, they can be named as 'science' and 'technology' or as 'knowledge' and 'products'. This categorisation is useful in establishing a linkage between *knowledge generation* and *socio-economic implications*.

This phased conception of the innovation process is supported by Von Braun (1997), who recorded the emergence of a frequent notion of the process of innovation that combines the individual phases mentioned above into a mental model summarised in the cycle shown in Figure 3.1 below:

Figure 3.1: Simple model of the innovation process



Source: Adapted from Von Braun (1997: 20)

In this simple innovation model, *creativity* may be substituted for *knowledge*, whereas *technology* and *invention* may be lumped together as *invention.*

The process of innovation is not always as sequential as it may appear to be in the above model. It is indeed iterative, and Drucker (1985) concurs that innovation can also be induced by, inter alia, external market forces, and innovation in turn may produce new knowledge, and thus cause a backward iteration that is depicted by the backward looping arrows in Figure 3.1.

3.3.1 Creativity and innovation

The early phase in the innovation process involves *creativity,* or knowledge generation or basic research, as it is referred to in the above 'simple innovation model'. Creativity is a dynamic whole-brain activity that involves conscious and subconscious mental processing in both generating an idea and making something happen as a result. Essentially, creativity has the features of newness, novelty, surprise, uniqueness and utility. 'Creativity is seen as higher order thinking or divination' (Lumsdaine & Binks, 2003: 23). It is expressed in the

quality of ideas and theoretical solutions and is therefore a necessary condition for inventions and innovation (Lumsdaine & Binks, 2003: 24-25).

Luecke (2003: xi) posits that many see innovation as a process that begins with two creative acts: idea generation and opportunity recognition. In the first, a person develops an insight about something new. Idea generation sometimes takes the form of a technical insight with no apparent commercial application. Opportunity recognition occurs when value to the customer is perceived from the initial idea. Once the opportunity is recognised and a financial feasibility is proved, the next phase of the process is idea development, followed by a long and bumpy road toward the commercialisation of the innovation. Commercialisation is where the idea, converted into an innovation, is finally tested by the customer.

In the context of entrepreneurship, it is creativity that leads to entirely new products. It originates in an individual's mind, whereas innovation involves a team and subsequently a wider organisation. One of the key differences between creativity and innovation is the timing. Creativity constitutes the ideas that are often needed before product or service development, whereas innovation is the process that converts such ideas into products and services. Innovation takes place much later in the entrepreneurial process and it builds on creativity. Creativity is thinking about something, whereas innovation is doing something about it.

3.3.2 Invention and innovation

Schumpeter (1934) distinguished invention from entrepreneurial innovation. He hypothesised that the latter involved not only figuring out how to use inventions, but also involved introducing new means of production, new products, and new forms of organisation. In his view, innovation takes just as much skill and daring as does the process of invention.

Invention is similar to discovering something new. It is often associated with something that is unknown at the time of their development, something that is *unknowable* (Christensen, 2003: 165). Christensen argues that most managers learn about innovation in a sustaining technology context. Such innovations are, by definition, targeted at known markets in which customer needs are understood. This implies that the innovation process that follows discovery is a collaborative effort between suppliers and customers. They discover the product that meets customer needs together. The strategies and plans that managers formulate for confronting such discoveries, or disruptive technologies, must therefore be plans for learning and discovery, rather than plans for development and execution (Christensen, 2003: 166).

Christensen's views above appear to portray invention as something mysterious and which cannot be planned for before hand. Planning begins only after the invention has been made. A contrary view is the view that associates invention with research. Drucker (1985: 34) argued that by 1914, the time World War I broke out, invention had become a systematic, purposeful activity, which is planned and organised with high predictability of the results. Drucker goes on to advise that something similar now has to be done with respect to innovation. Entrepreneurs have to learn to practice systematic innovation

3.3.3 Change and innovation

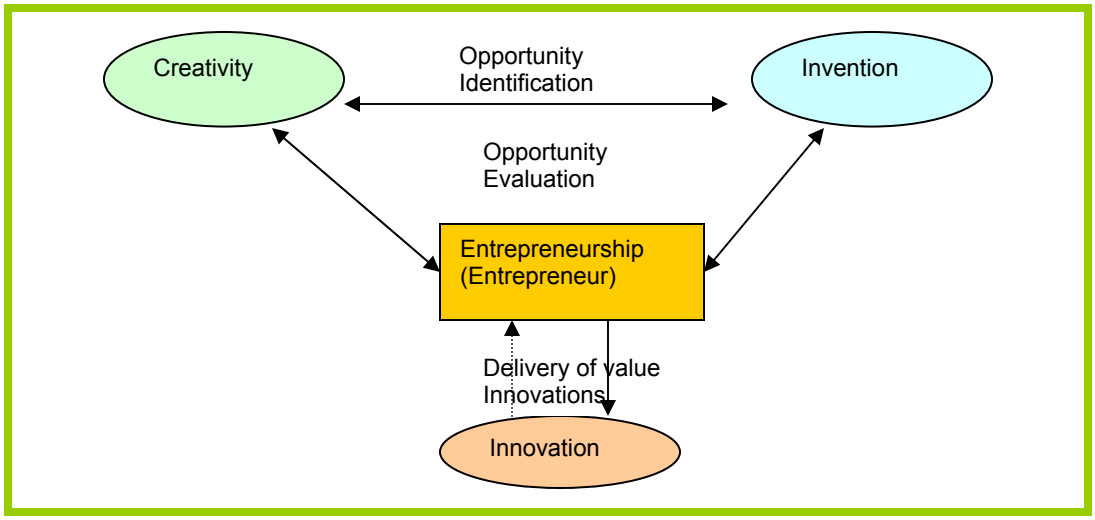
The 'new and different' is, however, motivated by change. The purposeful and organised search for such change and the systematic analysis of the opportunities presented by it constitute 'systematic innovation' (Drucker, 1985: 31). While Drucker (1985: 98-110) postulates that the discipline of innovation, which he refers to as the knowledge base of entrepreneurship, is a diagnostic discipline for identifying entrepreneurial opportunities, entrepreneurs do not only respond to change. They in fact cause and enable change (Di Gregorio, 2005). They unite all means of production (e.g. labour, capital and land) through innovative processes (Say, 1803 to 1832, in Nieman et al., 2003).

Therefore, entrepreneurs seek or attempt to cause market changes, applying innovation while taking risks. Within this process, ideas are identified and converted into opportunities to create a change in the marketplace.

3.3.4 Entrepreneurship and creativity, invention and innovation

As depicted in Figure 3.2 below, at the centre of the innovation process is the entrepreneur.

Figure 3.2 The process of entrepreneurial innovation



Source: Adapted from Wickham (2001: 222)

In this diagram, Wickam's (2001: 222) lines directly connecting creativity with innovation, and also those directly connecting invention with innovation, have been removed to emphasise the centrality of entrepreneurship and the entrepreneur in the delivery of innovation. The intention is, however, not to under-emphasise the backward iteration of the model, which indeed exists.

Therefore*, innovation* is an integral later part of the entrepreneurial process. It is the ultimate 'tool' and means by which entrepreneurs exploit change as an opportunity for a different business or service (Drucker, 1985). For Wickham (2001: 57), innovation lies at the heart of entrepreneurship, yet to believe in innovation, and to realise it, it is imperative to see a future that will be different

from the present. Entrepreneurs see that desired future and have the necessary motivation to achieve it.

In economics, innovation is seen as the act that endows resources with a new capacity to create wealth. Whatever changes the wealth-producing potential of already existing resources constitutes innovation. Therefore, innovation does not have to be technical, neither does it need to be a 'new thing' altogether, nor does it have to be based on scientific and technological discovery. In other words, innovation can be expressed as an economic or social phenomenon rather than a technical term. However, successful entrepreneurs, motivated by money, power, curiosity or desire for fame and recognition, try to create value and to make a contribution. They are not content simply to improve or modify on what already exists. They try 'new combinations' of existing resources.

3.4 Conclusion

The literature review of entrepreneurship in this chapter serves the following purposes: it lays the basis for a more focused discussion of the phenomenon of entrepreneurship within established organisations (Corporate Entrepreneurship); it identifies distinctive individual characteristics that should be targeted to foster CE; it establishes an interrelationship between an individual and the environmental context where entrepreneurial activity occurs; and it focuses due attention on the activities of the entrepreneur, rather than unduly on the traits of the entrepreneur.

The identified individual characteristics of potential entrepreneurial behaviour that should be borne in mind for the purposes of the present study are: risk-taking propensity; desire for autonomy; need for achievement; goal orientation; and locus of control. The purpose served by the identification of these individual characteristics is to target interventions such as coaching, training and development, while avoiding mismatches between individual motives and organisational needs.

It is also noted from the literature that entrepreneurs are not necessarily born with entrepreneurial characteristics, but that such characteristics can be acquired through life experiences and focused learning. Thus, entrepreneurial abilities can be directly developed by education, training, and experience. The result of such education and training is the accumulation of the entrepreneurial competencies, knowledge and skills required to carry out all or part of the entrepreneurial process (Block & MacMillan, 1995; Smith, 2000).

The training intervention component of this present study, reported in Chapter 7, is based on the theoretical underpinnings of the entrepreneurship theory, particularly: the theory that entrepreneurship can be nurtured; that entrepreneurial actions are associated with the perceiving of opportunities and the creation of organisations to pursue them; and that innovation lies at the heart of entrepreneurship and is seen as the act that endows resources with a new capacity to create wealth or change a socio-economic order for the better.

Unless opportunities and events are perceived and acted upon by members of the organisation, the individual characteristics, whether latent or developed, are worthless. It is for this reason that the behavioural approach to entrepreneurship is useful, in its focus on what entrepreneurs do within established organisations. The next chapter will further develop this argument by looking at the contextual factors within which such actions occur.

Chapter 4: Corporate Entrepreneurship

4.1 Introduction

The challenge faced by established corporations today is harnessing the energy of achievement-motivated employees who yearn to create new products, services and processes. Corporations are faced with the dilemma of needing to have order and control while allowing creative employees to think and act 'outside the box' of control and structure.

The following sections of this chapter review the literature on the various aspects of the notion of corporate entrepreneurship, thereby attempting to define the practice of entrepreneurship within corporations operationally. Corporate entrepreneurship theories are discussed first in order to establish a conceptual framework within which the various manifestations and dimensions of corporate entrepreneurship can be discussed and understood. The chapter ends with a synthesis of the corporate entrepreneurship constructs and relates them to the empirical study section of the thesis.

4.2 The Corporate Entrepreneurship construct

In defining entrepreneurship, Schumpeter (1934) did not limit his notion of the 'pursuit for a discontinuous opportunity' to new ventures only, he also allowed for entrepreneurship to exist within established organisations. Gartner (1989) disagreed and defined entrepreneurship as the creation of new organisations, thus excluding many of the activities commonly associated with corporate entrepreneurship, such as championing and creation of supportive structures and cultures to foster innovation. Other authors, such as Pinchot (1985) perceive corporate entrepreneurship as an extension of individual entrepreneurship within the context of existing organisations, that is: intrapreneurship. Still others approach corporate entrepreneurship from an organisational perspective and are concerned with the organisational and environmental factors that influence the

entrepreneurial process (Covin & Covin, 1990; Zahra, 1991; Russell & Russell, 1992; Zahra & Covin, 1995).

Bygrave (1995) excluded intrapreneurship from his definition of entrepreneurship. His exclusion was based on the assumption that a typical entrepreneur 'risks all his personal cash-flow, some or all of his personal capital, and his career in starting a new venture, which would not be viable without him'. Bygrave's exclusion assumes that corporate entrepreneurs do not risk *personal* cash-flow or *personal* capital, nor do they place their careers at risk. Carton et al. (1998) dispute this exclusion by asserting that these entrepreneurs also do risk *personal* cash-flow streams by placing their personal careers or jobs at risk should the corporate ventures or innovations they promote fail.

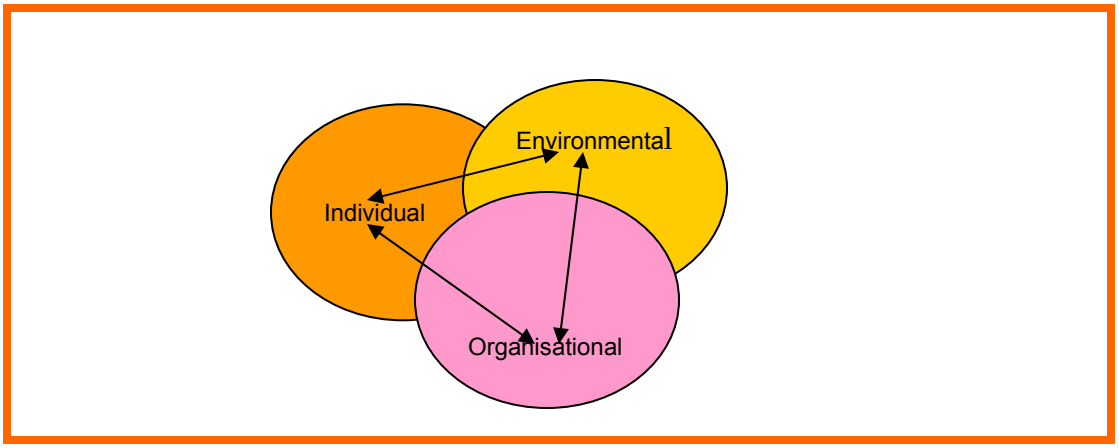
As indicated in the previous chapter, it is documented in the literature that an integral part of the entrepreneurial process is innovation. As such, in literature, corporate entrepreneurship and innovation concepts are used interchangeably. Covin (1999) states that innovation, broadly defined, is the single most common theme underlying all forms of corporate entrepreneurship. Covin (1999) goes further and defines corporate entrepreneurship as the presence of innovation, and adds competitive superiority to his definition. Schindehutte et al. (2000) mention several authors who link the process of 'organisational renewal' with 'innovation' (Miller & Friesen, 1985; Burgelman, 1984; Kanter, 1983; Naman & Slevin, 1993; Miller, 1990; Zahra & Covin, 1995). For Russell (1999), fostering entrepreneurial behaviours and practices assumes prime importance in the grand strategies of many firms where innovation is perceived as key in establishing and maintaining competitive advantage and initiating corporate renewal. Barrett, Balloun and Weinstein (2000) posit that corporate entrepreneurship is an organisational process that encourages and practises the utilisation of innovation, constructive risk-taking, and pursuit of new opportunities.

In modern times, the entrepreneurial function is widely exercised through strategic management, corporate planning, research and marketing structures

within corporations. Strategic management can therefore be a process that deals with the entrepreneurial work of the organisation and with organisational renewal and growth (Morris & Kuratko, 2002: 153). Senior management in large corporations has become increasingly aware of the need for entrepreneurial thinking, such as the infusion of organisations with innovative behaviours (Ginsberg & Hay, 1994; Schindehutte et al., 2000). Morris and Kuratko (2002) refer to this infusion as corporate entrepreneurship, while Pinchot (1985) uses the term intrapreneurship. Simon et al. (1999) call it a managerial approach that will stimulate innovation and re-energise employees.

A review of these and other definitions indicates that entrepreneurship in established organisations is a multi-dimensional phenomenon that incorporates individual, organisational and environmental elements, and is defined by the innovative nature of the actions performed. Figure 4.1 portrays a conceptual interactive relationship between individual, organisational/internal and environmental/external factors in corporate entrepreneurship.

Figure 4.1: Interactive relationship of CE contextual factors

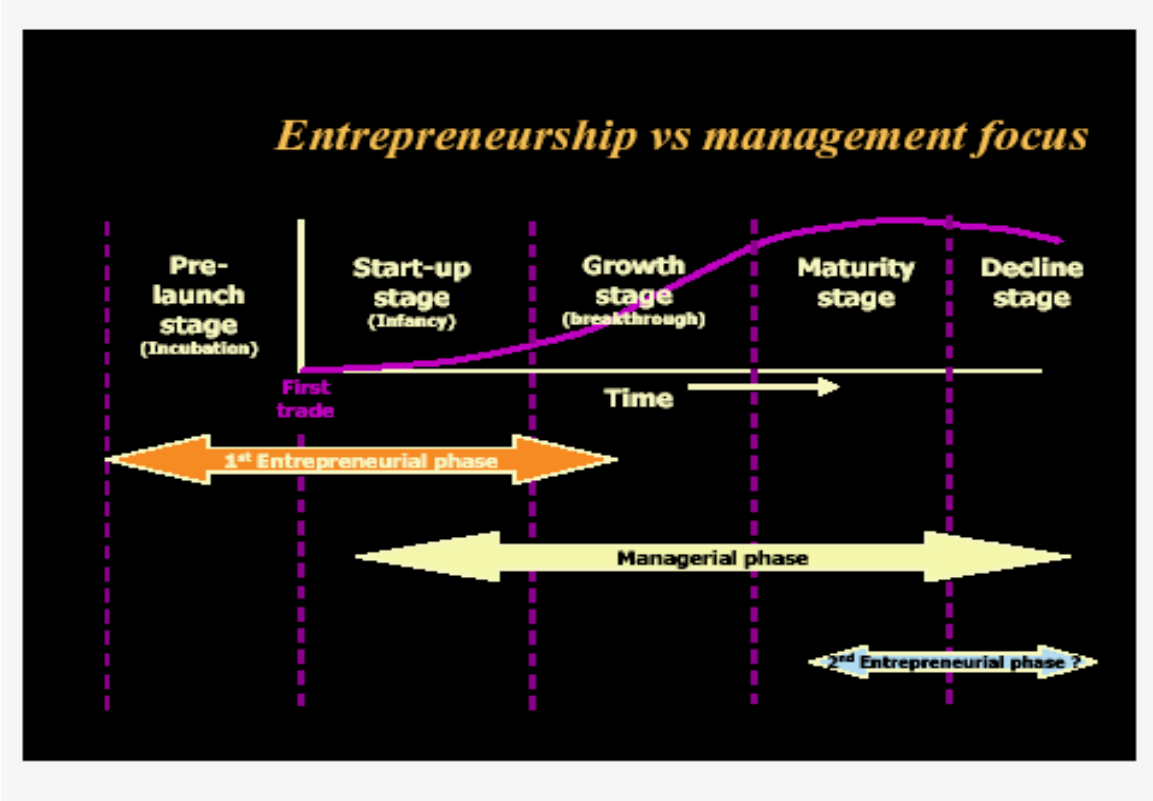


Source: Adonisi (2003)

A literature review of the individual factors is contained in the previous chapter. This chapter focuses on the organisational/internal factors and their interactive relationship with the individual factors in facilitating corporate entrepreneurship. The environmental/external factors are not dealt with in the present study.

It is further posited, as depicted in Figure 4.2, that a transition occurs at some point from entrepreneurship to general management as the organisation evolves and the actions change. Pursuing a 'discontinuous opportunity' constitutes entrepreneurship, whereas incremental changes that routinely occur in organisations constitute general management (Carton et al., 1998).

Figure 4.2: Transition from entrepreneurship to general management



Source: University of Pretoria M.Phil.-Entrepreneurship lecture notes (2005)

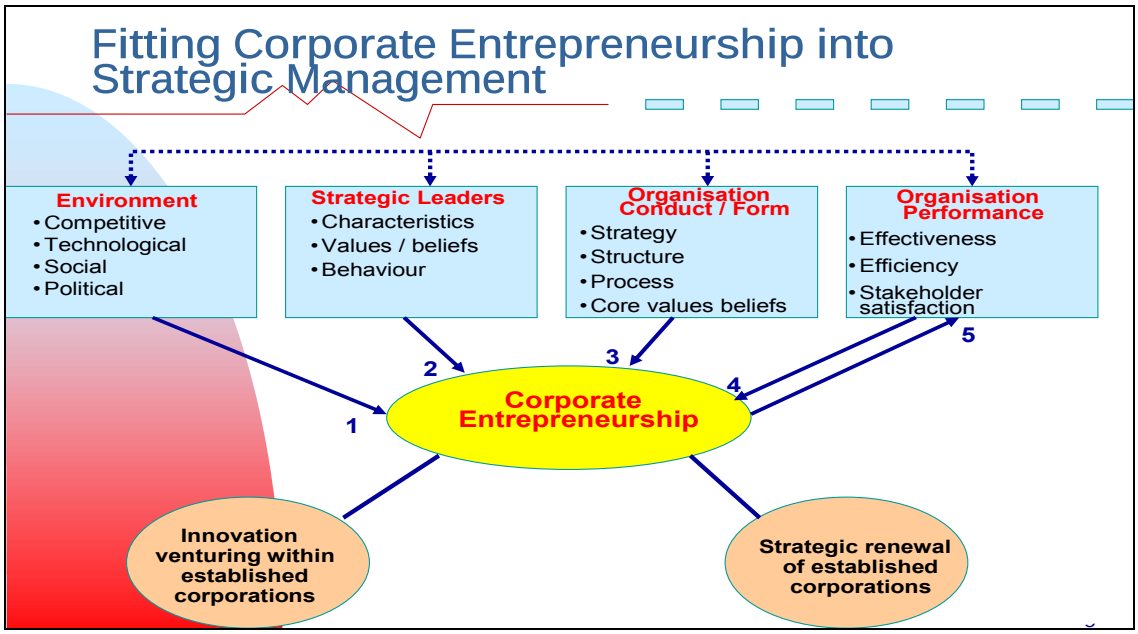
4.3 Corporate entrepreneurship conceptual models

The discussion in the preceding section alludes to the existence of corporate entrepreneurship antecedents and outcomes. The following sections give an overview of key contemporary corporate entrepreneurship conceptual theories and models. The emphasis of the discussion is on the nature of interrelationships between the individual and organisational antecedents, as well as on the outcomes of the entrepreneurial process.

4.3.1 Guth and Ginsberg CE model

In their definition of the CE construct, Guth and Ginsberg (1990: 5) posit that corporate entrepreneurship encompasses two types of phenomenon and the processes that surround them: the birth of new businesses within existing organisations (i.e. internal innovations or ventures); and the transformation of organisations through renewal. These authors' conceptual model depicts CE from a strategic management perspective, as shown in Figure 4.3.

Figure 4.3: A strategic management perspective model of CE



Source: Guth and Ginsberg (1990: 5-15).

The model by Guth and Ginsberg (1990) treats the following factors as antecedents of CE: environment, such as competition or technology; strategic leadership posture, such as values and behaviours; organisational form, such as structure and processes; and organisational performance, such as efficiency and job satisfaction.

The key weakness of the model is that it resembles a flow chart, and therefore depicts a sequential relationship between the CE factors and corporate

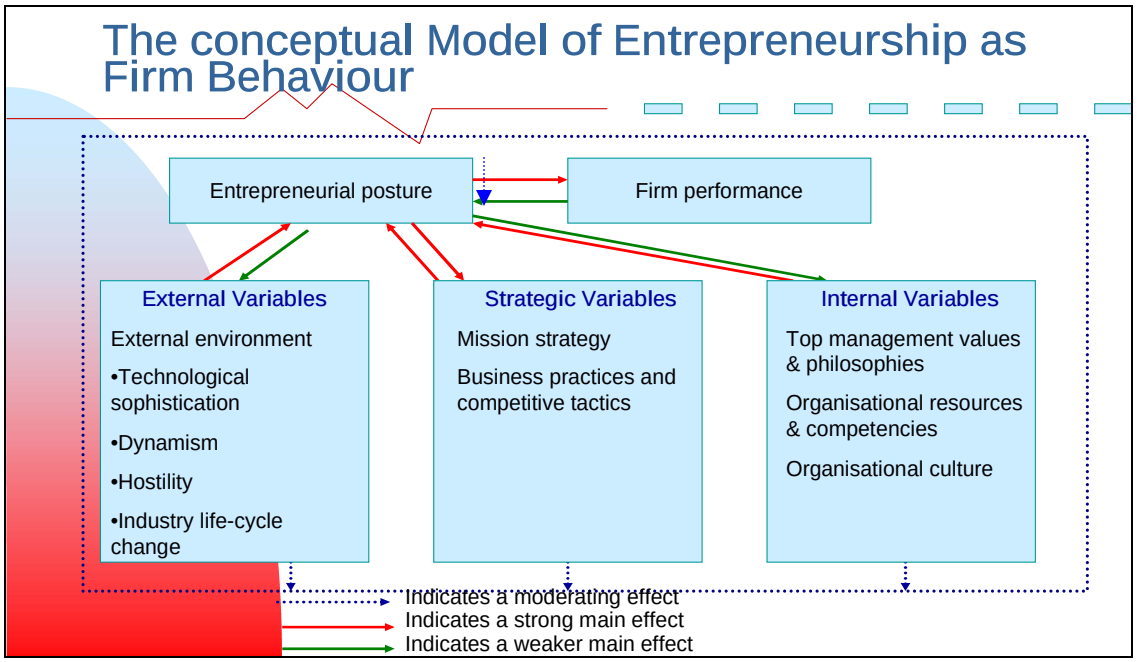
entrepreneurship. Except for the relationship between CE and organisational performance, possible feedback loops and interrelationships between the CE factors on the one hand, and between corporate entrepreneurship and the CE factors on the other, are not depicted.

4.3.2 Covin and Slevin CE model

According to Covin and Slevin (1991), CE involves extending the firm's domain of competencies and corresponding opportunity set through internally generated new combinations of resources. These authors developed a model, as illustrated in figure 4.4, which seems to improve on that of Guth and Ginsberg (1990) in at least two ways: by depicting feedback loops between CE factors and corporate entrepreneurship; and by not being too specific about the type of corporate entrepreneurship – reference is only made to entrepreneurial posture.

The key feature of the model is the recognition that entrepreneurial orientation influences the external environment and the internal variables, albeit to a weaker extent. Conversely, organisational performance has a weaker effect on entrepreneurial orientation. Significantly, it also highlights the acknowledgement that the three CE factors – environment, strategic variables and internal variables – have a moderating effect on the relationship between entrepreneurial orientation and organisational performance.

Figure 4.4: Firm-level behaviour model of CE



Source: Covin and Slevin (1991: 7-26).

Zahra (1991; 1993) criticised the reference in Covin and Slevin's (1990) model to the entrepreneurial posture construct without defining it. Zahra's criticisms and improvements of the model are incorporated in his own model, which is discussed next.

4.3.3 Zahra CE model

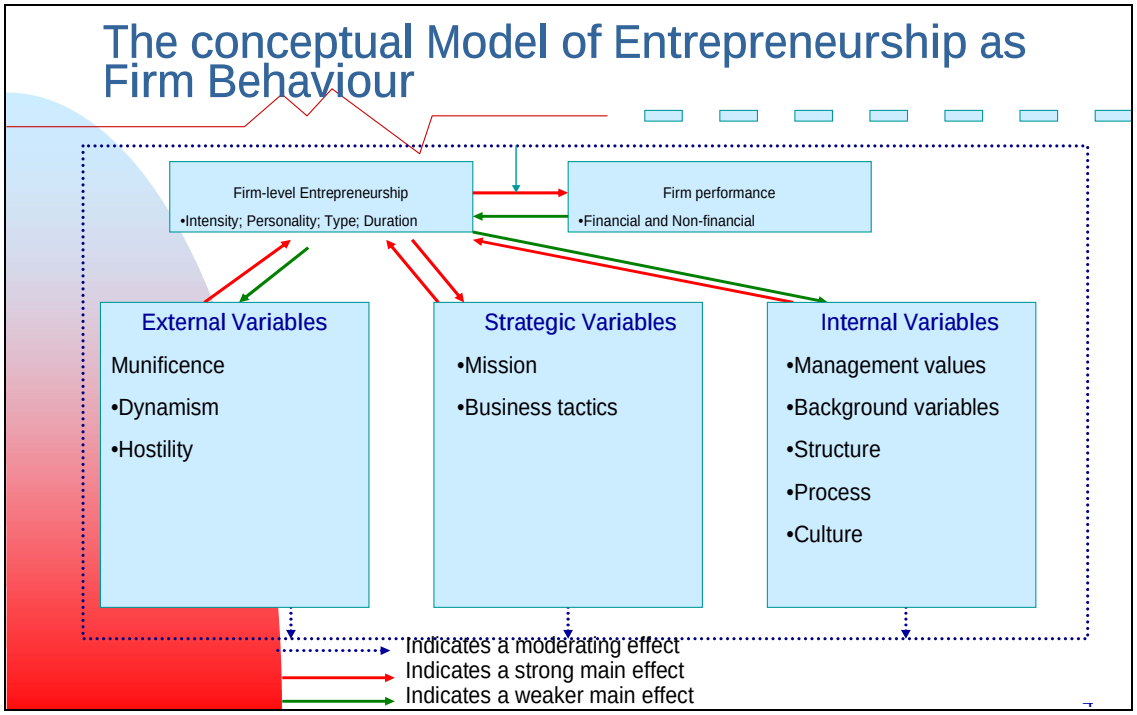
Zahra (1995: 227; 1996: 1715) sees corporate entrepreneurship as the combination of all the firm's efforts on innovation, renewal and venturing. Innovation involves creating and introducing new products, organisational processes and systems; venturing encompasses expanding existing operations or entering into new markets; and renewal entails revitalising the organisation's business model.

Zahra (1993) essentially revises Covin and Slevin's (1990) model in that he merges the technological environmental factor with the dynamism environmental

factor; he adds a new construct called 'munificence' to draw attention to a related construct of opportunity seeking; and he defines entrepreneurial behaviour more clearly, by differentiating between constructs such as 'intensity of behaviour', 'formality of entrepreneurial activities', 'types of entrepreneurial behaviour' and 'duration of such efforts'.

Zahra (1993) also recognises the possibility that different kinds of entrepreneurial posture may influence different dimensions of performance differently and at different times. Regarding the locus of entrepreneurship, he argues that CE occurs at multiple levels within an organisation.

Figure 4.5: Revised firm-level behaviour model of CE



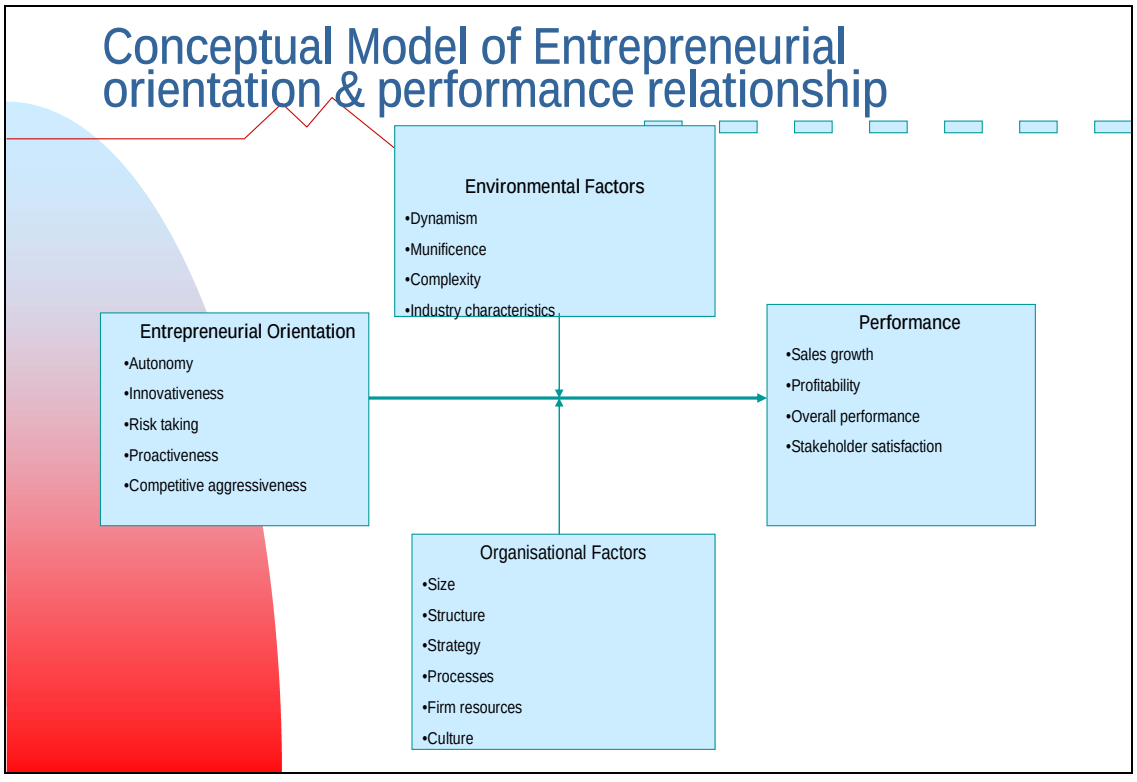
Source: Zahra (1993)

The present study and research instrument take account of all Zahra's (1993) internal variables.

4.3.4 Lumpkin and Dess CE model

As depicted in Figure 4.6, Lumpkin and Dess (1996) present an alternative CE model which describes entrepreneurial orientation in terms of five dimensions: autonomy; innovativeness; risk taking; proactiveness; and competitive aggressiveness. According to Lumpkin and Dess (1996), entrepreneurial orientation refers to the processes, practices and decision-making activities that lead to entering new markets with existing or new goods and services. In this context, a new entry is the idea that underlies the concept of CE (Adonisi, 2003: 47). Key dimensions that characterise entrepreneurial orientation include a propensity to act autonomously, and a willingness to innovate and take opportunities (Lumpkin & Dess, 1996).

Figure 4.6: Entrepreneurial orientation and performance model of CE



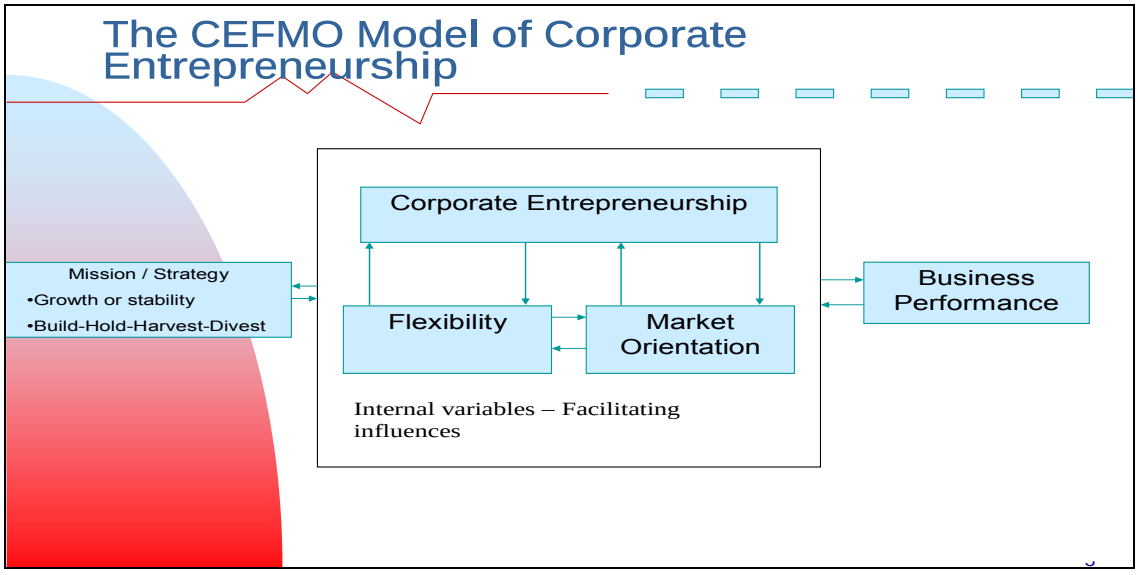
Source: Lumpkin and Dess (1996)

4.3.5 Barrett and Weinstein CE model

Barrett and Weinstein (1998) designed their CE model in an effort to explicate the strategy of an organisation with respect to CE, flexibility, market orientation and business performance. In their model they recognise the reciprocal influences that exist between strategy, internal facilitating variables and business performance.

Market orientation is envisaged as the direct linkage between marketing and corporate entrepreneurship and as the basis for a sustainable competitive advantage (Barrett & Weinstein, 1997). Market orientation requires that an organisation be able to process information quickly, and this in turn presupposes that there is a high level of flexibility with the organisation. Flexible organisations create more autonomy for employees (Adonisi, 2003). Barrett and Weinstein's (1998) dynamic model is shown in Figure 4.7.

Figure 4.7: CEFMO model of CE



Source: Barrett and Weinstein (1998)

4.3.6 Several other integrative CE models

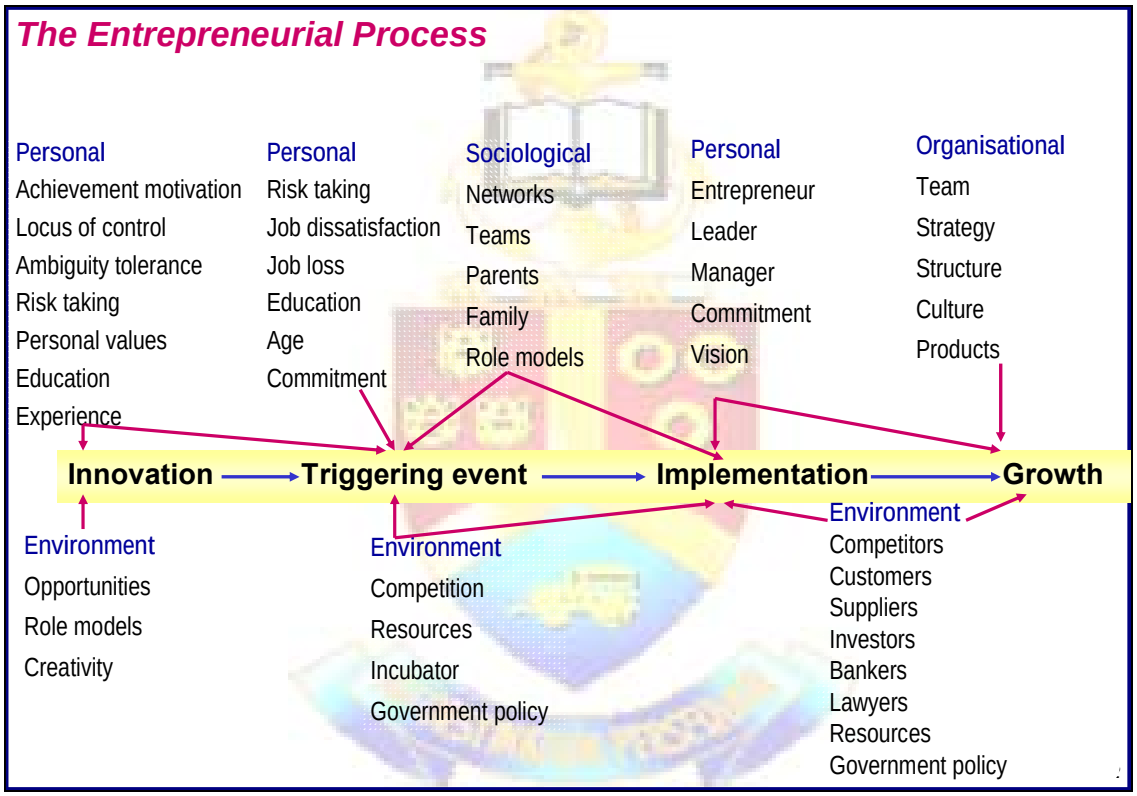
Discussed together in this section are the more integrative contemporary models of CE. These models all confirm that corporate entrepreneurship is a single phenomenon with multiple components. They indicate that there are mainly individual, organisational and environmental factors that are related to CE behaviour (Covin & Slevin, 1991; Hornsby et al., 1993; Morris, Lewis & Saxon, 1994).

On the subject of individual factors, it is argued that the propensity to act entrepreneurially is a function of motivation (McClelland, 1976), which in turn is a function of the individual's innate personality and the environmental and organisational context in which that action occurs.

Regarding the organisational factors, there is general support in the literature for the view that CE is a function of the organisational context (for instance, Morris & Kuratko, 2002). Organisational context has been defined as a set of administrative and social arrangements that shape the behaviour of individuals in the organisation over which top management have some control. Organisational factors such as management support, reward systems, organisational structures and bureaucracies, resource/time availability, and freedom to act, all influence and shape the behaviour of people who work in that organisation.

Taking into account all these factors, the following four models present a summarised picture of an integrated approach to corporate entrepreneurship.

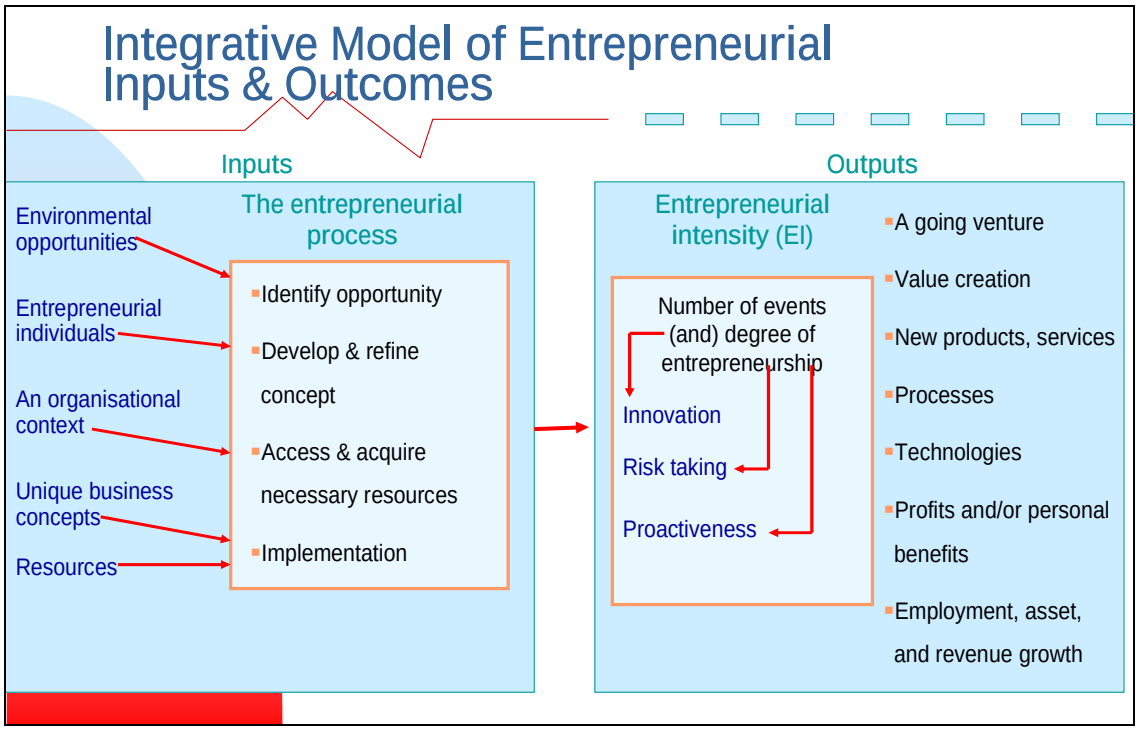
Figure 4.8: Entrepreneurial process model of CE



Source: Hisrich and Peters (2002: 39)

In Figure 4.8, Hisrich and Peters (2002: 39) present a process model of CE and suggest that CE: can be broken down into steps and stages; is a logical progression of events through an innovation life cycle; and can be applied to any organisational context, depending on the environmental context within which an entrepreneurial event occurs. The model identifies personal, sociological, organisational and environmental or external factors that trigger or moderate an entrepreneurial activity.

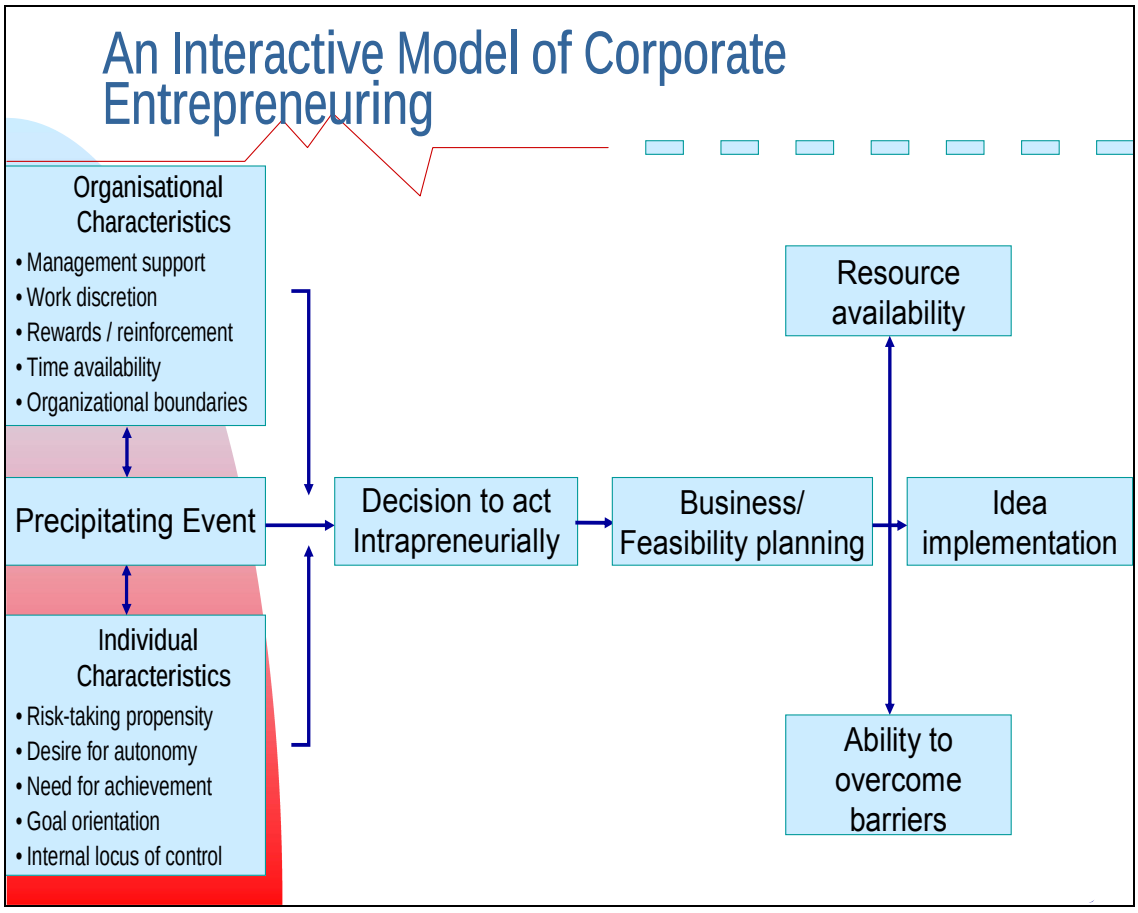
Figure 4.9: Input-outcome integrative model of CE



Source: Morris et al. (1994: 21-31).

Figure 4.9 presents a different model that is built around the concepts of inputs to, and outcomes from, the entrepreneurial process. The inputs component focuses on five sub-components that contribute to the entrepreneurial process itself, for example the environmental opportunities such as technological developments; the organisational factors; and the individual entrepreneurs who identify and pursue such opportunities. The outcomes component focuses firstly on the indicators of the level of 'entrepreneurial intensity', such as the incidence of risk taking, innovation and proactiveness, and secondly on the types of outcome of the entrepreneurial activity, for example successful ventures, new products and benefits or profits.

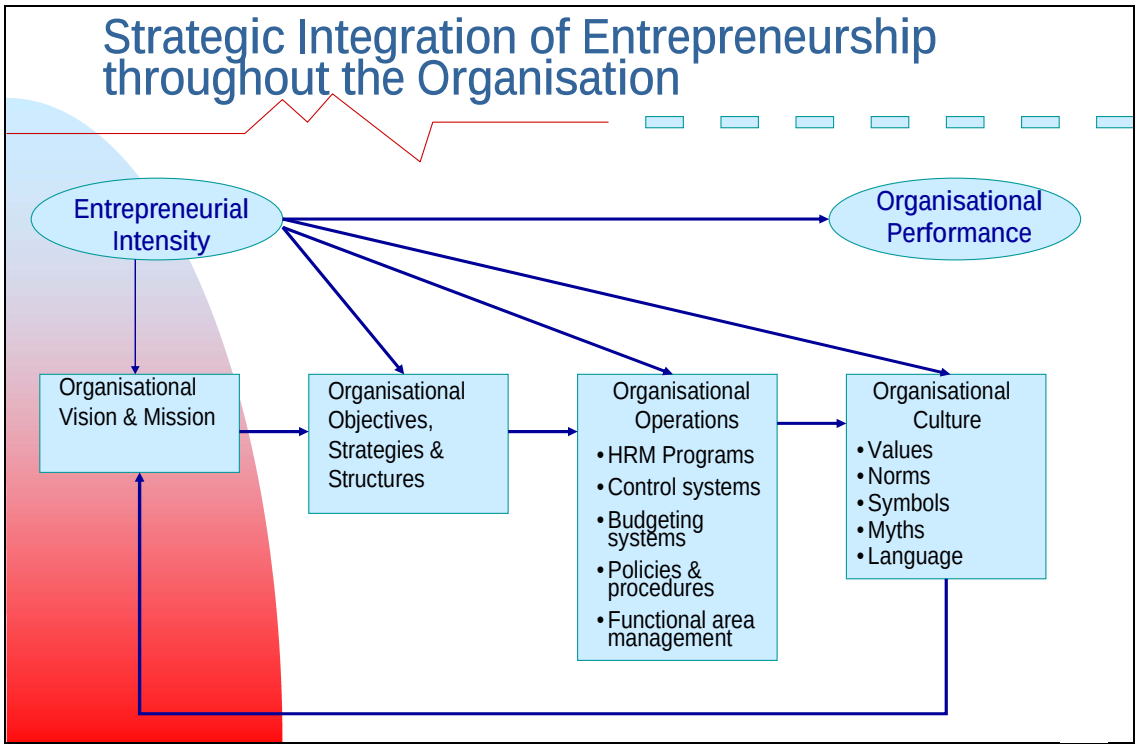
Figure 4.10: Precipitating event integrative model of CE



Source: Hornsby et al. (1993: 31)

The corporate entrepreneurship model presented in Figure 4.10 focuses on the integration of organisational factors and individual characteristics that are ignited by a precipitating event. This precipitated interactive integration then leads to what appears to be a sequential process, albeit moderated by resources and barriers at the implementation stage of the process (Morris & Kuratko, 2002).

Figure 4.11: Strategic integration model of CE



Source: Morris and Kuratko (2002: 34, adapted from Covin and Slevin, 1991: 7-26).

The next model, depicted in Figure 4.11, presents a strategic integration framework that approaches entrepreneurship as an overall orientation within an organisation, as contrasted with merely viewing entrepreneurship as a discrete activity, event or behaviour (Morris & Kuratko 2002: 33). Corroborating the other models, this strategic integration model posits that the entrepreneurial orientation or intensity is an integral component of an organisation's vision and mission and has a direct positive influence on organisational performance. According to Morris and Kuratko (2002: 34), the main feature of this integrative model is the provision for considerable management intervention and thus the reduction of the perception that corporate entrepreneurship is serendipitous or mysterious.

4.3.7 Relationship between CE and corporate performance

To conclude the overview discussion of the corporate entrepreneurship conceptual models above: the literature in general documents an increasing body of knowledge to support the proposition that corporate entrepreneurship has a generally positive effect on corporate renewal and corporate performance, mostly financial performance (Fombrun & Ginsberg, 1990; Covin & Covin, 1990; Jennings & Seaman, 1992; Zahra & Covin, 1995; Pearce II et al., 1997; Goosen, de Coning & Smit, 2002). There is general support for the view that higher levels of profitability result from entrepreneurially driven creation and introduction of new products and technologies (Devinney & Lengnick-Hall, 1992; in Goosen et al., 2002: 21). Morris and Sexton (1996) found that there is reason to believe that the level of entrepreneurial intensity may positively affect performance outcomes in a company and that this strengthens over time (Morris & Sexton, 1996: 8; 11), since research and development costs are defrayed over time.

Van der Post (1997: 75) suggests that financial performance is an all-encompassing indicator of the outcomes of 'system dynamics in an organisation'. In support of this view, Zahra and Covin (1995:15) argue that the relationship between performance and corporate entrepreneurship exists for two reasons. Firstly, innovation can be a source of strong positive market reputation and thus competitive advantage for an organisation. *Sustained* innovation sets an organisation apart from its rivals, and therefore makes it profitable. Secondly, entrepreneurial organisations are *agile, flexible and quick* to respond to lucrative opportunities. Davila, Epstein and Shelton (2006: 3) agree that, in the long run, the only reliable security for any company is the ability to innovate better and longer than competitors. Not only does corporate entrepreneurship constitute a weapon in competitive markets for established organisations to enhance their performance, it also contributes to their survival and growth.

Davila et al. (2006: 2) also posit that innovation has proven itself as an important source for redefining philanthropy and government under the umbrella of social

entrepreneurship. Zahra (1993) refers to this as 'munificence'. Dees (1998) defines social entrepreneurship as a combination of the passion of a social mission with the image of a business-like discipline, innovation and determination. In addition to innovative for-profit ventures, social entrepreneurship can include social-purpose business ventures, such as for-profit community banks (Dees, 1998). The best-known examples of social entrepreneurial ventures are Grameen Bank's micro-credit schemes, which offer a chance for low-income individuals to start or grow their businesses. These schemes have dramatically changed the standard of living of thousands of people who were denied access to loan finance by commercial banks' high interest rates, thus trapping them in poverty (Davila, 2006: 2).

4.4 Corporate entrepreneurship manifestations

To decipher a set of key drivers and inhibitors of corporate entrepreneurship from the corporate entrepreneurship literature and models presented above, it is useful to first examine the many forms in which entrepreneurship manifests itself in various organisations that have practised it**.** Jennings (1994: 185-193) suggests three perspectives for describing corporate entrepreneurship forms or types: the departmental innovation; corporate venturing; and intrapreneurship. These and other perspectives are discussed next.

4.4.1 Departmental innovation

The first perspective describes what Jennings refers to as *organisational innovation*. The outcomes of organisational innovation that are most related to corporate entrepreneurship are technological and administrative innovations. They occur internally and are controlled by the organisation's management. Schollhammer (1982) also refers to this type of corporate entrepreneurship as administrative (traditional research-based) innovation. This research-based innovation is akin to what can be described as 'basic research' in Von Braun's (1997) model discussed in Chapter 3. In established corporations, it is often

referred to as 'research and development' (R&D), and is a departmental activity primarily focused on creativity or new knowledge generation.

Jennings (1994: 185) supports other previously cited researchers who have identified *individual*, *organisational* and *environmental* variables that influence the quality and quantity of outcomes of the organisational innovation (or corporate entrepreneurship). Individual variables include values, roles and personalities of the organisational leadership; organisational variables include specialisation, size and administrative intensity; and environmental variables include market stability and the number of resources available to support the organisation.

The main criticism of this perspective is that it is too inwardly focused and underplays the power of partnerships. For example, instead of the usual R&D unit testing new products, an organisation could try outsourcing innovation testing to its customers. Microsoft has successfully relied on this technique in the past (Davila et al., 2006: 102). Incremental innovation, as opposed to radical innovation, would thrive under the organisational or administrative innovation model.

4.4.2 Corporate venturing

The second perspective suggested by Jennings (1994: 187) is the notion of *corporate venturing*. Covin (1999) refers to this as the phenomenon in which an established organisation enters a new business. Corporate venturing describes the manner in which corporations engage in internal ventures to take advantage of new business opportunities that arise from time to time. Simon et al. (1999) call it the creation of semi-autonomous structures, known as internal corporate ventures, to enter new emerging areas to which they cannot apply the established company's typical procedures for introducing products. Schollhammer (1982) calls it the incubative type of innovation and suggests that it entails the creation of semi-autonomous units that presumably have different innovation strategies, structures, reward systems and the like from the 'parent' company. Bloch and MacMillan (1995: 13) call corporate venturing 'internally

generated new businesses'. According to these authors (1995: 14), a project is a venture when it: involves an activity *new* to the organisation; is initiated or conducted *internally*; involves a significantly *high risk* of failure or large losses; is characterised by *uncertainty*; will be *managed separately* at some time; and is undertaken *to increase sales, profit, productivity, or quality*.

The key success factors for corporate ventures are: the level of autonomy and freedom to act by the operational-level staff; the ability of middle-level management to conceptualise the strategic implications of the new corporate venture initiatives; and the capacity of top-level management to allow viable entrepreneurial activities to change the corporate strategy (Jennings, 1994: 88).

The corporate venturing model of innovation is inspired by the theory of entrepreneurship in start-ups. It facilitates radical innovation in an existing organisation, while not hindering incremental innovation. Some organisations have tried to insulate the venturing function by moving it to a separate structure (or even a separate location) to accord an innovation the status of a start-up even if it is part of a larger organisation (Davila et al., 2006: 112).

Insulation allows and encourages the venture teams to break the rules and, most importantly, protects them from organisational 'antibodies' (Davila et al., 2006: 112). Such a separate structure can be successful because different types of innovation require different types of systems, resources and culture. However, separation may result in isolation from all aspects of the organisation, good or bad, rather than insulation from only the bad elements. For example, separation may cause the main company's employees to be suspicious of the separate venturing unit and not to promote it to clients. This will result in a higher likelihood that the innovations coming out of the separate venturing unit will not be an integral part of the culture and that organisational antibodies will arise to challenge the innovation once it is introduced in the marketplace.

4.4.3 Intrapreneurship

The third and last perspective on corporate entrepreneurship suggested by Jennings (1994: 190) focuses on *intrapreneurship*, or how entrepreneurs function within large corporations. Intrapreneurship is a term popularised by Pinchot (1985) and is better described by Covin (1999) as the phenomenon in which individuals champion new product ideas within a corporate context. The challenges that such internal entrepreneurs face have to do with corporate culture, size and bureaucracy.

4.4.4 Corporate or firm-level entrepreneurship

Entrepreneurship by established organisations in all its forms, some of which are described above, is a single phenomenon with multiple components in different environmental contexts (Gartner, 1990, in Morris & Kuratko, 2002: 22). Ideally, all the entrepreneurship components should be present within one established organisation to create a situation where the entrepreneurial spirit or philosophy permeates the entire organisation rather than individuals or other parts of the organisation exclusively. Such an ideal situation has been referred to in literature as true corporate entrepreneurship (Covin, 1999); entrepreneurial management (Stevenson & Jarillo, 1990); entrepreneurial posture (Covin, 1991);, firm-level entrepreneurship; strategic entrepreneurship (Dess, 1999), and pioneering-innovative management (Khandwalla, 1987).

There is a wide variety of attributes and practices that define corporate entrepreneurship as defined. The next part of the chapter will examine the question of how corporate entrepreneurship has been operationalised by those who have adopted a firm-level perspective to the concept. Alternatively, the question is about which attributes or factors must be fostered and be present in order to label a firm ‘entrepreneurial’.

4.4.5 Entrepreneurship in the public sector (or non-profit organisations)

Public sector entities are often portrayed as non-entrepreneurial and as having a culture similar to that of traditional (non-innovative) corporates. Sadler (2000: 3) describes them as 'bureaucratic, conservative and disingenuous monoliths'. Cornwall and Perlman (1990: 226-227, in Sadler, 2000: 3) cite the ambiguity of goals, limited autonomy, anti-risk-taking reward systems, short-term orientation and over-cautious managerial behaviour as reasons for the lack of innovation and entrepreneurship. The lack of a profit motive (or an expected return) is also often mentioned in literature as another reason.

Gartner's 1990 Delphi study highlighted the 'expected return' as a key component of entrepreneurship. Such a return does not have to be monetary. As such, both not-for-profit and for-profit organisations may pursue a return and thus both can be entrepreneurial. It is therefore noteworthy that more than 70 years ago Schumpeter (1934) posited that entrepreneurship existed in the private or public sector. He classified innovations, which he called new combinations, into various categories, among which the following three are important: (1) producing a new quality or a new kind of product; (2) introducing a new method of production; and (3) carrying out a new organisation of production. Schumpeter believed that innovation could be pursued by large corporations and government bodies as well as by small entrepreneurial firms.

Schumpeter's 1934 concept of public entrepreneurship is nowadays similarly referred to as '*social entrepreneurship'*. Dees (2001) posits that social entrepreneurship combines the passion of a social mission with an image of business-like discipline, innovation, and passion to succeed in the private sector. In addition to not-for-profit ventures, social entrepreneurship can add value in social purpose business ventures, such as pro-profit community development banks and hybrid organisations mixing not-for-profit and for-profit motives, such self sustaining development banks.

Public sector organisations are indeed concerned with broader goals than just a commercial motive (Forster, Graham & Wanna, 1996, in Wanna, Forster & Graham, eds. 1996), Borins (1998, in Sadler, 2000) asserts that public sector innovation often arises from a holistic integration of across-agency initiatives. He found that career public servants at the middle management and front-line staff levels initiate innovation in the public sector. His research contradicts the view that innovation in the public sector is invariably a response to a crisis. This view corroborates Drucker's (1985) view that entrepreneurship involves a purposeful and organised search for value-enhancing opportunities. Thus Borins (1998, in Sadler, 2000) work demonstrated that both planning and 'groping' have a role to play in public sector entrepreneurship. He cites the example of the establishment of the national health service of the UK as nothing less than a planned act of innovation.

4.4.6 Corporate entrepreneurship in DFIs

DFIs are a hybrid between commercial and public sector organisations. Their main competitive advantage over commercial organisations is the development knowledge that they possess. Their advantage over their public sector counterparts is financial prudence and businesslike governance practices. Thus DFIs ought to be knowledge-based organisations (DBSA Vision 2014, 2004: 2). This means that they should develop, adopt and adapt cutting-edge development knowledge and apply it to challenges of underdevelopment in the developing world. This application of knowledge is akin to 'innovation' in the Von Braun (1997) innovation model, discussed in Chapter 3 of the present study. Drucker (1985: 98) posits that knowledge-based innovation is a key source and driver of entrepreneurship. It should follow, therefore, that DFIs ought to be entrepreneurial, and for them to be entrepreneurial, their knowledge workers need to be entrepreneurs.

Knowledge-based innovations are characterised by long lead times from creativity to technology to products and services. They are also characterised by

the convergence of several different kinds of knowledge from a number of different sources. Drucker (1985: 103) cites the example of the Pereire Brothers who founded an entrepreneurial bank in 1852. The bank failed because it was based on a single concept of venture capital finance. Drucker (1985) argues that, for it to succeed, the bank also needed the systematic knowledge of banking that had been developed at the same time elsewhere. Indeed, until all the synergistic pieces of knowledge converge, the lead-time of knowledge-based innovation invariably cannot even begin.

The literature proposes certain requirements for knowledge-based innovation to meet the lead-time and convergence characteristics. These are: a clear focus on the strategic position (innovation cannot be introduced tentatively); a market focus, aimed at creating or capturing a market for its products; and a focus on learning and practising entrepreneurial management (Drucker, 1985; Davila et al., 2006).

4.5 Common corporate entrepreneurship attributes

Among the various definitions of the CE construct, the dissimilar conceptual models of CE and differing manifestations of CE from organisation to organisation and from sector to sector, it is evident that there is a constant set of organisational factors that summarise the major sub-dimensions of the concept of corporate entrepreneurship.

Based on the aforementioned literature review, the following summary of the most consistently mentioned major sub-dimensions is made: *management support*; *reward and resource availability*; *organisational structure and boundaries; risk taking; and innovation*. Kuratko, Hornsby and Montagno (1993) document a comparable list from their literature review and research of common CE factors. In agreement, Hornsby et al. (1999) identify a similar list of common constructs and elements of corporate entrepreneurship.

Lumpkin and Dess (1996, in Covin, 1999: 4), in their thorough review of the broadly defined corporate entrepreneurship literature, also identify five 'dimensions of entrepreneurial orientation', namely: autonomy; innovativeness; risk taking; proactiveness; and competitive aggressiveness. They also conclude that it is unclear whether all five dimensions of entrepreneurial orientation will always be present, or whether any of these identified dimensions must always be present before the existence of an entrepreneurial orientation should be claimed (Covin, 1999).

The instrument adapted and used in the present study to diagnose DFI organisational factors that foster or hinder innovation and corporate entrepreneurship is the Corporate Entrepreneurship Assessment Index (CEAI) developed by Hornsby et al. (1990), which they originally called the Intrapreneurial Assessment Instrument. This CEAI instrument was chosen because it measures five of the six dimensions that the present study has identified from the literature as consistent CE organisational factors. The CEAI is used in similar studies worldwide. It was adapted for the present study by adding three innovation factors, i.e. the innovation portfolio, the innovation processes, and the innovation systems, to form a new instrument called the Innovation and Corporate Entrepreneurship Assessment Instrument (ICEAI). The ICEAI is discussed in the next section.

4.6 Innovation and Corporate Entrepreneurship Assessment Instrument (ICEAI)

In their identified five-factor structure, Hornsby et al. (1990) and Kuratko et al. (1993) selected a number of items for each factor in the structure. The results of their factor analysis were as follows: top management support for CE (19 items) with a Chronbach alpha of .89; autonomy/work discretion (10 items) with an alpha of .80; rewards/reinforcement (6 items) with an alpha of .65; time availability (6 items) with an alpha of .92; and organisational boundaries (7 items) with an alpha of .58. These instrument validation results were reinforced by the

findings of a study of 119 Fortune 500 CEOs (Zahra, 1991), which examined the five-factors in the structure as antecedents, as well as the association between internal entrepreneurship and the financial performance of the firm. Hornsby, Kuratko and Montagno (1999) again later supported the existence of these factors in a cross-cultural study of Canadian firms.

Hornsby, Kuratko and Zahra (2002) established sound psychometric properties for an instrument that measures the five factors and concluded that the existence of such stable organisational factors should be recognised in promoting entrepreneurial activities within an organisation. They proffered the view that these five factors represent a succinct description of the internal organisational factors that influence middle managers to foster entrepreneurial activity within established companies.

Also, based on the results of empirical studies documented in literature, it is concluded that the greater the extent to which an individual perceives the existence of management support, autonomy/discretion, rewards/reinforcements, resource/time availability, and flexible organisational boundaries, the higher the probability of entrepreneurial behaviour by that individual.

The CEAI instrument (Hornsby et al., 1990) was modified by adding further dimensions in order to recognise the *presence of innovation* as a common dimension among all firms that could be reasonably described as entrepreneurial. The validity of the innovation dimensions and of the entire modified questionnaire is tested in the present study in Chapter 5.

The following eight sub-sections briefly discuss factors of the modified instrument, namely the **I**nnovation and **C**orporate **E**ntrepreneurship **A**ssessment **I**nstrument (ICEAI).

4.6.1 Management support for corporate entrepreneurship

Management support entails a clear direction from the top of the organisation that permeates throughout the organisation to motivate, support, and reward

innovation and entrepreneurial behaviours. In support of this view, the literature refers to the willingness of managers to facilitate and promote entrepreneurial activity in the organisation (Quinn, 1985; MacMillan, Block & Narasimha, 1986; Sykes & Block, 1989; Stevenson & Jarillo, 1990; Damanpour, 1991; Kuratko et al., 1993; Pearce II et al,. 1997, Hornsby et al., 1999; Hisrich & Peters, 2002). According to these authors, management support can assume many forms, including championing ideas, providing necessary financial or human resources, and facilitating the embedding of the entrepreneurial activity in the organisational systems and processes.

Barringer and Bluedorn (1999) and Zahra, Kuratko and Jennings (1999) assert that the ability of an organisation to increase its entrepreneurial activity is also determined by the compatibility of its management practices with its entrepreneurial intentions. Among the most pertinent of these management practices is strategic management leadership (Covin & Slevin, 1991; Zahra, 1993; Herbert & Brazeal, 1998; Barringer & Bluedorn, 1999). Strategic leadership implies management facilitation of both incremental and radical innovation in order to enhance the organisation's competitiveness and its tactical operations and processes (Kemelgor, 2002).

Covin and Slevin (1991) refer to the behaviour of top management in support of entrepreneurship as 'entrepreneurial posture'. Adonisi (2003: 36) claims that entrepreneurial posture comprises three components: strategic management's propensity to support risky ventures; the extent and frequency of product innovation; and the pioneering nature of management to engage in proactive competition with industry rivals.

Morris and Kuratko (2002) and many other researchers claim that organisational culture plays a key role in a company's ability to develop corporate entrepreneurship. However, Thornberry (2003: 341) asserts that 'pockets or islands of entrepreneurial activity can develop and thrive, at least for a while, in cultures that are not in themselves entrepreneurial'. According to this view,

successful ventures can develop in non-entrepreneurial companies with the right kind of technical interventions. All it takes is a critical mass of 'switched on' (Thornberry, 2003: 338) corporate entrepreneurs, with some championing at the leadership level, to start seeing entrepreneurial activity.

The management cadre plays an important role in fostering a culture of corporate entrepreneurship in an organisation or part thereof. The first step in the process of establishing such an entrepreneurial culture is to secure commitment and support by top and middle management. Only after commitment by these levels of management may the concept be introduced throughout the whole organisation (Hisrich & Peters, 2002: 53). This assertion will be tested in DFIs in the present study.

4.6.2 Work discretion

Work discretion is a construct that is affected by a number of factors: degree of formality and prescriptiveness; desire for conformance and compliance with set job descriptions; degree of rigidity in work formats; desire for consistency from time to time and between people doing the same task; desire for individual initiative in carrying out tasks; and level of freedom and discretion in own job (Morris & Kuratko, 2002: 220).

In the context of the corporate venturing form of corporate entrepreneurship, researchers are unanimous that a high degree of autonomy should be accorded to those charged with venturing (MacMillan, 1986; Block & MacMillan, 1995: 253; Simon et al., 1999: 156). Advocating for autonomy, Shapiro (1984) cites situations where increased autonomy dramatically increased performance of ventures. As for the characteristics of the venture teams, Hill and Hlavacek (1972) found in their study of a hundred cases that venture teams: separated from the operating organisation; were multidisciplinary; had diffuse authority; were given a broad mission; had direct access to senior management; and were not subjected to defined time deadlines. On the contrary, a later study by Dunn (1977) found the following characteristics of ten failed ventures: their missions

were too broad; too few constraints were placed on their activities; they enjoyed too much functional autonomy; and they were not put under enough pressure to produce.

It appears from these contradictory views that too much of a good thing can precipitate venture failure, as far as autonomy or work discretion is concerned. In support of this view, MacMillan (1986) suggests that management cannot abdicate its oversight responsibility, but has to monitor the venturing activity more closely.

In short, the facilitation of entrepreneurship appears more consistently with role flexibility and autonomy, which can be achieved if employees enjoy a high degree of autonomy and are empowered to exercise discretion and personal initiative in performing their jobs.

4.6.3 Rewards and reinforcements

Reward and reinforcement normally take the form of recognition and incentives. Recognition is a reward that occurs after demonstrable innovations or entrepreneurial outcomes. In contrast, incentives are designed before an innovation effort starts, and they link performance measures and rewards (Davila et al., 2006).

The literature on corporate entrepreneurship highlights the fact that an effective reward system that spurs entrepreneurial activity must consider: goals; feedback; individual responsibility; and results-based incentives or rewards (Kanter, 1983; Sathe, 1985; Barringer & Bluedorn, 1999; Davila et al., 2006).

To foster corporate entrepreneurship, recognition is more appropriate than incentives. It is important to note that recognition does not have to happen through explicit management systems in an organisation. It can happen within the realm of personal interactions: praise in the passage or over a cup of coffee, or recognition by peers. In short, people are motivated by: expected incentives;

passion about the activity; recognition; and leadership vision that provides a clear sense of purpose.

4.6.4 Resources/Time availability

Organisational resources are broadly defined to include time, money, equipment and competencies. The actual and perceived availability of these resources by employees is an important element in facilitating innovation and corporate entrepreneurship (Sathe, 1985; Schuler, 1986; Sykes & Block, 1989). Covin and Slevin (1991) indicate that entrepreneurial ventures are resource-consuming activities and, therefore, a firm's ability to pursue innovations will be constrained by the available resources. Hornsby et al. (1999) further argue that a key challenge facing the pursuit of corporate entrepreneurship as a strategic thrust is resource deployment to support strategic entrepreneurial efforts. Therefore, the resource view of strategy holds the internal resources of an organisation as a source of unique and inimitable competitive advantage (Twormey & Harris, 2000).

Hornsby et al. (1992) profess that fostering corporate entrepreneurship requires that individuals be afforded time to incubate new and innovative ideas. Therefore, the workload of employees must be moderated to such an extent that they are allowed to work with others on time-consuming innovations.

Time availability assumes greater importance when attempting to foster radical innovation than incremental innovation. Radical innovation takes time and is accompanied by a risk that the creation may not find its way to the marketplace.

Therefore, resource availability, particularly time, is an essential organisational characteristic for the implementation of CE. In the present study, employee perceptions about time availability in a DFI environment are assessed with the objective of fostering a CE culture within DFIs.

4.6.5 Organisational boundaries, barriers and bureaucracies

Following the old adage that 'structure follows strategy', the organisational structure should be supportive of the innovation strategy and should in turn act as a foundation for the innovation process and systems. However, not all structures facilitate the implementation of innovation and entrepreneurial strategies.

Obsolete strategy and bureaucratic structures create barriers to entrepreneurial behaviour in organisations. The most familiar forms of bureaucracy include hierarchical control, centralised authority and inflexible or fixed functional boundaries (Burgelman, 1983; Khandwalla, 1997). These authors argue that fixed and static bureaucratic organisational forms tend to stifle innovative behaviour.

According to Sharma (1999), in large organisations where established bureaucracies are prevalent, the creativity necessary for radical innovation and the individual initiative pertinent to embarking on new ventures are often suppressed. The sheer size of these organisations demands that there be control and order, but such order and predictability, if strictly adhered to, work against innovation.

The present study will test employee perceptions on organisational boundaries and bureaucracy and how these affect corporate entrepreneurship in DFIs.

4.6.6 Innovation technology enablement

It is essential to examine the available technology that enhances innovation and entrepreneurship within an organisation. This relates mainly to the use of electronic communication to: virtually extend the organisational boundaries; overcome cultural, physical and time separation; and tap into new ideas of employees, customers, suppliers and partners (O'Hara-Devereaux & Johansen, 1994; Schrage, 2000; Thomke, 2001). All these authors highlight electronic

technology as a new and important element of innovation management to harness the power of partnerships and collaboration within and between organisations.

The present study will assess the extent to which employees of DFIs use technology to enable innovation, and will attempt to foster the use of electronic communication in the experimental DFI to capture new ideas from employees.

4.6.7 Innovation management process and systems

Innovation systems are established policies, procedures and information mechanisms that facilitate innovation processes within and across organisations (Davila et al., 2006: 120). For innovation to take place successfully there needs to be an explicit process in place to manage all the steps of innovation, from conceptualisation through design, implementation, measurement, and reward to monitoring.

The rigidity or inflexibility that is often associated with defined processes and systems is not about systems and processes per se. The literature confirms that the problem is more about the inability to change them when they are no longer useful (Cameron, 1986; Miller, 1990; Leonard-Barton, 1995). The obsolescence of competencies and the inability to renew them is called the 'competency trap' (Levitt & March, 1988).

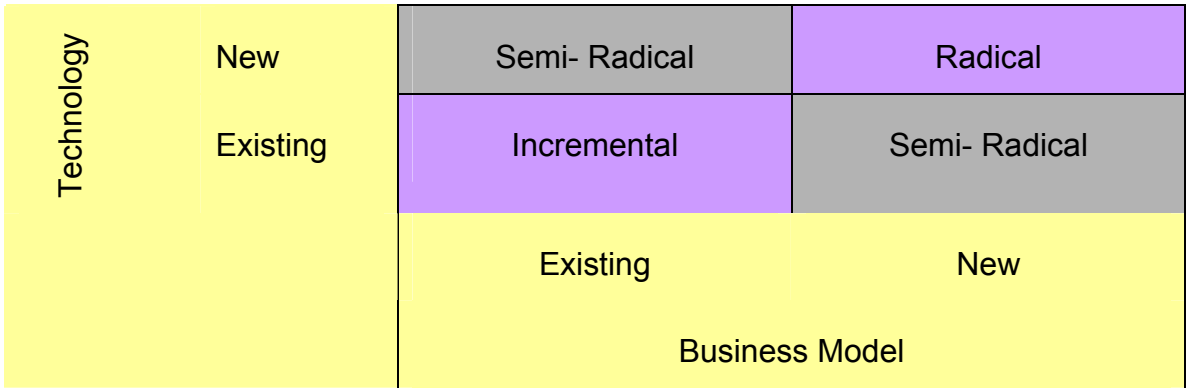
It is therefore wrong to assume that structure, processes and systems are the natural foes of creativity, or to feel that imposing any order on 'intrapreneurs' will have a detrimental effect on the results. What should be realised is that structure, systems and processes can enhance creativity, and ultimately innovation, if they are built and used in the right way.

The present study departs from the premise that structure, processes and systems are in place, and focuses rather on testing employee views on how these elements are allowed to evolve to facilitate innovation and entrepreneurial activity in DFIs.

4.6.8 Innovation portfolio management

As documented in Chapter 3, section 3.3, innovation is not only about technological innovations or how to use inventions. It also involves introducing new business models. Business model innovation is the introduction of a new means of production, new products, or new forms of organisation (Schumpeter, 1934). Davila (2006) concurs, and goes on to make the proposition that business models describe how the company creates, sells, and delivers value to customers. Therefore, business model innovation is about value capture or commercialisation of creativity. The risk and return characteristics differ within and between these types of innovation, depending on the amount of investment, the level of risk and the novelty of the innovation. The interplay between technological innovations and business model innovations indicates the nature of the innovation, and is shown in the Innovation Matrix illustrated in Figure 4.12.

Figure 4.12: The Innovation Matrix



Source: Adapted from Davila et al. (2006: 14).

Incremental innovation is the most prevalent form of innovation used by most companies. It entails small improvements to the 'business as usual' and is aimed at wringing out as much value as possible from existing products or services without making significant investments (Banbury & Mitchell, 1995).

Radical innovations are significant changes that alter the rules of the game for the business, technology or industry. Radical innovations carry by their nature

high risk and high impact and usually require substantial investments, so should be approached with caution in established businesses. They are usually associated with start-ups (Day & Schoemaker, 2000).

Creating a portfolio of incremental and radical (including semi-radical) innovations is essential in order to sustain innovation and corporate entrepreneurship (Davila et al., 2006: 15). Like financial asset portfolios, innovation portfolios are a risk-management technique if the diversification within the portfolio is optimal. It is the top-management team of an organisation that bears the responsibility of balancing the innovation portfolio. Aligning the innovation portfolio with the overall business strategy is a key role of top management.

4.7 Entrepreneurially conducive corporate culture

The fundamental role of corporate culture in motivating and shaping entrepreneurial activity has been discussed by, among others, Kanter (1983), Russell and Russell (1992) and Sadler (2000). These authors confirm what has been noted in 4.6.2 and 4.6.7 above, that rigid and outdated bureaucratic methods of control associated with organisational structure can constrain entrepreneurial activity, given the uncertainties inherent in innovation. As such, there are discernible differences between the traditional corporate and entrepreneurial corporate cultures. As products of the entrepreneurial corporate environments, the profile of intrapreneurs reflects the characteristics of the period and place in which they find themselves (McGuire, 1976) and such a profile differs from that of traditional managers.

According to Hisrich and Peters (2002), a typical corporate culture favours risk-averse, cautious and rational decision-making practices and processes. People are discouraged from taking initiative, being proactive, making learning mistakes or failing, and acting outside the strictly defined boundaries of their functional areas. This restrictive environment is not conducive to creativity, innovation, flexibility or independence or taking ownership and responsibility (Hisrich &

Peters, 2002: 47). Such a culture is supported by established *inflexible* control mechanisms such as hierarchical lines of authority, responsibility and reporting, and documented systems to be *strictly* adhered to.

A corporate entrepreneurial culture, on the other hand, encourages initiative and risk-taking inside and outside 'the box'. According to Hisrich and Peters (2002: 47), the goals under the intrapreneurial culture differ and are: 'to suggest, try, and experiment; to create and develop regardless of the area; and to take responsibility and ownership'. The supportive organisational structure for this culture is flat, networked and is conducive to knowledge sharing. This culture encourages the building of trust and counsel among people.

Russell and Russell (1992) have empirically verified the connection between culture and innovation by measuring the effects of norms and values on innovative outcomes. They have identified a number of dimensions of culture that impact the entrepreneurial process They argue that the innovation norms and values encapsulated in such dimensions tend to reinforce behaviours that assist organisation members in navigating the uncertain waters of innovation development (Russell, 1999).

4.8 Barriers to corporate entrepreneurship

Sadler (2000) suggested that corporate entrepreneurship and its facilitating factors are not absolutes - if certain factors exist, they will promote or inhibit the opportunity for corporate entrepreneurship. The literature has also observed the following common factors as promoting or inhibiting corporate entrepreneurship in the private sector, on the one hand, and in local government utilities, Government Business Enterprises (GBEs) or corporatised state-owned entities on the other hand. The following is a set of key drivers and inhibitors of corporate entrepreneurship:

- An intense external competitive environment is a positive incubator for corporate entrepreneurship (Slevin & Covin, 1990).

- Networked and flat structures are more communicative and tend to foster entrepreneurship (Slevin & Covin, 1990). Conversely, bureaucratic structures, which rely on centralised decision-making, inhibit entrepreneurship.

- Knight (1986) maintains that entrepreneurship involves tolerating failures as well as applauding successes. Saxena (1991) reasons that a managerial vision, policies and programs that are directed towards opportunities rather than problems must be established to facilitate the development of an entrepreneurial spirit.

- For Angel and Van de Ven (1989), the environment must promote cohesive work groups with open conflict-resolution mechanisms, and must provide access to innovation role models and mentors.

- Liebcap (1986) maintains that large organisations tend to plan strategy and are not as prepared as smaller organisations to implement spontaneous innovation. Size per se is not a problem, but it is the bureaucracy that often goes along with it that is an impediment (Saxena, 1991). Smaller companies are believed to be more entrepreneurial because they remain closer to their markets and become aware of opportunities more quickly (Zahra, 1995). Zahra (1995) suggests that they need to be innovative to survive, but that they may lack the financial resources to implement CE activities;

- A participative decision-making environment is more conducive to entrepreneurship, observe Pearce and David (1983);

- Hage and Aiken (1970) argue that an organisation with a high proportion of professionals and diverse specialists tends to be more change-tolerant and innovative, and that there is a high correlation between entrepreneurship and specialisation;

- Ramamurti (1986) observes that opportunities for entrepreneurship are enhanced in situations where the goals are inconsistent but are clearly understood. He argues that this promotes flexibility. He reasons that where

the value to be added may be expressed in financial or social or other measures, the pursuit of a particular value is a clear and necessary precondition to entrepreneurship conduct.

- It is recorded in the literature that organisational autonomy is a key ingredient of public-sector entrepreneurship. The public sector reforms and increased devolution to agency level have promoted autonomy (in Sadler, 2000).

During his 1998 fieldwork, Sadler (2000: 8) contradicted some of the above observations by identifying a number of factors that foster entrepreneurship in the private sector, but which demonstrate no significant statistical correlation in the public sector, including:

- A culture of risk-taking; this need not necessarily be financial, and risk-taking may be absent in an entrepreneurial public-sector environment;

- An organic organisational structure; Sadler's study (2000) did not support the view that the bureaucracy and conservatism of larger organisations act as a barrier to public-sector entrepreneurship. He found that the operations of the public-sector organisations necessitate hierarchical organisational structures. Cornwall and Perlman (1990: 111) advise that even where there is low centralisation of power and decision-making, such as in the public sector, the empowerment and delegation should not be equated with anarchy, and that entrepreneurial structures should be controlled. Despite the hierarchical structures, public-sector entrepreneurship emerges by utilising distinctive public-sector characteristics to promote flexibility and organic clusters within the structures.

4.9 Conclusion

This chapter is the second of the two literature review chapters. In this chapter, the theory of corporate entrepreneurship was reviewed to build on the argument started in Chapter 3 that unless opportunities and events are perceived and

acted upon by members of the organisation, the individual characteristics, latent or developed, are worthless.

According to the reviewed literature, entrepreneurial organisations create mechanisms that focus the attention of organisational members on entrepreneurial opportunities, and provide resources as empowerment to implement their innovations. The following organisational variables identified seem to enjoy general acceptance in literature as instrumental in the entrepreneurial process: management support; work discretion; rewards systems; resource availability; organisational culture, structure and bureaucracy; innovation processes and systems; and innovation portfolio management.

The outcome of a combination of the identified organisational variables and the individual factors is the organisational (profit- or non-profit-making) entrepreneurial intensity, which in turn results in enhanced organisational performance. Therefore the literature finding is to reject the following proposition:

H_0:A1 Entrepreneurship and corporate entrepreneurship principles are **not** applicable to organisations that pursue non-profit motives, such as DFIs; and **cannot** enhance their performance (refer to section 1.7 in Chapter 1).

Thus there is enough evidence in literature to **accept** the alternative proposition that: entrepreneurship and corporate entrepreneurship principles **are** also applicable to organisations that pursue non-profit motives, such as DFIs; and **can** enhance their performance.

The present study first performed a pre-experimental diagnosis of both factors, as reported in Chapter 6, using an innovation and corporate entrepreneurship assessment instrument, as tested for validity in Chapter 5. The results of both the training intervention and the entrepreneurial intensity are reported in Chapter 8.

PART III

EXPERIMENTAL RESEARCH SECTION

Chapter 5: CE measurement instrument development and validity testing

5.1 Introduction

This chapter marks the beginning of the experimental research section of the present study. In this section, Chapter 5 seeks to confirm the validity and reliability of the empirical research instrument used. Chapter 6 begins with an overview of the statistical tools and techniques used to analyse research data and contains the analysis of the results of the ex-ante assessment of corporate entrepreneurship environment and training needs of the experimental DFI, the Development Bank of Southern Africa. Chapter 7 details the CE and corporate venture training intervention applied to the experimental DFI and records the direct new venture outcomes of such an intervention. Chapter 8 contains the analysis of the results of the ex-post assessment of the corporate entrepreneurship environment at the same experimental DFI. This chapter seeks to disprove the research proposition: that after the CE training intervention, there is **not** a statistically significant change of CE opinions of the study observation groups.

5.2 Developing the innovation and corporate entrepreneurship measurement instrument

The instrument used to diagnose the DFI organisational factors that foster or hinder innovation and corporate entrepreneurship was developed by adapting the Corporate Entrepreneurship Assessment Index (CEAI) developed by Hornsby et al. (1990), which is used in similar studies worldwide, and a previously untested DBSA innovation diagnostic questionnaire. The first five constructs of the questionnaire, i.e. C1: Management support for Corporate Entrepreneurship; C2: Work discretion; C3: Rewards/Reinforcements; C4: Time availability; and C5: Organisational boundaries, barriers and bureaucracies, were sourced from the CEAI. The remaining three constructs, i.e. C6: Successful technology

enablement; C7: Innovation process; and C1: Innovation portfolio, were adapted from DBSA's innovation diagnostic instrument. The remaining two constructs, i.e. C6: Innovation organisational support; and C7: Innovation portfolio management, were adapted from the DBSA's innovation diagnostic instrument.

The questionnaire consists of 48 diagnostic questions (questions 1 to 48), 6 biographic information questions (questions 49 to 54) and 3 open-ended questions (questions 55 to 57).

5.3 Statistical techniques for confirming validity and reliability

5.3.1 Selecting a multivariate technique

The objective is to determine if the measurement instrument variables could be reduced to a smaller set of variables that could account for most of the variations among respondents. Table 5.1 was used as a guide for choosing an appropriate technique to 'focus upon, and bring out in bold relief, the structure of simultaneous relationships among three or more phenomena' (Sheth, 1977: 3, in Cooper & Schindler, 2003: 611).

Table 5.1: Selecting from the most common multivariate techniques

No dependent variables	**Interdependence of variables is assumed**	
Metric IV	❖ **Factor Analysis** ❖ Cluster Analysis ❖ Multidimensional Scaling	
Non Metric IV	❖ Non metric Cluster Analysis ❖ Non metric Factor Analysis	
One dependent variable (One DV)	**Metric DV**	**Non Metric DV**

Metric IV	❖ Multiple Regression ❖ Multiple Classification Analysis (**MCA**) ❖ Automatic Interaction Detection (**AID**)	❖ Multiple Discriminant Analysis **(MDA)**
Non Metric IV	❖ Multiple Regression *with dummy variables*	❖ Multiple Classification Analysis *with dummy variables*
Two or more dependent variables (>2 DV)	**Metric DV**	**Non Metric DV**
Metric IV	❖ LISREL	❖ Conjoint Analysis
Non Metric IV	❖ MANOVA	❖ Conjoint Analysis

Understanding the distinction between the concepts of dependency and interdependency is an a priori condition for applying Table 5.1.

The fact that the variables being tested in the study are interrelated, without some being designated as dependent and others as independent, allowed for an assumption of interdependence of variables. Furthermore, based on the measurement scale and the type of data collected by the measurement instrument, i.e. ratio data, the data are decidedly metric. These decisions led to the choice between the factor analysis technique, the cluster analysis technique, and the multidimensional scaling technique.

5.3.2 Factor analysis technique

Factor analysis is a technique that that allows for the reduction of a large number of variables or questions (i.e. 48 questions in this study) to a smaller number of variables, 'super variables' or 'latent variables' or factors (seven factors in this study). It does this by attempting to account for the pattern of correlations between the variables in terms of the factors. Factor analysis groups variables with similar characteristics together. In other words, it explains a pattern of

similarity between observed variables. Questions or variables which belong to one factor are highly correlated with one another and have overlapping measurement characteristics. The resultant smaller number of factors are then capable of explaining the observed variance in the larger number of variables and can be used for further analysis.

Numerical values from a factor analysis are correlation coefficients between the factor and the variables, and such correlation coefficients are called *loadings*. In order to find 'pure' constructs underlying each factor, the SAS program (1988) *rotates* the factor loadings such that some pattern is found in which one factor is heavily loaded (has a high correlation coefficient) on some variables, and another factor is heavily loaded on other variables, and so on.

5.3.2.1 Rotated factor analysis results for O_1

Tables 5.2 and 5.3 below show original factor loading matrices that were produced by the SAS program (1988). The columns show variances explained by factors. The rows indicate the original variables as grouped under the original five constructs in Morris and Kuratko's Corporate Entrepreneurship Assessment Instrument (CEAI) (Morris & Kuratko, 2002: 295), and as grouped under an additional two constructs added to place additional emphasis on innovation.

Section 1: Corporate entrepreneurship assessment section

It is apparent from Table 5.2 that only three out of five constructs equal the anticipated factors, i.e. Construct 1 (Management support), Construct 2 (Work discretion) and Construct 4 (Time availability). The interpretation of the results of the factor analysis on all five constructs under section 1 is as follows:

Questions 1–11: Questions 1-11 are highly correlated with one another and have overlapping measurement characteristics and therefore represent variables which belong to one factor, **Factor 1**.

Questions 12–16 &17: Questions 12 -16 are highly correlated with one another and have overlapping measurement characteristics and therefore represent variables which belong to one factor, **Factor 2**.

However, the factor analysis indicates that question 17, *'I seldom have to follow the same work methods or steps for doing my major tasks from day to day'*, is testing for the Organisational boundaries and barriers construct (Construct 5) and not for the Work discretion construct (Construct 2) as suggested by Morris and Kuratko (2002: 295). Question 17 has strong overlapping characteristics with questions 28 and 29, which have high factor loadings for Factor 5. Question 17 will therefore be reclassified under the Boundaries and barriers construct (Construct 5) and will be analysed under **Factor 5**.

Question 18–22: Questions 18-19 and question 21 are highly correlated with one another and have overlapping measurement characteristics and therefore represent variables which belong to one factor, **Factor 3**.

Question 20 *'individuals receive additional rewards…'* The factor analysis indicates that the subjects construed the 'additional reward' variable as a form of management support or as possessing similar characteristics to those possessed by variables under the Management support construct (C1). However, question 20 is a Reward/Reinforcement variable and clearly possesses similar characteristics to other questions of a reward and reinforcement nature This variable will be further rotated and analysed under the Rewards/Reimbursement construct (C3) or as **Factor 3**.

Question 22, *'there are a lot of positive challenges in my job'*, has been loaded under Factor 2, as it can easily be viewed as similar to 'autonomy' questions under the Work discretion construct (C2). In line with its factor loading, this question will be reclassified under the Work discretion construct (C2) and analysed under **Factor 2.**

Questions 23–26 & 27: Questions 23-26 are highly correlated with one another and have overlapping measurement characteristics and therefore represent variables which belong to one factor, **Factor 4**.

As a result of the frequency analysis, question 27 had more than 5 missing responses and was therefore deleted from Construct 4. It will therefore not be analysed.

Questions 28–29; 30; 31-34: Questions 28-29 are highly correlated with one another and have overlapping measurement characteristics and therefore represent variables which belong to one factor, **Factor 5**.

Question 30, '*My job description allows for me to come up with ideas and be innovative'*, sounds more like a Work discretion (C2) question, such as question 16, 'to autonomy in job and being left on own to do own work', and was therefore loaded under Factor 2. In line with its factor loading, this question will therefore be reclassified under the Work discretion construct (C2) and analysed under **Factor 2.**

Questions 31-34 are all loaded under and are construed to test for Rewards and Reinforcements (C3). Reading the questions closely, it seems that the ongoing or frequent involvement of manager/supervisor to clarify work expectations causes the questions to be construed as C3. Questions 31-34 will therefore be reclassified under the Rewards/Reinforcements construct (C3) and analysed under **Factor 3.**

The questionnaire will be modified for the reclassification of questions 17, 22, 30 and 31-34, and for the deleted question 27, before it is administered again for the second observation (O_2). Table 5.2 illustrates such reclassifications. The second observation will also confirm whether or not there are significant differences between the South African DFI subjects and the subjects (presumably American) who were used in validating the original questionnaire.

Table 5.2: Corporate Entrepreneurship assessment section

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Construct 1: Management support					
V1	0.609				
V2	0.530				
V3	0.500				
V4	0.599				
V5	0.738				
V6	0.779				
V7	0.772				
V8	0.700				
V9	0.629				
V10	0.648				
V11	0.399				
Construct 2: Work discretion					
V12		0.554			
V13		0.287			
V14		0.693			
V15		0.779			
V16		0.682			
V17 *Reclassify under* ***construct 5***					0.482
Construct 3: Rewards/Reinforcements					
V18			0.377		
V19		0.375	0.418		
V20 *Rotate under* ***factor 3***	0.405				
V21			0.581		
V22 *Reclassify under* ***construct 2***		0.456			
Construct 4: Time-availability					
V23				0.524	
V24				0.948	
V25				0.652	
V26				0.342	
V27	deleted	Deleted	Deleted	deleted	deleted
Construct 5: Organisational boundaries/barriers					
V28					0.657
V29					0.612
V30 *Reclassify under* ***construct 2***		0.399			
V31			0.812		
V32 *Reclassify under* ***construct 3***			0.558		
V33			0.716		
V34			0.594		

Section 2: Innovation diagnostic section

It is apparent from Table 5.3 below that the two constructs under section 2 of the questionnaire equal the anticipated factors, i.e. Construct 6 (Innovation organisational support) and Construct 7 (Innovation portfolio management). The interpretation of the results of the factor analysis on the two constructs under section 2 is as follows:

Questions 35–43: Questions 35-43 are highly correlated with one another and have overlapping measurement characteristics and therefore represent variables which belong to one factor, **Factor 6**.

Questions 44–48: Questions 44-48 are highly correlated with one another and have overlapping measurement characteristics and therefore represent variables which belong to one factor, **Factor 7**.

Table 5.3: Innovation diagnosis section

	Factor 1	Factor 2
Construct 1: Innovation organisational support		
V35	0.543	
V36	0.727	
V37	0.723	
V38	0.792	
V39	0.652	
V40	0.701	
V41	0.705	
V42	0.640	
V43	0.558	0.287
Construct 2: Innovation portfolio management		
V44	0.278	0.623
V45		0.717
V46		0.961
V47		0.936
V48		0.854

5.3.2.2 Derived rotated factor analysis results

Table 5.4 and Table 5.5 below show the original factor loading matrices as produced by the SAS program (1988). However, to arrive at the derived rotated factors, some variables that formed the original classification were dropped and some were reclassified into new factors. The reclassifications per the factor analysis were carefully interpreted to make sure that they fitted the label of the factor. The labels in turn were checked to ensure that they truly reflected the latent construct.

The columns, titled factors, appear in decreasing order of variance explained by factors. The rows indicate reconstituted constructs that are made up of reclassified original variables as contained in Morris and Kuratko's Corporate Entrepreneurship Assessment Instrument (CEAI) (Morris & Kuratko, 2002: 295), and two additional constructs that are made up of new variables designed to place additional emphasis on innovation.

The modified classification of factor loadings has been rearranged so that for each successive factor only loadings equal to or greater that 0.3000 are reflected in descending order. Loadings less than 0.3000 have been replaced by zeros.

Table 5.4: Derived rotated factor loading matrix for observation 1: Corporate Entrepreneurship assessment section

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Construct 1: Management support					
V6	0.779	0.000	0.000	0.000	0.000
V7	0.772	0.000	0.000	0.000	0.000
V5	0.738	0.000	0.000	0.000	0.000
V8	0.700	0.000	0.000	0.000	0.000
V10	0.648	0.000	0.000	0.000	0.000
V9	0.629	0.000	0.000	0.000	0.000
V1	0.609	0.000	0.000	0.000	0.000
V4	0.599	0.000	0.000	0.000	0.000
V2	0.530	0.000	0.000	0.000	0.000
V3	0.500	0.000	0.000	0.000	0.000
V11	0.399	0.000	0.000	0.000	0.000
Construct 2: Work discretion					
V15	0.000	0.779	0.000	0.000	0.000
V14	0.000	0.693	0.000	0.000	0.000
V16	0.000	0.682	0.000	0.000	0.000
V12	0.000	0.554	0.000	0.000	0.000
V22	0.000	0.456	0.000	0.000	0.000
V30	0.000	0.399	0.000	0.000	0.000
V13	0.000	0.287	0.000	0.000	0.000
Construct 3: Rewards/Reinforcements					
V31	0.000	0.000	0.812	0.000	0.000
V32	0.000	0.000	0.558	0.000	0.000
V33	0.000	0.000	0.716	0.000	0.000
V34	0.000	0.000	0.594	0.000	0.000
V21	0.000	0.000	0.581	0.000	0.000
V19	0.000	0.000	0.418	0.000	0.000
V20	0.000	0.000	0.405	0.000	0.000
V18	0.000	0.000	0.377	0.000	0.000
Construct 4: Time-availability					
V24	0.000	0.000	0.000	0.948	0.000
V25	0.000	0.000	0.000	0.652	0.000
V23	0.000	0.000	0.000	0.524	0.000
V26	0.000	0.000	0.000	0.342	0.000
Construct 5: Organisational boundaries/barriers					
V28	0.000	0.000	0.000	0.000	0.657
V29	0.000	0.000	0.000	0.000	0.612
V17	0.000		0.000	0.000	0.482

Innovation diagnosis section

	Factor 1	Factor 2
Construct 1: Innovation organisational support		
V38	0.792	000
V36	0.727	000
V37	0.723	000
V41	0.705	000
V40	0.701	000
V39	0.652	000
V42	0.640	000
V43	0.558	000
V35	0.543	000
Construct 2: Innovation portfolio management		
V46	000	0.961
V47	000	0.936
V48	000	0.854
V45	000	0.717
V44	000	0.623

Table 5.5: Variance explained by the factor

Factors	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
VP	**4.645**	**3.881**	**3.232**	**2.746**	**1.834**

The VP is the variance explained by the factor. It is computed as the sum of the squares for the variables or elements of the factor's column in the factor loading matrix (SAS computer program, 1988).

Table 5.6: Factor correlations for rotated factors

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	1.000				
Factor 2	0.570	1.000			
Factor 3	0.157	0.450	1.000		
Factor 4	0.122	0.334	0.468	1.000	
Factor 5	0.159	0.191	0.117	1.164	1.000

5.3.3 Cronbach's Alpha analysis technique

Cronbach's Alpha is regarded as one of the most important reliability estimates. It measures internal consistency (reliability) by determining the degree to which instrument items are homogeneous and reflect the same underlying construct(s) (Cooper & Schindler, 2003: 237). It detects whether the *indicators of a construct*, also known as variables, have an acceptable fit on a single factor. A Cronbach's Alpha value of above 0.5 is regarded as an indication of reliability.

Cronbach's Alpha analysis is appropriate when individuals respond to items on multiple levels. It is particularly useful for the Likert-type scale mapping rule, i.e. 1- Strongly disagree, 2- Disagree, 3- Not sure, 4- Agree, to 5- Strongly agree, used to measure empirical responses of respondents in the pre-test - post-test observations of the study.

5.3.4 Validity and reliability of questionnaire items (Questions)

Table 5.7 and Table 5.8 present Cronbach Alpha analyses on deleted results of each question of the two sections of the questionnaire. They reflect Cronbach Alpha values that the rest of the questions in the group will accept should one indicated question be deleted.

Table 5.7: Cronbach Coefficient Alpha with deleted variables of Section 1

Constructs	Variables (Questions)	Raw Variables Alpha	Standardised Variables Alpha
C 1: Management support Total Alpha = (Raw = **0.888870**) (Stzd = 0.891409)	V6 V7 V5 V8 V10 V9 V1 V4 V2 V3 **V11**	0.872782 0.876660 0.874360 0.875405 0.874066 0.883495 0.879874 0.880266 0.880559 0.881230 **0.890806**	0.875951 0.879558 0.877226 0.878399 0.877199 0.886374 0.882683 0.883043 0.883589 0.884225 0.890993
C 2: Work discretion Total Alpha = (Raw = 0.823382) (Stzd = 0.823068)	V15 V14 V16 V12 V22 V30 V13	0.784534 0.782252 0.788849 0.798814 0.816784 0.806465 0.817567	0.783914 0.781347 0.788459 0.789041 0.817067 0.805582 0.818516
C 3: Rewards/Reinforcements Total Alpha = (Raw = 0.832951) (Stzd = 0.831943)	V31 V32 V33 V34 V18 V19 V20 V21	0.798667 0.817705 0.800640 0.819389 0.819138 0.813701 0.830530 0.805537	0.798137 0.816664 0.800085 0.818345 0.816835 0.812295 0.830590 0.804203
C 4: Time availability Total Alpha = (Raw = **0.714309**) (Stzd = **0.716088**)	V23 V24 V25 **V26**	0.712315 0.547786 0.584232 **0.735972**	0.710257 0.550891 0.584474 **0.740703**
C 5: Organisational barriers Total Alpha = (Raw = 0.672103) (Stzd = 0.677381)	V28 V29 V17	0.533765 0.560093 0.641735	0.533969 0.565585 0.645575

Table 5.8: Cronbach Coefficient Alpha with deleted variables (questions) of Section 2

Constructs	Variables (Questions)	Raw Variables Alpha	Standardised Variables Alpha
C 6: Innovation organisational support Total Alpha = (Raw = **0.915831**) (Stzd = **0.918801**)	V35 V36 V37 V38 V39 V40 V41 **V42** V43	0.909331 0.904564 0.905345 0.902110 0.906112 0.900985 0.904423 **0.920280** 0.902896	0.912973 0.908590 0.909085 0.905070 0.909210 0.903454 0.908009 **0.922513** 0.906098
C 7: Innovation portfolio management Total Alpha = (Raw = 0.955334) (Stzd = 0.955598)	V44 V45 V46 V47 V48	0.951435 0.942688 0.940709 0.945764 0.943296	0.951551 0.943254 0.940871 0.946060 0.943625
Note: Highlighted deleted variables alphas are higher than construct alphas			

The raw variables Alpha results with deleted variables are compared with the raw variables Cronbach Alpha results of each group of questions (constructs). If the deleted Cronbach Alpha value increases, i.e. is higher than the Cronbach Alpha result of the construct, then that variable is neither reliable nor valid, and can be excluded from further analysis.

Only three (3) out of forty seven (47) variables (questions) were shown not to be reliable; each affected different constructs; and all Cronbach Alpha values were higher than 0.05.

The computed overall alpha value of 0.9254 for the instrument used for Observation 1 indicates a strong internal consistency and a strong degree to which instrument items are homogeneous and reflect the same underlying construct (Cooper & Schindler, 2003: 237).

It is therefore concluded that the questionnaire variables (questions) are reliable; and that the constructs are measuring what they are supposed to measure, indicating a good and reliable instrument.

5.4 Conclusion

The CEAI instrument applied on the pre-test experimental group observation 1 was adapted from Morris and Kuratko (2002: 295). The original instrument was modified by removing some questions that were regarded as superfluous and irrelevant to the South African context and the DFI environment, and by adding additional questions and two completely new 'innovation' constructs. The modified instrument was further refined based on the results of the factor analysis. The refinement resulted from the factor analysis and was in the form of deleting questions that had more than five missing responses and reclassifying others under constructs where they loaded strongly logically, though differently from what was originally anticipated.

The adapted and refined instrument is reliable and valid. It can be applied, in its modified and refined state, on the post-test experimental group (observation 2), on the pre-test comparative group and in other similar research studies.

Having tested the instrument for validity and reliability, the next chapter, Chapter 6, will now analyse the results of the pre-test application of such an instrument (observation 1) on the DBSA (experimental group) and ten other DFIs (the control group).

Chapter 6: Pre-intervention CE assessment (O_1): Comparisons between employee groups of experimental DFI

6.1 Introduction

This chapter analyses the results of the pre-intervention assessment of the corporate entrepreneurship environment and training needs in the experimental DFI.

The statistical tools used to perform statistical comparisons between employee groups are explained first, followed by a summary of the hypotheses to be tested. For the pre-intervention assessment of the CE environment and training needs of the **experimental DFI**, each hypothesis is tested to reach a conclusion as to whether it should be rejected or accepted. The hypothesis testing and discussion format is similar for all hypotheses. The following format is followed: For each entrepreneurship and innovation factor, the respondents' typical perceptions are summarised using descriptive statistics such as the mean and standard deviation; differences between the perceptions of the various stratification groups, i.e. manager and non-manager employees; male and female employees; age groups of employees; experience levels of employees; and employee education levels, are analysed using ANOVA; and where the null hypothesis is rejected, the Scheffe's Test is performed to control for type 1 error, to determine significant differences between the individual mean or means and the consensus value, and to establish the direction of the deviations. The results of the ex ante assessment of the CE environment of the control group DFIs are compared with those of the experimental DFI to ascertain significant differences.

6.2 Statistical significance testing

Testing for statistical significance follows a well-defined process. Cooper and Schindler (2003: 529) recommend a six-stage sequence of steps, as follows:

1. **State the null hypothesis**. Both the null hypotheses and the research or alternative hypotheses are stated in Chapter 1 under section 1.7: Propositions (null hypotheses).

2. **Choose the statistical test**. To test a hypothesis, one must choose an appropriate statistical test from a variety of tests and using a number of criteria that are both measurement-level and testing-situation dependent. Cooper and Schindler (2003) developed a classification of the major parametric and nonparametric significance tests and measures. Such a classification is contained in Table 6.1 below.

Table 6.1: Recommended statistical techniques by measurement level and testing situation

Measurement Level	One-Sample Case	Two-Samples Case		*k*-Samples Case	
		Related Samples	Independent Samples	Related Samples	Independent Samples
Nominal	-Binomial -*Chi-square* One- sample	-McNemar	-Fisher exact test - *Chi-square* Two-samples test	-Cochran	- *Chi-square* *k*-samples
Ordinal	-Kolmogorov-Smirnov one sample-test -Runs test	-Sign test -Wilconox matched-pairs test	-Median test -Mann-Whitney U -Kolmonorov-Smirnov -Wald-Wolfowitz	-Friedman two-way ANOVA	-Median extension -Kruskal-Wallis one-way ANOVA
Interval and ratio	-*t*-test -*Z*-test	-*t*-test for repeated samples	-*t*-test -*Z*-test	-Repeated-measures ANOVA	-One-way ANOVA -*n*-way ANOVA
Source: Cooper & Schindler (2003: 534)					

3. **Select the desired level of significance.** The exact level to choose is largely determined by how much risk there is of accepting the null hypothesis when in truth it should be rejected (type 1 error or **α**). For the purposes of this study, a 5% level of significance is chosen.

4. **Compute the calculated difference value.** After the empirical data have been collected, the significance value (*F*, *t*, Chi-square or other measure) is calculated, based on the significance test chosen under step 2 above. For the purposes of this study, the SAS (1988) computer program used computed the significance values.

5. **Obtain the critical test value.** After the difference value (*F* or other) is calculated, the critical value is obtained from the appropriate table for that distribution.

6. **Interpret the test.** For this step, the conclusion is stated in terms of rejecting or not rejecting the null hypothesis, depending on whether or not the calculated value (step 4) is more extreme than the critical value (step 5).

6.2.1 Probability values (P-Values)

There are several ways of carrying out hypothesis testing. One can carry out a formal test using Cooper and Schindler's (2003: 529) six-step procedure described above, or one can compute a *p*-value to do the test, or one can use a confidence interval as a hypothesis test. These methods are equivalent to one another and they will all lead to the same conclusion. The formal, six-step method is easiest to grasp initially; the *p*-value method is commonly used by computer statistical analysis packages such as the SAS program (1998); and the confidence interval approach is easy to interpret (Hildebrand & Ott, 1996: 249).

The *p*-value indicates the weight of evidence, or the conclusiveness index for rejecting a null hypothesis. In other words, the p-value is the probability (assuming a H_0) of a test statistic value equal to or more extreme than the actual observed value. Therefore, the Universal Rejection Region is stated as:

Reject the null hypothesis if, and only if, the p-value is less than α.

Bearing in mind the basic hypothesis-testing strategy of trying to support the research hypothesis and reject the null hypothesis by showing that the data are highly unlikely, assuming that H_0 is true, the *p*-value is interpreted as follows:

> *The farther within the rejection region the test statistic falls, the smaller the p-value is, and the stronger evidence there is to reject the null hypothesis and support the research hypothesis* (Hildebrand & Ott, 1996: 260).

The SAS (1998) program works out the p-values that automatically incorporate the values in the F statistical tables. The p-value method will be used to interpret the results of the empirical section of this study.

6.2.2 Analysis of variance (ANOVA)

One of the most notable trends in management over the past few decades has been the use of scientifically controlled and carefully designed experiments. Controlled experiments are especially useful to management in the assessment of the likely effect of changes. The improvement in management trends lies in the fact that well-designed experiments convert a discussion from speculative opinion to the assessment of actual data (Hildebrand & Ott, 1996: 354).

Typically the data resulting from an experiment consist of multiple samples. The statistical method for testing the null hypothesis, that the means of several samples of a population or means of populations are equal, is the analysis of variance (ANOVA). The ANOVA method leads to a single statistic for comparing all the means, so the overall risk of type 1 error can be controlled (Hildebrand & Ott, 1996).

The analysis of variance is based on 'taking apart' the variability in the data into the part attributable to variation between groups, and the remaining part attributable to variation within groups. Variation is assessed by sums of squares (SS) (Hildebrand & Ott, 1996).

The test statistic for ANOVA is the *F* ratio. The calculation of an *F* ratio can be computed by the SAS program (1988) and most other statistical packages. To begin with, one (or the computer program) calculates the *total sum of squares* (**SS (Total)**) as the sum of squared deviations of individual values around the grand mean of all the scores. Thus, **SS (Total)** is by definition the sum of all squared deviations around the grand mean, and is partitioned into two components, **SS (Between)** and **SS (Within)** (Hildebrand & Ott, 1996).

SS (Between), also called SS (Factor), is the variability between groups. It is the sum of squared deviations of each group mean from the grand mean, multiplied by the sample size for the group. If the means for the various groups (the various levels of the experimental factor) are nearly the same, there is little variability attributable to the factor, and SS (Between) will be small (Hildebrand & Ott, 1996).

SS (Within) is the variability within groups. If all the data in each group are close together and therefore close to the group mean, then the variances and SS (Within) will be small (Hildebrand & Ott, 1996).

The *degrees of freedom* for SS (Within) can be found by realising that there is *n*-1 d.f. for squared deviations within a group. Similarly, the degrees of freedom for SS (Between) can be found by realising that there is *I*-1 d.f for *I* number of groups. Dividing the sum of squares by their degrees of freedom results in *mean squares* **(MS).** Using this terminology, the ANOVA (test statistic) for testing the equality of I group means is expressed as follows:

T.S. : $F = \frac{\text{MS (Between)}}{\text{MS (Within)}} = \frac{\sum_i n_i (y_i - y)^2 / (I-1)}{\sum_{ij} (y_{ij} - y_i)^2 / (n-I)}$

The rejection rule for the hull hypothesis is expressed as: R.R.: For a specified α, reject H_0 if $F > F_\alpha$, where F_α cuts off a right-tail area of α in the F distribution with *I*-1 numerator and n-1 denominator d.f. (Hildebrand & Ott, 1996: 358)

Large positive values of MS (Between) relative to MS (Within) indicate differences among the population means and lead to the rejection of the null hypothesis (Hildebrand & Ott, 1996).

Like all statistical inference procedures, the *F* test is based on certain assumptions. The three basic assumptions are population normality; equal group variances; and independence of observations The ANOVA is a test on means and therefore the Central Limit Theorem is relevant (Hildebrand & Ott, 1996). For the purposes of this study, there is no problem, as the sample sizes are large.

Changes in an organisation's entrepreneurial climate, attitudes, or behaviours are common areas of interest to organisational behaviour analysts. This study assesses the probable results of a change in training, knowledge, process, or policy, by performing an experiment on carefully chosen samples, making the changes, and measuring the results.

6.2.3 Multiple comparison tests

ANOVA does not indicate which individual mean or means are different from the consensus value and in which direction they deviate. The most effective way to find out is to plot the data or alternatively, but less effectively, to carry out a multiple comparison test such as Scheffe's Test. The Scheffe's Test controls for type 1 error, is conservative and is robust to violations of assumptions.

Multiple comparisons test the difference between each pair of means and indicate significantly different group means at a specified α level. Multiple comparison tests use group means and incorporate MS_{error} term of the *F* ratio. Together they produce confidence intervals for the population means and a criterion score. Differences between the mean values may be compared (Cooper & Schindler, 2003: 551).

The Scheffe's S Test is chosen for the present study to indicate which comparisons are significant at α=0.05 level. Scheffe's Test results also indicate the direction of the difference where the null hypothesis is rejected.

6.2.4 Means and standard deviations

Descriptive statistics such as means and standard deviations are useful in performing an initial summary of the collected data and to check for errors. The mean (X), or arithmetic average, is a common measure of location and has been used in this study to determine a typical (average) response by all respondents to a question. The standard deviation (S) summarises how far away from the average data values typically are.

6.3 Propositions tested

Tables 6.2 and 6.3 reflect a summary of all propositions for the five constructs of section 1 and the two constructs of section 2 of the questionnaire. The tables also indicate the respective sections in which detailed statistical testing analyses are performed in this chapter. For the sake of brevity, only the null propositions, and not the alternative propositions, are summarised.

Table 6.2: Summary of H_0: **B** propositions: Section 1 factors **(**Refer Chapter 1, section 1.7)

Sec.	H_0	There is not a significant difference regarding…	Between manager & non-manager groups (ANOVA)	Between male & female groups (ANOVA)	Between age groups (ANOVA)	Between experien.g roups (ANOVA)	Between educat. groups (ANOVA)
6.4.1	H_0**B** 1	Managerial support for corporate entrepreneur	H_0**B**1.**1**	H_0**B**1.**2**	H_0**B**1.**3**	H_0**B**1.**4**	H_0**B**1.**5**
6.4.2	H_0**B** 2	Work discretion	H_0**B**2.**1**	H_0B2.**2**	H_0**B**2.**3**	H_0**B**2.**4**	H_0**B**2.**5**
6.4.3	H_0**B** 3	Rewards/reinf orcements	H_0**B**3.**1**	H_0B3.**2**	H_0**B**3.**3**	H_0**B**3.**4**	H_0**B**3.**5**
6.4.4	H_0**B** 4	Time availability	H_0**B**4.**1**	H_0B4.**2**	H_0**B**4.**3**	H_0**B**4.**4**	H_0**B**4.**5**
6.4.5	H_0**B** 5	Organisationa l barriers	H_0**B**5.**1**	H_0B5.**2**	H_0**B**5.**3**	H_0B5.**4**	H_0**B**5.**5**
Key: **B** = proposition (H_0) that **there is not a significant difference between the pre-intervention CE opinions of the experimental DFI employee categories regarding the constructs**							

Table 6.3: Summary of H_0: **B** propositions: Section 2 factors (Refer Chapter 1, section 1.7)

Para.	H_0	There is not a significant difference regarding…	Between manager & non-manager groups (ANOVA)	Between male & female groups (ANOVA)	Between age groups (ANOVA)	Between experi-ence groups (ANOVA)	Between educat. groups (ANOVA)
6.4.6	H_0**B**6	Innovation org. support....	H_0**B**6.**1**	H_0**B**6.**2**	H_0**B**6.**3**	H_0**B**6.**4**	H_0**B**6.**5**
6.4.7	H_0**B**7	Innovation portfolio support	H_0**B**7.**1**	H_0**B**7.**2**	H_0**B**7.**3**	H_0**B**7.**4**	H_0**B**7.**5**
Key: **B** = proposition (H_0) that **there is not a significant difference between the pre-intervention CE opinions of the experimental DFI employee categories regarding the constructs**							

6.4 Proposition testing: Pre-intervention comparisons between experimental DFI employee groups

First, for each entrepreneurship and innovation factor, the respondents' typical opinions will be summarised using descriptive statistics such as the mean and standard deviation. The opinion survey instrument used a five-point Likert scale to solicit ratings from the respondents. On such a scale, the middle value is 3, and therefore a mean above 3 is regarded as good and below 3 as not so good.

Second, differences between the mean scores of the various employee category groups, i.e. manager and non-manager employees; male and female employees; age groups of employees; employee experience and employee education levels, will be analysed using ANOVA.

6.4.1 Factor 1: Management support for CE

Table 6.4.1.1: Descriptive statistics on Factor 1: Management support

N	$\overline{X}$	S
312	2.645	0.694

The 312 employee respondents are of the opinion that the organisational support for corporate entrepreneurship at the experimental DFI is below average (2.645 out of 5).

Table 6.4.1.2: Overall ANOVA on Factor 1: Management support

Source of variation	Degrees of Freedom (D.F)	Sum of Squares (SS)	Mean Square (MS)	F Value	F Critical Value	P-Value
Between all groups	12	25.975	2.164	5.56	2.32	<0001***
Within groups	281	109.386	0.389			
Total	293	131.362				
*** indicates a statistically significant difference						

Applying the *p*-value approach, the p-value of 0.0001 is < α of 0.05; it is found that there **is** a statistically significant difference between the corporate entrepreneurship opinions of *one or more* of the different employee categories (*managers, non-managers, male, female, different age groups, different experience groups, different education levels)* regarding the Management support factor (Factor 1).

Applying the *F* test: F_{value} of 5.56 is > F_{crit} of 2.32 at α = 0.05 for 12 and 281 (read at df=240) degrees of freedom, a similar conclusion is reached.

The above finding does not indicate which individual mean or means are different from the consensus value and in what direction they deviate. The following more detailed ANOVA, Scheffe's Test and discussion examine for the difference between each pair of means and indicate significantly different stratification group means at a specified α level.

Table 6.4.1.3: ANOVA (between groups) on Factor 1: Management support

Hypothesis	Stratification groups	D.F.	Sum of Squares (SS)	Mean Square (MS)	F Values	P-Value
H_0B1.**1**	Managers and non-managers	1	0.3168	0.3168	0.81	0.3677
H_0B1.**2**	Male and female	1	0.1718	0.1718	0.44	0.5070
H_0B1.**3**	Age groups	3	1.2329	0.4109	1.06	0.3683
H_0B1.**4**	Experience groups	4	10.7476	2.6869	6.90	<0.0001***
H_0B1.**5**	Education levels	3	10.0980	3.3660	8.65	<0.0001***
*** indicates a statistically significant difference at α = 0.05 level						

Applying the *p*-value Rejection Rule that one should 'reject the null hypothesis if, and only if, the p-value is less than α', Table 6.4.1.3 results indicate:

That there is **not** a statistically significant difference between: managers and non-managers (**H_0B1.1)**; male and female **(H_0B1.2)**; and various age groups **(H_0B1.3)**, regarding **management support for CE**. Therefore propositions H_0B1.1, H_0B1.2 and H_0B1.3 are **accepted.**

According to this finding, employee job status, gender, and age categories do not play a statistically significant role in employee opinions about management support for corporate entrepreneurship.

Conversely, the following propositions are rejected:

Proposition H_0B1.4: Rejected

There **is** a significant difference between the corporate entrepreneurship opinions of employees with service year ranges *0 to 4* and *5 to 9* and *10 to 14* and *15 to >20* regarding **management support for CE**.

To further analyse the rejected hypothesis and to control for type 1 error (where a true hypothesis is rejected), Table 6.4.1.4 contains Scheffe's Test results

indicating significant comparisons, and the direction thereof, of employees experience categories at α of 0.05.

Table 6.4.1.4: Scheffe's comparison between work experience sub-groups on Management support (Factor 1)

Work experience (years) categories	Difference between means	Simultaneous 95% confidence limits		
2 > 4	0.48201	0.06045	0.90357	***
1 > 3	0.37351	0.01877	0.72825	***
1 > 4	0.46656	0.19033	0.74279	***

*** indicates comparisons significant at the 0.05 level

1= 0 to 4 yrs;

2= 5 to 9 yrs;

3= 10 to 14 yrs;

4= 15 to 19 yrs;

The results in Table 6.4.1.4 indicate that employees with 5 to 9 years' experience have a statistically better opinion (mean score) on the construct than those with 15 to 19 years. Moreover, employees with experience of up to 5 years have a statistically better opinion (mean score) than those with 10 years and above.

These results indicate that 'newer' employees (means = 2.8799 (2) and 2.8644 (1)) have a better view of the organisation than the 'more experienced' (means = 2.3978 (4) and 2.4909 (3)) with respect to entrepreneurial management support (Factor 1). This has implications on the retirement/recruitment policies of DFI institutions. Policies that encourage early retirement and external recruitment could be beneficial for corporate entrepreneurship.

Proposition H_0B1.5: Rejected

There **is** a significant difference between the corporate entrepreneurship opinions of employees with education levels: less than *matric* and *matric* and

post matric and *graduate and post graduate levels* regarding **management support for CE**.

To further analyse the rejected hypothesis and to control for type 1 error (where a true hypothesis is rejected), the following table contains Scheffe's Test results indicating significant comparisons of employees' levels of education stratification sub-groups at α = 0.05.

Table 6.4.1.5: Scheffe's comparison between levels of education sub-groups on Management support (Factor 1)

Employee levels of education	Difference between means	Simultaneous 95% confidence limits		
1&2 > 5	0.45353	0.06222	0.84485	***
3 > 5	0.32611	0.06511	0.58711	***
*** indicates comparisons significant at the 0.05 level **1&2**= matric and less than matric; **3**= after matric; **4**= degree; **5**= post graduate				

In table 6.4.1.5, the results indicate that there is a significant difference between employees with qualifications lower than a degree and those that have degrees.

The 'employees without degrees' have a statistically significantly better view of the organisation than 'degreed' employees with respect to entrepreneurial **management support** (Factor 1). This may mean that management does not understand and support 'sophisticated' ideas.

6.4.2 Factor 2: Work discretion

Table 6.4.2.1: Descriptive statistics on Factor 2: Work discretion

N	$\bar{X}$	S
312	3.134	.763

The 312 employee respondents are of the opinion that the work discretion at the DBSA is above average (3.134 out of 5).

Table 6.4.2.2: Overall ANOVA on Factor 2: Work discretion

Source of Variation	D.F	Sum of Squares	Mean Square	F Value	F-Critical Value	P-Value
Between all groups	12	13.849	1.154	2.02	2.32	0.0229***
Within groups	281	160.864	0.572			
Total	293	174.713				
*** indicates a statistically significant difference at α = 0.05 level						

Applying the *p*-value approach, the p-value of 0.0.229 is < α of 0.05; it is found that there **is** a statistically significant difference between the corporate entrepreneurship opinions of *one or more* of the different employee groups (*managers, non-managers, male, female, different age groups, different experience groups, different education levels)* regarding the **work discretion** factor (Factor 2)

The above result does not indicate which individual mean or means are different from the consensus value and in what direction they deviate. The following more detailed ANOVA and Scheffe's Test and discussion examine for the difference between each pair of means and indicate significantly different stratification group means at a specified α level.

Table 6.4.2.3: ANOVA (between groups) on Factor 2: Work discretion

Hypothesis	Stratification Groups	D.F	Sum of Squares	Mean Square	F Values	P-Value
H_0B2.**1**	Managers and non-managers	1	0.3184	0.3184	0.56	0.4564
H_0B2.**2**	Male and female	1	0.0574	0.0574	0.10	0.7517
H_0B2.**3**	Age groups	3	0.3574	0.1191	0.21	0.8907
H_0B2.**4**	Experience groups	4	7.4793	1.8698	3.27	0.0122***
H_0B2.**5**	Education levels	3	4.8315	1.6105	2.81	0.0397***
*** indicates a statistically significant difference at α = 0.05 level						

Applying the p-value Rejection Rule that one should 'reject the null hypothesis if, and only if, the p-value is less than α', Table 6.4.2.3 results indicate:

That there is **not** a statistically significant difference between: managers and non-managers (**H_0B2.1)**; male and female **(H_0B2.2)**; and various age groups **(H_0B2.3)**, regarding **work discretion**. Therefore, propositions H_0B2.1, H_0B2.2 and H_0B2.3 are **accepted.**

According to this finding, employee job status, gender and age categories do not play a statistically significant role in employee opinions about work discretion to facilitate corporate entrepreneurship.

However, the following propositions are rejected:

Proposition H_0B2.4: Rejected

There **is** a statistically significant difference between the corporate entrepreneurship opinions of employees with service year ranges *0 to 4* and *5 to 9* and *10 to 14* and *15 to >20* regarding **work discretion**.

To further analyse the rejected hypothesis and to control for type 1 error (where a true hypothesis is rejected), the following table contains Scheffe's Test results indicating significant comparisons of employees' experience categories.

Table 6.4.2.4: Scheffe's comparison between experience sub-groups on Work discretion (Factor 2)

Work experience (yrs) stratification	Difference between means	Simultaneous 95% confidence limits		
2 > 4	0.55870	0.04749	1.06992	***
*** indicates comparisons significant at the 0.05 level **1**= exp 0 to 4yrs; **2**= exp 5 to 9yrs; **3**= exp 10 to 14yrs; **4**= exp 15 to 19yrs; **5**= 20yrs and more				

In Table 6.4.2.4, the results indicate that employees with 5 to 9 years' experience have a statistically significantly better view of the organisation than those with 15 to 19 years with respect to entrepreneurial work discretion (Factor 2).

Proposition H_0B2.5: Rejected

There **is** a statistically significant difference between the corporate entrepreneurship opinions of employees with education levels less than *matric* and *matric* and *post matric* and *graduate and post graduate* regarding **work discretion**.

To further analyse the rejected hypothesis and to control for type 1 error (where a true hypothesis is rejected), the following table contains Scheffe's Test results, indicating that **none** of the comparisons of employees' levels of education stratification sub-groups were significant at α = 0.05.

Table 6.4.2.5: Scheffe's comparison between levels of education sub-groups on Work discretion (Factor 2)

Employee levels of education groups	Difference between means	Simultaneous 95% confidence limits		
1&2 > 5	0.10062	-037392	0.57516	
1&2 > 4	0.29645	-0.24320	0.83611	
1&2 > 3	0.38135	-0.13708	0.89977	
5 > 4	0.19583	-0.15437	0.54604	
5 > 3	0.28073	-0.03579	0.59724	
4 > 3	0.08489	-0.32281	0.49259	
1= less than matric; **2**= matric; **3**= after matric; **4**= degree; **5**= post graduate				

The results indicate a possibility that a true hypothesis may have been rejected. Scheffe's Test results in Table 6.4.2.5 indicate that there **is not** a significant difference between the corporate entrepreneurship opinions of employees with education levels less than *matric* and *matric* and *post matric* and *graduate and post graduate* regarding **work discretion**.

6.4.3 Factor 3: Rewards/Reinforcements

Table 6.4.3.1: Descriptive statistics on Factor 3: Rewards/Reinforcements

N	$\overline{X}$	S
312	3.068	0.782

The 312 employee respondents are of the opinion that rewards/reinforcements at the experimental DFI are average to good (3.068 out of 5).

Table 6.4.3.2: Overall ANOVA Factor 3: Rewards/Reinforcements

Source of Variation	Degrees of Freedom (D.F)	Sum of Squares (SS)	Mean Square (MS)	F Value	F Critical Value	P-Value
Between all groups	12	12.6316	1.0526	1.71	2.32	0.0639
Within groups	281	172.8267	0.6150			
Total	293	185.4583				

Applying the *p*-value approach, the p-value of 0.0639 is > 0.05*(α)*, a finding is made that there **is not** a significant difference between the corporate entrepreneurship opinions of any of the different employee categories (*managers, non-managers, male, female, different age groups, different experience groups, different education levels)* regarding **rewards/reinforcements** factor (Factor 3)

The above result is corroborated by the following more detailed ANOVA and discussion of differences between stratification groups on rewards/reinforcements.

Table 6.4.3.3: ANOVA (between groups) on Factor 3: Rewards/Reinforcements

Hypothesis	Stratification Groups	Degrees of Freedom (D.F)	Sum of Squares (SS)	Mean Square (MS)	F Values	P-Value
H_0B3.**1**	Managers and non-managers	1	0.4354	0.4354	0.71	0.4008
H_0B3.**2**	Male and female	1	0.2655	0.2655	0.43	0.5116
H_0B3.**3**	Age groups	3	2.9518	0.9839	1.60	0.1896
H_0B3.**4**	Experience groups	4	5.6973	1.4243	2.32	0.0575
H_0B3.**5**	Education levels	3	2.3699	0.7899	1.28	0.2800

Applying the *p*-value Rejection Rule that one should 'reject the null hypothesis if, and only if, the p-value is less than α', Table 6.4.3.3 results indicate:

That there is **not** a statistically significant difference between: managers and non-managers (**H_0B3.1)**; male and female **(H_0B3.2)**; various age groups **(H_0B3.3);** work experience groups **(H_0B3.4)**; and education groups **(H_0B3.5),** regarding **rewards/reinforcements**. Therefore propositions H_0B3.1, H_0B3.2, H_0B3.3, H_0B3.4 and H_0B3.5 are **accepted.**

According to this finding, differences within all the employee stratification groups do not play a statistically significant role in employee opinions about rewards/reinforcements for corporate entrepreneurship.

6.4.4 Factor 4: Time availability

Table 6.4.4.1: Descriptive statistics on Factor 4: Time availability

N	$\overline{X}$	S
312	2.553	0.814

The 312 employee respondents are of the opinion that time availability for corporate entrepreneurship at the experimental DFI is below average (2.553 out of 5).

Table 6.4.4.2: Overall ANOVA on Factor 4: Time availability

Source of Variation	Degrees of Freedom (D.F)	Sum of Squares (SS)	Mean Square (MS)	F Value	F Critical Value	P-Value
Between all groups	12	13.18038	1.0983	1.69	2.32	0.0688
Within groups	281	182.8028	0.6505			
Total	293	195.9832				

Applying the *p*-value approach, the p-value of 0.0688 is > 0.05 *(α)*, a finding is made that there **is not** a significant difference between the corporate entrepreneurship opinions of any of the different employee categories (*managers, non-managers, male, female, different age groups, different experience groups, different education levels)* regarding the **time availability** factor (Factor 4)

The above result is corroborated by the following more detailed ANOVA and discussion of differences between stratification groups on time availability.

Table 6.4.4.3: ANOVA (between groups) on Factor 4: Time availability

Hypothesis	Stratification Groups	Degrees of Freedom (D.F)	Sum of Squares (SS)	Mean Square (MS)	F Values	P-Value
H_0B4.**1**	Managers and non-managers	1	0.1666	0.1666	0.26	0.6132
H_0B4.**2**	Male and female	1	0.0038	0.0038	0.01	0.9389
H_0B4.**3**	Age groups	3	3.9560	1.3186	2.03	0.1103
H_0B4.**4**	Experience groups	4	1.1295	0.2823	0.43	0.7840
H_0B4.**5**	Education levels	3	3.3110	1.1036	1.70	0.1680

Applying the *p*-value Rejection Rule that one should 'reject the null hypothesis if, and only if, the p-value is less than α', table 6.4.4.3 results indicate:

That there is **not** a statistically significant difference between: managers and non-managers (**H_0B4.1)**; male and female **(H_0B4.2)**; various age groups **(H_0B4.3);** work experience groups **(H_0B4.4)**; and education groups **(H_0B4.5),** regarding **time availability**. Therefore propositions H_0B4.1, H_0B4.2, H_0B4.3, H_0B4.4 and H_0B4.5 are **accepted.**

According to this finding, differences within all the employee stratification groups do not play a statistically significant role in employee opinions about time availability for corporate entrepreneurship.

6.4.5 Factor 5: Organisational boundaries

Table 6.4.5.1: Descriptive statistics on Factor 5: Organisational boundaries

N	$\overline{X}$	S
312	2.858	0.852

The 312 employee respondents are of the opinion that organisational boundaries against corporate entrepreneurship at the experimental DFI are below average (2.858 out of 5).

Table 6.4.5.2: Overall ANOVA on Factor 5: Organisational boundaries

Source of Variation	(D.F)	Sum of Squares (SS)	Mean Square (MS)	F Value	F-Critical Value	P-Value
Between all groups	12	14.8798	1.2399	1.72	2.32	0.0619
Within groups	281	202.4372	0.7204			
Total	293	217.3170				

Applying the *p*-value approach, the p-value of 0.0619 is > 0.05*(α)*, a finding is made that there **is not** a significant difference between the corporate entrepreneurship opinions of any of the different employee groups (*managers,*

non-managers, male, female, different age groups, different experience groups, different education levels) regarding the **organisational boundaries** factor (Factor 5)

Contrary to the above result, the following more detailed ANOVA and Scheffe's Test and discussion indicate significant differences between some stratification group means at a specified α level.

Table 6.4.5.3: ANOVA (between groups) on Factor 5: Organisational boundaries

Hypothesis	Stratification Groups	Degrees of Freedom (D.F)	Sum of Squares (SS)	Mean Square (MS)	F Values	P-Value
H_0B5.**1**	Managers and non-managers	1	1.1535	1.1535	1.60	0.2068
H_0B5.**2**	Male and female	1	0.4300	0.4300	0.60	0.4404
H_0B5.**3**	Age groups	3	1.3460	0.4486	0.62	0.6008
H_0B5.**4**	Experience groups	4	8.1093	2.0273	2.81	0.0257***
H_0B5.**5**	Education levels	3	2.0409	0.6803	0.94	0.4196
*** indicates a statistically significant difference at α = 0.05 level						

Applying the p-value Rejection Rule that one should 'reject the null hypothesis if, and only if, the p-value is less than α', Table 6.4.5.3 results indicate:

That there is **not** a statistically significant difference between: managers and non-managers (**H_0B5.1)**; male and female **(H_0B5.2)**; various age groups **(H_0B5.3);** and education level groups **(H_0B5.5),** regarding **organisational boundaries**. Therefore, propositions H_0B5.1, H_0B5.2, H_0B5.3, and H_0B5.5 are **accepted.**

According to this finding, employee job status, gender, age categories and education levels do not play a statistically significant role in employee opinions about organisational boundaries to facilitate corporate entrepreneurship.

However, the following proposition is rejected:

Proposition H_0B5.4: Rejected

There **is** a significant difference between the corporate entrepreneurship opinions of employees with service year ranges *0 to 4* and *5 to 9* and *10 to 14* and *15 to >20* regarding **organisational boundaries**.

To further analyse the rejected hypothesis and to control for type 1 error, the following table contains Scheffe's Test results indicating significant comparisons of employees' experience categories at α = 0.05

Table 6.4.5.4: Scheffe's comparison between experience sub-groups on Organisational boundaries (Factor 5)

Work experience (yrs) groups	Difference between means	Simultaneous 95% confidence limits		
1 > **4**	0.3943	0.0185	0.7700	***
*** indicates a statistically significant difference at α = 0.05 level **1**= exp 0 to 4yrs; **2**= exp 5 to 9yrs; **3**= exp 10 to 14yrs; **4**= exp 15 to 19yrs; **5**= 20yrs and more				

The results indicate that employees with experience of up 5 years have a statistically significantly better opinion with respect to entrepreneurial organisational boundaries (Factor 5) than those with 15 years and above work experience. This has implications on the type of policies followed for recruitment and retirement, and on whom entrepreneurial training for staff should be focused in development finance institutions.

6.4.6 Factor 6: Innovation organisational support

Table 6.4.6.1: Descriptive statistics on Factor 6: Innovation organisational support

N	$\overline{X}$	S
312	2.644	0.770

The 312 employee respondents are of the opinion that the innovation organisational support at the experimental DFI is below average (2.644 out of 5).

Table 6.4.6.2: Overall ANOVA on Factor 6: Organisational innovation support

Source of Variation	Degrees of Freedom (D.F)	Sum of Squares (SS)	Mean Square (MS)	F Value	F Critical Value	P-Value
Between all groups	12	35.4552	2.9546	6.02	2.32	<0.0001***
Within groups	281	137.9274	0.4908			
Total	293	173.3827				
*** indicates a statistically significant difference at α = 0.05 level						

Applying the *p*-value approach, the p-value of '<0.0001' is < 0.05 *(α)*, it is found that there **is** a significant difference between the innovation opinions of *one or more* of the different employee categories (*managers, non-managers, male, female, different age groups, different experience groups, different education levels)* regarding the **organisational innovation support** factor (Factor 6)

The above result does not indicate which individual mean or means are different from the consensus value and in what direction they deviate. The following more detailed ANOVA and Scheffe's Test examine for differences between each pair of means and indicate statistically significantly different group means at a specified α level.

Table 6.4.6.3: ANOVA (between groups) on Factor 6: Organisational innovation support

Hypothesis	Stratification Groups	D.F.	Sum of Squares (SS)	Mean Square(MS)	F Values	P-Value
H_0B6.**1**	Managers and non-managers	1	0.4786	0.4786	0.98	0.3242
H_0B6.**2**	Male and female	1	0.2536	0.2536	0.52	0.4729
H_0B6.**3**	Age groups	3	0.1660	0.0553	0.11	0.9526
H_0B6.**4**	Experience groups	4	6.0233	1.5058	3.07	0.0170***
H_0B6.**5**	Education levels	3	16.4947	5.4982	11.2	<0.0001***
*** indicates a statistically significant difference at α = 0.05 level						

Applying the p-value Rejection Rule that one should 'reject the null hypothesis if, and only if, the p-value is less than α', Table 6.4.6.3 results indicate:

That there is **not** a statistically significant difference between: managers and non-managers (**H_0B6.1)**; male and female **(H_0B6.2)**; and various age groups **(H_0B6.3)**, regarding **organisational innovation support**. Therefore, propositions H_0B6.1, H_0B6.2 and H_0B6.3 are **accepted.**

According to this finding, employee job status, gender and age categories do not play a statistically significant role in employee opinions about organisational support for innovation.

However, the following propositions are rejected:

Proposition H_0B6.4: Rejected

There **is** a significant difference between the opinions of employees with work experience year ranges *0 to 4* and *5 to 9* and *10 to 14* and *15 to >20* regarding **organisational innovation support**.

To further analyse this rejected hypothesis and to control for type 1 error (where a true hypothesis is rejected), the following table contains Scheffe's Test results

indicating significant comparisons of employees' experience categories at α = 0.05

Table 6.4.6.4: Scheffe's comparison between experience sub-groups on Organisational innovation support (Factor 6)

Work experience (yrs) groups	Difference between means	Simultaneous 95% confidence limits		
1 > 4	0.34211	0.03194	0.65229	***
*** indicates a statistically significant difference at α = 0.05 level **1**= exp 0 to 4yrs; **2**= exp 5 to 9yrs; **3**= exp 10 to 14yrs; **4**= exp 15 to 19yrs; 5= 20yrs and more				

The results in Table 6.4.6.4 indicate that employees with work experience of up to 5 years have a statistically better opinion of the organisation than those with work experience of 10 to 19 years ('more experienced' employees) with respect to organisational innovation support (Factor 6).

One of the implications of this finding is that a DFI with relatively 'newer' employees would do better on innovation than a DFI that has employees with long experience. These 'newer' employees do not necessarily have to be younger in age. Where innovation and corporate entrepreneurship are a pillar of corporate strategy, the recruitment and retirement policies, as well as the focus of entrepreneurial training for staff, must take account of this finding.

Proposition H_0B6.5: Rejected

There **is** a significant difference between the opinions of employees with education levels less than *matric* and *matric* and *post matric* and *graduate and post graduate* regarding **organisational innovation support**.

To further analyse the rejected hypothesis and to control for type 1 error (where a true hypothesis is rejected), the following table contains Scheffe's Test results indicating significant comparisons of employees' experience categories at an α of 0.05

Table 6.4.6.5: Scheffe's comparison between levels of education sub-groups on Organisational innovation support (Factor 6)

Employee levels of education	Difference between means	Simultaneous 95% confidence limits		
1&2 > 4	0.54147	0.04176	1.04117	***
1&2 > 5	0.81461	0.37521	1.25402	***
3 > 5	0.57782	0.28474	0.87090	***
*** indicates a statistically significant difference at α = 0.05 level **1**= less than matric; **2**= matric; **3**= after matric; **4**= degree; 5= post graduate				

The results in Table 6.4.6.5 indicate that employees without a degree have a statistically significantly higher opinion of the organisation than employees with degrees and higher education levels with respect to organisational innovation support (Factor 6). This may mean that management does not understand and support 'sophisticated' innovations.

6.4.7 Factor 7: Innovation portfolio management

Table 6.4.7.1: Descriptive statistics on Factor 7: Innovation portfolio management

N	X	S
312	2.500	0.839

The 312 employee respondents are of the opinion that the innovation portfolio management at the experimental DFI is below average (2.500 out of 5).

Table 6.4.7.2: Overall ANOVA on Factor 7: Innovation portfolio management

Source of Variation	Degrees of Freedom (D.F)	Sum of Squares (SS)	Mean Square (MS)	F Value	F Critical Value	P-Value
Between all groups	12	36.5408	3.0450	5.05	2.32	<0.0001***
Within groups	281	169.3579	0.6026			
Total	293	205.8987				
*** indicates a statistically significant difference at α = 0.05 level						

Applying the *p*-value approach, the p-value of '<0.0001' < 0.05 *(α)*, a finding is made that there **is** a significant difference between the innovation opinions of *one or more* of the different employee categories (*managers, non-managers, male, female, different age groups, different experience groups, different education levels)* regarding the **innovation portfolio management** factor (Factor 7)

The above result does not indicate which individual mean or means are different from the consensus value and in what direction they deviate. The following more detailed ANOVA and Scheffe's Test examine for the difference between each pair of means and indicate significantly different stratification group means.

Table 6.4.7.3: ANOVA (between groups) on Factor 7: Innovation portfolio management

Hypothesis	Stratification Groups	D.F	Sum of Squares	Mean Square	F Values	P-Value
H_0B7.**1**	Managers and non-managers	1	0.5978	0.5978	0.99	0.3201
H_0B7.**2**	Male and female	1	0.4878	0.4878	0.81	0.3691
H_0B7.**3**	Age groups	3	1.0307	0.3435	0.57	0.6351
H_0B7.**4**	Experience groups	4	9.3644	2.3411	3.88	0.0043***
H_0B7.**5**	Education levels	3	14.8736	4.9578	8.23	<0.0001***
*** indicates a statistically significant difference at α = 0.05 level						

Applying the p-value Rejection Rule that one should 'reject the null hypothesis if, and only if, the p-value is less than α', Table 6.4.6.3 results indicate:

That there is **not** a statistically significant difference between: managers and non-managers (**H_0B7.1)**; male and female **(H_0B7.2)**; and various age groups **(H_0B7.3)**, regarding **innovation portfolio management**. Therefore, propositions H_0B7.1, H_0B7.2 and H_0B7.3 are **accepted.**

According to this finding, employee job status, gender and age categories do not play a statistically significant role in employee opinions about innovation portfolio management.

However, the following propositions are rejected:

Proposition H_0B7.4: Rejected

There **is** a significant difference between the opinions of employees with service year ranges *0 to 4* and *5 to 9* and *10 to 14* and *15 to >20* regarding **innovation portfolio management**.

To further analyse this rejected hypothesis and to control for type 1 error (where a true hypothesis is rejected), the following table contains Scheffe's Test results indicating significant comparisons of employees' experience categories at α= 0.05

Table 6.4.7.4: Scheffe's comparison between experience sub-groups on Innovation portfolio management (Factor 7)

Work experience (yrs) groups	Difference between means	Simultaneous 95% confidence limits		
1 > 4	0.3588	0.0151	0.7025	***
*** indicates a statistically significant difference at α = 0.05 level **1**= exp 0 to 4yrs; **2**= exp 5 to 9yrs; **3**= exp 10 to 14yrs; **4**= exp 15 to 19yrs; **5**= 20yrs and more				

Table 6.4.7.4 results indicate that employees with experience of up 4 years' work experience ('newer' employees) have a statistically significantly higher opinion of the organisation than those with 15 to 19 years' work experience, with respect to **innovation portfolio management**.

This finding may mean that where innovation is a strategic thrust in a DFI, external recruitment and early retirement would serve the strategic purpose. It also implies that the focus of innovation portfolio management training for staff should fall more on those with longer work experience.

Proposition H_0B7.5: Rejected

There **is** a significant difference between the opinions of employees with education levels less than *matric* and *matric* and *post matric* and *graduate and post graduate* regarding **innovation portfolio management**.

To further analyse the rejected hypothesis and to control for type 1 error (where a true hypothesis is rejected), the following table contains Scheffe's Test results indicating significant comparisons of employees' experience categories at α=0.05

Table 6.4.7.5: Scheffe's comparison between levels of education sub-groups on Innovation portfolio management (Factor 7)

Employee levels of education	Difference between means	Simultaneous 95% confidence limits		
1&2 > 5	0.78098	0.29407	1.26788	***
3 > 5	0.54385	0.21909	0.86861	***
*** indicates a statistically significant difference at α = 0.05 level **1**= less than matric; **2**= matric; **3**= after matric; **4**= degree; 5= post graduate				

The results indicate that there is a significant difference between the opinions of employees with qualifications of less than a degree and those that have degrees.

These results indicate that employees without degrees have a statistically significantly better view of the organisation than employees with degrees with respect to innovation portfolio management (Factor 7). The narrative comments

on the questionnaire indicate, however, that employees are not familiar with the 'innovation portfolio management' construct.

6.4.8 Summary: Statistical comparisons between experimental DFI employee groups

Table 6.4.8.1 contains a summary of all **PRE group (H_0: B)** propositions contained in Chapter 1 section 1.7. Please remember that propositions contained in section 1.7 in Chapter 1 are divided into three, i.e.:

H_0: **A** for the LITERATURE review;

H_0: **B** for the PRE group; and

H_0: **C** for the POST and CONTROL groups.

Table 6.4.8.1: Summary results on H_0: **B** propositions testing for Section 1

Para.	H_0	There is not a significant difference regarding…	Between manager & non-manager (t-test)	Between male & female groups (t-test)	Between age groups (ANOVA)	Between experien. groups (ANOVA)	Between educat. groups (ANOVA)
6.4.1	H_0B 1	Managerial support…….	H_0B1.**1** **Accepted**	H_0B1.**2** **Accepted**	H_0B1.**3** **Accepted**	H_0B1.**4** **Rejected**	H_0B1.**5** **Rejected**
6.4.2	H_0B 2	Work discretion	H_0B2.**1** **Accepted**	H_0B2.**2** **Accepted**	H_0B2.**3** **Accepted**	H_0B2.**4** **Rejected**	H_0B2.**5** **Rejected**
6.4.3	H_0B 3	Rewards/reinforcements	H_0B3.**1** **Accepted**	H_0B3.**2** **Accepted**	H_0B3.**3** **Accepted**	H_0B3.**4** **Accepted**	H_0B3.**5** **Accepted**
6.4.4	H_0B 4	Time availability	H_0B4.**1** **Accepted**	H_0B4.**2** **Accepted**	H_0B4.**3** **Accepted**	H_0B4.**4** **Accepted**	H_0B4.**5** **Accepted**
6.4.5	H_0B 5	Organisational barriers	H_0B5.**1** **Accepted**	H_0B5.**2** **Accepted**	H_0B5.**3** **Accepted**	H_0B5.**4** **Rejected**	H_0B5.**5** **Accepted**

Table 6.4.8.2: Summary results on H_0: **B** proposition testing for Section 2

Para.	H_0	There is not a significant difference regarding…	Between manager & non-manager groups (t-test)	Between male & female groups (t-test)	Between age groups (ANOVA)	Between experience groups (ANOVA)	Between educat. groups (ANOVA)
6.4.6	H_0B6	Innovation org. support...	H_0B6.**1** **Accepted**	H_0B6.**2** **Accepted**	H_0B6.**3** **Accepted**	H_0B6.**4** **Rejected**	H_0B6.**5** **Rejected**
6.4.7	H_0B7	Innovation portfolio support	H_0B7.**1** **Accepted**	H_0B7.**2** **Accepted**	H_0B7.**3** **Accepted**	H_0B7.**4** **Rejected**	H_0B7.**5** **Rejected**

Tables 6.4.8.1 and 6.4.8.2 above summarise the findings of the **pre-test** diagnosis of employee views on corporate entrepreneurship and innovation constructs respectively.

6.4.8.1 Management support (Construct 1)

The average opinion of employees about management support for corporate entrepreneurship at the experimental DFI was that it was below average at 2.645.

There was no significant difference between the following employee categories in the way that they perceived this construct: *managers and non managers*; *male and female* and *different age groups*.

However, there was a significant difference between the following employee categories in the way that they perceived this construct: employees with *different experience periods* and employees with *varying levels of education*. 'Newer' employees (0 to 9 years) had a better view of the organisation than those with more experience (10 to 19 years). Also, employees without degrees had a better view of the organisation than those with degrees.

6.4.8.2 Work discretion (Construct 2)

The average opinion of employees about entrepreneurship promoting work discretionary practices at the experimental DFI was that it was above average at 3.134.

There was no significant difference between the following employee categories in the way that they perceived this construct: *managers and non managers*; *male and female* and *different age groups*.

However, there was a significant difference between the following employee categories in the way that they perceived this construct: employees with *different experience periods* and employees with *varying levels of education*. 'Newer' employees (5 to 9 years) had a better view of the organisation than those with more experience (10 to 19 years). The multi-comparison results were inconclusive on the significance of the differences between the various education levels of employees.

6.4.8.3 Rewards/Reinforcements (Construct 3)

The average opinion of employees about entrepreneurship-promoting rewards/reinforcement practices at the experimental DFI was that they were above average at 3.068.

There was no significant difference between the employee categories in the way that they perceived this construct.

6.4.8.4 Time availability (Construct 4)

The average opinion of employees about entrepreneurship-promoting time availability practices at the experimental DFI was that they were below average at 2.553.

There was no significant difference between the employee categories in the way that they perceived this construct.

6.4.8.5 Organisational boundaries (Construct 5)

The average opinion of employees about entrepreneurship-enhancing organisational boundaries at the experimental DFI was that they were below average at 2.858.

There was no significant difference between the following employee categories in the way that they perceived this construct: *managers and non managers*; *male and female*; *different age groups* and *varying levels of education*.

However, there was a significant difference between employees with *different experience periods* at the experimental DFI in the way that they perceived this construct.

6.4.8.6 Innovation organisational support (Construct 6)

The average opinion of employees about entrepreneurship-promoting innovation organisational support at the experimental DFI was that it was below average at 2.644.

There was no significant difference between the following employee categories in the way that they perceived this construct: *managers and non managers*; *male and female* and *different age groups*.

However, there was a significant difference between the following employee categories in the way that they perceived this construct: employees with *different experience periods,* and employees with *varying levels of education*. 'Newer' employees (5 to 9 years) had a better view of the organisation than those with more experience (10 to 19 years). Employees without a degree have a statistically significantly better opinion of the organisation than employees with degrees and above, with respect to organisational innovation support.

6.4.8.7 Innovation portfolio management (Construct 7)

The average opinion of employees about entrepreneurship-promoting innovation portfolio management at the experimental DFI was that they were below average at 2.500.

There was no significant difference between the following employee categories in the way that they perceived this construct: *managers and non managers*; *male and female* and *different age groups*.

However, there was a significant difference between the following employee categories in the way that they perceived this construct: employees with *different experience periods* and employees with *varying levels of education*. 'Newer' employees (5 to 9 yrs) had a better view of the organisation than those with more experience (10 to 19 yrs). Employees without degrees have a statistically significantly better view of the organisation than employees with post graduate degrees, with respect to innovation portfolio management.

6.4.8.8 Conclusion

There were five out of seven constructs where propositions for this section were rejected. Only for the rewards/reinforcements and time availability constructs were all the propositions accepted. In all the rejected propositions, length of work experience was a common source of such a significant difference. Level of education was the other source for all but one.

In employee experience categories, 'newer' employees had a statistically significantly better view of the organisation on such constructs than their 'older' (i.e. longer-serving) colleagues. This has implications for the retirement/recruitment policies of DFI institutions, i.e. having policies that encourage early retirement, and using outside recruitment for replacement.

For employee education levels categories, the analysis indicates that employees without degrees have a statistically significantly better view of the organisation on

the identified constructs, except for the work discretion construct, where the results were inconclusive. The narrative comments on the qualitative sections of the questionnaire indicate:

- frustration by higher-educated employees about poor management support and rigid organisational boundaries against the identified corporate entrepreneurship constructs; and
- poor understanding of the innovation constructs by the less educated employees.

It is concluded therefore that:

- Employees who have long employment tenure in DFIs appear set in their conventional ways of doing things. The Innovation and corporate entrepreneurship training interventions may need to be tailored targeted for such employees.
- Higher educated employees either find it difficult to see or think outside established patterns. It could also be that management and organisational support is not suited for their 'innovative' ideas.

Chapter 7: CE training intervention (X)

7.1 Introduction

This chapter describes the actual application of the corporate entrepreneurship and innovation training at the DBSA, the experimental DFI, and the strategic context within which the year-long interventions were introduced, experiences noted and observations made during such interventions. The experiences and observations are based on the training material and first-hand experiences by the researcher, and comments, inputs and appraisal from several sources within the organisation; namely, participants in the training programme, new venture team members, evaluation panellists, business process management professionals, and discussions with management and staff in general.

To validate factors that are perceived to either enhance or inhibit entrepreneurship within the experimental DFI, the training intervention participants' evaluations are summarised. Such evaluation insights corroborate those identified by evaluation reports on other parallel and related components of the all-encompassing change management process.

The synthesis from this analysis contributes to the overall conclusions and recommendations about corporate entrepreneurship approaches in similar corporate environments.

7.2 The entrepreneurship and innovation strategic imperative

External and start-up entrepreneurs who become highly successful as a result of their grit and determination are generally envied and perhaps emulated. It is documented in literature that having a few such people inside an organisation might bring a breath of fresh air, innovation and challenge to bureaucratic barriers to opportunity seeking (Timmons, 1999; Bartlett & Ghoshal, 2002, Nijhof et al., 2002).

There is a proliferation of literature, including Schrage (2000), on empirical examples of companies with a long history of innovation- and opportunity-focus as corporate values, who then tried to institutionalise such values in order to instil corporate entrepreneurship into their bureaucratic cultures**.** There is, however, relatively little empirical evidence regarding the success or failure of such efforts. In the following examples of organisations that have tried to instil the entrepreneurship culture, Thornberry (2003: 333-336) gives an overview of different corporate entrepreneurship training approaches, programme designs and possible outcomes.

7.2.1 SNI and Mott's examples

Both Siemens-Nixdorf Information Systems Company (SNI) and Mott's followed a corporate venturing approach to promoting corporate entrepreneurship within their respective companies.

SNI approached Babson College in 1995 with a request for a proposal to design and deliver a management education programme for its unit managers. The purpose of the programme was to create a group of 300 corporate entrepreneurs within SNI. This was a key component of SNI's change management programme (already under way) aimed at turning a staid, conservative, risk-averse culture into a more opportunistic, market focused, fast, flexible organisation that would compete more effectively in its market.

The SNI programme was carried out over a two-year period and focused on entrepreneurial *thinking* and *acting*. Each staff participant was asked to work on an intense project, which involved the real identification of a new venture, development of a formal business plan, presentation to the executive board, and competition for internal venture capital.

Mott's, in its programme, aimed to create new businesses and new markets in order to meet an agreed aggressive goal of doubling shareholder value every three years. Mott's realised that such a goal would not be reached through its

conservative, albeit successful, organisation. It needed to develop a more creative, innovative and entrepreneurial culture. Mott's, unlike SNI, opened up the entrepreneurship programme to any employees in the company who had entrepreneurial tendencies and trained them in entrepreneurial *thinking* and *acting*. The intention was that they would then be able to identify, develop, and capture new business opportunities.

Mott's programme was similar to that of SNI but had a much shorter duration. It revolved around the three major activities of entrepreneurs: opportunity identification; shaping; and capturing. It approached the programme much as a venture capitalist would. That is, if no venture proposals emanated from the first module on 'opportunity identification', then either more time would be spent on ideation or further investment would cease.

7.2.2 PDVSA and Colonia-Axa Insurance examples

PDVSA and Colonia-Axa aimed at creating entrepreneurially-minded managers who would be more attuned to new market opportunities and would stimulate a more innovative and risk-taking culture. The hope was that the resultant change in the managers' behaviour and entrepreneurial orientation would eventually *'trickle down'* to the rest of their respective organisations.

While the content of the PDVSA and Colonia-Axa training programmes was similar to that of SNI and Mott's programmes, the approach was to teach managers not to be corporate venturers themselves, but to spur more opportunity focus and orientation within their respective companies as a whole. Therefore, the goal was for these managers to act as catalysts and coaches for more entrepreneurial thinking and acting. This approach is supported by a study by Pearce et al. (1997), which has shown that managers who adopt more entrepreneurially-focused behaviours, such as encouraging the destruction of red tape or encouraging staff to try new ways of doing their work, can have an impact on employee satisfaction as well as the company's bottom line.

7.2.3 Summary of findings from the four examples

Thornberry (2003: 335) highlights two main findings from the above four examples: much of what start-up entrepreneurs do can be taught to relatively ordinary but motivated corporate individuals; and some of the business plans developed as part of the training programmes do eventually result into successful businesses.

7.3 Innovation and CE strategic foci

The experimental DFI Vision 2014 corporate strategy stresses the organisation's commitment to innovation and creativity. This is evidenced by the inclusion of 'innovation and corporate entrepreneurship' as one of seven mutually supportive strategic thrusts to underpin Vision 2014. The other six strategic thrusts addressed: risk taking and risk management; knowledge management; strong and smart partnerships; performance recognition and rewards; alignment of strategy structure and processes; and black economic empowerment.

This entrepreneurial strategic posture was assumed in response to the persistent poverty and backlogs in the delivery of basic services in the Southern African Development Community (SADC) region. Also, commercial institutions were becoming more aggressive in their competition with the experimental DFI for the financing of development projects. These and other external push factors spurred the DFI to introduce a change management programme, of which innovation and corporate entrepreneurship were cornerstones.

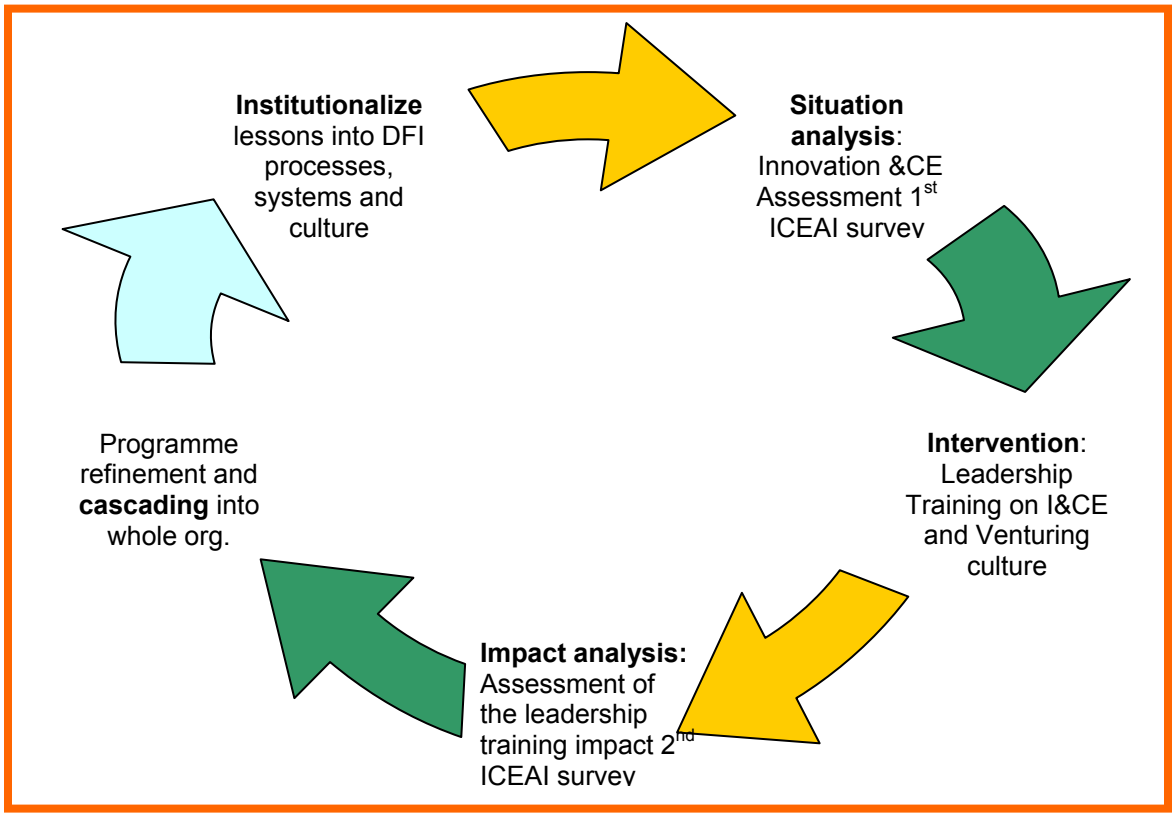
Top management started the change management process by sending out to the organisations messages such as 'think outside the box', 'business as usual is not enough', 'the biggest risk is not taking one', 'mistakes committed in good faith and with good intentions will not be punished but should not be repeated'. An entrepreneurial way of achieving organisational goals was encouraged and promoted through a number of change management interventions which also called for better communication, leadership and the revision of corporate values.

The core purpose of these interventions was to ensure that new ideas were strategically consistent with the DFI vision and mission and that they enhanced its mandate execution.

7.4 Innovation and corporate entrepreneurship process

In order to develop and apply the innovation and entrepreneurial interventions, a holistic process approach was adopted, as demonstrated below.

Figure 7.1: Innovation and CE approach process flow



Source: Adapted from a compilation by Kgarimetsa-Phiri (2006)

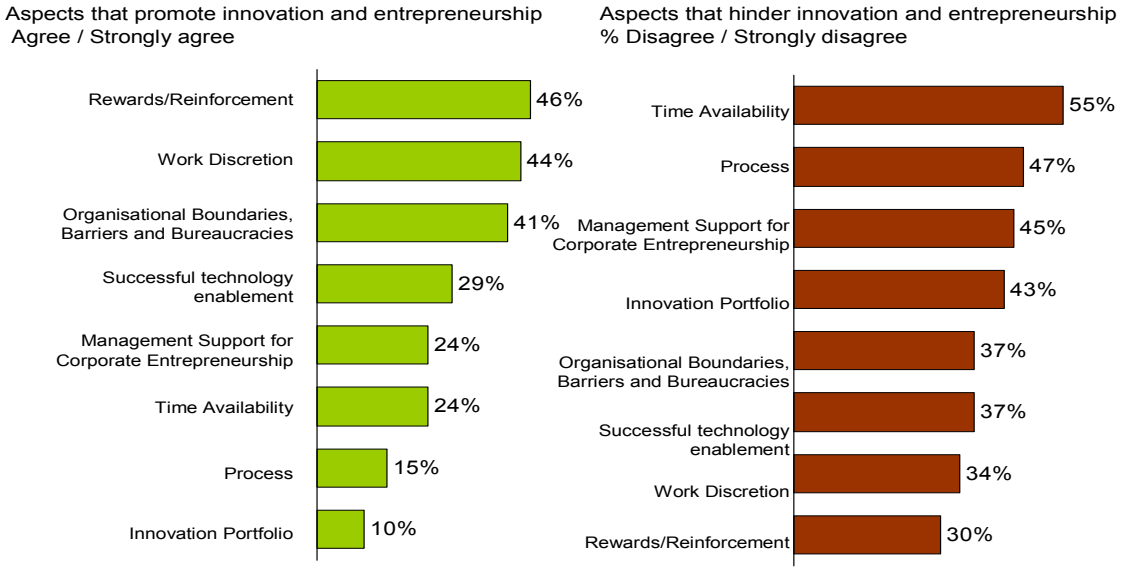
7.4.1 Situation analysis

As discussed in Chapter 6, the researcher conducted an assessment of the state of innovation and corporate entrepreneurship at the experimental DFI by

measuring employee opinions and feelings in this regard. Staff perceptions were surveyed in March 2005 through the Innovation and Corporate Assessment Instrument (ICEAI), a diagnostic questionnaire.

The dichotomously presented results of the ICEAI are depicted in Figure 7.2 below, and revealed that, generally, knowledge on innovation and corporate entrepreneurship was medium to low and that there was a need to increase staff's exposure in this regard.

Figure 7.2: Situation analysis overall results



Which aspects of the workplace and organisation promote, or hinder, innovation and corporate entrepreneurship? (n=322)

Aspects in which at least 50% of the respondents agreed or strongly agreed with statements in each dimension (or at least 44%, where 35% or fewer disagreed or strongly disagreed) are depicted as promoting entrepreneurship and innovation in Figure 7.2.

Aspects in which at least 50% of the respondents disagreed or strongly disagreed with statements in each dimension (or at least 44%, where 35% or

fewer agreed or strongly agreed), are depicted as barriers to entrepreneurship and innovation in Figure 7.2.

It therefore appears that employees feel positive about aspects that relate to general job satisfaction such as: work discretion; rewards and reinforcements; and existing organisational boundaries, barriers and bureaucracies. They know what level of work experience is expected from them and feel that their managers keep to those parameters when evaluating their job performance.

The corollary is that employees feel that aspects that hinder entrepreneurship and innovation are: lack of time availability for innovation; lack of a clear process flow; and lack of management support for corporate entrepreneurship. Many employees also do not seem to understand the concept of innovation portfolio management.

It is on the basis of these results that a targeted training intervention was conceived and designed.

7.4.2 Leadership training

The researcher advised the experimental DFI to approach the University of Pretoria (UP), as in the case of the SNI example presented in 7.2.1 above. The UP was asked to design and deliver a corporate entrepreneurship and innovation training programme that would address the results of the ICEAI questionnaire. The training started with the leadership group In July 2005. One hundred and four (104) members of the leadership group were trained on corporate entrepreneurship and innovation.

The training of the leadership group was an acknowledgment of their change agency status in the organisation and was aimed at capacitating them to provide staff with the required support for innovation and entrepreneurship. In addition to the promotion of knowledge about entrepreneurship and innovation, a corporate venturing culture was fostered within the leadership group.

Cascading of the training programme in a condensed form was then designed for the rest of the organisation. The aim of the cascading of the programme organisation-wide was to supplement the envisaged change agency role of the leadership group and to ensure that everyone within the organisation was given a fair opportunity to acquire entrepreneurial skills and to be exposed to the practice of corporate venturing.

7.5 I&CE training programme content

A five-module training course was put in place to address specific areas/dimensions measured by the Innovation and Corporate Entrepreneurship Assessment Instrument. The following subsections illustrate the outcome of the assessment per dimension and discuss particular focal points of the training course lectures and assignments.

7.5.1 Management support for CE and innovation

This dimension addressed issues relating to the extent to which management supports and encourages idea generation, creativity and innovation among staff, especially in relation to the services and products that the DFI offers to its clients. This included issues of career development, value-adding new idea generations, calculated risk taking, rules bending, improved work methods, and the like. Table 7.1 summarises 'management support' training needs assessment results, the training intervention focal areas, and comments and recommendations.

Table 7.1: Management support training intervention focal points

ICEAI Results	Targeted training focal points	Comments and recommendations
• All categories of staff, except management who were neutral, disagreed with positive statements on management support for I&CE. • Employees felt that the DFI *generally* encourages new ideas for the improvement of the organisation, and supports staff with their career development. • They were much less likely to see support as being targeted specifically towards innovative individuals and projects. • Project managers and specialist/professional staff were especially negative about the level of management support they received for corporate entrepreneurship at the DFI. • All groups agreed that employees working on projects are not free to make their own decisions. • All groups other than Unit and Exco managers also agreed that the DFI is not aware of or receptive to workers' ideas and suggestions	All five-module I&CE courses targeting the leadership group: • Module 1-Creativity, innovation and opportunity finding • Module 2-Corporate Venturing: Creating new businesses within the firm • Module 3- Entrepreneurial Human Resource Management • Module 4-Entrepreneurial Marketing. • Module 5-Entrepreneurial financial management. Specific focus on: • Corporate entrepreneurial management • Intrapreneurship • Innovation • Corporate venturing - Venturing process model • Developing the venture business plan. • Fitting corporate entrepreneurship into strategic management. • The conceptual model of entrepreneurship as firm behaviour	• Emphasis was laid on building the capacity of management to provide support for innovation and entrepreneurship. • A significant number of the leadership (80%) group underwent targeted entrepreneurship training. • The overall training involved building a foundation for management entrepreneurial thinking and acting; support; encouragement; and change agency role.

7.5.2 Work discretion

This dimension measured the employees' freedom and autonomy in their jobs, opportunity to use own abilities, being their own boss, freedom to follow unconventional methods of doing their own work, independent judgment and decision-making and latitude for making mistakes without fear of being punished. Table 7.2 summarises 'work discretion' training needs assessment results, the training intervention focal areas, and comments and recommendations.

Table 7.2: Work discretion training intervention focal points

ICEAI Results	Targeted training focal points	Comments and recommendations
• With the exception of project managers, employees were positive about work discretion they have at the DFI. • Unit and Exco managers have most discretion at work, with a large degree of autonomy and freedom. • The project manager group feels that they have less autonomy at work or that they are not their own bosses. • Both project managers and Unit/Exco managers felt that they would be subject to criticism and punishment if they made a mistake on the job.	• Management of innovation • Opportunity environment • Organisational culture characteristics. • Management styles(16) • Processes for sustaining a healthy business-building programme. • Entrepreneurial initiatives that do not always work • Managing disappointment • Managing failure/how to handle failure. • Reactions to success or failure	• Executive direction has promoted and encouraged staff to take responsible risk taking. • The Chief Executive and Managing Director of the DFI has personally assured staff that he will take failure of any entrepreneurial effort by staff member as a learning step provided it is done responsibly. • Reactions to success and failure are dependent on the organisational culture.

7.5.3 Employee rewards/reinforcements

This dimension sought to assess positive work challenges, job responsibility, work performance and recognition, and targeted rewards that promote or hinder corporate entrepreneurship and innovation. Table 7.3 summarises 'employee

rewards/reinforcements' training needs assessment results, the training intervention focal areas, and comments and recommendations.

Table 7.3: Employee rewards/reinforcements training intervention focal points

ICEAI Results	Targeted training focal points	Comments and recommendations
• All employee groups felt that their jobs presented a lot of positive challenges. • They believed that their responsibilities would be increased if they performed well at work. • Only Unit and Exco managers felt that rewards were dependent upon performance. • Only managers were likely to think that managers would tell their bosses if an employee performed well! • Respondents were even less positive about reward specifically for innovation; Most did not feel that innovation was currently being awarded within the DFI. • The most frequently mentioned award for entrepreneurship and corporate innovation involved some kind of monetary benefit in the form of a salary increase, a bonus, royalties, or a profit share. • Employees were more interested in public recognition and acknowledgement for their work than financial gain.	• Entrepreneurial Human Resource Management o Traditional and conventional performance management practices o How to give incentives to employees to be entrepreneurial • Entrepreneurial compensation and rewards: o Focus on long-term performance with incentives for group efforts o Significant financial rewards for new venture o Emphasises responsibility. o Merit and incentive based management practices	• The DFI's Integrated Reward and Recognition Framework (IRR) with its related bonus scheme are suited for incremental entrepreneurial initiatives at individual and team level. • Innovative ways of giving recognition to entrepreneurial individuals and teams within the DFI need to be explored. • A combination of incentives and recognition should be explored for promoting both incremental and radical entrepreneurship, from idea generation to corporate venturing. • Chief Executive Awards have made provision for awarding innovation. • I&CE fund set aside for start-ups should include awards for the best ventures.

7.5.4 Time availability

This dimension assessed time availability for staff to perform their functions, including those related to idea generation, innovation and entrepreneurship. This area also looked at workload and long-term problem solving. Table 7.4 summarises 'time availability' training needs assessment results, the training intervention focal areas, and comments and recommendations.

Table 7.4: Time availability training intervention focal points

ICEAI Results	Targeted training focal points	Comments and recommendation
• Employees agreed that there was hardly enough time to perform their standard job functions. • No time to come up with innovative ideas and putting these into action.	• Innovation management. • Time for I&CE training	• The DFI might learn from other organisations that have put a day per week or month aside for innovation

7.5.5 Organisational boundaries, barriers and bureaucracies

This dimension assessed the level of expectation and agreement on employees' work performance and Balance Score Card measures, level of trust in the performance management system, rigidity of the system and the change management role of management. It also examined the level at which policies, procedures, rules and workload promoted or hindered entrepreneurship and innovation within the DFI. Table 7.5 summarises 'organisational boundaries' training needs assessment results, the training intervention focal areas, and comments and recommendations.

Table 7.5: Organisational boundaries training intervention focal points

ICEAI Results	Targeted training focal points	Comments and recommendations
• Employees knew what level of work experience was expected of them. • Most stated that their managers kept to these parameters when evaluating their job performance • Employees stated that they had to follow a large range of standard operating procedures as part of their major tasks at the DBSA. • Non-managerial/professional staff did not see scope for themselves to be innovative within their current job description and scorecard. • The project managers stated that they had many rules and regulations to follow on a daily basis. • They also stated that there were obstacles and roadblocks within the DFI that they could not overcome without managerial assistance. • Project managers felt that bureaucracy was standing in the way of innovation and corporate entrepreneurship at the DFI	• Creative environment • Creativity, innovation and opportunity finding • Creativity, innovation and opportunity; theory-knowledge base • Creative environment barriers: o Social o Economic o Physical o Cultural o Perpetual • Variables influencing intrapreneurship • Management of Innovation • Internal politics of venturing • Using political approaches to solve political problems. • The conceptual model of entrepreneurship as firm behaviour	▪ The DFI has entrenched strong and set ways of doing things based on its historical precedents e.g. business development approaches and the way projects and programmes are appraised. ▪ There is a need to increase entrepreneurial behavioural traits within the organisation whilst diminishing barriers to the creation of new ideas. ▪ Addressing barriers and promoting I&CE stand to unleash creative potential of the DFI staff.

7.5.6 Successful technology enablement

This dimension measured the extent to which the experimental DFI uses technology to enable innovation and entrepreneurship. This relates to the use of the intranet and/or internet to maximise and promote entrepreneurship, and the exploration of the existence of any programme that facilitates the flow and capturing of new ideas. Table 7.6 summarises 'technology enablement' training needs assessment results, the training intervention focal areas, and comments and recommendations.

Table 7.6: Technology enablement training intervention focal points

ICEAI Results	Targeted training focal points	Comments and recommendations
• Employees are sceptical about technology enablement at the DFI. • Some were uninformed about the state of technology enablement within the DFI, and thus were not able to rate any of the elements for this.	• The design and delivery of the training intervention acknowledged efforts under way in this regard and therefore did not focus on technology enablement	• The Innovation portal was launched at the same time as the I&CE 1st diagnosis was conducted. • Staff were not familiar with the use of the portal at the time. • The efficient management of the portal and deployment of the portal administrator took time to be effected within the DFI.

7.5.7 The innovation process and portfolio management

This dimension assessed whether the organisation had a portfolio approach to managing innovation and sought to find out if staff understood the concepts of incremental and radical innovations. It also sought to find out if staff were familiar with the process of screening ideas and resource allocation within the experimental DFI, and whether there was any formalised or structured manner in which ideas were gathered, sorted, responded to, and developed. Table 7.7 summarises 'Innovation process and portfolio management' training needs

assessment results, the training intervention focal areas, and comments and recommendations.

Table 7.7: Innovation process and portfolio management training focal points

ICEAI Results	Targeted training focal points	Comments and recommendations
• Staff did not feel sufficiently informed to rate the questions relating to the innovation process. • Some were doubtful about the very existence of such a process.	• Corporate entrepreneurship process model: o Setting the scene o Identifying ventures o Planning, organising and starting the venture o Monitoring and controlling the venture o Championing the venture • *The DFI business process management*	The innovation process unfolded as the DFI business process management evolved, particularly when this process included idea generation and corporate entrepreneurship.
• Staff were in agreement about the fact that an innovation portfolio management approach did not currently exist at the DFI.	• Locating the venture in the organisation • Innovation portfolio to include and balance both radical and incremental innovations	There is no I&CE portfolio of innovations currently. It was suggested that such a portfolio should be managed centrally by the Corporate Strategy unit.

7.6 Corporate venturing

Corporate venturing involves the starting of new businesses within established organisations, usually emanating from an existing core competency, process or business model (Thornberry, 2003). For example, a development finance institution which has development risk analysis and pricing as its core competencies, can turn such competencies into a separate business and offer development risk management services to private sector companies which are increasing their involvement in development finance.

7.6.1 Identification of corporate ventures

Nineteen new corporate venture proposals were identified as part of the outcomes of the five training modules conducted for the leadership group. In addition to this, two other ideas were posted on the innovation portal. Therefore 21 new ventures were discussed and refined at the plenary session of the members of the leadership group. These 21 new ventures could be further categorised into 6 venture plans and 15 ideas. Of these, three have been accepted for recommendation for funding by executive management (Exco) of the experimental DFI. The process followed to screen and evaluate the proposals was as follows:

7.6.2 New venture evaluation panel: Roles and functions

A New Venture Evaluation Committee (NVEC) was established and consisted of leadership representation from each division and an external expert. It is anticipated that the NVEC will, over time, evolve into a permanent committee with full decision-making powers. Its purpose is to screen the new ideas and venture plans identified in the organisation, allocate the necessary resources within its delegated authority for further development of the plans, and recommend accepted venture plans to the Exco for final approval and funding.

It is further hoped that the NVEC will fill a change management role by dealing with cultural barriers to entrepreneurship and innovation and fostering entrepreneurial thinking and acting.

7.6.3 Screening the new venture plans: Screening criteria

The experimental DFI introduced standard screening criteria for new ideas and venture plans. These criteria were extensively discussed and tested during the screening of submitted venture plans; they are:

Strategic Fit: This facilitates the assessment of whether the venture is in line with the DFI's strategic objectives and would add value to the customer or

organisation. It highlights the need to assess whether the venture requires strategic partnerships.

Market position and sustainability: The market position criterion measures: the status of the current and anticipated competition or substitutes; and the current or potential size of the market. The sustainability criterion measures the venture's sustainability in terms of affordability and barriers to entry.

Required resources: Resources include both financial and human resources.

- *Financial performance requirements*: This includes issues such as projected cost of preparation, start-up capital and life-cycle costs, and projected revenues and cash-flows.

- *Human capital:* Human capital performance requirements involve questions of how the venture will be run and managed, and readiness of processes and systems to roll out the execution of the venture plan. This criterion further looks at whether the new venture will require new capabilities or substantial alterations in current capacities and skills. An assessment of whether or not the venture requires outside partners/resources for its execution is undertaken.

Time horizon: Time required for the venture preparation needs to be stated in each plan. This means time from start (design) to end (launch), including the key milestones of the project planning life cycle.

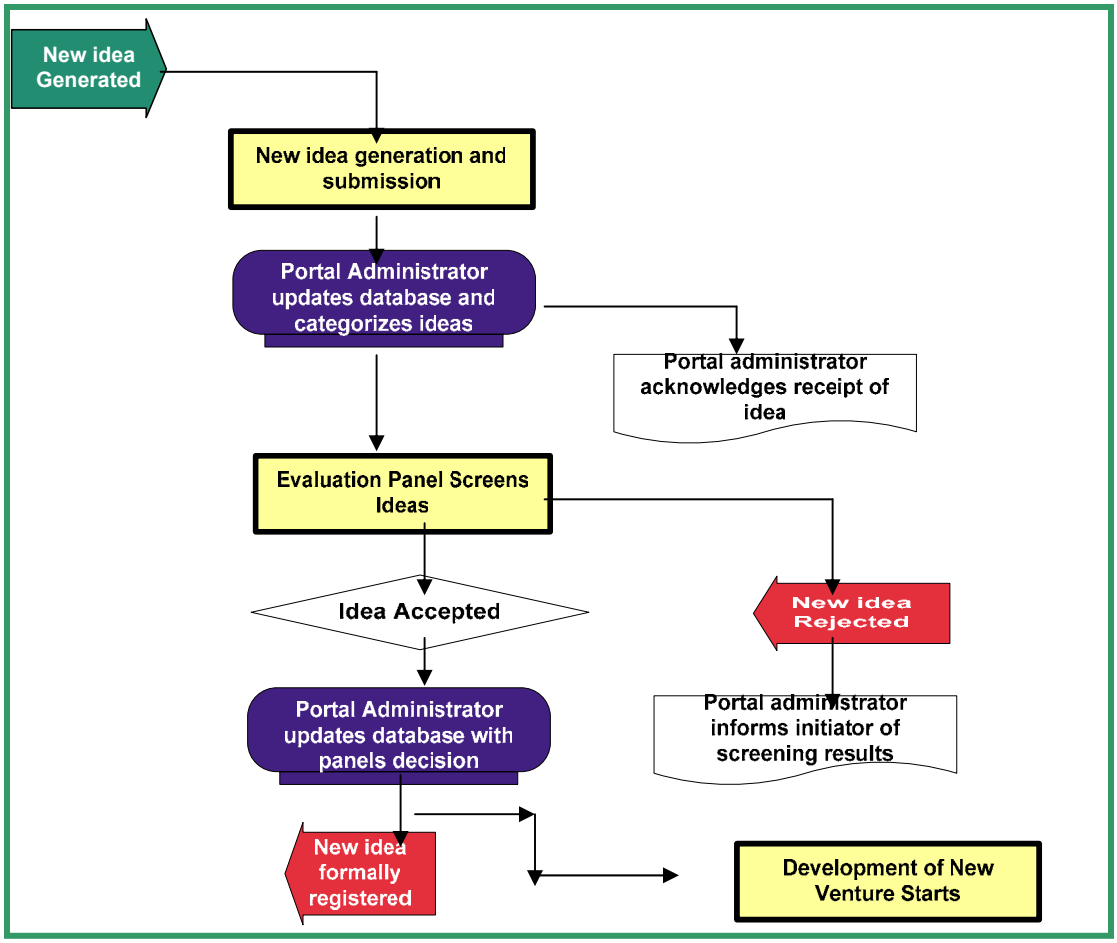
Newness and originality: The novelty of the idea is a key consideration. The panel looks at originality, uniqueness, newness and level of creativity of the proposed venture.

Potential risk: This relates to the probability and impact of the risk on the financial performance, credit rating, reputation and development impact.

7.7 Entrepreneurship and innovation process

It became essential to lay out a comprehensive process flow, from idea generation to new venture implementation. The process flow serves as a guide to inform staff on where to take their creative ideas and how these will be treated at different stages of the innovation process. It provides a description of approval points and clarifies the roles and functions of different role-players such as the portal administrator, the venture evaluation panel and executive management. This was posted onto the experimental DFI's innovation portal at the start of the business planning phase (Feb 2006) of the corporate venturing component of the training intervention. Figure 7.3 depicts a process flow for the venturing process.

Figure 7.3: Venturing process flow



Source: Adapted from the BPM's output on innovation and corporate entrepreneurship: Process Steward, H. Moatshe

7.8 Communication and promotion of the ventures

7.8.1 The innovation portal

The innovation portal was put in place and launched in May 2005. Staff members posted their innovative ideas on the portal. It became clear, however, that for better efficiency of the portal and for a speedy response to the ideas generated, further systems and processes needed to be developed and implemented. To this effect a portal administrator was appointed and the portal's development continues to evolve and to improve in efficiency and effectiveness.

7.8.2 Awareness raising

As part of the integration of the change management interventions, innovative ways of raising awareness around entrepreneurship and innovation were implemented. This entailed the use of animated email messaging and closed-circuit broadcast screens (plasma screens hanging from the ceiling, instead of paper posters), creating platforms where staff could table ideas and introducing competitions to encourage teamwork in innovation. In order to maintain the momentum of infusing an entrepreneurial culture in the experimental DFI, national and international entrepreneurs and innovators were invited to participate in strategic conversations and dialogues.

7.9 Participants' evaluation feedback reports

In addition to responses to the open-ended questions in the first diagnostic survey, diverse feedback was obtained from the training intervention and Management Review Meetings. These evaluations identified the following factors that promote and enhance or detract from entrepreneurship and innovation within the DBSA. This feedback is classified under factors that have promoted entrepreneurship and innovation in the DBSA to date and those that have hindered it.

7.9.1 Factors that have promoted entrepreneurship and innovation

7.9.1.1 Executive management's exposure

The exposure of most senior executives to the discipline of entrepreneurship and value innovation has been a trigger for steering the experimental DFI towards entrepreneurial orientation. This has ensured that interventions introduced are championed from the top management level. It has also ensured that entrepreneurship and innovation remain a priority strategic consideration.

7.9.1.2 Strong leadership

The DFI leadership has consistently promoted entrepreneurial thinking and acting. The leadership has also committed resources (human, time and finance) to untried ideas and programmes. The leadership support for entrepreneurship has cultivated entrepreneurial thinking amongst staff and enhanced entrepreneurial behaviour.

7.9.1.3 Organisational values

Redefining the experimental DFI values and the visible commitment to those values by the leadership group ensured a solid foundation for the embedding of innovation and entrepreneurship in the organisational culture. The signing of the leadership charter in front of the entire staff membership of the organisation committed the leadership group to espouse entrepreneurial values such as responsible risk taking and decision making.

7.9.1.4 Knowledge management orientation

The experimental DFI has in place a knowledge management strategy which sets out a vision and processes for maximising organisational learning. This creates a climate conducive to: ideation, creativity, innovation, and the introduction of new ventures; and shared learning.

The training intervention and venturing exercises have enabled the experimental DFI to systematically collect information from practical experience. The learning involves knowledge collection, accounting, sharing, and application. All this bodes well for the fostering of an entrepreneurial learning culture within the organisation.

7.9.2 Factors that hinder corporate entrepreneurship

7.9.2.1 Attitudes towards innovation and corporate entrepreneurship

The attitude of some staff towards the innovation and corporate entrepreneurship training intervention was sceptical. Staff perceived the introduction of corporate entrepreneurship in the organisation as another 'fad' that was likely to fade away as it became replaced by other incoming initiatives.

7.9.2.2 Performance contracting

The perception that performance contracting in the DFI is inflexible renders the introduction of new initiatives after the signing of performance contracts difficult. This leads to staff not giving new initiatives priority, as such initiatives are unlikely to impact on their performance incentives.

7.9.2.3 The nature of work

It has also been identified that the diminution in numbers of staff attending training over time was due to the nature of their work, which required extensive travelling for business purposes. This factor has implications for how management responds and makes 'time available' for corporate entrepreneurship in the organisation.

7.10 Proposition testing

Twenty one new ventures were proposed, and business plans for six of them proved viable and were approved for funding by Exco.

Previously, the experimental DFI's Balance Score Card budgeted for three new products per annum. Only one on average would materialise (DBSA Annual Reports, 1996-2005). Therefore:

Proposition H_0D1: Rejected

There **is** a significant increase in the number of new ventures that are indicative of a corporate entrepreneurship culture.

7.11 Conclusions

This chapter shows that the corporate entrepreneurship training intervention was aligned with the results of the innovation and corporate entrepreneurship assessment.

The scientific measurement and verification of the impact the courses have had on successfully increasing the knowledge of entrepreneurship required by the leadership group to support staff in their innovative endeavours is the subject of Chapter 8:

However, concrete evidence in the form of viable business plans for new corporate ventures has emerged, demonstrating a practical increase in the leadership group's own corporate venturing capability. This group was targeted for innovation and corporate entrepreneurship training so that they could serve as change agents for the rest of the experimental DFI.

The regular administering of the ICEAI to identify both triggers for and barriers to entrepreneurship is necessary. This should lead to an in-depth qualitative exploration of ways and means to reinforce enhancers and minimise or eliminate barriers.

Chapter 8: Post-intervention CE assessment (O_2): Comparisons between pre-, post- and control groups (O_1, O_2, O_3)

8.1 Introduction

This chapter presents statistical comparisons of employee opinions about innovation and corporate entrepreneurship between: the experimental DFI pre-intervention survey results (O_1), the experimental DFI post-intervention survey results (O_2), and the control group of DFI's survey results (O_3). The analysis seeks to prove the research hypothesis based on the research question of "how successful can corporate entrepreneurship training be in DFIs?" In other words, the intention is to test the proposition that:

> There **is not** a significant difference between the corporate entrepreneurship opinions of the study observation groups (pre-, post and control groups) regarding the Corporate Entrepreneurship constructs.

The format in which the results of the analysis are presented is as follows:

- An ANOVA is conducted between the opinions of the three observation groups, i.e. the pre-intervention, the post-intervention and the control groups. This is to test the proposition that there **is not a** significant difference between the innovation and corporate entrepreneurship opinions of the study observation groups *(pre-, post and control groups)* regarding the seven constructs in the questionnaire.

- An ANOVA is conducted between the opinions of two observation groups, i.e. the pre-intervention and the post-intervention groups. This is to test the proposition that there **is not** a significant change in the corporate entrepreneurship opinions of the employee stratification groups from the pre- to post-intervention groups regarding the seven constructs in the

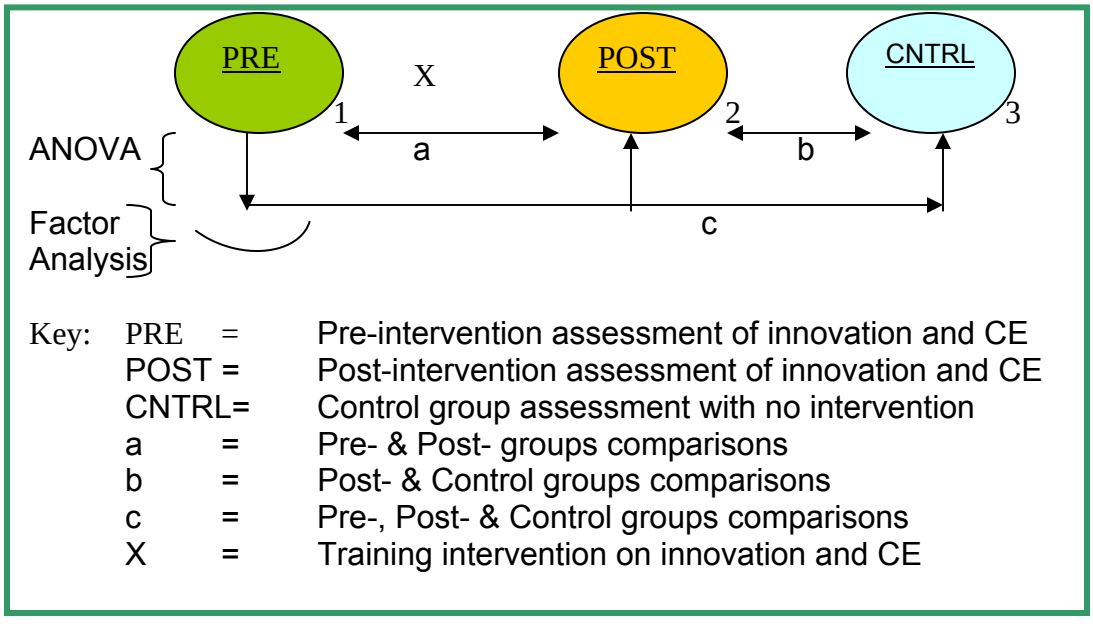
questionnaire. This will indicate the extent of the effectiveness of the training intervention described in Chapter 7, per the various employee categories.

Observations and comments are made on ANOVA results between the post-intervention and the control group results, as these reflect the scope for further training interventions needed at the experimental DFI or its superiority as a result of innovation and CE intervention;

Where the ANOVA displays significant differences, and to compensate for the fact that an ANOVA does not indicate which individual mean or means are different from the consensus value and in what direction they deviate, the Scheffe's Test, a multiple comparison test, is carried out. The Scheffe's Test controls for type 1 error.

In order not to fall into an analysis paralysis trap, only the comparisons that result in statistically significant differences will be discussed in detail. However, recommendations will be based on all observations. Figure 8.1 below depicts the ANOVA comparisons diagrammatically.

Figure 8.1: Depiction of ANOVA comparisons



Source: Own compilation

Table 8.1 below summarises the seven constructs of the questionnaire used in observations 1, 2, and 3 to survey the views of pre-, post-, and control groups respectively. The table also shows propositions H0: C1-C7 tested in the indicated sections of the chapter.

Table 8.1: Summary of H_0: **C** propositions testing for sections 1 and 2

H_0	There is not a significant difference regarding…	Between **Post** and **Pre** Groups (ANOVA)	Between **Post** and **Control** Groups (ANOVA)	Between **Control** and **Pre** Groups (ANOVA)
H_0**C**1	Managerial support	H_0**C**1.**1**	H_0**C**1.**2**	H_0**C**1.**3**
H_0**C**2	Work discretion	H_0**C**2.**1**	H_0C2.**2**	H_0**C**2.**3**
H_0**C**3	Rewards / Reinforcements	H_0**C**3.**1**	H_0C3.**2**	H_0**C**3.**3**
H_0**C**4	Time availability	H_0**C**4.**1**	H_0C4.**2**	H_0**C**4.**3**
H_0**C**5	Organisational boundaries	H_0**C**5.**1**	H_0C5.**2**	H_0**C**5.**3**
H_0**C**6	Innovation org. support	H_0**C**6.**1**	H_0C6.**2**	H_0**C**6.**3**
H_0**C**7	Innovation portfolio management	H_0**C**7.**1**	H_0C7.**2**	H_0**C**7.**3**
Key: **C** = proposition (H_0) that there is not a significant difference between **pre**-, **post**- and c**ontrol** groups, regarding the innovation and CE constructs.				

8.2 Proposition testing: Comparisons between *all* study observation groups

Table 8.2.1 presents the results of an analysis of the three observation groups' data sets for all constructs at the same time. Table 8.2.2 presents further analysis to determine the direction of the difference, mainly between the pre-intervention and the post-intervention groups.

Table 8.2.1: ANOVA: Between ***all*** observation groups regarding constructs

Proposition	Construct	Observation Group	N	Mean	Standard Deviation	F Values	P-Value
H_0C1	Management support	Pre	312	2.645	0.694	11.46	<.0001*
		Post	206	2.823	0.717		
		Control	101	3.008	0.659		
H_0C2	Work discretion	Pre	312	3.134	0.763	5.16	0.0060*
		Post	206	3.311	0.772		
		Control	101	3.358	0.677		
H_0C3	Rewards / Reinforcements	Pre	312	3.068	0.782	5.75	0.0034*
		Post	206	3.212	0.785		
		Control	101	3.355	0.767		
H_0C4	Time availability	Pre	312	2.553	0.814	1.09	0.3376
		Post	206	2.449	0.860		
		Control	101	2.467	0.855		
H_0C5	Organisational boundaries	Pre	312	2.858	0.852	2.49	0.0836
		Post	206	2.935	0.834		
		Control	101	2.706	0.841		
H_0C6	Innovation org. support	Pre	312	2.644	0.770	8.53	0.0002*
		Post	206	2.933	0.755		
		Control	101	2.760	0.838		
H_0C7	Innovation portfolio mngmt.	Pre	312	2.500	0.839	9.89	<.0001*
		Post	206	2.817	0.787		
		Control	101	2.512	0.868		
* = statistical significance; α = 0.05;							

Applying the p-value Rejection Rule that one should 'reject the null hypothesis if, and only if, the p-value is less than α', based on α=0.05, the following is found:

- That there are **not** significant differences between the pre-, post-, and control groups' corporate entrepreneurship opinions about ***Time availability*** (**H_0C4)** and ***Organisational boundaries*** (**H_0C5).** It can therefore be concluded without further analysis that the training intervention has not succeeded in influencing opinions on these two constructs, and that more training is recommended.

- That there **are** significant differences between the pre-, post-, and control groups' corporate entrepreneurship opinions about ***Management support for CE*** **(H_0C1)**, ***Work discretion*** **(H_0C2)**, ***Rewards/reinforcements*** **(H_0C3)**,

Innovation organisational support **(H_0C3)**, and ***Innovation portfolio management*** **(H_0C3)** constructs.

Table 8.2.2 presents Scheffe's Test results to determine which groups are statistically different and to indicate the direction of the difference.

Table 8.2.2: Scheffe's Test: Pre-, post- and control groups regarding constructs

Proposition	Construct	Means (of observation groups)			Significance test		
		Pre-	Post-	Control	Post- vs. Pre-	Post- vs. Control	Pre- vs. Control
$H_0C1.1$ $H_0C1.2$ $H_0C1.3$	Mangmt support	2.64	2.82	3.00	**+*** Po > Pr**	**-*** Po < Co**	**-*** Pr < Co**
$H_0C2.1$ $H_0C2.2$ $H_0C2.3$	Work discretion	3.13	3.31	3.35	**+*** Po > Pr**	**-*** Po < Co**	**-*** Pr < Co**
$H_0C3.1$ $H_0C3.2$ $H_0C3.3$	Rewards / Reinforc.	3.06	3.21	3.35			**-*** Pr < Co**
H_0C4	Time availability	2.55	2.44	2.46			
H_0C5	Organis. boundaries	2.85	2.93	2.70			
$H_0C6.1$ $H_0C6.2$ $H_0C6.3$	Innovation org. support	2.64	2.93	2.76	**+*** Po > Pr**		
$H_0C7.1$ $H_0C7.2$ $H_0C7.3$	Innovation portfolio mngmt.	2.50	2.81	2.51	**+*** Po > Pr**	**+*** Po > Co**	**-*** Pr < Co**

***indicates a statistically significant difference at α = 0.05 level; **Po** = Post group; **Pr** = Pre group; **Co** = Control group.

Based on the results in Table 8.2.2, the following is found:

- There **is** a statistically significant improvement in the corporate entrepreneurship opinions of the experimental DFI employees from pre- to post-intervention groups regarding: *Management support for CE* **(H_0C1.1)**; *Work discretion* **(H_0C2.1)**; *Innovation organisational support* **(H_0C6.1)**; *Innovation portfolio management* **(H_0C7.1).** This means that the training intervention was successful in changing the opinions of employees on these constructs for innovation and corporate entrepreneurship.

- Despite the improvement, the post- group opinions are still statistically significantly below those of their counterparts in other DFIs (control group). This is an indication that, even though there is an improvement at the experimental DFI, the training intervention should be maintained in order to raise innovation and CE awareness to an international standard.

- In all the other constructs, there was no statistically significant change from pre- to post- groups.

In summary, the results in Table 8.2.2 indicate that:

- A statistically significant improvement occurred from the pre-intervention to post-intervention state of employee attitudes to innovation and corporate entrepreneurship at the experimental DFI in all but three constructs.

- Two of the constructs that do not show a statistically significant difference: 'rewards/reinforcements' and 'organisational boundaries', nevertheless show an improvement, albeit not a statistically significant one, with the 'rewards/reinforcements' construct also showing an above-average mean.

- Where the intervention **has not** been statistically successful, opinions on innovation and corporate entrepreneurship are below average, and innovation and CE opinion levels are at similar levels in all tested DFIs. Alternative

intervention mechanisms are recommended for future research and implementation.

Where there **has been** a statistically significant difference (improvement) from pre- to post-intervention groups per construct, further analysis is conducted below to determine which employee categories contributed most, or did not contribute, to the improvement. Conversely, the analysis will show areas of focus in other (non-experimental) DFIs for them to be able to improve their innovation and corporate entrepreneurship climate. This will also highlight remaining areas of focus for improving or sustaining similar interventions in DFIs.

Therefore, the tables below examine the source of the difference per independent variable (employee category) for those constructs that show significant differences, i.e. Management support, Work discretion, Innovation organisational support, and Innovation portfolio management.

Table 8.2.3: ANOVA: Observation groups; 'Management support'; and employee categories

Proposition	Construct Name	Sub-proposition	Employee Category	Degrees of Freedom (D.F)	Mean Square (MS)	*F* Values	*P*-Value
H_0C8	Management support	**H_0C8.1**	Job category	3	0.4070	0.94	0.4214
		H_0C8.2	Gender	3	0.0793	0.18	0.9078
		H_0C8.3	Age	9	0.7489	1.73	0.0798
		H_0C8.4	Experience	12	1.1287	2.60	0.0022*
		H_0C8.5	Education	8	1.6911	3.90	0.0002*

Comparing mean scores on 'Management support' by the three observation groups and per employee category, the following is found:

Proposition H_0C8.1: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of managers and non-managers of the experimental DFI from pre- to post-intervention groups regarding *Management support for CE*.

Proposition H_0C8.2: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of males and females of the experimental DFI from pre- to post-intervention groups regarding *Management support for CE*

Proposition H_0C8.3: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of the various age categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Management support for CE.*

Proposition H_0C8.4: Rejected

There **is** a significant change in the corporate entrepreneurship opinions of the various *experience* categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Management support for CE.*

- All employee **experience** categories improved from pre- to post-intervention except those who had been with the experimental DFI for 5-9 years. 'Newer' (0-5 years) and the 'very experienced' (10-20 and above) employees are therefore amenable to entrepreneurial training. Opinions of DFI employees with 5-10 years' experience regressed between pre- and post observations, and further research is recommended to find the reasons.

Proposition H_0C8.5: Rejected

There **is** a significant change in the corporate entrepreneurship opinions of the various education level categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Management support for CE.*

- All employee **education** categories improved from pre- to post-intervention. The statistically significant improvement proves that the intervention has worked even to the education levels that had the least average opinion on this construct. However, there may still be significant differences among

employee education categories of the same organisation regarding management support for CE in DFIs;

Table 8.2.4: ANOVA: Observation groups; 'Work discretion'; and employee categories

Proposition	Construct Name	Sub-proposition	Employee Category	Degrees of Freedom (D.F)	Mean Square (MS)	*F* Values	*P*-Value
H_0C9	Work discretion	**$H_0C9.1$**	Job category	3	0.7455	1.36	0.2558
		$H_0C9.2$	Gender	3	1.5502	2.82	0.0385
		$H_0C9.3$	Age	9	0.2539	0.46	0.9002
		$H_0C9.4$	Experience	12	1.2014	2.18	0.0114
		$H_0C9.5$	Education	8	0.8327	1.51	0.1494

Comparing mean opinions on 'Work discretion' by the three observation groups and per employee categories, the following is found:

Proposition $H_0C9.1$: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of managers and non-managers of the experimental DFI from pre- to post-intervention groups regarding *Work discretion*.

Proposition $H_0C9.2$: Rejected

There **is** a significant change in the corporate entrepreneurship opinions of males and females of the experimental DFI from pre- to post-intervention groups regarding *Work discretion.*

- Both employee **gender** categories improved from pre- to post-intervention. Both males and females have an above average view of CE in all experiment DFIs. Therefore, gender does not seem to be a differentiating factor in changing employee opinions about CE supportive work discretion in DFIs;

Proposition H_0C9.3: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of the various age categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Work discretion.*

Proposition H_0C9.4: Rejected

There **is** a significant change in the corporate entrepreneurship opinions of the various *experience* categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Work discretion.*

- All employee **experience** categories have an overall above-average view of the work discretion dimension of CE. However, 'newer' (0-5 years) and the 'very experienced' (15-20 years and above) employee experience categories improved from pre- to post-intervention. Opinions of DFI employees with 5-14 years experience regressed between pre- and post- observations, and further research is recommended to find the reasons.

Proposition H_0C8.5: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of the various education level categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Work discretion.*

Table 8.2.5: ANOVA: Observation groups; 'Innovation Organisational Support'; and employee categories

Proposition	Construct Name	Sub-proposition	Employee Category	Degrees of Freedom (D.F)	Mean Square (MS)	*F* Values	*P*-Value
H_0C13	Innovation Org. Support	**H_0C13.1**	Job category	3	0.3618	0.67	0.5734
		H_0C13.2	Gender	3	0.1072	0.20	0.8982
		H_0C13.3	Age	9	0.3547	0.65	0.7517
		H_0C13.4	Experience	12	1.0503	1.93	0.0285
		H_0C13.5	Education	8	2.3949	4.41	<.0001

Comparing mean opinions on 'Innovation organisation support' by the three observation groups and per employee categories, the following is found:

Proposition H_0C13.1: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of managers and non-managers of the experimental DFI from pre- to post-intervention groups regarding *Innovation organisational support*.

Proposition H_0C13.2: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of males and females of the experimental DFI from pre- to post-intervention groups regarding *Innovation organisational support.*

Proposition H_0C13.3: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of the various age categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Innovation organisational support.*

Proposition H_0C13.4: Rejected

There **is** a significant change in the corporate entrepreneurship opinions of the various *experience* categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Innovation organisational support.*

- All employee **experience** categories improved from pre- to post-intervention. Therefore, employee levels of experience do not seem to be a differentiating factor in changing employee opinions about organisational support (systems and processes) for innovation in DFIs.

Proposition H_0C13.5: Rejected

There **is** a significant change in the corporate entrepreneurship opinions of the various education level categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Innovation organisational support.*

- All employee **education** categories improved from pre- to post-intervention. The statistically significant improvement proves that the intervention has worked even to the education levels that had the least average opinion on this construct. However there may still be significant differences among employee education categories of the same organisation regarding organisational support (systems and processes) for innovations in DFIs;

Table 8.2.6: ANOVA: Observation groups; 'Innovation portfolio management'; and employee categories

Proposition	Construct Name	Sub-proposition	Employee Category	Degrees of Freedom (D.F)	Mean Square (MS)	*F* Values	*P*-Value
H_0C14	Innovation Portfolio Management	**H_0C14.1**	Job category	3	0.3698	0.59	0.6242
		H_0C14.2	Gender	3	0.2545	0.56	0.6402
		H_0C14.3	Age	9	0.3796	0.60	0.7958
		H_0C14.4	Experience	12	1.3442	2.13	0.0138
		H_0C14.5	Education	8	1.9720	3.13	0.0018

Comparing mean opinions on 'Innovation portfolio management' by the three observation groups:

Proposition H_0C14.1: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of managers and non-managers of the experimental DFI from pre- to post-intervention groups regarding *Innovation portfolio management*.

Proposition H_0C14.2: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of males and females of the experimental DFI from pre- to post-intervention groups regarding *Innovation portfolio management.*

Proposition H_0C14.3: Accepted

There **is not** a significant change in the corporate entrepreneurship opinions of the various age categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Innovation portfolio management.*

Proposition H_0C14.4: Rejected

There **is** a significant change in the corporate entrepreneurship opinions of the various *experience* categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Innovation portfolio management.*

- All employee **experience** categories improved from pre- to post-intervention. Therefore employee levels of experience do not seem to be a differentiating factor in changing employee opinions about Innovation portfolio management in DFIs.

Proposition H_0C14.5: Rejected

There **is** a significant change in the corporate entrepreneurship opinions of the various education level categories of employees of the experimental DFI from pre- to post-intervention groups regarding *Innovation portfolio management.*

- All employee **education** categories at holders of a degree and above improved from pre- to post-intervention. Employee **education** categories below holders of a degree regressed from pre- to post-intervention. 'Innovation portfolio management' is a sophisticated function and is a top management responsibility. Lack of understanding by the lower-educated

employees is therefore not surprising. No further action to rectify this is recommended.

8.3 Conclusion

Findings outlined in this chapter are summarised in Chapter 9, which deals with findings, recommendations and future research. It should, however, be noted that no analysis was done of the least squares means to test for interaction effect between employee categories and observation groups (DFIs). The datasets allow for such further studies, which are recommended.

PART IV

RESEARCH SYNTHESIS AND RECOMMENDATIONS

Chapter 9: Conclusions, recommendations, limitations and future research

9.1 General findings

The main general findings from the literature review are:

- Corporate entrepreneurship is important for DFIs because it can enhance their entrepreneurial thinking and acting, or performance, and consequently place them in a position to play the role of 'super entrepreneur' or catalyst for development.

- There are distinctive entrepreneurial characteristics that should be targeted to foster CE. These are: risk-taking propensity; desire for autonomy; need for achievement; goal orientation; and locus of control. The identification of these characteristics serves the following purposes: coaching, training and development can be targeted; and mismatches between individual motives and organisational needs can be avoided.

- Entrepreneurial abilities can be directly developed by education, training, and experience.

- An interrelationship exists between the individual and the organisational context in which entrepreneurial activity occurs. However, due attention should be given to the activities of the entrepreneur, rather than placing undue emphasis on the traits of the entrepreneur.

- There is a presence of innovation as a common corporate entrepreneurship dimension among all firms that can be reasonably described as entrepreneurial.

- The outcome of a combination of the identified organisational entrepreneurship variables and the individual factors is the organisational

entrepreneurship intensity, which in turn results in enhanced organisational performance.

The main general findings from the innovation and corporate entrepreneurship instrument development and validity testing are:

- The applied ICEAI instrument is reliable and valid, after: the removal of some questions that were regarded as superfluous and irrelevant to the South African context generally and the DFI environment in particular; the addition of innovation constructs; and further refinement of Hornsby's (1990) CEAI instrument.

- The ICEAI instrument can be applied, in its modified and refined state, in similar research studies.

The main findings from the innovation and corporate entrepreneurship training intervention are:

- Managers and senior professionals of DFIs can be trained to think and act entrepreneurially. This is borne out by the fact that after the training of the leadership group in the experimental DFI, twenty two (22) new venture plans were developed, of which six received final approval and funding;

- Organisational leaders can be change agents for innovation and corporate entrepreneurship.

9.2 Specific findings: Pre-intervention CE assessment (O_1)

The main specific findings from the pre-intervention CE assessment (O_1) are summarised in Tables 9.2.1 to 9.2.2:

Table 9.2.1: Summary results from the pre-intervention CE assessment (O_1): CE constructs

Para.	H_0	There is not a significant difference regarding…	Between manager & non-manager	Between male & female groups	Between age groups	Between experien. groups	Between educat. groups
6.5.1	H_0B 1	Managerial support…….	H_0B1.**1** **Accepted**	H_0B1.**2** **Accepted**	H_0B1.**3** **Accepted**	H_0B1.**4** **Rejected**	H_0B1.**5** **Rejected**
6.5.2	H_0B 2	Work discretion	H_0B2.**1** **Accepted**	H_0B2.**2** **Accepted**	H_0B2.**3** **Accepted**	H_0B2.**4** **Rejected**	H_0B2.**5** **Rejected**
6.5.3	H_0B 3	Rewards/reinforcements	H_0B3.**1** **Accepted**	H_0B3.**2** **Accepted**	H_0B3.**3** **Accepted**	H_0B3.**4** **Accepted**	H_0B3.**5** **Accepted**
6.5.4	H_0B 4	Time availability	H_0B4.**1** **Accepted**	H_0B4.**2** **Accepted**	H_0B4.**3** **Accepted**	H_0B4.**4** **Accepted**	H_0B4.**5** **Accepted**
6.5.5	H_0B 5	Organisational barriers	H_0B5.**1** **Accepted**	H_0B5.**2** **Accepted**	H_0B5.**3** **Accepted**	H_0B5.**4** **Rejected**	H_0B5.**5** **Accepted**

Table 9.2.2: Summary results from the pre-intervention CE assessment (O_1): Innovation constructs

Para.	H_0	There is not a significant difference regarding…	Between manager & non-manager groups	Between male & female groups	Between age groups	Between experience groups	Between educat. groups
6.5.6	H_0B6	Innovation org. support	H_0B6.**1** **Accepted**	H_0B6.**2** **Accepted**	H_0B6.**3** **Accepted**	H_0B6.**4** **Rejected**	H_0B6.**5** **Rejected**
6.5.7	H_0B7	Innovation portfolio mngmt	H_0B7.**1** **Accepted**	H_0B7.**2** **Accepted**	H_0B7.**3** **Accepted**	H_0B7.**4** **Rejected**	H_0B7.**5** **Rejected**

Tables 9.2.1 and 9.2.2 above summarise the findings of the **pre-test** diagnosis of employee views on corporate entrepreneurship and innovation constructs respectively. The following overview findings are noteworthy:

- On a five point Likert scale, only two constructs, the Work discretion and the Rewards/Reinforcements, were rated above average by employees. This indicates an area to focused on when planning innovation and corporate entrepreneurship training interventions;

- There were five out of seven constructs where some propositions for this section were rejected. Only for the Rewards/Reinforcements and Time availability constructs were all the propositions accepted. In all the rejected propositions, *Work experience category* was a common source of such a significant difference. *Education levels category* was the other source for all but one.

- For employee experience categories, 'newer' employees had a statistically significantly better view of the organisation on such constructs than their longer-tenure colleagues.

- For employee education levels categories, the analysis indicates that employees without degrees have a statistically significant better view of the organisation on the identified constructs, except for the Work discretion construct, where the results were inconclusive. The narrative comments on the qualitative sections of the questionnaire indicate:

    - frustration by higher-educated employees about poor management support and rigid organisational boundaries against the identified corporate entrepreneurship constructs; and

    - poor understanding of the innovation constructs by the less educated employees.

It is concluded therefore that:

- Age is not a factor in corporate entrepreneurship but, employee tenure is. For an organisation that works in teams, this conclusion means that while veterans can have deep expertise; the newcomers bring fresh perspectives as they are not contaminated by conventional thinking.

- A different approach to innovation and corporate entrepreneurship training interventions should be researched and designed for employees who have a longer tenure in organisations such as DFIs.

- Higher educated employees either find it difficult to see or think outside established patterns or management and organisational support is not suited for their 'innovative' ideas.

9.3 Specific findings: Pre-test- post-test- control groups (O_1,O_2,O_3) Comparisons

The main specific findings from the pre-, post-intervention, and control group comparisons are summarised in Tables 9.3.1 and 9.3.2:

Table 9.3.1: Summary of findings: Comparisons between pre-, post, and control groups regarding CE and innovation constructs

Proposition	Construct Name	Observation Group	F Values	P-Value	Finding
H_0C1	Management support	Pre Post Control	11.46	<.0001*	Rejected
H_0C2	Work discretion	Pre Post Control	5.16	0.0060*	Rejected
H_0C3	Rewards / Reinforcements	Pre Post Control	5.75	0.0034*	Rejected
H_0C4	Time availability	Pre Post Control	1.09	0.3376	Accepted
H_0C5	Organisational boundaries	Pre Post Control	2.49	0.0836	Accepted
H_0C6	Innovation org. support	Pre Post Control	8.53	0.0002*	Rejected
H_0C7	Innovation portfolio mngmt.	Pre Post Control	9.89	<.0001*	Rejected

Table 9.3.1 reflects the following findings:

- That there are **not** significant differences between the pre-, post-intervention, and control groups' corporate entrepreneurship opinions about ***Time***

availability and ***Organisational boundaries***. It can therefore be concluded without further analysis that the training intervention has not succeeded in influencing employee opinions on these two constructs; and that more training is recommended.

That there **are** significant differences between the pre-, post-intervention, and control groups' corporate entrepreneurship opinions about the ***Management support for CE***, ***Work discretion***, ***Rewards/Reinforcements***, ***Innovation organisational support***, and ***innovation portfolio management*** constructs. The directions of such differences are summarised in Table 9.3.2.

Table 9.3.2: Summary of findings: Direction of differences between pre-, post, and control groups regarding CE and innovation constructs

Proposition	Construct Name	Significance test			Findings		
		Post- vs. Pre-	Post- vs. Control	Pre- vs. Control	Post- vs. Pre	Post- vs. Control	Pre- vs. Control
H_0C1.1,2,3	Management support	+***	-***	-***	Rejected	Rejected	Rejected
H_0C2.1,2,3	Work discretion	+***	-***	-***	Rejected	Rejected	Rejected
H_0C3.1,2,3	Rewards / Reinforcements			-***	Accepted	Accepted	Rejected
H_0C4.1,2,3	Time availability				Accepted	Accepted	Accepted
H_0C5.1,2,4	Organisational boundaries				Accepted	Accepted	Accepted
H_0C6.1,2,3	Innovation org. support	+***			Accepted	Accepted	Accepted
H_0C7.1,2,3	Innovation portfolio mngmt.	+***	+***	-***	Rejected	Rejected	Rejected

The acceptance of the proposition is, among other conclusions, a finding that, for the relevant construct, there is not a significant difference between post- and pre-intervention. This importantly means that the intervention has not been effective;

The rejection of the proposition is, among other conclusions, a finding that, for the relevant construct, there has been a statistically significant change in the opinions of employees regarding that construct.

Findings reflected in Table 9.3.2, read together with Table 8.2.2 in Chapter 8, indicate that the following has occurred:

- A statistically significant improvement from the pre-intervention to post-intervention state of employee opinions on innovation and corporate entrepreneurship at the experimental DFI in all but three constructs.

- Two of the constructs that do not show a statistically significant difference, 'Rewards/Reinforcements' and 'Organisational boundaries', nevertheless show an improvement, albeit not a statistically significant one, with the 'Rewards/Reinforcements' construct also showing an above-average mean.

- Where the intervention **has not** been statistically successful, opinions on innovation and corporate entrepreneurship are below average, and innovation and CE opinion levels are at similar levels in all tested DFIs. Future research to find alternative intervention mechanisms is recommended.

Where there **has been** a statistically significant difference (improvement) from pre- to post- groups per construct, further analysis was conducted to determine which employee categories contributed most, or did not contribute, to the improvement, and the results are shown in tables 8.2.3 to 8.2.6 in Chapter 8. Conversely, the analysis shows areas of focus in other (non-experimental) DFIs for them to be able to improve their innovation and corporate entrepreneurship climate. This also highlights remaining areas of focus for improving or sustaining similar interventions in DFIs.

The areas of focus are the *experience* and *education* employee categories, which contributed to statistically significant differences in comparisons between the observation groups regarding CE and innovation constructs. Both categories had the least average opinions on similar constructs during the pre-intervention observation, but after the intervention they both showed statistically significant improvement. This means that the intervention worked in these categories. However, there may still be significant differences among such employee categories within the same organisation, and future research is recommended to establish this.

9.4 Recommendations

It is recommended that the present study and its findings should form the basis for infusing DFIs with corporate entrepreneurship and innovation thinking and acting.

It is specifically recommended that:

- The modified innovation and corporate entrepreneurship instrument (the ICEAI) should be adopted by all African development finance institutions to diagnose their entrepreneurial climate and to identify innovation and corporate entrepreneurship training needs. The modified instrument is valid and reliable for their environments;
- An intervention similar to the one used for the experimental design of the present study should be adopted by African DFIs to foster their innovation and corporate entrepreneurial culture;

9.5 Limitations of the study

Due to time limitations, not all non-professional and support staff members of the experimental DFI were trained in innovation and corporate entrepreneurship. Therefore, the results of the present study reflect to an extent the trickle-down effect of the leadership group training on innovation and corporate

entrepreneurship. Furthermore, the number of individual responses from the control group DFIs was statistically too small to draw general conclusions about those DFIs. However, for the purposes of the design of the present study, the number of responses from the control group of DFIs was, collectively, statistically adequate to serve the study design purpose.

9.6 Future research

The results of this study provide adequate evidence in support of the sound principles of entrepreneurship documented in literature. Furthermore, the results contribute to the science and body of knowledge on corporate entrepreneurship, and establish a platform for longitudinal research on corporate entrepreneurship inside DFIs.

To take the findings of the present study forward, it is recommended that the impact of the improved entrepreneurial thinking and acting by DFIs, as observed in the experimental DFI, on poverty reduction and economic growth should be researched in future.

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Zahra, S.A., Kuratko, D.F. & Jennings, D.F. 1999. Entrepreneurship and the acquisition of dynamic organisational capabilities. *Entrepreneurship: Theory and Practice*, 23(3): 5-10.

PART V

APPENDICES

Appendix One: Reference list

Reference:	Paragraphs where used:
Adonisi, M. 2003	4.3.4; 4.3.5; 4.6.1
Angel, H.L., & Van de Ven, A.H. 1989	4.8
Banbury, C.M. & Mitchell, W. 1995	4.6.8
Barringer, M.S. & Bluedorn, A.G. 1999	4.6.1; 4.6.3
Barrett, H & Weinstein, A. 1997.	4.3.5
Barrett, H., Balloun, J.L., & Weinstein, A. 2000	4.2; 4.3.5; 4.3.5; 4.3.5; 4.3.
Bartlett, C.A. & Ghoshal, S. 2002	7.2
Block, Z., & MacMillan, I.C. 1995	3.2; 3.4; 4.4.2; 4.6.2
Burgelman, R.A. 1983	4.6.5;
Burgelman, R.A. 1984	4.2
Bygrave, W.D. 1995	4.2; 4.6.1
Bygrave, W.D., & Hofer, C.W. 1992	3.1; 3.2;
Cameron, K.S. 1986	4.6.7
Carton, R.B., Hofer, C.W., & Meeks, M.D. 1998	3.1; 3.2; 4.2
Christensen, C.M. 2003	3.3.2
Cooper, D., Schindler, P. 2003	2.1; 2.2; 2.4; 2.5; 2.9; 3.1; 5.3.1, 5.3.3; 6.2; 6.2.1; 6.2.3
Cornwall, J.B., & Perlman, B. 1990.	4.4.5; 4.8

Gantsho, M.S.V. 2004 **2.1**

Gartner, W.B. 1989 **4.2**

Gartner, W.B. 1990 **4.4.4; 4.4.5**

Ginsberg, A. & Hay, M. 1994 **4.2**

Goosen, C.J., De Coning, T.J., & Smit, E.v.d.M. 2002 **4.3.7**

Greenwood, J., & Jovanovic, B. 1990 **1.2**

Guth, W.D., & Ginsberg, A. 1990 **4.3.1; 4.3.2**

Hage, J., & Aiken, M. 1970 **4.8**

Herbet, T.T. & Brazeal, D.V. 1998 **4.6.1**

Hildebrand, D.K., & Ott R.L. 1996 **1.7; 6.2.1; 6.2.1; 6.2.2; 6.2.2; 6.2.2; 6.2.2; 6.2.2; 6.2.2; 6.2.2; 6.2.2; 6.2.2**

Hill, R.M. & Hlavacek, J.D. 1972 **4.6.2**

Hisrich, R.D. & Peters, M.P. 2002 **4.6.1; 4.3.6; 4.3.6; 4.7**

Hornsby, J.S., Ireland, R.D. & Kuratko, D.F. 1990 **2.3; 4.6; 5.2; 9.1**

Hornsby, et al. 1992 **4.6.4**

Hornsby, J.S., Kuratko, R.V. & Montagno, D.F. 1999 **4.5; 4.6; 4.6.1; 4.6.4**

Hornsby, J.S., Kuratko, F. & Zahra, A. 2002 **4.6**

Hornsby, J.S., Naffziger, D.W., Kuratko, D.F. & Montagno, R.V. 1993 **4.3.6**

Jennings, D.F. 1994 **3.1; 4.4; 4.4.1; 4.4.2; 4.4.3**

Jennings, D.F., & Seaman, S.L. 1992 **4.3.7**

Miller, D. 1990	**4.2; 4.6.7**
Miller, D. 1983	**1.2**
Miller, D. & Friesen, P. 1982	**4.2**
Morris, M.H., & Kuratko, D. 2002	**1.1; 4.2; 4.3.6; 4.4.4; 4.6.1; 4.6.2; 5.3.2.1; 5.3.2.2; 5.4**
Morris, M., Lewis, P., & Sexton, D. 1994	**1.1; 4.3.6**
Morris, M.H., & Sexton, D.L. 1996	**4.3.7; 4.4.4**
Naman, J.L., & Slevin, D.P. 1993	**1.2; 4.2**
Nieman, G.H., & Bennett, J.A. ed. 2002	**3.2; 3.2; 3.2**
Nijhof, A., Krabbendum, K. & Looise, J.C. 2002	**7.2**
OECD & AfDB. 2006	**1.3**
O'Hara-Devereaux, M. & Johansen, R. 1994	**4.6.6**
Pearce, J.A., & David, F.R. 1983	**4.8**
Pearce II, J.A., Kramer, T.R., & Robbins, D.K. 1997	**1.6; 4.3.7; 4.6.1; 7.2.2**
Pinchot, G. 1985	**4.2; 4.4.3**
Quinn, J.B. 1985	**4.6.1**
Ramamurti, R. 1986	**4.8**
Russell, R.D. 1999	**4.2; 4.7**
Russell, R. & Russell, C. 1992	**4.2; 4.7**
Sadler, R. 2000	**4.4.5; 4.4.5; 4.7; 4.8**

SAS 1988	**2.5; 5.3.2; 5.3.2.1; 5.3.2.2; 5.3.2.2; 6.2; 6.2.1; 6.2.1; 6.2.2**
Sathe, V. 1985	**4.6.3; 4.6.4**
Saxena, R.K. 1991	**4.8**
Schindehutte, M., Morris, M.H. & Kuratko, D. 2000	**1.1; 4.2**
Schollhammer, H. 1982	**1.2; 4.4.1; 4.4.2**
Schrage, M. 2000	**4.6.6; 7.2**
Schuler, R.S. 1986	**4.6.4**
Schumpeter, J.A. 1942	**1.4; 3.2; 3.3.2**
Schumpeter, J.A. 1939	**3.2**
Schumpeter, J.A. 1934	**3.2; 4.2; 4.6.8**
Shapiro, A. 1984	**4.6.2**
Sharma, P. & Chrisman, J.J. 1999	**4.6.5**
Simon, S., Houghton, S.M. & Gurney, J. 1999	**1.1; 4.2; 4.4.2; 4.6.2**
Slevin, D.P., & Covin, J.G. 1990	**4.8**
Smith, K.G., & Di Gregorio, D. 2002	**3.2**
Smith, W. 2000	**3.2; 3.4**
Stevenson, H.H. & Jarillo, J.C. 1990	**1.1; 4.4.4; 4.6.1**
Sykes, H.B. & Block, Z. 1989	**4.6.1; 4.6.4**
Thomke, S. 2001	**4.6.6**

Innovation and Corporate Entrepreneurship Assessment Instrument (ICEAI)

ICEAI Post test for staff of the Experimental DFI

The Organisation (The Bank) is embarking on this second employee survey about innovation and corporate entrepreneurship. The Bank needs to evaluate the developments that took place regarding the Innovation and Corporate Entrepreneurship intervention since the previous survey in May 2005.

What is the Innovation and Corporate Entrepreneurship Assessment Instrument? It is a specially designed research tool to measure employee opinions & feelings about innovation & entrepreneurship.

Who must answer the questions? All staff at the Bank interested in entrepreneurship and corporate entrepreneurship are invited to complete this questionnaire.

Why should I take this survey? It is important for the Bank to know how you perceive your workplace at the Bank at this moment regarding innovation and entrepreneurship.

Are my answers confidential? Yes. Your name is optional and your responses will remain strictly confidential.

Are there any right or wrong answers? No, there are no right or wrong answers. Please give your honest opinions and perceptions. Your answers must be based on your actual experiences. Other questions may explore your general impressions or perceptions.

Your answers should reflect your honest opinions and perceptions of the Bank.

It will take about 20 minutes to complete this questionnaire.

Example	Strongly disagree	Disagree	Not sure; don't know; not applicable	Agree	Strongly agree
I like what our organisation stands for	1	2	3	4	5

1=Strongly disagree; 5=Strongly agree

An example where you wanted to "agree": 1 2 3 **(4)** 5

Part 1: Corporate entrepreneurship

Section 1: Management Support for Corporate Entrepreneurship

1.	The organisation is quick to use improved work methods that are developed by workers.	1 2 3 4 5
2.	At the organisation, developing new ideas for the improvement of the organisation is encouraged.	1 2 3 4 5
3.	Upper management is aware of and very receptive to my ideas and suggestions.	1 2 3 4 5
4.	Those actively working on projects are allowed to make decisions without going through elaborate justification and approval procedures.	1 2 3 4 5
5.	The executive management at the organisation encourage innovators to bend rigid procedures in order to keep promising ideas on track.	1 2 3 4 5
6.	The executive management at the organisation are known for their experience with the innovation process.	1 2 3 4 5
7.	There are several options within the organisation for individuals to get financial support for their innovative projects and ideas.	1 2 3 4 5
8.	Individual risk takers are recognized for their willingness to champion new projects, whether eventually successful or not.	1 2 3 4 5
9.	The organisation supports many small and experimental projects realizing that some will undoubtedly fail.	1 2 3 4 5
10.	The organisation encourages people to take calculated risks with their new ideas.	1 2 3 4 5
11.	The organisation equally supports managerial and professional staff with career development.	1 2 3 4 5

Section 2: Work Discretion 1=Strongly disagree; 5=Strongly agree	
12. I feel that I am my own boss and do not have to double-check all my decisions with someone else.	1 2 3 4 5
13. I am not subject to criticism and punishment resulting from mistakes made on the job.	1 2 3 4 5
14. My own judgment is highly appreciated at the organisation.	1 2 3 4 5
15. The organisation gives me the opportunity to make use of my abilities.	1 2 3 4 5
16. I have much autonomy in my job and I am left on my own to do my own work.	1 2 3 4 5
17. My job description and scorecard allow me to come up with ideas and be innovative.	1 2 3 4 5
18. There are lots of positive challenges in my job.	1 2 3 4 5
Section 3: Rewards/Reinforcement	
19. The rewards I receive are dependent upon my work performance.	1 2 3 4 5
20. My manager/supervisor will increase my job responsibilities if I am performing well in my job.	1 2 3 4 5
21. Individuals running or initiating successful innovative projects receive additional rewards and compensation for their ideas and efforts beyond the standard reward system.	1 2 3 4 5
22. My manager/supervisor would tell his/her boss if my work was outstanding.	1 2 3 4 5
23. My immediate supervisor discusses my work load and performance with me frequently.	1 2 3 4 5
24. I clearly know what level of work performance is expected from me in terms of quantity, quality and timeline of output.	1 2 3 4 5
25. My manager/supervisor helps get my work done by removing obstacles and roadblocks.	1 2 3 4 5
26. My manager/supervisor keeps to all the rules, the original terms of reference and the original set of specifications when my performance is evaluated.	1 2 3 4 5
Section 4: Time Availability	
27. During the past three months, my workload was not too heavy.	1 2 3 4 5
28. I always seem to have plenty of time to get everything done.	1 2 3 4 5
29. I have just the right amount of time to do everything well.	1 2 3 4 5
30. My co-workers and I always find time for long-term problem solving.	1 2 3 4 5
Section 5: Organisational Boundaries, Barriers and Bureaucracies	
31. In the past three months, I had to follow very little standing operating procedures or practices to do my major tasks.	1 2 3 4 5
32. There are few written rules and procedures that exist for doing my major tasks.	1 2 3 4 5
33. 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

Part 2: Innovation 1=Strongly disagree; 5=Strongly agree

Section 6: Successful technology enablement

34. The organisation currently assesses and measures innovation progress by successfully using technology.	1 2 3 4 5
35. The organisation currently has a knowledge management program that successfully facilitates the flow and capturing of ideas.	1 2 3 4 5
36. The organisation currently enables innovation by using the intranet or internet successfully.	1 2 3 4 5

Section 7: Process

37. The organisation has a system that ensures innovation/corporate entrepreneurship activities are integrated into everyday tasks.	1 2 3 4 5
38. The organisation has removed the mystery out of innovation and corporate entrepreneurship by defining these processes.	1 2 3 4 5
39. The organisation uses screening and resource allocation process to ensure that new ideas, ventures and initiatives are investigated.	1 2 3 4 5
40. There is currently a structured and formal process for gathering ideas from staff.	1 2 3 4 5
41. The organisation uses cluster / information sharing forums to facilitate the cross-pollination of ideas (e.g. showcases, brainstorming, "keeping current" sessions)	1 2 3 4 5
42. The organisation provides clear, concise and timely feedback to innovators or intrapreneurs.	1 2 3 4 5

Section 8: Innovation Portfolio

43. The organisation currently uses an innovation portfolio/system to provide an overall view of all innovation initiatives in the Bank	1 2 3 4 5
44. The organisation currently uses a system to measure innovation.	1 2 3 4 5
45. The organisation compares innovation initiatives across dimensions to ascertain synergies.	1 2 3 4 5
46. The organisation compares innovations to obtain information on risk, potential return and resource requirements.	1 2 3 4 5
47. The organisation uses an appropriate classification mechanism to classify new ideas and submissions.	1 2 3 4 5

Part 3: Biographic information:

48.	Did you answer the questions in your capacity as: 1. = Management 2. = Project manager 3. = Specialist or professional staff 4. = Other staff……..	1 2 3 4
49.	Your gender?: 1. = Male 2. = Female	1 2
50.	Your age category?: 1. = 20 to 30 2. = 31 to 40 3. = 41 to 50 4. = 51 to 60 5. = 61 and up	1 2 3 4 5

51. How many years have you been at the organisation? (full years) 1. = 0 to 4 years 2. = 5 to 9 years 3. = 10 to 14 years 4. = 15 to 19 years 5. = 20 years and more	1 2 3 4 5
52. What is the highest level of education that you completed? 1. = Less than Grade 12 2. = Grade 12 3. = Other qualifications after Grade 12 4. = Degree 5. = Post graduate qualification 6. = Doctorate	1 2 3 4 5 6
53. Which category best describes your current position? 1. = I manage others 2. = I don't manage others	1 2

Open questions:

54. Which other barriers are hampering innovation & corporate entrepreneurship?

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55. How should innovation be rewarded?

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56. Additional Comments: ……
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Optional information:

57. Your name: ……..
58. Your unit ……
59. Work title: ……
60. Contact Details, (e-mail and cell): ……...

Thank you for your time and participation

Source of the Questionnaire: Adapted from the Corporate Entrepreneurship Assessment Instrument (CEAI) of Morris and Kuratko; Corporate Entrepreneurship, 2002, Harcourt, Inc that is used in similar studies worldwide; and the diagnostic questionnaire suggested in the Bank's innovation strategy.

Appendix 3 Author's Biography

Mandla Sizwe Vulindlela Gantsho was born in South Africa in 1962. He matriculated at the Umtata Technical and Commercial College, Umtata, in 1980. He went on to obtain: a B.Com from the University of Transkei in 1983; a Certificate in the Theory of Accounting (CTA) from the University of Cape Town (UCT) in 1985; a B.Com Honours from UCT in 1986; and an M.Sc from the George Washington University in the USA in 2002. He qualified as a Chartered Accountant (SA) in 1987.

After a successful career in the private sector, Gantsho became the CFO of the Development Bank of Southern Africa (DBSA) for five years from 1995 to 2000 and later became its Chief Executive and Managing Director for another five years from 2001 to 2006. DBSA is a regional Development Finance Institution (DFI) operating in 14 countries that constitute the Southern African Development Community (SADC). With effect from July 2006, Gantsho took up continental responsibilities as the African Development Bank's Vice President responsible for: Infrastructure; Private Sector; Regional Integration & Nepad; and Water and Sanitation.

His Excellency President Nelson Mandela appointed Gantsho in 1997 as a member of the Financial and Fiscal Commission, a constitutional body to advise Government on inter-governmental fiscal relations matters. In 2001, His Excellency President Thabo Mbeki appointed Gantsho to the three-person Commission of Inquiry to investigate the 2000/2001 rapid depreciation of the South African currency, the Rand.

Mandla Gantsho is married to Karen and they have two children.