

**A FRAMEWORK FOR THE EFFECTIVE CREATION OF BUSINESS
INCUBATORS IN SOUTH AFRICA**

by

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Thesis submitted in fulfilment of the requirements for the degree

Doctoris Technologiae (D.Tech)

in the discipline of Business

FACULTY OF MANAGEMENT SCIENCES

LOGISTICS DEPARTMENT

at the

VAALE UNIVERSITY OF TECHNOLOGY

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2019

DECLARATION

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ACKNOWLEDGEMENTS

I have a clear view now because I am standing on the shoulders of thinkers.

I would like to thank the following individuals:

- My promoter, Prof. M. Dhurup (Executive Dean of the Faculty of Management Sciences) for his remarkable and endless support and supervision.
- My co-promoter, Prof. C. Mafini (Head of the Department of Logistics) who took great interest in both my research and personal life.
- The National Research Foundation for financial assistance towards this study and the Vaal University of Technology for their research award.
- Drs Cheryl Thomson and Andrea Garnett for editing this research study and Ms Linda Scott for editing the proposal.
- My colleagues Mr Nkosivile Welcome Madinga, Lloyd Kapondoro, Dr. Eugene Tafadzwa Maziriri, Mlamli Hoyana, Richardt Kok, Chumani Stemele, Ngcebo Mabizela, Samson Nambei Asoba, Ludwe Masito, Zikhona Madlingozi, Zandisile Mkhubukeli, Thenjiwe Dlamini, Sesethu Dyayiya, Lesego Maphanga, Prominent Choto and Dr. Yamkela Oko Jama for their constant support in keeping me motivated and moving forward.
- Dr Nikiwe NIKI Khunjuza, Ms Mzikazi Fuzile and Kholofelo Mashitisho for their support and encouragement during the academic journey, which resulted in the completion of this thesis.
- The VUT Research Committee, for the feedback that they provided on all the HDC meetings, in particular Ms Beatrice Phume for her support and the entire staff of the Department of Logistics in the Management Sciences faculty.
- I would also like to acknowledge the support from my sisters Thenjiswa Nkuzo Lose, Thantaswa Sindi, Thandiswa Lose and Thozama Mqhuba Lose, as well as cousins, nieces and nephews for their encouragement.
- The incubator centre managers, incubation project specialists and business development officers for their time in participating in the survey.

DEDICATION

This research study is dedicated to scholars everywhere, an African child, and most importantly to the less privileged individuals who educate, influence, and lead by example. With them in heart, this thesis is an effort towards the development of small businesses. Finally, to my late parents who will never witness this day, Simon Mcinezeli 'Zava' Lose and his sweetheart Nonugget 'Shumikazi' Lose.

ABSTRACT

The majority of business incubators in South Africa are supported by the Small Enterprise Development Agency (SEDA). However, a notable proportion of business incubators face a number of challenges to growth and development. Despite a number of studies conducted on business incubators generally, little information exists on the framework for the creation of business incubators. The concept of business incubation has gained prominence in academia in recent years as a vehicle for small business development. In view of the growing importance of business incubators, the objective of this study is to develop a framework for the creation of business incubators in South Africa.

Business incubator managers, coaches, project specialists, and enterprise development practitioners were selected, being considered the ideal target population for this study. The study adopted a sequential mixed-methods methodology that commenced with a qualitative study and was followed by a quantitative study. For the qualitative study, data were collected from a purposively selected business incubator sample comprising nine participants. The principle of technical saturation was applied to ascertain the adequacy of the sample size. The trustworthiness and credibility of the qualitative study were achieved through pre-testing of the interview guide, bracketing, prolonged engagement with participants, peer debriefing, and researcher reflexivity. The analysis of the qualitative data was conducted using content and thematic analyses.

The qualitative element of the study identified incubator prerequisites, situational analyses, operational processes/incubation strategies, and operational outputs as the main determinants of the framework for business incubators. In line with the methodology of the study, the determinants of the framework for business incubators that emerged from the qualitative study were further examined through a quantitative study.

The data for the quantitative study were generated from a conveniently selected incubator practitioner sample of 121 respondents, using a structured self-administered questionnaire. Furthermore, the historical evidence method guided the determination of the sample size for the quantitative study.

Prior to questionnaire administration of this study a pilot study was conducted to improve the accuracy of the survey instrument. The quantitative section utilised statistical data analysis procedures, descriptive statistics, reliability and validity analysis, correlation analysis and confirmatory factor analysis. The Statistical Package for Social Sciences (SPSS) software was utilised to analyse the quantitative data. The results of the quantitative data analysis revealed that the framework for incubation presents incubator prerequisites (incubation entry of incubatees) as the predictor construct. This construct has eight sub-components, which are situational analysis (incubatees' characteristics), key requirements, operational process, factor components, intellectual capabilities, administrative capabilities, market force engineering, and strategic resourcing (impact) with KPIs. The mediating construct is business incubator performance (incubation process—industry coaches, governance structure, and entrepreneurial focus), which in turn leads to monitoring and evaluation (incubation output—graduation phase, impact, and follow-ups). The relationships between these constructs were tested. In order to verify the reliability of the measurement items of the current study, Cronbach's alpha coefficient, the item-to-total values and composite reliability were computed. The validity of the survey instrument was enhanced through content, convergent, discriminant and predictive validities. In addition, the reliability and validity measures employed in the present study showed that the survey instrument utilised in the quantitative study was both reliable and valid. The study is significant in terms of its theoretical and business incubation policy implications. Theoretically, the study provides a comparative impression of the South African business incubation perspective and current trends in the ecosystem. Thus, future researchers, particularly in developing countries, may use the results of this study as a reference benchmark in terms of literature and research methodology. The various organs of the state, government agencies, as well as non-governmental organisations that are responsible for entrepreneurship development and the creation of additional business incubators, may use the study as a reference point in the generation of different initiatives aimed at improving the small business environment in South Africa.

Key words: Business incubators, incubation, framework, incubatees, small and medium enterprise(s)

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ACRONYMS AND ABBREVIATIONS

BBIC	Bahrain Business Incubator Centre
BI(s)	Business Incubator(s)
CEO	Chief Executive Officer
CfERI	Centre for Entrepreneurship Rapid Incubator
CSES	Centre for Strategy and Evaluation Services
CSES	Centre for Strategy and Evaluation Studies
DTI	Department of Trade and Industry
EU	European Union
GEM	Global Entrepreneurship Monitor
IBI(s)	International Business Incubator(s)
ICT	Information and Communication Technology
IGMDP	Incubation Governance Management Development Programme
ILO	International Labour Organization
MBO	Management by Objectives
NBIA	National Business Incubation Association
NOTAP	National Office for Technology Acquisition and Promotion
SABIC	Southern Africa Business Incubation Conference
SABTIA	Southern Africa Business Technology Incubation Association
SBDC	Small Business Development Corporation
SEDA	Small Enterprise Development Agency
SME(s)	Micro, Small and Medium-sized Enterprise(s)
SP	Science Park
SPSS	Statistical Package for Social Sciences
STP	SEDA Technology Programme
TBIs	Technology Business Incubators
TP	Technology Park
TQM	Total Quality Management
UKBI	UK Business Incubation
VUT	Vaal University of Technology

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

Globally, entrepreneurship is viewed as having a significant impact on economic growth and development (Nafukho & Muyia 2010:97; Ozdemir & Şehitoglu 2013:282). According to Choto, Tengeh and Iwu (2014:93), and Olawale and Garwe (2010:729), the importance of small and medium enterprises (SMEs) is becoming fully realised as the engine driving economic growth and employment. In South Africa, entrepreneurship practices through SMEs significantly affect employment creation and economic development (Fatoki 2014:2). Despite their contribution in both developed and developing countries, SMEs have high failure rates in their early stages of operation and only a few survive and grow (Ndabeni 2008:259; Worku 2015:250). In response to the failure rate of new entrepreneurial ventures, business incubation was identified as a strategic tool to help entrepreneurs develop their businesses from inception to commercialisation (Buys & Mbewana 2007:356; Marimuthu & Lakha 2015:79).

In 1995, the South African government committed to economic restructuring and began to roll out initiatives targeted to nurture SMEs (Gwija, Eresia-Eke & Iwu 2014:168; Malefane 2013:671). In acknowledging the contributions that SMEs make towards economic development, there is a need to promote and support start-up enterprises to meet international standards (Mafini & Omoruyi 2013:166; Masutha & Rogerson 2014b:142-143). South African government agencies and private organisations embarked on a number of support initiatives for SMEs, and a number of programmes are continuously being implemented (Buys & Mbewana 2007:358; Lose 2016:1). South Africa has adopted business incubation as a tool to strengthen the economy through SMEs (Dubihlela & van Schalkwyk 2014:265). Business incubators are essentially organisations that assist in increasing survival rates of innovative start-up companies and supporting entrepreneurial ventures.

According to Masutha and Rogerson (2014a:227), the incubation idea in South Africa originated in the 1990s and was accelerated by numerous industry programmes. These include the Godisa programme, the expansion of the Small Enterprise Development Agency (SEDA) initiatives from the Department of Trade and Industry (DTI), incubation support programmes and the SEDA Technology Programme (STP) (Ndabeni 2008:265-266; Neneh 2012:3368;

Worku 2015:252). It is currently estimated that in South Africa, 82 percent of incubators are publically owned and 18 percent are privately owned (Masutha & Rogerson 2014b:148; Tengeh & Choto 2015:152).

1.2 BACKGROUND TO THE RESEARCH PROBLEM

There is evidence that business incubators play a critical role in the success of entrepreneurship (Ndabeni 2008:260; Cullen, Calitz & Chandler 2014:76; Masutha & Rogerson 2014b:141). In South Africa, entrepreneurship offers a solution to the high unemployment rate (25.5%) and it supports economic development to eradicate poverty and crime while uplifting the standards of living. In addition, entrepreneurship promotes income redistribution, black economic empowerment, and economic development (Ndabeni 2008:259; Iwu, Ezeuduji, Eresia-Eke & Tengeh 2016:165). Despite the significant benefits of entrepreneurial activities and government efforts to support them, many entrepreneurial ventures fail at the start-up phase or in the first year of operation (Skaik 2013:3; Masutha & Rogerson 2014b:143).

Given the above, business incubation has emerged as a remedy for the reduction of entrepreneurial failure (Dba, Comm & Accy 2008:41; Junaid Ahmad 2014:375). Business incubators help to combat a number of factors that contribute to the failure of entrepreneurial ventures, these include: education and training, limited resources, negative individual mindsets, isolation from markets, being unaware of potential and a few income-generating activities (Choto *et al.* 2014:95; Ntlamelle 2015:20). A framework for effective business incubation is, therefore, essential to ensure that vibrant and successful business incubators exist to promote entrepreneurship.

The development of a framework for business incubators may also assist in alleviating the failure of SMEs in South Africa. If SMEs in South Africa become successful, they will contribute to the further economic development of the country, through, amongst other benefits, the reduction of the unemployment rate. For instance, in the first quarter of 2016, the South African unemployment rate increased to 26.7 percent from 25.5 percent in 2014 (SSA 2016:4). The unemployment rate remains high, regardless of the efforts by government agencies (Choto *et al.* 2014:94). This study, therefore, aims to develop a business framework for the effective creation of business incubators in South Africa, which could facilitate improvements in various areas of the economy.

1.3 SIGNIFICANCE OF THE STUDY

This study is of importance to stakeholders, namely business incubators, incubatees, researchers and the national government. In South Africa, the inception of business incubation is recent and still developing although limited literature is available. One of the primary objectives of the study is to conduct a literature review on the definition and theory of business incubation. Although there are ongoing trends of framework generation for effective business incubators, the literature indicates that limited models exist to promote incubators. This study delivers an effective framework for the start-up of business incubators.

It is also important to note that, like incubatees, business incubators in South Africa face a number of challenges including lack of funding, competence and motivation (Tengeh & Choto 2015:153). This study, therefore, attempts to explore the knowledge gap by profiling and providing insights into the challenges and future direction of business incubators. Specifically, the study generates awareness of the factor components of a business incubation framework in the start-up phase. Furthermore, the empirical findings of this study will guide incubators in the formation of their objectives to operate efficiently. The researcher also benefits in the sense of knowledge and this study adds value to the existing body of knowledge by providing proposals for future research on the matter under study.

1.4 PROBLEM STATEMENT

It is widely acknowledged that business incubators are an important vehicle for economic prosperity and a remedial solution to micro, small and medium-sized enterprise (SME) development in emerging economies (Mahmood, Jianfeng, Jamil, Karmat, Khan & Cai 2015:147). As suggested by Masutha and Rogerson (2014b:141), the concept of business incubators is in its infancy stage and limited models exist to promote their creation and effective operation in South Africa. In addition, despite the importance of business-related resources to promote small businesses and the operation of business incubators, previous research reports (for example, Buys & Mbewana 2007:358; InfoDev 2010a:29; Tengeh & Choto 2015:153) mention that business incubators face operational challenges such as geographical dispersal, the lack of funding, attracting quality entrepreneurs and unsupportive government policies. Other scholars (Stefanovic, Devedzic & Eric 2008; Lose 2016:27) further report on a mixture of factors such as the lack of entrepreneurial skills, lack of commitment, lack of advanced

technological facilities and competent and motivated management, which threaten the sustainability and long-term survival rate of business incubators in South Africa. Information generated through research is thus needed to enable business incubator operations in South Africa to overcome these challenges. The non-existence of an incubator framework with which to benchmark such initiatives creates a need to develop a business incubator framework that will assist in guiding incubator policy objectives, incubator managers, and practitioners within the South African context.

Research evidence exists on the impact and performance of business incubators (Choto 2015:4; Diedericks 2015:8; Kavhumbura 2014:9; Masutha & Rogerson 2014b:144; Ntlamelle 2015:10) as well as contribution of networking skills (de Beer 2012:5) in the South African context. Other studies (Bergek & Norman 2008:23; Cullen *et al.* 2014:76; Dubihlela & van Schalkwyk 2014:265; Sithole & Rugimbana 2014:643; Lose & Tengeh 2015:14344) concentrated on incubator services and sustainability whilst Masutha and Rogerson (2014c:S47) focused on business incubators as an emerging phenomenon. Research evidence is also available in the international context where several studies (Hannon 2003:449; Hannon 2005:57; Bergek & Norman 2008:20; McGrath 2015; Oliveira & Vieira 2016:62) put forward different business incubator frameworks for their own specific environments. However, there is scant evidence of research studies that developed frameworks for the creation of business incubators in South Africa. Still, as recommended by Al-Mubaraki and Busler (2010:19), it is necessary to create more business incubators and operational frameworks to establish viable businesses in the country. Lose, Maziriri and Madinga (2016:27) emphasise the need to use empirical data to develop effective business frameworks for the creation of business incubators. Thus, in acknowledging the challenges that business incubators face in South Africa and the existing research gaps, the current study aims to propose a business framework for the effective creation of business incubators in South Africa.

1.5 OBJECTIVES OF THE RESEARCH

1.5.1 Primary objective

The study was guided by primary and theoretical research objectives. The primary objective of this study was to develop a framework for the creation of business incubators in South Africa.

1.5.2 Theoretical objectives

The primary objective of the study was achieved through the following theoretical objectives:

- To conduct a literature review on the definition and evolution of business incubators;
- To conduct a literature review on the incubation theoretical framework;
- To conduct a literature review on the key requirements for effective business incubators;
- To conduct a literature review on the factors inhibiting performance of business incubators;
- To conduct a literature review on the challenges facing business incubators; and
- To conduct a literature review on the characteristics contributing to the successful start-up of a business incubator.

1.5.3 Empirical objectives

The aim of the study is:

- To analyse the existing framework for the creation of incubators in South Africa;
- To determine factor components of business incubation framework in the start-up phase;
- To determine resources critical to the effective start-up of business incubators in South Africa; and
- To investigate entrepreneurial characteristics contributing to successful start-up of business incubators in South Africa.

1.6 PRELIMINARY LITERATURE REVIEW

For this study, literature was reviewed under the following headings: theoretical framework, definitions of business incubation, types of business incubators, factors inhibiting performance of business incubators, key requirements for effective business incubators and characteristics contributing to the successful start-up of a business incubator.

1.6.1 Research theory

For the purposes of this study, the systems theory of management was identified as the applicable research theory. The main idea in systems theory is the argument that a system can be decomposed into inputs, processes and outputs (Hunter 2012:24). In this manner, organisations (including business incubators) can be viewed as systems that use the transformation process to convert inputs into outputs (Hunter 2012:25). The propositions of systems thinking have generally been accepted in business management (Barile & Saviano 2011:4) and are arguably suitable for use in this study. Firstly, the systems theory upholds that systems achieve specific goals through purposeful behaviour (Severance 2001:1). Likewise, business incubators have specific goals like any other organisation. Secondly, the systems theory views organisations as open systems that interact with their environments. The same holds true for business incubators since they operate within a greater external environment from which various forms of inputs are obtained. Thirdly, the systems theory states that systems create, possess, transfer, and modify information. Similarly, information is a major input into the activities of business incubators since they are intended to provide support to SMEs. Therefore, the research problem can be conceptualised within the views of the general systems theory.

1.6.2 Conceptual framework

To create a framework for the effective creation of incubators, a preliminary conceptual model based on acceptable axioms with consideration of the literature is essential. A conceptual framework is a population of propositions (arguments, hypotheses, predictions, explanations, and inferences) that provide a skeletal structure for an explanation of real-world phenomena (Adams, Hester, Bradley, Meyers & Keating 2011:115). The above discussion manifests in the conceptual framework depicted in Figure 1.1.

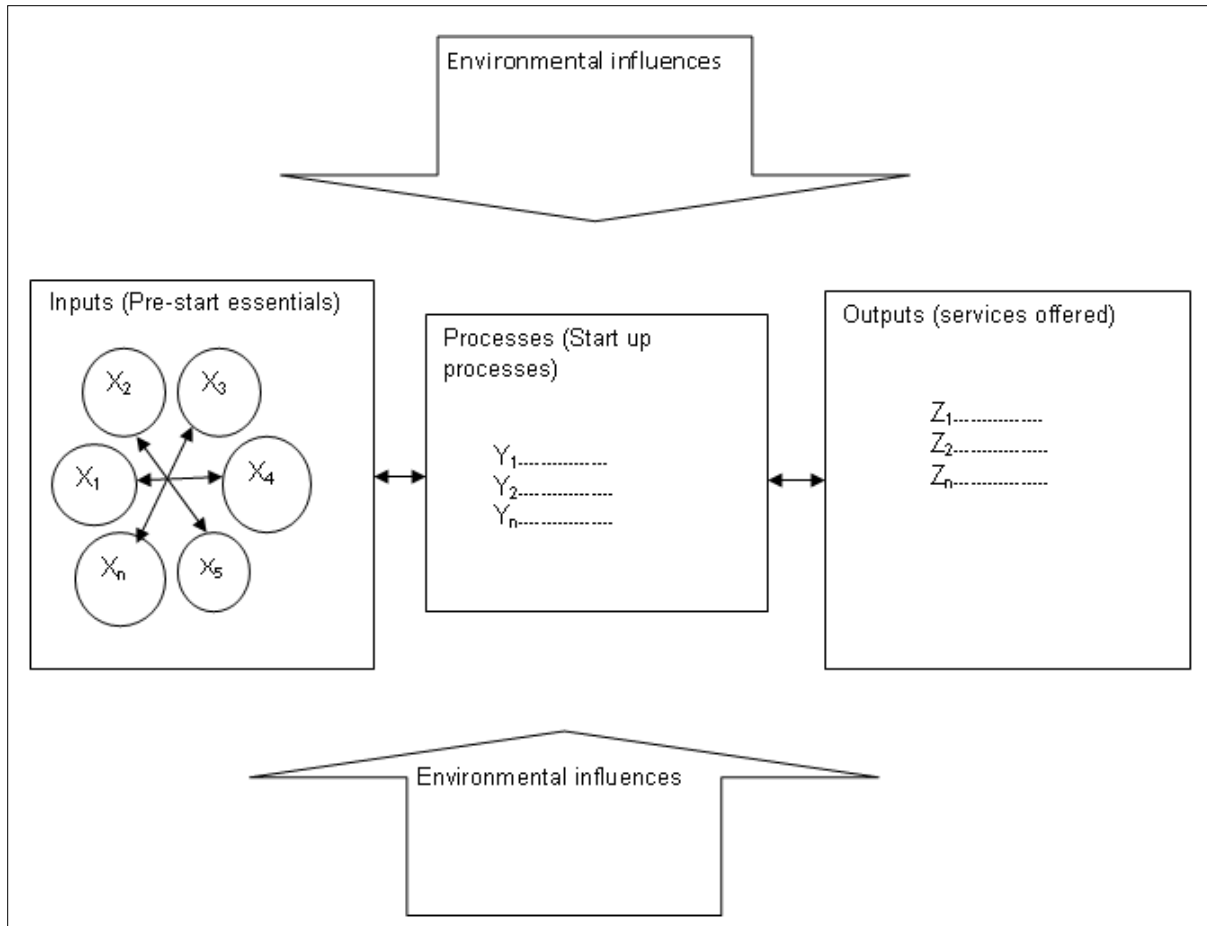


Figure 1.1: Conceptual framework for business incubators

Source: Author's own construct based on the perspective of Severance (2001:1).

Figure 1.1 illustrates that pertaining to the objectives of this study, the factor components of business incubators are the inputs, while the environmental influences are the contextual variables and the services of business incubators are the outputs. The outputs are the services (for example training and management support) that business incubators provide to SMEs.

1.6.3 The evolution of business incubators

Business incubators are programmes implemented to provide support to start-up enterprises that require advice and start-up capital to get their business ideas off the ground. They are designed to help the successful development of entrepreneurial ventures through a number of business support services (Lesáková 2012:85). Hence, business incubation aims to increase the chances of success and sustainability of start-up businesses by producing a supportive environment to SMEs (Skaik 2013:3).

Duff (2000:11) describes business incubators with the aid of five dimensions, namely enterprise development, a consultancy network, entrepreneurial synergy, flexible space and shared services. In line with these dimensions, Hackett and Dilts (2004:57) and von Zedtwitz (2003) identify business incubators as organisations that offer a range of business development services to local community businesses, namely shared office space, a pool of support services, professional business support or advice and network provision.

Bollingtoft and Ulhoi (2005:270) identify the following as resources and services offered by business incubators:

- Incubators are providers of a sheltered environment for young, growing firms; they help place entrepreneurs in an environment with peers who provide social inputs as well as resources and psychological support across and between tenants; incubators offer rentals space, services and equipment at an affordable rate, for example office and communications services, such as typing, copying and answering the phone.
- Business services, such as business and financial planning; facilities and equipment services, including a reception area, conference rooms and computers assist entrepreneurs to obtain legitimacy, as incubation in a well-known incubator enhances the tenant's visibility and credibility and assist incubatees with financing, either by investing in the ventures themselves or by arranging contact with potential investors (Bollingtoft & Ulhoi 2005:270).

1.6.4 Types of business incubators

There are different types of incubators and the categories into which each incubator falls is determined by the objective they pursue, business models and source of competitive advantage (Carayannis & von Zedtwitz 2005:103). SEDA (2017:3) identifies the following types of incubators as the most popular in various regions of the world: Business Incubators (BIs); Technology Incubators/Technology Business Incubators (TBIs); University Based Incubators (UBIs); Virtual Business Incubators (VBIs); Science Parks/Technology Parks (SPs &TPs); Collaborative Technology Incubation Centres (CTIC) and Rapid Incubators (RIs).

1.6.5 Factors inhibiting the performance of business incubators

Different factors affect the performance of business incubators. Among these are the skills and knowledge of incubation teams and managers, selection of appropriate performance measures and the availability of resources. These factors are discussed below.

1.6.5.1 Skills and knowledge

Fukugawa (2013:72) is of the view that incubation managers who have various professional skills are critical to the acquisition of human capital and the performance of the business incubation programme. Incubation managers are supposed to transfer their knowledge and expertise to their incubatees, so that they master entrepreneurial processes, are able to graduate, and complete the business incubation programme successfully. Similarly, Lose and Tengeh (2015:14348) maintain that the inability to manage is the main reason behind the failure of new entrepreneurial ventures. Incubation managers, therefore, play a key role in the successful operation of their programmes.

1.6.5.2 Selecting appropriate measure of performance

Selecting the appropriate measure of performance is also a contributing factor that inhibits performance. Performance measures used by business incubators might not be a true reflection of their actual performance (Fukugawa 2013:73). For example, some incubators measure performance based on the number of incubatees who graduate from their programmes, without considering their survival outside of the incubation programme.

1.6.5.3 Physical resources

Physical resources such as buildings, facilities, and locations in which incubators operate can hinder the performance of the business incubators. Resources necessitate the effective operation and delivery of services of a business incubator.

In addition to the above, the Centre for Strategy and Evaluation Services came up with a number of factors that influence the extent to which incubators can achieve best practices in operation (CSES 2002:29-30). These are summarised below but discussed in more detail in Chapter 2.

- Setting up and operating incubators;

- Key incubator functions, management and promotion; and
- Evaluation of incubator services and impacts.

1.6.6 Key requirements

Tulchin and Shortall (2008:3) identify key requirements for the successful operation of business incubation. These are described below.

- **Sufficient working capital for the incubator:** Start-up funding is easier to find, operating capital is more difficult. Over time, self-sufficiency and independence are critical, especially in rural areas where the local government might not be able to provide support indefinitely.
- **Experienced managers:** Rural managers note inexperience as a major challenge and needing a wide range of skills: business support, operations, and technology/financial literacy.
- **Good location:** Repercussions of poor site selection include high renovation costs, low access to networks/customers and small size with insufficient income to cover overheads.
- **Appropriate tenants:** Incubators must follow their mission to help new entities succeed. Managers should balance needs for stable, lower-risk tenants and support businesses that need it most.
- **Critical client screening:** Incubators should assess potential tenant managers' readiness to grow, be coached, and contribute to a community.
- **Economies of scale:** The National Business Incubation Association (NBIA) notes this challenge for rural incubators, with fewer clients and graduates, and smaller rating budgets. Some rural incubators have developed a 'hub' system that serves satellites in less populous areas or 'incubator-without-walls' programmes with no real estate. Others use university support to relieve resource pressures. Still other incubators reserve space for anchor tenants—mature businesses that do not use incubator services but provide steady rental income (Adkins 2002:np).

1.7 RESEARCH METHODOLOGY

This section discusses the research methodology utilised in this research. However, only summarised discussions are provided in this section, since more indepth discussions of the research methodology are presented in Chapter 4.

1.7.1 Research design

Hayes, Bonner and Douglas (2013:9) define a research design as the entire process of what will materialise during the research, from the time the problem is hypothesised to writing the full study. This study utilised a mixed method approach which included the use of both qualitative and quantitative data collection methods in the same study to gain a more rounded and holistic understanding of the phenomena under investigation (Creswell 2013:3; Hayes *et al.* 2013:9). Caruth (2013:112) states that mixed method research was developed in response to the perceived limitations of both quantitative and qualitative designs. In line with this school of thought, Creswell (2012), Frels and Onwuegbuzie (2013) and Hong and Espelage (2011) conclude that the use of the mixed method presents a more enriched understanding of the research problems and questions than using either qualitative or quantitative method independently. The mixed method approach has been adopted in several studies (Obaji, Senin & Richards 2013:3; Choto *et al.* 2014:93; Cullen *et al.* 2014:82; Costello 2015:7) that focused on business incubators. Hence, a mixed method approach was deemed appropriate for this study. The research design comprises a literature review and an empirical study.

1.7.2 Literature review

In this research project, a review of the literature (secondary data collection) on the research design was conducted in order to support the empirical study. According to Choto (2015:13), secondary data are information that is not collected for the first time. Literature reviewed in the current study comprised relevant academic articles, textbooks, authentic journal articles downloaded from the Internet, business articles, newspaper and magazine articles, and online academic databases.

1.7.3 Empirical study

A mixed method approach was selected and the empirical portion of this study involved a combination of qualitative and quantitative research. Creswell (2013:4) describes qualitative

research as an approach to exploring and understanding the meaning individuals or groups ascribe to a social problem. Polit (2010) states that qualitative research is any research that comprises the collection, analysis, and interpretation of narrative forms of data and results that are not obtained by means of statistical procedures. Conversely, quantitative research is an approach for testing objective theories by examining the relationship between variables (Creswell 2013:4). It includes the collection, analysis, and interpretation of data in numerical form to reach and obtain findings (Hayes *et al.* 2013:8).

1.7.3.1 Population

The target population in this study was composed of all business incubator managers, business coaches, enterprise development officers and programme managers. These individuals were selected because they have extensive knowledge of and insight into the business incubation ecosystem. Bertram and Christiansen (2014:55) assert that a population is the total number of people that can be included in the study. Therefore, for the purpose of this study, the target population was made up of an estimated total of 200 people.

1.7.3.2 Sample frame

According to DiGaetano (2013:296), a sample frame is the listing of the units from which a sample is selected with a view to obtain relevant data. It is important to use a sample frame because of the accuracy of information for the whole group. In this study, the sample frame was drawn from a list of all SEDA business incubators. The list of incubators surveyed was obtained from the SEDA database of incubators.

1.7.3.3 Sampling approach

A sample is any subset of elements of the population scientifically and systematically selected for a study (Flick 2011:253). In research, there are two sets of sampling methods, namely probability and non-probability sampling (Wretman 2010:29). According to Babbie and Maxfield (2014:222), probability sampling permits the study to estimate the expected error and it gives everyone an equal chance of being selected in the study, while non-probability does not use samples with known probabilities and is a convenient way to assemble a sample (Wretman 2010:30-31). Since the study employed the mixed method approach to research, both probability and non-probability sampling methods were adopted.

For the qualitative portion of the study, non-probability-sampling using the purposive technique was utilised. A purposive sample is a technique widely used in qualitative research and involves identifying and selecting individuals that are knowledgeable and experienced with a phenomenon (Blumberg, Cooper & Schindler 2010:257). A purposive sample was appropriate for this study because the respondents are knowledgeable or experienced in the topic and this allowed an opportunity to gain in-depth, detailed insight into the specific investigation.

For the quantitative part of the study, probability sampling using a simple random technique was utilised. Probability sampling refers to the notion of random selection with a controlled procedure that assures that each population component has a chance of selection (Tilana 2015:67). A probability sample was appropriate for this study because it provided an estimation of precision. Thus, participants of the study were given an equal chance of being selected. According to Cooper and Schindler (2011:379), simple random sampling increases the statistical efficiency of samples, provides adequate data for analysing various sections, and enables different research methods and procedures to be used in different sections.

1.7.3.4 Sample size

The study used both qualitative and quantitative methods. For the qualitative part of the study, no sample size was predetermined because in-depth interviews were conducted until the point of saturation. Part of the study utilised a quantitative approach. A total number of N=132 managers, coaches and enterprise development practitioners were selected. Therefore, to achieve the sample size of the study, previous studies were considered and the Raosoft (2009) software was utilised to calculate the sample size. A total of 200 managers, coaches, specialists and enterprise development practitioners were selected. Therefore, to maintain the 95 percent confidence level (5% error margin), the ideal sample size calculated was 132, and the response distribution was 127 (96%), and 121 of them were considered useful for the usability of responses.

1.7.4 Data collection instruments

Since the study utilised a mixed method approach, separate data collection instruments were used in the qualitative and quantitative phases of the study. For the qualitative phase, in-depth

interviews were used (see Annexure F), while for the quantitative phase a survey questionnaire (see Annexure G) was used to collect the data.

1.7.4.1 Interviews

Remenyi (2011:1) defines the in-depth interview as a formal method that involves face-to-face discussion to gather related data. For the purposes of this study, the semi-structured in-depth interview technique was used to collect qualitative data. According to Zikmund, Babin, Carr and Griffin (2010:150), semi-structured in-depth interviews are an effective way to obtain required data in a form of direct communication between two or more people in which an interviewer asks the respondent and the respondent answers questions. In-depth interviewing in research is considered an excellent method of data collection since it allows the researcher to get in-depth information (Klenke 2008:126). Semi-structured interviews were conducted with selected participants. Semi-structured in-depth interviews were used because they offer various advantages, such as enabling the interviewer to develop an interview guide, flexibility, engagement with participants, and the ability to produce meaningful insights about the phenomenon of interest. An interview guide with pre-set questions was used as the source of interview questions. Interviews were conducted on a face-to-face basis and a voice recorder was used to record each discourse. The interview schedule is provided in Annexure F. The questions were adapted from Bergek and Norman (2008:24).

1.7.4.2 Survey questionnaire

Quantitative data were collected through a four section survey questionnaire. The first section of the questionnaire focused on the demographic details of the respondents while Section B focused on the incubator prerequisites. Section C focused on eliciting business incubator performance indicators and Section D directed attention to incubator monitoring and evaluation. A Likert-type format was used to present response options for sections B, C and D.

1.8 MEASURES OF TRUSTWORTHINESS

For the purpose of this study, trustworthiness was ascertained through four measures, namely credibility, transferability, dependability and conformability. Credibility was ascertained through the use of well-established research methods, peer scrutiny of the research project and

the examination of previous research findings. Transferability was ensured by making a detailed description of the contexts in which data was collected, including the number of participants in the study. In conducting the study, a rigorous description and approach to both the methodology and design was applied to make it easier for dependability. Furthermore, the use of a combination of qualitative and quantitative methods to collect data ensured that the study was triangulated, which led to higher conformability.

1.9 VALIDITY AND RELIABILITY

For the quantitative part of the study, reliability and validity were tested. In this study, reliability was ascertained using Cronbach's alpha value, which should be equal to or greater than 0.7 as recommended by van Scheers (2011:5050). In order to ensure the validity of the study a panel of experts in business incubation ecosystems, entrepreneurial space and small business management were requested to assess the questionnaire as a way of checking the face validity. A pilot study was conducted to identify areas of improvement that could have a negative impact on the data collection and analysis. Also, construct validity was ascertained through correlation analyses between the constructs.

1.10 DATA ANALYSIS

For this study two data analysis methods were used. The collected questionnaires were screened before the data were captured on an Excel document. The Excel document was then imported into the Statistical Package for Social Sciences (SPSS) software where it was coded and utilised to analyse quantitative data. The quantitative data were presented in the form of graphs, tables and pie charts. Initially, descriptive statistics (mean and standard deviation, frequencies, percentages) were used to analyse the data. Thereafter, thematic analyses was used to analyse qualitative data. The qualitative data were identified in themes, patterns, similar phrases; sub-groups and sequences; as well as commonalities and differences.

1.11 ETHICAL CONSIDERATIONS

The study was conducted in an ethically responsible manner. The participants were given formal consent letters outlining the content of the research. They were requested to append their signatures, indicating their consent to participate, and the participants were free to withdraw from the study at any given time. The study only commenced after permission was

granted by business incubator specialists. Furthermore, the following ethical considerations were adhered to:

- The right to confidentiality and anonymity: participating individuals remained anonymous;
- The right to non-participation: participants were not forced to participate in this study;
- Protection from discomfort and harm: All the respondents were protected; Informed consent: all the participants were fully informed about the research and procedure.
- Ensure permission is obtained: The researcher obtained formal written approval from the Vaal University of Technology (VUT) Ethics committee to conduct this study. Furthermore, letters of permission were obtained from the three participating business incubators to conduct the research within their organisations (see Annexures B, C and D).

1.12 CHAPTER CLASSIFICATION

Chapter 1: Introduction

Chapter 1 presents an overview of the study. The chapter also provides a broad overview of the research problem, research question, research sub-questions, research objectives and the research design and methodology, significance of the study and the definition of key terms.

Chapter 2: Evolution of business incubators

This chapter contains a literature review of the key concepts pertaining to this research. Literature was reviewed under the following main headings: definition and evolution of business incubators, incubation theoretical framework and key requirements for effective business incubators.

Chapter 3: Challenges faced by business incubators

Chapter 3 reviews literature on the factors inhibiting performance of business incubators, challenges of business incubators and characteristics contributing to successful start-up of a business incubator.

Chapter 4: Research methodology and design

In this chapter, the mixed method approach to obtain data is discussed. The research problem is investigated based on this method to fulfil the research question and research sub-questions.

Chapter 5: Qualitative data analysis, findings and interpretation

Chapter 5 presents and discusses the results of the qualitative data that were collected and analysed. The results are presented in themes and sub-themes.

Chapter 6: Quantitative data analysis, findings and interpretation

Chapter 6 presents and discusses the results of the quantitative data that were collected and analysed. This chapter contains a detailed data analysis and interpretation, based on the findings of the study in relation to the key research objective. The evidence is mapped to the literature to provide a clear understanding of the research problem and evaluation is analysed based on existing and new literature. The information gathered is presented in tables, graphs and pie charts.

Chapter 7: Business framework proposal

This chapter proposes a business framework for the effective start-up of business incubators in South Africa.

Chapter 8: Conclusions and recommendations

This chapter concludes the study. The study is summarised and recommendations are suggested for future research.

CHAPTER 2

BUSINESS INCUBATOR THEORY

2.1 INTRODUCTION

In Chapter 1, both the empirical and the theoretical objectives of this study were stated. This chapter is a dissection of incubation literature in pursuit of the theoretical objectives that were set out earlier. It must be re-stated that the outcome of this study is to develop a framework for the creation of business incubators in South Africa. Accordingly, one can premise the study on certain key themes, derived from the literature and examined with a view to appraising, approving, or disapproving existing models.

At the end of the literature review, a theoretical impression of the framework emerges. This theoretical framework forms the foundation for Chapter 3, which scrutinises the theoretical framework and tests practical appropriateness. The chapter has five main sections, namely definitions, evolution of business incubation models, types of incubators, theoretical framework for business incubation and finally, key requirements for business incubation.

2.2 DEFINITIONS OF BUSINESS INCUBATORS

The etymological definition of the word incubation is described in Mutambi, Byaruhanga, Trojer and Buhwezi's (2010:194) study as the artificial nurturing of chicken eggs in order to hatch them faster in a sheltered environment. This definition captures the essence of business incubation. Table 2.1 lists some recent definitions of business incubation. These definitions are functionally descriptive and so provide a clear picture of the basic functions of business incubators.

Table 2.1: Definitions of business incubation

Hughes, Ireland and Morgan (2007:155)	A business incubator is a facility that houses young, small firms to help them develop quickly into competitive businesses.
Eshun (2009:156)	A business incubator is an environment formally designed to stimulate the growth and development of new and early stage firms by improving their opportunities for the acquisition of resources aimed at facilitating the development and commercialisation of new products, new technologies and new business models. Business incubation is also a social and managerial process aimed at supporting the development and commercialisation of new products, new technologies and new business models.
UKBI (2009:2)	Business incubation is a unique and highly flexible combination of business development processes, infrastructure and people designed to nurture new and small businesses by supporting them through the early stages of development and change.
INBIA (2010)	A business incubator is a business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services. These services are usually developed or orchestrated by incubator management and offered both in the business incubator and through its network of contacts. A business incubator's main goal is to produce successful firms that will leave the programme financially viable and freestanding. These incubator graduates have the potential to create jobs, revitalise neighbourhoods, commercialise new technologies, and strengthen local and national economies.
Entrepreneur (2014)	A business incubator is an organisation designed to accelerate the growth and success of entrepreneurial companies through an array of business support resources and services that could include physical space, capital, coaching, common services, and networking connections.

Source: Theodorakopoulos, Kakabadse and McGowan (2014:4)

As evidenced from definitions by authors in Table 2.1 above, there is no standard definition for a business incubator. This is mainly because incubators vary by type and by purpose, and cater to different regional specifications and needs. For instance, INBIA (2010) points out that incubators are aimed at empowering or revitalising a community and have different impacts on local economies in comparison to those defined by Entrepreneur (2014), which are possibly

profit-based technology incubators. The diversity of business incubation models makes the classification of an incubator according to a standard industry definition or model difficult, and this in turn, makes measuring the economic outcome of incubators challenging (RESI Research & Consulting 2001:4).

Authors seem to agree that incubation's main goal is to create successful business through varied resource provision (UKBI 2009; Entrepreneur 2014; Hughes *et al.* 2007:154; Eshun 2009:157). INBIA (2010) indicates that the importance of the role that business incubators play is evident when one considers the fact that an estimated three out of every four new start-up businesses fail. INBIA (2014) adds that businesses that go through incubators historically have a nearly 90 percent survival rate.

Hughes *et al.* (2007:155) state that incubation quickens the pace at which a business develops and achieves success. This is attributed to the fact that incubators create a supportive environment that provides key services under one roof and enables overhead costs to be reduced by sharing facilities. In this way, business incubators can significantly improve the survival and growth prospects of start-ups and small firms. According to CSES (2002), the business incubation process adds value to a technology by accelerating the start-up of new businesses, helps to establish and develop an enterprise and maximise their growth potential.

Business incubation, its benefits, effectiveness and success, as well as the economic and social contributions of business incubation, has received considerable attention from researchers and policy-makers (Bergek & Norman 2008:20; Lose & Tenge 2016:370). Eshun (2009:156) in Table 2.1 gives a divergent meaning by pointing out that incubators provide an environment that stimulates growth by enabling resource acquisition and other opportunities that are not necessarily provisions of physical workspaces and facilities. Eshun (2009:159) also states that business incubation is a social and managerial process aimed at supporting the development and commercialisation of new products, new technologies and new business models.

It is possible, from the preceding opinions, to assert that business incubators can be termed as social enterprises as well. This is against the backdrop of the definition of both Eshun (2009:160) and part of the INBIA (2010) one, which candidly states that incubator graduates have the potential to create jobs, revitalise neighbourhoods, commercialise new technologies, and strengthen local and national economies. In order for incubation to work, incubators

themselves, like companies, must generate most of their income through some form of trade. Within themselves, they create social change through economic empowerment to both incubatees and their own management teams (Social Enterprise UK 2012:2).

Table 2.1 lists a range of basic and complex definitions of business incubators. Authors seem to agree that business incubation should lead to success of one sort or another. This is quantified in profitability, market growth, social impacts through increased employment rates and community development (Hughes *et al.* 2007:164; INBIA 2010). BBIC (2014) extends this collection of meanings by stating that business incubation is a business support process that is designed to accelerate the successful development of entrepreneurial small businesses through an array of targeted resources and services which are offered both in the incubator and through its network of contacts. The main goal of this process is to produce successful enterprises that leave the business incubator financially viable and freestanding. A critical component of the definition of an incubator is the provision of management guidance, technical assistance and consulting tailored to small and emerging enterprises.

Other academics, such as Lalkaka (2001:5), describe the traditional business incubator as a microenvironment with a small management team that provides a shared physical workspace to small businesses in which office facilities, counselling, information, training and access to finance and professional services, are offered in one affordable package. This aligns with the definition of INBIA (2010). In so doing, business incubators help entrepreneurs develop their ideas from inception through to commercialisation, reduce the failure rate of early stage companies, accelerate the growth of companies and in the process, help to create jobs and contribute to economic development (CSES 2002).

Business incubation is a vital component for new venture success as well as extending the life span of business ideas. Entrepreneur (2014) indicates how incubators are designed to accelerate the growth and success of entrepreneurial ventures through a varied set of business services. Consequently, one can argue that incubation, in different forms and models, is essential for local, national, regional and global growth. This assertion is conceptualised against the backdrop of the idea that entrepreneurship is a backbone of economic growth. Growth of enterprise and companies is a catapult for increased exports, imports, gross domestic output, as well as socio-economic wellness.

According to Table 2.1, incubators provide resources in the form of working space, financial aid, networking and partnerships. Incubators, by definition, provide the resources necessary to make businesses a success. From a general perspective, the primary function of business incubators is to help new established firms to survive and assist in the development and growth of existing companies (Lose, Nxopo, Maziriri & Madinga 2016:130). Incubation has customarily been associated with ordinary and homogenous provisions such as physical space, business counselling, office facilities and business information. This is the basis on which the system was created but modifications are required to suit the South African landscape.

South African incubators, by definition, would then need to cater for the complexities of the different local cultures, geographical locations, and small business types. The given definitions strengthen the opinion that incubation cannot have a standard definition in that it exists within different contexts, governed as countries with differing national policies. The design of business incubators reflects differences in local cultures, traditions, attitudes to business and the variations in stages of technological, social, political and economic development. From the review of the various definitions discussed, it is possible to conclude that a business incubator describes a wide range of organisations that provide an instructive and supportive environment to start-up businesses.

In summary, incubation is an essential tool for entrepreneurs to grow and develop viable start-ups. It is possible that given an environment where incubation itself is fully endorsed and applied, economies can thrive. According to Marks (2015:n.p.), entrepreneurship is not yet recognised for the impact, growth, and possibilities it can offer economies, or for the impact it can have on unemployment and other social issues. Herrington and Kew (2016) highlight the sentiment that Africa's main social problems remain its extremely high-income inequality and employment challenges, weak job-creating capacity that has led to chronically high unemployment and even more significantly, under employment has been a critical contributory factor in the country's persistent poverty and inequality. According to Herrington and Kew (2016), it has become important and urgent for South Africa's policy-makers to make a strong commitment to growing the economy.

2.3 EVOLUTION OF BUSINESS INCUBATORS

2.3.1 Overview

This section traces the development and evolution of business incubators and their models of operation from classical prototypes to their modern state. South Africa only came on board in 1995 when the first form of a business incubator was developed by the Small Business Development Corporation (SBDC) to facilitate small business development in townships and contribute to SME's sector growth (Buys & Mbewana 2007:357). In the townships, these forms of business incubators were known as 'hives of industry', with the necessary infrastructure like telephones, electricity, office space and warehousing space (Buys & Mbewana 2007:357). These early forms of incubators mainly focused on new technologies, light manufacturing industries and services.

Current South African small businesses and start-ups are influenced by a variety of evolutionary factors, which include politics and government regulations, changes in economy, social lifestyle and technology (Ndabeni 2008:263). Masutha and Rogerson (2014b:153) mention that geographical location is one environmental factor that seems to be a drawback to incubation in South Africa because over half of the existing business incubators are located in South Africa's leading metropolitan centres, with Johannesburg having the greatest individual number of incubators. It is further observed that all the private sector business incubators are situated in metropolitan areas and that the private sector-driven incubators are absent from secondary cities or small towns.

The argument that incubation models have evolved over time is consistent with Pauwels, Clarysse, Wright and van Hove's (2016:2) view. The basis of this postulation is the premise that a generational sequence of incubation models exist. Bruneel, Ratinho, Clarysse and Groen (2012:110) emphasise that incubation models adapt their value proportionate to the evolving needs of participating ventures. This argument clearly recognises the significant role of environmental variables in the development and evolution of incubation models. South Africa is not spared in terms of a wide variety of variables, as well as the level of complexity they present to both incubators and incubatees.

In a conceptual paper on what matters in business incubation, Theodorakopoulos *et al.* (2014:6) put forward a representation of the generational evolution of business incubators as shown in Figure 2.1.

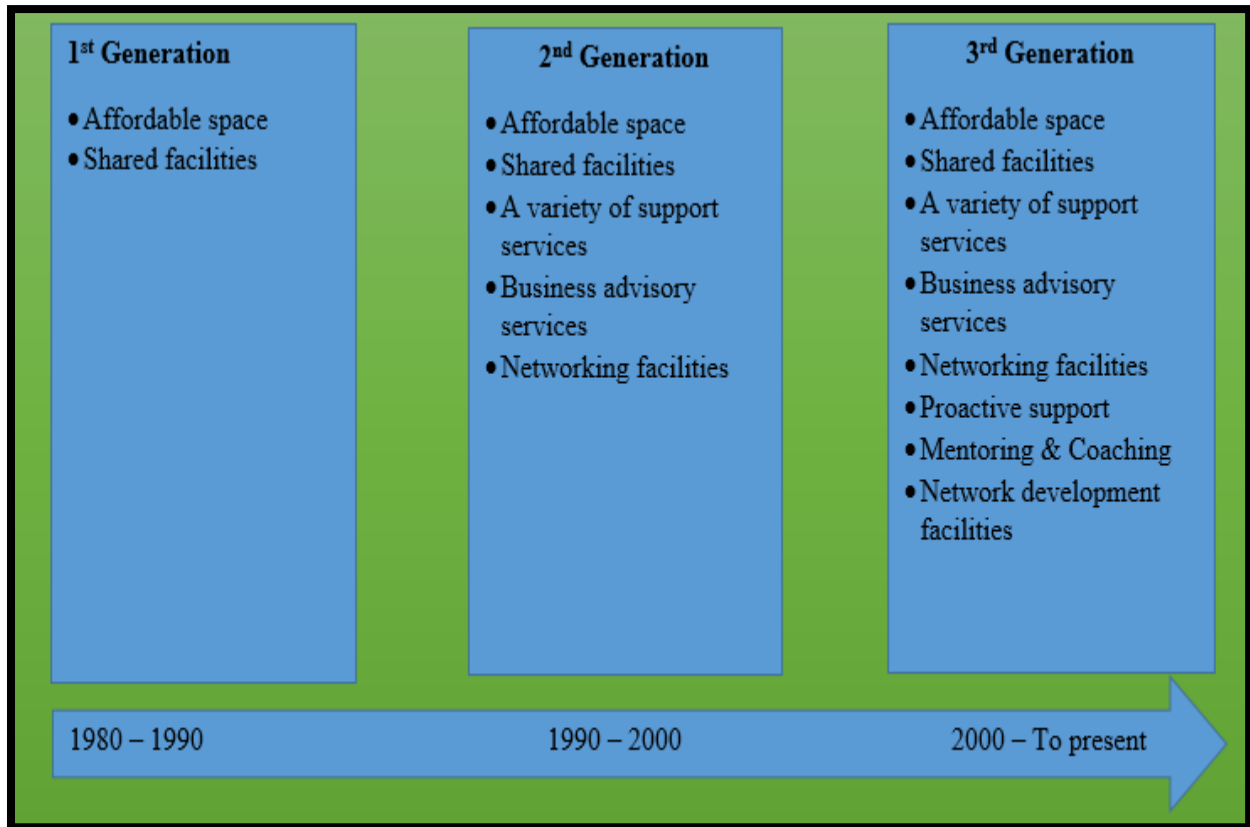


Figure 2.1: The evolution of business incubation models

Source: Theodorakopoulos *et al.* (2014:6)

Incubation literature supports the evolutionary development of incubator models as shown in Figure 2.1. Therefore, Figure 2.1 is essential in indicating the present day situation relative to the phenomenon. Figure 2.1 can, however, be criticised because it does not capture the pre-1980 period. A comprehensive discussion of the evolution of business incubators would surely take note of the pre-1980 period, considering the Batavia Industrial Centre in New York of 1959, which is believed to be the first business incubator. The sections below present a discussion of the generational development of the incubator models indicated in Figure 2.1.

Allahar, Brathwaite, Roberts and Hamid (2016:625) also offer a generation-based model for the evolution of business incubators. This model differs from Theodorakopoulos *et al.* (2014:6) in that it has four generations and uses the idea of how the incubator provides support to differentiate between different types of generations that have evolved over time. This model is depicted in Figure 2.2.

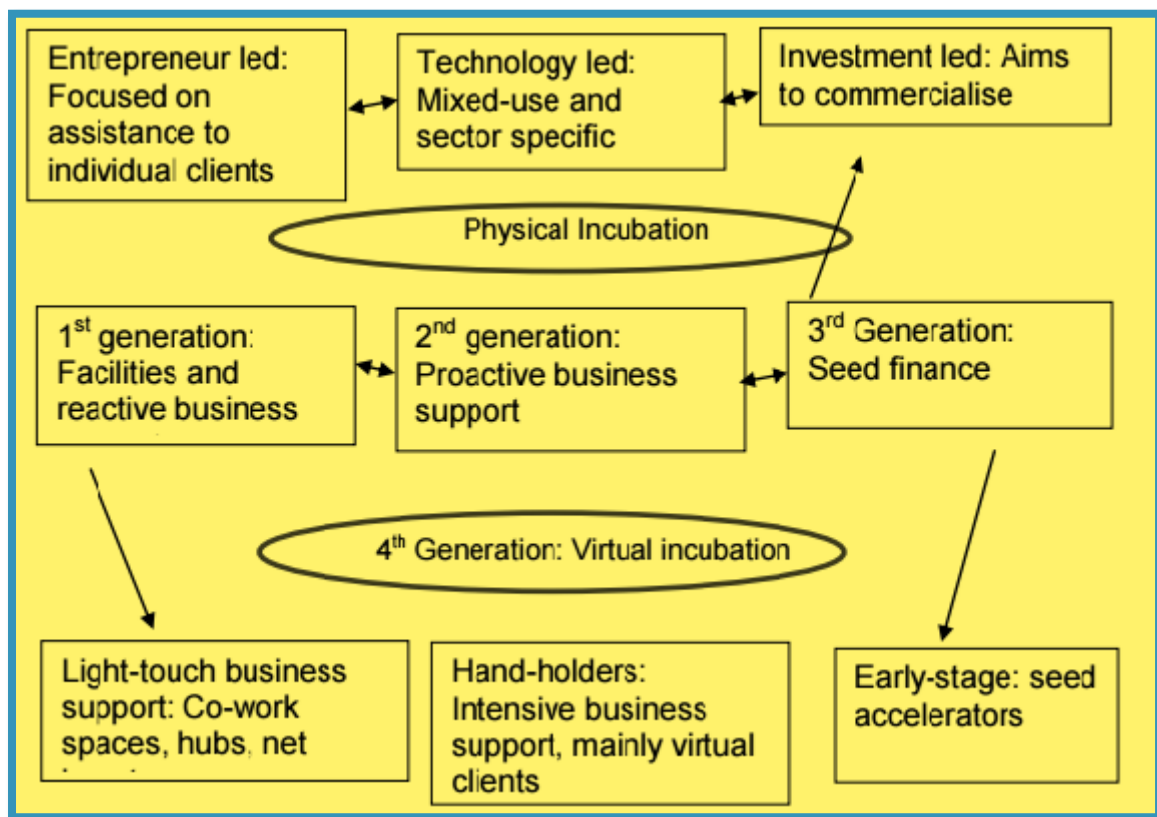


Figure 2.2: Business incubator models

Source: InfoDev/The World Bank (2013:n.p.)

2.3.2 First generation incubators (1980–1990)

Pauwels *et al.* (2016:3) support that, indeed, the first generation of incubators focused on providing physical space and financial resources. Allahar *et al.* (2016:625) agree with this perspective and describe the first generation incubators as providers of facilities. The kind of support provided is seen as reactive. Such a model can be said to be simplistic and typical of a formative stage of a phenomenon. Through supplying physical needs of entrepreneurs only, the incubators met simple needs of a less complex business environment at a time when entrepreneurship was less pronounced as a vehicle for economic development.

Furthermore, it is believed that the first generation models were based on offering entrepreneurs help only when it was critically needed. This is because first generation incubators, as indicated by the model, offered no more than physical space, which is in stark comparison to current incubator models. The basic function of a business incubator in this model was to provide office space for entrepreneurs to initiate their business activities (Saffar 2008:n.p.). Services offered at first generation incubators were fundamental and aimed to accommodate the basic needs of new businesses (Lalkaka 2001:4). Aerts, Matthyssens and Vandenbempt (2007:260) add that besides office space, incubatees were also provided with shared facilities such as meeting rooms, access to telephone and fax machines, as well as management support.

It is possible to argue that this trend was befitting of the period, as creativity and innovation were not trending as in current times. It is not arguable that the youth demographic and general population of the time was much smaller and possibly absorbed in formal labour with a stable job/labour market (Lalkaka 2001:4). Business incubators evolved to be perceived as vital components for economic development, perhaps because economies have shifted in their well-being in contrast to the decade 1980 to 1990.

2.3.3 Second generation incubators (1990–2000)

Theodorakopoulos *et al.* (2014:6) hold the view that second generation incubators, in addition to providing affordable space and facilities, offer a variety of other support services, business advisory services and networking. Allahar *et al.* (2016:625) describe the support provided by the incubators as proactive, in contrast to the reactive models of the preceding generation. This means that business incubators of this period interpreted possible future challenges for the entrepreneur and provided support in advance. Entrepreneurs had possibly become more complex and had disruptive innovations that required specialised services.

Clearly, this period shows an expansion in terms of the range of services and products offered. The increase in services and products offered can be attributed to environmental complexity, mere innovation or simply natural evolution of entrepreneurship. Second-generation incubators were still limited in services provided compared to the generation they preceded. In spite of this, it is notable that incubators have proven to be an economic development tool for entrepreneurs, hence their market demand (van Huijgevoort,

2012:1). Since 1980, incubated companies have created over 250 000 jobs, thereby increasing the tax base, occupying additional commercial real estate space, contributing to local business infrastructures and creating even more jobs in other industry sectors (Wiggins & Gibson 2003:64).

The first generation incubators initially provided sufficient support for the incubatees who only sought office space and basic office facilities. However, the need for consultancy and business advice became significant, which altered the model of the first generation incubators to second-generation incubators. The characteristics of second-generation incubators include the typical office space rental, shared facilities, proactive support and business advisory services (Lalkaka, 2001:5). This type of incubator model predominantly existed in Malaysia between 1995 and 1998, an era when the information and communication technology (ICT) industry was booming, although many of the incubators today still epitomise similar attributes.

2.3.4 Third generation incubators (2000 to 2010)

Although Allahar *et al.* (2016:625) describe third generation incubators as seed financiers, Theodorakopoulos *et al.* (2014:6) include in their model several other services offered by the incubator, including network development, business acceleration, mentoring and coaching, proactive support, networking, business advisory services, a variety of support services, shared facilities and affordable space.

Third generation incubators operate in highly specialised and complex environments with a wider array of innovations and ideas. The rise in technology and entrepreneurs in both the private and public sectors has heightened the demand for social services. Incubators have had to remodel from basic resource provision to specialised and customised services. Third generation incubators have experienced government policy co-ordination and frameworks created to foster growth of enterprise.

The growth and great expansion of enterprise has also caused a shift in thinking in society in general. Entrepreneurship has become central to higher education and training, government research, industrial research and development and academic research. Individuals and corporates alike are creating different custom models for entrepreneurial support for their respective industries, hence the expansion of the sector. Third generation incubation is

described by Peters, Rice and Sundararajan (2004:83) as having a focus on the importance of business support beyond just facilities and administrative services.

2.3.5 Fourth generation incubators (2010 to present)

While Figure 2.1 does not necessarily illustrate fourth generation incubators, in contrast to Figure 2.2, scholars such as Khalid, Gilbert and Huq (2014:396) indicate the most recent development of business incubation as being the move to fourth generation incubators. These incubators departed from the traditional facilities of an incubator and provided more than merely business support services. Characteristics of fourth generation incubators as asserted by Saffar (2008:n.p.) include being accredited International Business Incubators (IBIs) and co-incubation. An example of this would be the International Business Incubator (IBI) in Silicon Valley that offers services to SMEs from other countries to establish their businesses in the US market. Similarly, IBIs are also present in San Jose, California and the Ben Craig Centre at the University of North Carolina (Lalkaka 2001:14). Services that fourth generation-type incubators offer, include: market assessment, market strategy consulting, partner and sales development, and establishment of an office in the respective countries. A contrasting view by Scaramuzzi (2002:8) associates fourth generation incubators with higher levels of risk and mortality rates.

Fourth generation incubators are described in some literature as ‘virtual,’ implying that they can offer advisory support using Internet communication technology and other modern communication technological services. Virtual incubators utilise computer technology to deliver services, or a hybrid approach that uses virtual and physical contact methods by incorporating elements of all previous generations of incubators. The current state of world economies, in particular regional integrations and globalisation, requires the remodelling of incubation itself, hence virtual/fourth generation incubators.

2.4 TYPES OF BUSINESS INCUBATORS

Several archetypes of business incubators can be identified in the literature. Scholars use different criteria to categorise and group incubators. Allahar *et al.* (2016:625) report that to date there is no unique business incubation model. What is observable, is diversity in terms of types of incubators, their modes of operation, and the objectives they pursue. Most incubators tend to be either physical incubators (PI) providing work space for clients, virtual incubators

(VI) which utilise computer technology to deliver services, or a hybrid approach incorporating elements of the two main types (Allahar *et al.* 2016:625). Schiopu, Vasile and Tuclea (2015:476) recognise a profit-based classification by mentioning that some incubators are ‘for-profit’ while others are ‘not-for-profit’.

According to EU (2010), incubators cover a wide range, which includes business advice, coaching and workstations to assist with the presentation of start-up business plans. Academic incubators, based at universities and research centres, support business ideas generated by students or the research output of R&D activities. Furthermore, the resources include a full range of support services from pre- to post-incubation, irrespective of the business sector. Sector-specific incubators focus on areas such as environment, agribusiness, ICT and tourism, all of which reflect the context of the location and may require special infrastructure to meet client needs. Also available are enterprise hotels that offer physical incubation services, especially office space, where these present an access problem, particularly in urban areas.

2.5 THEORETICAL FRAMEWORKS FOR BUSINESS INCUBATION

2.5.1 Introduction

The technicalities involved in starting and running an incubation business can be identified from the literature, but what is lacking is a simplified framework for the operation that depicts incubation business essentials in a condensed form (Al-Mubarakhi & Busler 2010:19; Lose *et al.* 2016:26). This study seeks to deduce a framework for business incubators from the lens of the general systems theory. The founding argument is that business incubators operate in a form that can be generalised within the general systems theory. Academics view business incubators as systems that are a combination of sponsoring agencies, entrepreneurs, business incubators from concentrated industries, and support systems. The sponsors to these vary from private firms, universities, governmental agencies and non-profit organisations (Verma 2004:44; Allahar *et al.* 2016:631). The key support system includes secretarial and administrative support, personnel and provision of facilities, services and access to business expertise, coaching and mentorship. While the focus of incubators varies, the common objective is similar, such as economic development, start-up success, profitability, technology diversification, job creation and production of successful products and services. This description is supported by Figure 2.3.

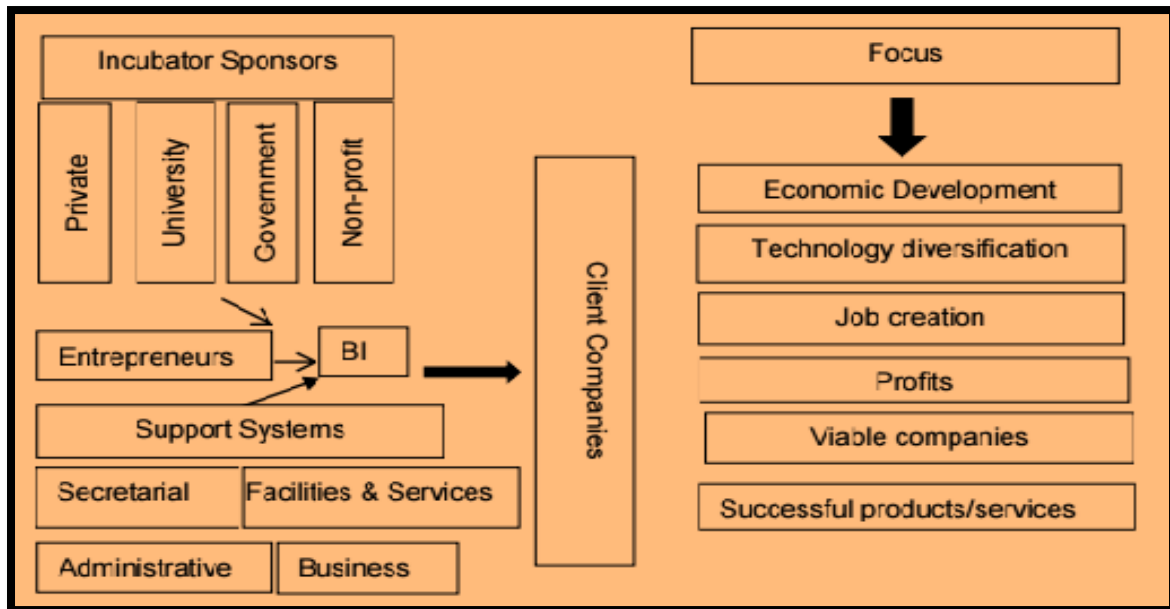


Figure 2.3: The business incubation complex

Source: Verma (2004:18)

The above model clearly indicates the various stakeholders and illustrates how they are linked in the incubation complex. It cannot, however, be used as a framework of business incubation.

2.5.2 The general systems perspective of business incubation

The use of the general systems theory as a lens to study business management concepts is well appreciated in the literature. Hunter (2012:24) explains that the systems approach to management has promoted the development of several management techniques such as total quality management (TQM), learning organisation, management by objectives (MBO) and business scorecards. Therefore, this study is based on the assumption that the general systems approach is suitable for studying business incubation theory. The study opines that starting a business incubation business requires certain resources followed by processes to combine the resources and then the provision of outputs to users of incubation services. Such a description resembles the ‘inputs, processes and outputs’ model of the general systems theory (Hunter 2012:24). A representation of the general systems theory is depicted in Figure 2.4 and as seen in this figure, a system can be deconstructed into its partial components (Severance 2001:1). This partial decomposition results in subsystems, which are characterised by cause-effect relationships (Iwu, Kapondoro, Twum-Darko & Lose 2016:8). In a mathematical interpretation of systems thinking, Severance (2001:1) claims that all the environmental influences on a

system can be interpreted as inputs in a vector of m real variables of the form $x(t) = [x_1(t), \dots, x_m(t)]$ and all system effects can be summarised by n real variables that vary with time and $z(t) = [z_1(t), \dots, z_n(t)]$ where $z(t)$ is the output and the components $z_1(t)$ are the processes. This means for suitable functions f and g , $z(t) = [f(x(t), y(t))] \equiv g[x(t)]$. This interpretation implies business incubation outcomes exist as functional variables that form a subsystem, which can be assumed to depict the general framework for business incubators (Iwu, Kapondoro, Twum-Darko & Lose 2016:8).

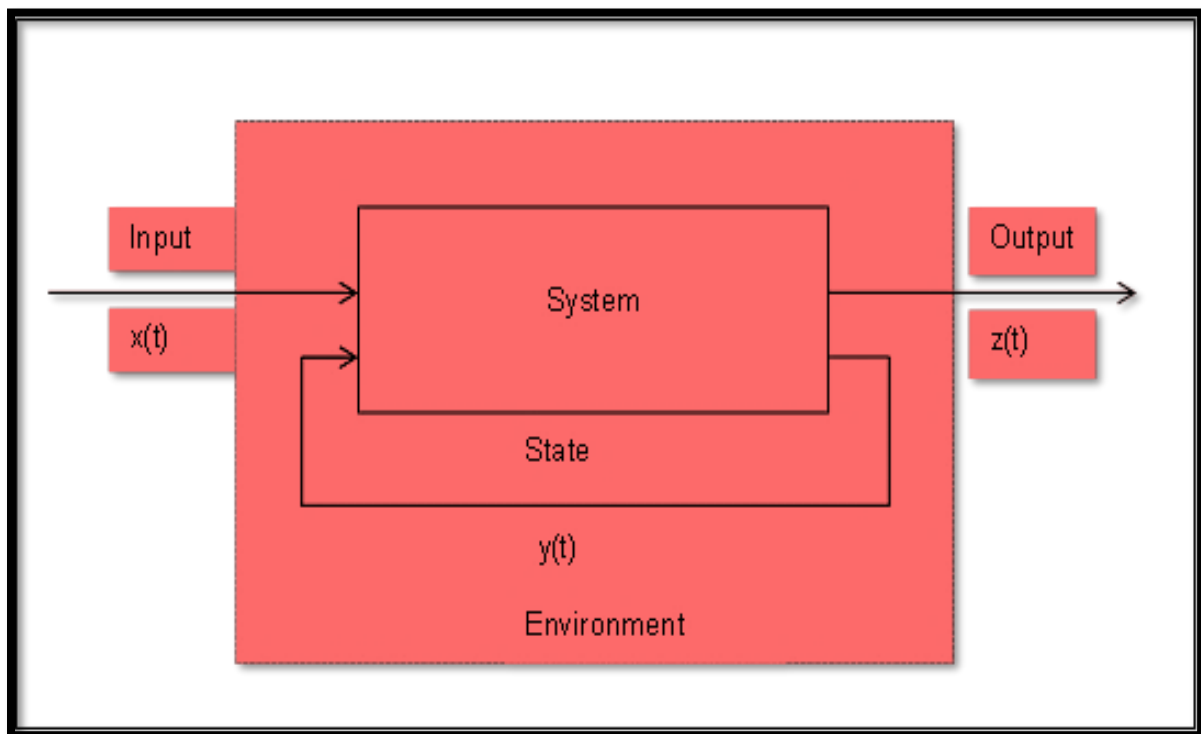


Figure 2.4: The general systems theory

Source: Severance (2001:1)

2.5.3 Business pre-start essentials

Carayannis and von Zedtwitz (2005:104) identified the following five key pre-start essentials for business incubators.

i) Access to physical resources

Incubators offer office space, furniture, sports facilities, a computer network, 24-hour security and other amenities related to physical infrastructure and real estate. Poorly performing

incubators have focused too much on their role as landlords, neglecting other services described further below. In this field, incubators compete with technology and science parks and, sometimes, real estate companies.

ii) Office support

In addition to infrastructure, incubators also maintain efficient operation of basic office support such as secretarial and reception services, mail handling, fax and copying services, computer network support, and bookkeeping. These services are hardly complex or technologically advanced, but they ensure that basic organisational resources are in place and save time and effort for entrepreneurs who want to get going quickly. Although these services may be taken for granted when they are working well, the lack of, for example, proper bookkeeping or timely IT support can be a major hindrance.

iii) Access to financial resources

Incubators also offer access to venture capital, usually a combination of private funds and outside capital invested by business angels, venture capitalists or local institutions and companies. Venture capital criteria apply for due diligence and in the selection of start-ups. In general, incubators target very early stage, sometimes pre-seed money, start-ups and try to bring them to the next financing round. Natural competitors are business angels as well as early-stage venture capitalist and investment firms.

iv) Entrepreneurial start-up support

Entrepreneurs may be strong in technological skills and perhaps business vision, but usually lack organisational, management and legal skills. Incubators guide entrepreneurs through the necessary steps that a newly founded company must take, sometimes even helping define the business plan, but more often providing professional services such as accounting, legal advice for incorporation and taxation issues, and formulating ownership and employee option plan structures. Different strategic objectives and competitive scopes define four archetypes of incubation, namely coaching, support, helping entrepreneurs develop and apply leadership and management skills (Carayannis & von Zedtwitz 2005:95–110). Many incubator managers,

however, have not been able to provide real value added in start-up coaching, competing in this space with law, accountancy and consulting firms.

v) Access to networks

Good incubators are able to identify and leverage key individuals for the success of their start-ups. Entrepreneurs usually do not have the network that an incubator has taken years to create. Incubators can bring in individuals crucially important to a start-up's business: a potential customer, a leading-edge programmer, a new Chief Executive Officer (CEO), an interested venture capitalist. The central tool is the incubator director's Rolodex, as well as his or her intuition for making the right calls at the right time. Access to these networks is sometimes also provided by human resource firms, consulting companies, business angels or networking organisations (Carayannis & von Zedtwitz 2005:104).

2.5.4 Business environmental influences

The socio-cultural, political (legal regulations and policy frameworks), technological, economic and geographical environment of a business is integral to its success or failure. Business incubators are greatly affected by changes in these variables. Incubators are businesses that require necessary steps to mitigate, avoid or otherwise cope with the effects of environmental changes. South Africa, in particular, has incubators that depend largely on government or public funding (Grimaldi & Grandi 2005:115). This is risky, as most public-funded initiatives tend to create a high dependency syndrome, thus increasing the rate of failure or otherwise poor performance.

According to Adkins (2002:n.p.), a business incubator must be grounded in the real world of business. That is, to be successful an incubator must be run like a business that adjusts and reacts to changing market conditions. A key factor to achieving this is employing incubator management from the business sector. Additionally, another important factor to the success of the incubator programme is that it must have deep-rooted support from the local business community. Ramluckan (2010:16) states that incubators need to stimulate local economic development, contribute to the diversification of local economic activity, create markets, meet the needs of the community, make the region more competitive and stimulate networking and interaction among enterprises.

In direct response to the prevailing business environment, incubators need to pay attention to the development of management capabilities that are sensitive to the environment, which is a critical component in achieving any desired business (incubator) outcomes. Lalkaka (2001:26) and Lalkaka and Shaffer (1999:13) propose a framework for evaluating the performance of incubators. As with the Centre for Strategic and Evaluation Studies, they agree that the performance of incubator programmes should be validated against the medium term to long-term outcomes and benefits that accrue to the various stakeholders. This study validates this opinion in that any business framework should be sensitive and reactive to environmental trends in order to register any meaningful success.

2.5.5 Business start-up processes

Business start-up processes are the routes or methods used to build up a venture in its birth phase. The future growth of a modern small-business sector requires renewed efforts to improve production methods, to raise quality and to shift to value-added products and services through modern design and technological innovations (Ndedi 2009:467). It also requires a special focus on support systems that provide integrated services for production, management, marketing and finance (ILO 2008). The processes of setting up incubators should therefore meet the standards or criteria set in frameworks within the South African context.

The general systems theory comprises the inputs, processes and outputs to achieve success in the business. Business incubation, as a tool for promoting innovation and economic development (Bergek & Norman 2008:2), is designed to be capable of adding value to incubated companies with the intention of increasing the survival rates of such incubated companies. This arguably means that processes within the incubator have to prove capable of churning out both successful incubatees and achieve the highest possible performance rates in the incubator itself.

2.5.6 Business start-up outputs

Hackett and Dilts (2004:73) explain that the attempt to measure the impact of business incubation is as important as it is challenging. The marginal product of an input is the amount of output that is gained by using one additional unit of that input (Boundless.com 2016). Outputs can be described as the result or product of the processes undertaken in the initial

stages mentioned in Section 2.5.4. These are key in measuring performance and quantifying the key result areas of an incubation process.

Some of the outputs of incubation should be turning ideas into tangible goods or services, increasing sales and ultimately profits of a venture, and a wider partnership and customer base through networking. Further to this, Voisey, Gornall, Jones and Thomas (2006:465) propose that business incubators create other outputs in addition to profit and cost improvements (hard measures), which they classify as soft measures. Soft measures, presumably, are benefits such as increased business knowledge and skills, business awareness and client networking. These are subjective measures, which are difficult to ascertain and assess, but nonetheless exist.

2.6 CONCLUSION

In pursuit of the theoretical objectives, the existing literature on business incubators was reviewed and categorised into five sections. The first section gave an overview of the definitions, evolution of business incubation models, and types of incubators. In the second section, the general systems theory was chosen as a lens to deduce a framework for business incubators. The founding argument is that business incubators operate in a form that can be generalised within the general systems theory. In the third section, the key pre-start up essentials for business incubators were examined. These included access to physical resources, office support, access to financial resources, entrepreneurial start-up support, and access to networks. Furthermore, the socio-cultural, political, technological, economic and geographical environments of a business are integral to its success or failure.

In the fourth section, the future growth of a modern small-business sector was examined. These include efforts to improve production methods, to raise quality, and to shift to value-added products and services through modern design and technological innovations. It also requires a special focus on support systems that provide integrated services for production, management, marketing and finance. The fifth section investigated the key in measuring the performance of an incubator. Output was utilised as the result or product of the processes undertaken in the initial stages. Further to this, business incubators create other outputs in addition to profit and cost improvements, which they classify as soft measures.

CHAPTER 3

CHALLENGES FACED BY BUSINESS INCUBATORS

3.1 INTRODUCTION

Chapter 2 reviewed available literature related to the definition and evolution of business incubators, and the incubation theoretical framework. This chapter reviews existing literature and seeks to determine resources critical to the effective start-up of business incubators in South Africa, and investigates entrepreneurial characteristics that contribute to the successful start-up of business incubators in South Africa. This chapter is divided into three sections. The first section examines the factors that inhibit the performance of business incubators; the second section explores the challenges faced by entrepreneurs before joining the incubator programme; and the third section examines the characteristics that contribute to the successful start-up of a business incubator.

3.2 FACTORS INHIBITING PERFORMANCE OF BUSINESS INCUBATORS

3.2.1 Access to qualified staff

According to Cullen *et al.* (2014:83), access to qualified staff to manage the functioning of incubators, as well as managing the growth of incubated entrepreneur-owned enterprises, are critical factors in the success or failure of business incubators. Without experienced and qualified staff in incubator programmes, sustainable and quality services will be limited to entrepreneurs. Despite South Africa's numerous efforts to assist SMMEs through incubator programmes, Trade and Industry Minister, Rob Davies, has acknowledged that five out of every seven small businesses in South Africa fail within one year and lack of skilled staff was identified as one of the chief impediments to growth (SACBC 2014:2). Furthermore, Gabcanova (2011:6) argues that staff are the greatest asset of an organisation. However, development and growth is one of the possible challenges facing human resources management. In line with the above argument, it is vital for incubators to recruit staff that are knowledgeable in management, technical and consulting services to support entrepreneurs in growing successful enterprises.

3.2.2 Lack of entrepreneurial skills

Despite considerable evidence that entrepreneurial skills are critical for the success of every business incubator, Lalkaka (2002:173) argues that a significant portion of these business incubators are unable to deliver services to entrepreneurs, and this can be partially attributed to the fact that the majority of staff do not come from an entrepreneurial background and have little business experience. One may also draw on InfoDev's (2010a:29) argument that most business incubators lack the skilled staff required to adapt to the need of entrepreneurs and more often than not they provide educational programmes based on what they can afford, not necessarily what the entrepreneurs need. Grimaldi and Grandi (2005:117) also point out that the management of most profit-oriented business incubators provide capital, knowledge, managerial skills, and day-to-day support to new ventures; however, the management team of most non-profit oriented incubators usually act as intermediaries, and are not directly involved in new ventures. Grimaldi and Grandi (2005:117) add that very often incubator staff do not have the required financial and advisory skills to assist entrepreneurs to achieve their mission. Further obstacles are quality of mathematics and science education. For instance, relating to other studies, a study conducted by the World Economic Forum (as cited in SACBC 2014:6) ranked "South Africa last out of 148 countries for the quality of its mathematics and science education. It also ranked the country 146th for the overall quality of education." SBP Alert (2014:1) in their study on the competitiveness and growth of 500 SMEs in South Africa, reports that one of the chief impediments to growth is lack of skilled staff. Apparently, entrepreneurial skill is considered a significant contributor to ensure the success of small business. Considering the cries of many small businesses, the researcher posits that recruitment of staff with entrepreneurial skills will ensure well-developed and sustainable incubators as well as incubated entrepreneurs.

3.2.3 Access to advanced technology based prototype

Access to advanced technology-based facilities enhances the performances of business incubators. Lose and Tengeh (2015:14349), and Lose and Tengeh (2016:373) argue that a significant portion of business incubators in South Africa do not have access to intangible and tangible resources to demonstrate or to test a product. Thus, there is limited innovation and creativity for incubated entrepreneurs to complete incubation programmes. Likewise, Ramluckan (2010:33), in a South African study argues that incubators perform poorly in terms

of delivering technological services to their clients. Overall, incubators should provide information on appropriate space and flexible equipment leasing facilities, and cost-effective ways to meet the needs of incubated entrepreneurs (Ndabeni 2008:268).

3.2.4 Access to funding and sponsorship

The traditional approach to measure the management of an incubator is its ability to attract sponsors, raise capital, and provide services to incubatees (Scaramuzzi 2002:35; Tengeh & Choto 2015:153). These researchers concur that most incubatees in the developing countries are evolving in business incubator programmes that rely on public funding. However, they face the challenge of limited funds when servicing survivalist entrepreneurs. In South Africa, the main public funders are the SEDA Technological Programme (STP) and the Department of Trade and Industry (DTI) (Lose & Tengeh 2015:14349). However, private business incubators do not normally get sponsorship and funds from these funders. As a result, private incubators depend on their own funds and sponsorship. (Cushy 2010:9) found that universities and government/private agencies mostly fund universities and private incubators themselves.

3.2.5 Geographical areas

Although business incubators aim to facilitate an environment conducive to business creation and growth, considerable evidence exists that business incubators are affected by the wider environment for business development. For example, it is very difficult to access all survivalist entrepreneurs located in remote rural areas in Africa, especially when electricity supply is limited. In line with this discussion, Buys and Mbewana (2007:357) recommend that business incubators should be located in an environment that has access to supporting infrastructure, as well as access to scientific and technical knowledge.

3.2.6 Lack of commitment of entrepreneurs

The success of survivalist businesses depends solely on the commitment of the entrepreneurs. However, Rolfe, Woodward, Ligthelm and Guimaraes (2010:6) argue that only a handful of survivalist entrepreneurs are committed to growing capital and have the potential to flourish. These authors further argue that the objectives of survivalist entrepreneurs, especially in developing countries, is to generate minimal income while they wait for job opportunities in the formal sector; hence, only a select few create viable businesses (Rolfe *et al.* 2010:6).

Furthermore, Buys and Mbewana (2007:358) assert that the success of incubator programmes depends on the commitment of incubatee entrepreneurs. The entrepreneur should be committed, be prepared to learn, and take calculated risks.

3.2.7 Government policies

There is substantial evidence that in developing countries, and in South Africa in particular, small businesses continue to struggle and success of incubator programmes depends on government policies. Government policies should support incubator programmes, not limit their funding, to fully support incubated entrepreneurs (Lalkaka 1990:19; Buys & Mbewana 2007:357). In line with this discussion, the South African government has created the Department of Small Business Development to reaffirm the importance of small business growth to South Africa's economy. Despite the country's ongoing efforts, small businesses continue to struggle. As a result, the SACBC (2014:6) recommends that for the department to be effective in achieving its goals it must engage in substantive action to change the landscape for small businesses in South Africa.

3.2.8 Mentorship

According to Kirsty (2010:36), the success and failure of an entrepreneur depends on mentorship in the form of emotional support, funding, and friendship and is crucial for the success of a business. Kirsty adds that entrepreneurs should look for mentors that are patient, tolerant of the possibility of failure, and have a long-term outlook. According to Lalkaka and Abetti (1999:201), culture shows a strong preference for organisational structure, evaluation modalities, and business strategies. The authors add that culture determines the structure and characteristics prevailing on the firms and other organisations. Furthermore, Lalkaka and Abetti (1999:201) argue that culture (in the form of community and family) plays a major role in people taking up entrepreneurial activities and this determines the success and failure of small businesses globally. This view also possibly applies to South Africa. However, Rwigema and Venter (2004:49) argue that there are a lack of role models for black entrepreneurs in South Africa and believe that a significant number of black families encourage their children to work for a company or the government, rather than working for themselves. Nieman, Hough and Nieuwenhuizen (2003:12-29) add that having a role model increases the tendency of young people to become entrepreneurs.

3.2.9 Stakeholder support

Consistency, clarity and co-operation from the local business community, government, the broader community, venture capital providers, entrepreneurs, incubator managers, and advisory boards is crucial for the functionality and success of business incubators (Buys & Mbewana 2007:358). It is very important for these supports to be consistent with the objectives of business incubators. Therefore, for business incubators to be sustainable, management should look for stakeholders that can provide the support needed to run the incubators efficiently and effectively (Lose & Tengeh 2015:14349). However, Buys and Mbewana (2007:358) found that in South Africa that there is a weak correlation between support from advisory boards and incubator success. This could be that advisory boards have not yet made an impact because incubation in South Africa is still in the early stages, or advisory boards are ineffective (Buys & Mbewana 2007:358).

3.2.10 Quality of entrepreneurs

The qualities that an entrepreneur should have include being ate about a product or service, being visionary, energetic and driven, being a self-starter, being decisive, taking calculated risks, having the ability to multi-task, possessing resilience, being focused, being persuasive, and having leadership skills (Buys & Mbewana 2007:357). Furthermore, Nair and Pandey (2006:60) add that entrepreneurial qualities include economic status of the family, age, technical education/training, work experience, and internal locus of control. There is a correlation between the quality of an entrepreneur and the success and failure of an incubator programme. Buys and Mbewana (2007:357) share a similar view and believe that the success of an incubator programme is dependent on the quality of entrepreneurs enrolled for the programme. These authors add that the incubator should ensure they recruit incubatees who have the desire to succeed, willingness to learn, and are prepared to take calculated risks.

3.2.11 Competent and motivated management team

Largely, the success of an incubator programme depends on a competent and motivated management team (Buys & Mbewana 2007:358; Masutha & Rogerson 2014b:152). The management team should have entrepreneurial and networking skills. The management team should set objectives, monitor these objectives and team members should be incentivised to encourage performance (Khalid, Gilbert & Huq 2012:4). In addition to the above, by recruiting

enthusiastic staff members into the management team, business incubators will be capable of achieving their targets.

3.2.12 Networking

Through networking, incubators will be able to share information gathered from both achievement and failure. Partner networks assist entrepreneurs and graduates to identify expanding marketing opportunities. These networks include universities, lawyers, accountants, market specialists, venture capitalists, investors, clients, and volunteers (Buys & Mbewana 2007:358).

3.2.13 Financial sustainability

The success of business incubators depends on financial sustainability. It is believed that for incubator businesses to be viable, their source of sustainability should be subsidised. Incubator programmes should have dynamic models of operation. According to Buys and Mbewana (2007:358), there is a correlation between implementing a comprehensive business plan and the success of business incubator. However, in the South African context these authors found a weak correlation in this regard.

3.3 CHALLENGES FACED BY ENTREPRENEURS BEFORE JOINING INCUBATOR PROGRAMMES

3.3.1 Lack of skills

According to Afolabi and Macheke (2012:239), entrepreneurs should employ innovative, strategic, and management skills in their businesses. These management skills include knowledge of competitors, being market-oriented, offering good client service, possessing financial insight, having interpersonal skills, and the ability to scan the environment.

Nieman and Nieuwenhuizen (2014:33-36) stress that potential entrepreneurs must be able to innovate, take risks, increase market share, introduce new goods, introduce new methods of production, open new markets, and find various sources of supply. However, Bosma and Harding (2006) indicate that management and entrepreneurial skills are major obstacles to entrepreneurship. Lose and Tengeh (2016:372) opine that a significant number of South African entrepreneurs (incubatees) lack the necessary skills to attain their business goals. These authors recommend that entrepreneurs continue participating in incubation programmes to

obtain the relevant financial, technical, and management skills such as planning, organising, leading, and controlling.

3.3.2 Lack of access to finance for expansion and diversification

Lose, Maziriri, Choto and Madinga (2017:362) and Asoba and Tengeh (2016:416) concur that identifying finance for expansion and diversification is of paramount importance to an entrepreneur. These financial resources can take the form of cash, bank overdrafts and short-term loans (Ross, Westerfield, Jordan & Fire 2001:525). Many entrepreneurs launch their businesses with their own savings and with financial assistance from friends and families. At some stage, to expand and diversify their businesses, entrepreneurs need to turn to the banking and other sectors for financing. Access to finance for expansion and diversification is a stumbling block to most entrepreneurs because financial institutions are often prejudiced against small businesses because of the associated risk, lack of income, poor credit history, and lack of collateral security (Asoba 2016:110). Furthermore, Lose (2016:28) and InfoDev (2010a:29) mention access to finance as an obstacle to expansion in a new business; one of the strategic tools perceived to assist entrepreneurs is business incubators.

3.3.3 Competition

According to Hodgetts and Kuratko (2008:10), businesses that satisfy the same niche market are competitors. Advances in information technology have made the world a global village, and as a result, competition is a threat to most businesses. Khosa and Kalitanyi (2014:212) observed that although competition is very tough, not only within South Africa but internationally as well, the majority of entrepreneurs lack strategies to overcome competition. Khosa and Kalitanyi (2014:209) further assert that competition affects the start up and growth of businesses. Low entry barriers are one of the reasons for competition and it becomes very difficult to increase productivity and growth (Rogerson & Rogerson 2011:11742). Rogerson (2010:37) recommends that small businesses must be innovative and introduce new product lines to meet the challenges in local markets as well international markets.

3.3.4 Business support services

Business incubators can provide a range of business support services such as counselling, training, affordable space, and much more to entrepreneurs (Adelowo, Olaopo & Siyanbola

2012:176; Masutha & Rogerson 2014b:147). Although the provision of space is core to the incubator, Adelowo *et al.* (2012:176) argue it is the quality of business service support, such as entrepreneur training, business advice, financial support, and technology that merit special attention. These authors further contend that in the case of Nigeria, the National Office for Technology Acquisition and Promotion (NOTAP) provides technology support services such as access to patent information, technical support in the commercialisation process, and a technology advisory service. In the case of South Africa, Masutha and Rogerson (2014b:141) argue that to enhance business support to incubatees there is a need for greater sharing of good business practices between incubator management and incubatees

3.3.5 Access to better equipment and technology transfer

Worldwide, the scientific bases of most countries are still weak and access to equipment and technology support through proximity to technical universities and research and development institutes appear to have a holistic approach to assist entrepreneurs (Rothaermel & Thursby 2005:307; Diedericks 2015:85; Lose & Tengeh 2015:14349). These authors further argue that one of the reasons for the high success rate in the USA is because 40 percent of incubator programmes are generally located at a university or research park. As a result, there is synergy between the park, entrepreneurs, and incubators from the outset. The park assists incubators with an environment and associated infrastructure that is conducive to success. In contrast, business incubators focus on developing entrepreneurs by providing shared facilities, outside services, and seed capital.

3.3.6 Limited networks

According to Walter, Auer and Ritter (2006:542), a network comprises relationships with various organisations and each of these relationships provides critical resources to the entrepreneur. These relationships include customers' needs, they shorten and accelerate firms' learning processes, promote the sharing of knowledge, afford access to markets, encourage innovation, enhance technology transfer, and give access to financial investors. In addition, performance variables such as sales growth, profit attainment, perceived customer relationships, and competitive advantages are influenced by spin-offs through networking. Furthermore, business incubators provide office space, funding, basic services, and extensive powerful networks, which enable entrepreneurs to overcome competitors (Hansen,

Chesbrough, Nohria & Sull 2000:76). Networks reduce the time and cost of accessing valuable information, increase a firm's legitimacy, build partnerships, assist in identifying markets, and recruit highly talented people (Hansen *et al.* 2000:78). McAdam and McAdam (2006:87) in their Irish study note that the incubator environment enhances the development of social networks that support entrepreneurs during the start-up phase. Ndabeni (2008:89) adds that through networking, entrepreneurs can benefit from technological acquisition, investment choice, commercialisation, interaction with industry, and reduced risk and time to improve business skills.

3.3.7 Access to mentorship

According to Mariotti and Glackin (2015:11), a mentor is a trusted advisor with whom an entrepreneur forms a developmental partnership to solicit information, skills, knowledge and other benefits to promote personal and professional growth. In addition to professional advisors, such as accountants, attorneys, market specialists, venture capitalists, angel investors, and volunteers, enrolment in a business incubator programme can mean the difference between success and failure. Enrolment in entrepreneurship courses and workshops on business incubator programmes can offer considerable benefits such as the provision of commercialisation specialists that work with entrepreneurs (Vanderstraeten & Matthyssens 2012:664). Beyond this, Lose and Tengeh (2016:376) suggest that entrepreneurs should continue to participate in mentorship programmes to solicit information, knowledge, financial management skills, technical skills, and management skills.

3.3.8 Access to market

According to Makhitha (2016:665), marketing is the backbone of a business as it brings the right products to the right places at the right price to the consumer. Large businesses have resources to market their product successfully whereas the majority of small entrepreneurs do not have resources to assist in marketing their products (Masutha & Rogerson 2014b:152). Simpson and Taylor (2002:279) assert that lack of access to finance, business knowledge, experience, and time are some of the challenges entrepreneurs face in marketing their products or services. Because of these challenges, a significant number of informal entrepreneurs often adopt an informal marketing approach that relies on personal contact rather than the application of marketing tools. Choto (2015:32) adds that the majority of entrepreneurs do not consider

marketing plans as critical to the success of their business. Van Scheers (2011:5049) argues that lack of time and funds to invest in market research and establish target markets are major challenges to marketing planning. Furthermore, Brink, Cant and Ligthelm (2003:17) found that a large number of entrepreneurs in South Africa could not afford rental in areas where there are business activities. Subsequently, their businesses are located in areas that are not conducive to success. In line with the above studies, Lose and Tengeh (2016:375) believe that business incubators cater to the needs of destitute entrepreneurs by providing them with a wide range of business assistance that includes marketing, networking, physical opportunities, and funding.

3.3.9 Lack of access to bookkeeping

Bookkeeping is the act of recording business transactions in a systematic way so that the financial position of the business can be assessed at any time. Masutha and Rogerson (2014b:152) concur that lack of access to professional bookkeeping is a challenge faced by small businesses. These transactions include sales, purchases, income and payment. Entrepreneurs must keep adequate records to plan and control their business operations and increase the chances of business survival and growth (Nyathi 2015:2).

Sound bookkeeping practices enable an entrepreneur to know the financial position of their business and to implement control measures to increase performance and growth. Bookkeeping provides a wealth of information to investors, leaders, customers, suppliers, and regulators. Olukotun, James and Olore (2012:59) assert that a good record plan should be simple to use, easy to understand, reliable, accurate, and consistent. Despite the importance of bookkeeping, little attention has been given to bookkeeping in relation to business transactions. Furthermore, the low educational background of entrepreneurs and managers and the employment of unskilled accounting staff also contribute to business failure (Abdul-Rahamon & Adejare 2014:2). Chelimo and Sopia (2014:433) found that 60 percent of small businesses failed within the first three years due to poor record keeping and inefficient or absence of bookkeeping.

3.3.10 Poor product quality

Quality is a subjective term that can be based on a customer's perception of a product or service (Abdullah & Rozario 2009:346; Liepina, Lapina & Mazais 2013:628). Luken (2006:1) defines the quality of a product in terms of parameters or the characteristics of a product to meet its

specifications. The specification is the minimum requirement of a product or service being delivered to consumers. The specification includes uses or customer needs, safety and health hazards, requirement for national and international standards, and competition product specification to gain market advantage. In addition, the overall design of a product should have a dimension (such as length, diameter, thickness or area), physical properties (such as weight, volume and strength), appearance (such as finish colour or texture), functionality qualities (such as output or kilometre per litre), and lastly, effect on service (such as taste, feel or noise level).

According to Juran (1970), as cited by Liepina *et al.* (2013:628), quality is “fitness for use”. The quality of a product is the key issue for consumers and must exceed a consumer’s expectations. Furthermore, the quality of the product or service determines the success or failure of an organisation (Abdullah & Rozario 2009:346). The quality of the product should improve continuously and entrepreneurs should ensure that their products or services offer long-lasting solutions. In line with the above authors, the researcher believes that an incubation programme should serve as a platform for entrepreneurs to improve their product or service.

3.4 CHARACTERISTICS CONTRIBUTING TO SUCCESSFUL START UP OF A BUSINESS INCUBATOR

3.4.1 Proximity to incubators

Rothaermel and Thursby (2005:305) opine that proximity to places such as universities is critical to the successful start-up of business incubation. They indicate that specialised areas such as business schools and laboratories offer advantages similar to those provided by universities for business incubators. Sheanan (2005:1) shares similar views, stating that universities assist incubators in several ways, including assisting with technology, hence reducing risk due to investment. Universities are often abreast of cutting edge technology and have state of the art laboratories. Diedericks (2015:86) adds that it is best to locate incubators in areas which offer easy access to supporting infrastructure and technical services to improve the incubators’ chances of success. Research further postulates that existing interaction between universities and incubators makes it easier for entrepreneurs to gain access to university courses because entrepreneurs know the scientists and professors (Sbragia & Pereira 2004, as cited by Stal, Andreassai & Fujino 2016:91). University professors provide assistance in accounting, tax rules and management practices for tenant companies (Harwit 2002:2)

3.4.2 Feasibility study

According to Fominienė and Grigaitienė (2017:34), an incubator programme depends on a number of divergent factors for it to be successful, and one of these factors is a feasibility study. Through a feasibility study, incubators are able to have a critical look at their needs and the resources necessary to develop a viable programme. Furthermore, a feasibility study allows stakeholders to understand the climate within which incubators operate. Richards (2002:2) and Groenewald *et al.* (2006:71) state that a feasibility exercise should include site selection, market analysis, financial planning, measures to plan the project, identifying the right project leader and employees, and the development of effective selection criteria before investing time and money in developing a business plan and starting an incubator business

3.4.3 Availability of funding to entrepreneurs

According to Lose *et al.* (2016:698), the availability of funding is a critical factor in the success of entrepreneurs. Barrow (2001:36) cited grants and loans, equity and debt financing, business tax and risk management as reasons for the success of business incubators in the United Kingdom (UK). Lose (2016:28) posits that without adequate funding only a handful of start-ups can transform into successful businesses. Hence, the ability of a start up incubator to raise capital for its clients by granting funding internally or through external (angels or venture capital) funding increases the chances of success.

3.4.4 Quality of entrepreneurs

There is a correlation between the quality of an entrepreneur and the success or failure of an incubator programme (Buys & Mbewana 2007:357). According to Buys and Mbewana (2007:357), the quality of entrepreneurs enrolled for an incubator programme is critical to the success or failure of the programme. The authors suggest that for an incubator programme to be successful, incubators should recruit entrepreneurs who have the desire to succeed, have a willingness to learn, and be prepared to take calculated risks. Furthermore, the entrepreneurs should be able to multitask, be able to calculate risk, be visionary, energetic, self-starting, resilient, have passion for a product or service, and have leadership skills. Choto (2015:40) adds that the chances of incubators' success are improved if the entrepreneurs have substantial knowledge of the industry. Entrepreneurship quality can be determined by the economic status

of the family, age, technical education/training and work experience, and internal locus of control.

3.4.5 Successful incubatee

According to Barrow (2001:33), the success of incubators depends greatly on how firms perform after they graduate from the incubator programmes. Barrow added that incubator models are dependent on the success of companies within their portfolios. Traditionally, once the incubatees graduate they are responsible for the day-to-day management of their respective companies but not all of them achieve sustainable growth. Richards (2002:45) recommends that incubators should continue to contribute to companies so they can grow stronger, better and faster than those who were not involved in incubator programmes.

3.4.6 Supportive government policy

The success of business incubators is likely to vary according to the level of government policy (Obaji, Senin & Onyemerela 2016:29). Government policies exert significant influence on technological changes, university technological transfer, financial crises, regional innovation systems, and the performance of business incubators. These authors point out that government always takes the lead in national economic activities before the private sector enters (Obaji *et al.* 2016:29). Obaji *et al.* (2016:29) and Obaji *et al.* (2013:3) found that there is likely a positive relationship between the success of businesses and government policies. However, Chailom and Kaiwinit (2010), as cited by Obaji *et al.* (2016:29) examined government policy as a potential moderator in the relationships between incubator performance and their predictors. They discovered that government support failed to act as a moderating variable in the study. In addition, the moderating effect of government support has no statistical significance.

3.4.7 Stakeholder strategies

Stakeholder strategies that include clarity, consistency, and co-operation are critical to an incubator's success. Lalkaka (1990:25) recommends that the strategy must be consistent with the needs and capacities of the locality which the incubator aims to serve. These must be clearly defined as objectives to be reached because conflict in these areas could mean trouble for the incubators. Generally, most incubators work through relationships with other stakeholders and these include sponsors, government, venture capital, entrepreneurs and incubator management

(Masutha & Rogerson 2014b:145). They all work together to produce sustainable graduates and through these graduates, employment opportunities are created, the community develops economically, income is increased, and shareholder investment is returned.

3.4.8 Management team

Management teams play a critical role in the success of incubators. Lose (2016:15) posits that for an incubator programme to be successful, the ownership should be separated from management. The management team should be contracted for a limited period in which they are given tasks to perform, which must be monitored and evaluated.

3.4.9 Advisory board

According to Richards (2002:25), an advisory board is a critical component in the success of incubator programmes. He adds that the selection of advisory board members should be based on a wide range of disciplines and experience available to assist companies at a reasonable cost. For an incubator programme to be successful it is important for advisory board members to be willing to share their experiences with management of incubators and the entrepreneurs.

3.4.10 Financial sustainability

According to Mbewana (2006:37), the ultimate test of an incubator is whether it is financially self-sustainable. Richards (2002:45) added that incubator programmes must be viable and that this can be achieved through acquiring equity, royalties, operating as a business unit, and having their own source of sustainability even if it is reliant on subsidies. Furthermore, Obaji *et al.* (2016:29) point out that the main objective of setting up technology business incubators is to assist start up entrepreneurs that possess sufficient technology input and output. Hence, it is critical for the incubators to be financially sustainable to provide financial resources to the entrepreneurs. However, Lish (2012) indicates that only a handful of incubators provide real financial support to entrepreneurs and that a large number of incubators access financial support from their contacts, as well as deriving funding from training courses.

3.4.11 Selection criteria

Khalid *et al.* (2012:3) assert that incubators should have some sort of entry and exit criteria. The screening of the technical, business and market potential of entrepreneurs is critical to the success of incubator programmes. Mbewana (2006:38) points out that the feasibility of the

product/process of the entrepreneur requires a good business plan as entry criteria, as well as technical focus and the ability to self-fund. These criteria enable incubators to set milestones, which must be strictly adhered to. Furthermore, Mbewana (2006:38) suggests that incubators should focus on niche clients whose needs they can best service.

3.4.12 Networking

Networking is critical for the success of incubator programmes. According to Mbewana (2006:38), through networking, the entrepreneurs, incubators and stakeholders share experiences for both success and failure such that incubators can learn. Another benefit of networking is the opening up and widening of new market opportunities for incubation. Hackett and Dilts (2004:41) cite examples of networking which include universities, industry contacts, professional service providers such as lawyers, accountants, incubator management staff, advisory boards, incubatee companies, as well as venture capitalists, angel investors, and volunteers. Some of the benefits of networking are gaining an understanding of customer needs, shortening and accelerating firms' learning processes, sharing of knowledge, access to markets, innovation, technology transfer and access to financial investors (Walter *et al.* 2006:542). Hence, networking is essential for entrepreneurial businesses to succeed.

3.5 CONCLUSION

This chapter reviewed existing literature and sought to determine resources critical to the effective start-up of business incubators in South Africa. Also identified were the challenges that face entrepreneurs before they join incubator programmes. The factors that contribute to the successful start-up of a business incubator were explored.

This chapter was divided into three sections. The first section reviewed literature on the access to qualified staff, entrepreneurial skills, access to advanced technology-based prototypes, access to funding and sponsorship, and geographical areas. This was followed by the commitment of entrepreneurs, government policy, mentorship, stakeholder support, and quality of entrepreneurs. Furthermore, the concepts of a competent and motivated management team, networking, and financial sustainability were explored.

In the second section, the researcher examined factors that inhibit the performance of business incubators. These include skills, lack of access to finance for expansion and diversification,

competition, business support services, access to better equipment and technology transfer. Further challenges to the performance of business incubators were limited networks, access to mentorship, lack of access to bookkeeping, and poor product quality.

The third section investigated the characteristics that contribute to the successful start-up of a business incubator. These include proximity to incubators, feasibility studies, available funding to entrepreneurs, quality of entrepreneurs, and successful incubatees and graduates. Further characteristics that were examined were supportive government policy, stakeholder strategies, management teams, advisory boards, financial sustainability, selection criteria, and networking. The next chapter discusses the research methodology.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

The previous chapter pursued the theoretical objectives underpinning this study. Review of scholarly articles led to the conclusion that an appropriate framework for business incubation in South Africa needs to be informed empirically. Such a conclusion takes cognisance of the uniqueness of the South African business context. The purpose of this chapter, therefore, is to detail how data were collected for this study and achieve the empirical objectives, which were stated in Chapter 1 of this study.

The chapter is articulated in a manner meant to harness findings from Chapter 2 with the empirical data collected so that a holistic interpretation of the framework for business incubation in the South African context becomes possible. The chapter commences with an explanation of the philosophical basis of the objectives of the study that includes both the ontological and epistemological perspectives of the objectives set for the study in Chapter 1. This is followed by the research strategy and design. The methods of data collection and the research tools used to collect data are presented in this chapter.

The researcher clearly states the variables investigated and how they were interpreted, exposing possible study errors and pitfalls, including how they were managed to arrive at the scientific findings reported on in the next chapter.

4.2 RESEARCH PHILOSOPHY

4.2.1 Overview of research philosophy

Researchers generally contend that all research strategies emanate from certain philosophical standpoints that form the basis on which reality is perceived and how knowledge of that reality can be obtained. These arguments vindicate the need for provision of both ontological and epistemological perspectives of an investigation. Following these ideas, the current analysis is based on the phenomenological and epistemological views provided for by both the general systems theoretical framework and by the phenomenological approach to the conduct of research. In Chapter 1, a general systems theoretical framework was highlighted as the underpinning theory for the study. The theory enabled the generation of a conceptual

framework, which allowed meaningful dissection of literature related to this study. However, data collection followed a theoretical dichotomy whereby a phenomenological philosophy embedded within the general systems perspective was followed. The following sections explain this view.

4.2.2 Phenomenological perspectives of the study

This study was based on the assumption that for the derivation of a framework for business incubation in South Africa, current incubators should offer their experiences of the process of incubation. Their experiences, together with related ideas as informed by the literature, can then be interpreted to solve the research problem. In this way, the reality of the components of an effective framework for business incubation can be found in the experiences of those who have operated incubator businesses in South Africa. These include those who succeeded in their businesses and those who discontinued their operations. The study also assumes that, scholars, researchers, and other stakeholders within the SMEs have useful experiences that could inform a framework for business incubation in South Africa. The methodology for this investigation, therefore, was informed by the phenomenological approach to data collection in research. Phenomenology is a philosophy that seeks reality from individuals' narratives of their experiences (Yuksel & Yildirim 2015:1). This philosophy posits that reality is found from the lived experiences of individuals, with the objective of capturing the true description of the experiences lived by the research participants in a study (Giorgi 2009:122). The choice of the research tools and strategy adopted was a necessity of the implications of a phenomenological study based on the need to understand and describe a specific phenomenon in depth as stated by participants in description and evaluation of their lived experiences.

4.2.3 Epistemological perspectives of the study

Given the assumption that the reality of a framework for incubation in South Africa is such that it can be constructed from the lived experiences of participants in the SME industry, knowledge of such, therefore, can be obtained through asking for the narratives of the individuals involved. Having a phenomenological ontology implies a phenomenological epistemology that is non-hypothesised and firmly qualitative and interpretive. An interactive epistemology was considered an appropriate data collection method but the need for triangulation was considered necessary. Therefore, although the basis of the study was interviews (a purely qualitative

approach to research), the researcher decided to follow up the findings of the interviews using questionnaires, thereby permitting a quantitative cross-interpretation of results. In view of these arguments, the research design as explained in the following paragraph was mixed and considered as both qualitative and quantitative.

4.3 RESEARCH APPROACH

Following the research philosophies detailed in the preceding section, a mixed research strategy was used. A mixed method strategy is one that comprises both quantitative and qualitative research methods (Choto 2015). This study utilised a mixed method approach, which included the use of both qualitative and quantitative data collection methods in the same study to gain a more rounded and holistic understanding of the phenomena under investigation (Creswell 2013:3; Hayes *et al.* 2013:9).

Caruth (2013:112) argues that mixed method research was developed in response to the perceived limitations of both quantitative and qualitative designs. In line with this school of thought, Creswell (2012:5), Frels and Onwuegbuzie (2013:184), and Hong and Espelage (2011:115) conclude that the use of the mixed method offers a more enriched understanding of the research problems and questions, rather than using either qualitative or quantitative methods independently. The use of the mixed method approach has been adopted in several studies (Obaji *et al.* 2013:2; Choto *et al.* 2014:93; Costello 2015:7; Cullen *et al.* 2014:82) that focused on business incubators. The justification of such an approach is rooted in the need to triangulate data and increase the reliability of the study within the qualitative and quantitative paradigms. Analysis of the qualitative data obtained was interpretative. The chosen strategy and design offers the advantage of providing in-depth data and a broad scope of information as basis for the realisation of research objectives. The research design was also considered as double edged and suitable in generating solid conclusions. Hence, a mixed method approach was deemed appropriate for this study.

Hayes *et al.* (2013:9) define a research design as the entire process of what will materialise during the research, from the time the problem is hypothesised to writing the full article. It aids the researcher to plan, conduct and implement their research in a systematic way.

4.4 DATA COLLECTION PROCEDURES

4.4.1 Qualitative data collection

Data were collected in two stages. Stage one involved personal interviews with centre managers of incubators. Interviews are very common in gathering qualitative research data (Asoba 2016:57). A personal interview is direct communication between an individual and an interviewer, in which the interviewer engages the respondent to answer questions (Zikmund *et al.* 2010:150). Objectives of the semi-structured interviews include:

- To understand the services provided by the centre managers at the business incubator;
- To understand the definition and evolution of business incubators;
- To understand the incubation theoretical framework;
- To understand the key requirements for effective business incubators;
- To understand the factors inhibiting performance of business incubators;
- To understand the challenges of business incubators during the incubation process; and
- To understand the characteristics contributing to the successful start-up of a business incubator.

Most incubators are structured in such a way that there is a centre manager as the overall administrator and coaches and enterprise development persons who engage in the operational activities of the incubator. The centre manager of the incubator functions as the overall administrator of the strategic issues involved in business incubation. Therefore, to seek data on incubation at a strategic level, it is critical to seek responses from the centre managers who are the overall administrators of an incubation business. Nine interviews were conducted across the nine provinces with the centre managers during the months of October and November 2017. All interviews were conducted in English. The interviews took between 30 to 45 minutes and the interviewer took notes during the interviews.

Remenyi (2011:1) defines an in-depth interview as a formal method that involves face-to-face discussion to gather related data. For the purposes of this study, the semi-structured, in-depth interview technique was adopted to collect qualitative data. According to Zikmund *et al.* (2010:150), semi-structured in-depth interviews are an effective way to obtain required data in

a form of direct communication between two or more people in which an interviewer poses questions to a respondent and the respondent answers. In-depth interviewing in research is considered an excellent method of data collection, since it allows the researcher to gather in-depth information (Klenke 2008:126). Semi-structured interviews were conducted with selected participants, namely the centre managers of business incubators. Semi-structured, in-depth interviews were used because they offer advantages such as enabling the interviewer to develop an interview guide, flexibility, engagement with participants, and the ability to produce meaningful insight into the phenomenon of interest. An interview guide with pre-set questions was used as the source of interview questions. Interviews were conducted on a face-to-face basis and a voice recorder was used to record each discourse. The interview schedule is provided in Annexure F.

4.4.2 Quantitative data collection

The second stage of data collection involved the administering of questionnaires to coaches and enterprise development specialists employed to handle the day-to-day incubation functions of an incubator. Adams and Cox (2008:18) maintain that a questionnaire should be designed so that the respondent easily understands and responds with the required information. Townsend (2013:91) concurs that the collection of data through questionnaires allows for more participants than could be achieved from interviews in a similar timeframe. The questionnaires were adapted from Hannon and Chaplin (2003:865), Hannon (2003:454; 2005:60-65), Buys and Mbewana (2007:357), Bergek and Norman (2008:24), and Ndabeni (2008:23). A total of 132 questionnaires were collected for the study, of which 121 were usable and 11 were unusable.

The decision to administer a questionnaire to the practitioners and to seek their responses was purposive owing to the extensive exposure and knowledge of incubation expected of such persons. In line with the research philosophy of this study, the coaches and enterprise development personnel have extensive experience of the factors that are critical to the success of business incubation. These people provided in-depth information on how a possible framework for business incubation in South Africa could be operationalised, including the critical factor components of such a framework. The geographic distribution of the participants was important to obtain data relevant to the entire South African landscape.

A self-administered survey questionnaire was utilised to collect quantitative data. The questionnaire was divided into four sections. Section A elicited demographic information from the respondents. The section comprised six questions pertaining to gender, age group, education, race group, position in the company and the period of existence of the company. Section B (incubator prerequisites) focused on the factor components that make up an incubator framework not limited to key requirements for effective business incubators. The section comprised 32 questions adapted from Bergek and Norman (2008:24). Sections B, C and D were adopted from the interview results.

Section C elicited business incubators' performance indicators (incubation process). The section comprised nine questions adapted from Ndabeni (2008:23). Section D focused on the monitoring and evaluation (outcomes) of an incubator, which results in characteristics contributing to successful start-up of businesses. The section comprised eight questions adapted from Hannon (2003:454) and Hannon and Chaplin (2003:865). Questions in these sections were presented in a Likert-type format.

4.5 SAMPLING DESIGN

4.5.1 Population

Gazzaniga, Heartherton and Halpern (2010:46) define a population as “the group you want to know about” and a sample as a subset of the population. To conduct this study, it was essential to define the sample and population clearly from which participants were selected to participate in the study for both the first and the second stages of data collection. The population for the qualitative part of the study included incubator managers. In South Africa, there are about 50 STP Centres (SEDA 2017:3). For the quantitative part of the study, the population consisted of all coaches, enterprise development practitioners and programme co-ordinators in SEDA business incubation programmes in all the provinces of South Africa; those involved in the day-to-day operations of the incubator. These individuals were selected because they have ample knowledge and insight of the incubator operations and all the stakeholders involved with the incubators. Each incubator has approximately four incubator practitioners. Therefore, the estimated number of elements in the population for the quantitative part of the study was two hundred (N=200).

In order to determine the population for data collection, the audit of national incubators published by Masutha and Rogerson (2014c:S50) was used. Table 4.1 shows the number of incubators by Province in South Africa. The table shows that the majority of incubators are found in Gauteng and KwaZulu-Natal.

Table 4.1: Number of incubators in South Africa by province

Province	Number of incubators
Gauteng	17
KwaZulu-Natal	12
Eastern Cape	7
Western Cape	5
Mpumalanga	5
Limpopo	2
Free State	1
North West	1
Northern Cape	1

Source: Masutha and Rogerson (2014c:S50)

Considering that successful interviews are based on the willingness of participants to provide information, the researcher sent emails and made telephone calls to 51 incubators to establish rapport and create a relationship conducive to the exchange of data and information.

4.5.2 Sample frame

A sample frame is the listing of the units from which a sample is to be selected with a view to obtain relevant data (DiGaetano 2013:296). It is important to use a sample frame to increase the accuracy of information for the whole group. In this study, the sample frame is a list of all SEDA business incubators. The list of incubators to be surveyed was obtained from the SEDA database of incubators.

4.5.3 Sample approach

A sample is described as any subset of elements of the population that is selected scientifically and systematically for study (Flick 2011:253). In research, there are two sets of sampling methods, namely probability and non-probability sampling (Wretman 2010:29). According to Babbie and Maxfield (2014:222), probability sampling permits the study to estimate the expected error and it gives everyone an equal chance of being selected in the study, while non-probability do not use samples with known probabilities and it is a convenient way to assemble a sample (Wretman 2010:30-31). Since the study is based on the mixed method approach to research, both probability and non-probability sampling methods are adopted.

For the qualitative portion of the study, non-probability sampling, using the purposive technique was utilised. Purposive sampling is a technique that is widely used in qualitative research and identifies and selects individuals that are knowledgeable and experienced with a phenomenon (Blumberg *et al.* 2010:257). A purposive sample was appropriate for this study because it was convenient and allowed an opportunity to gain detailed insight and more depth in this investigation. The sample size was not predetermined, since in-depth interviews were conducted until a point of saturation was reached.

For the quantitative part of the study, probability sampling using the simple random technique was utilised. Probability sampling refers to the notion of random selection with a controlled procedure that assures that each population component is given a chance of selection (Tilana 2015:67). A probability sample was appropriate for this study because it provided an estimation of precision. Thus, participants of the study were given an equal chance of being selected. According to Cooper and Schindler (2011:379), simple random sampling increase the sample's statistical efficiency, gains adequate data for analysing various sections, and it enables different research methods and procedures to be used in different sections.

4.5.4 Sample size

Malhotra (2010:374) defines sample size as the number of items involved in the study. According to Choto (2015:11), a sample size must be a true representative of the unit of analysis. For the qualitative part of the study, no sample size was predetermined and in-depth interviews were conducted until the point of saturation. The point of saturation occurs when similar views from participants begin to appear repetitively as the interviews continue, making

it unnecessary to continue probing for new information (Palinkas, Horwitz, Green, Wisdom, Duan & Hoagwood 2015:534). Since the study was conducted in two parts, one of them qualitative and the other quantitative, the quantitative part followed the procedures required in sample selection for quantitative designs. For the quantitative section, a sample size of n=132 incubator coaches and co-ordinators was randomly selected from business incubators. This sample size was consistent with previous studies of a similar nature, such as Buys and Mbewana (2007:357 - N=73), van der Zee (2007:24 - N=157), Al-Mubarak and Busler (2010:8 - N=79), Masutha and Rogerson (2014b:151 - N=46), Diedericks (2015:13 - N=125) and Tengeh and Choto (2015:155 - N=100) and therefore was considered sufficiently large.

4.6 RESEARCH INSTRUMENTS

4.6.1 Overview of research instruments

Since the study used a mixed method approach, separate data collection instruments were used in the qualitative and quantitative phases of the study. For the qualitative phase, in-depth interviews were conducted while for the quantitative phase, a survey questionnaire was used to collect the data. Two research instruments were used: an interview guide and a questionnaire. The sections below present a discussion of the interview instruments used, including their construction and justification for use.

4.6.2 Interview guide

The interview guide that was used in the first stage of interviews was developed based on literature, the empirical objectives of the study and discussions with research experts and specialists from business incubation. The underpinning theory of the study was the general systems theory that allowed the dissection of the literature within the inputs, processes and outputs anatomy of the general systems theory. Based on this, the conceptual framework developed was vindicated by literature and the empirical data sought more evidence and further development of the conceptual framework. It is from this conceptual framework that the six sections for the interview guide were formulated as shown in Table 4.2.

Table 4.2: Outline of the interview guide

Section 1	Business incubator evolution
Section 2	Business incubator framework
Section 3	Key requirements for effective business incubators
Section 4	Factors inhibiting perform of business incubation
Section 5	Challenges of business incubators
Section 6	Characteristics contribution to successful start up

Source: Author's own construct

After developing the initial interview guide, it was sent to research experts in business management who made suggestions for its adjustment. As suggested, certain items were removed and new items were included. The interview was then tested by creating prototype interviews in which the researcher simulated the interview situation with other business management students to establish its suitability and appropriateness to yield scientific information. The instrument was then deemed appropriate and suitable for purposes of this study.

4.6.3 Questionnaire

The questionnaires that were used in the second stage of data collection were developed by considering the empirical objectives of the study, findings from the literature review, and the theoretical and conceptual frameworks of the study. Gazzaniga *et al.* (2010:55) describe the use of questionnaires as “question-based research” and further explain that when questionnaires are used for data collection it is important to consider how to frame questions. The questionnaire was structured following the ideas and techniques offered by Likert (1932), suggesting the use of scales in measuring the inclination of respondents to certain predispositions. Five-point Likert-type scales were used to assess respondents' views on statements to generate more data to augment the interviews that were held in the first stage of data collection. The questionnaire gives the advantage of large sample sizes. As such, opinions

of a large number of people can be determined and analysed, thereby providing conclusions that can be generalised.

The researcher decided to issue questionnaires to all 50 functional incubators across South Africa. It was found that on average, four persons are required to run an incubator, therefore 132 questionnaires were sent out for data collection. Before sending the questionnaire out, a panel of experts assessed its suitability for data collection in relation to this study. The panel suggested some adjustments to the questionnaire. Certain items were removed while others were included. The panel suggested that a few of the questionnaires be practically tested. Following this suggestion, 40 questionnaires were sent to coaches and enterprise development specialist incubators. The participants of this testing phase did not partake in the actual study, hence their views did not inform the conclusions of this study. When the 40 questionnaires were returned, the researcher sat with the panel to assess the response patterns of the test participants and check erroneous statements on the questionnaire. These processes resulted in further amendments to the questionnaire before it was finally administered.

In this study, data were collected through interviews and a structured questionnaire. Quantitative research is an approach for testing objective theories by examining the relationship between variables (Creswell 2013:13). It includes the collection, analysis and interpretation of data in numerical forms to reach and obtain findings (Hayes *et al.* 2013:8).

4.7 TRUSTWORTHINESS

For the qualitative part of the study, trustworthiness was ascertained through four measures, namely credibility, transferability, dependability and conformability.

a) Credibility

Credibility is defined as the degree to which the findings of a study reflect reality (Shenton 2004:63; Tracy 2010:842). In this study, credibility was ascertained through the use of well-established research methods, developing early familiarity with research participants, ensuring honest responses from participants, peer scrutiny of the research project and the examination of previous research findings.

b) Transferability

Transferability lies in the applicability of the findings of a study in other contexts and environments (Shenton 2004:70). This study followed the principle of transferability by outlining a detailed description of the contexts in which data were collected, including the number of participants in the study, data collection instruments, any restrictions in the collection of data and the period over which data were collected.

c) Dependability

Dependability is the qualitative option for reliability in quantitative studies and implies a clear description of the research design (Shenton, 2004:71). In conducting the study, a rigorous description and approach to both the methodology and design was applied to make it easier for repeatability.

d) Conformability

As a measure of trustworthiness, conformability focuses on objectivity and the extent to which the data collected and presented are free from bias and the views of the researcher (Lee & Lings 2008:210). For this study, the triangulation technique was used. Both qualitative and quantitative data were collected to give the study strength and to ensure conformability.

4.8 VALIDITY AND RELIABILITY

For the quantitative part of the study, reliability and validity were tested. Thatcher (2010:36) defines reliability as the extent to which an experiment, test, or any measuring procedure yields the same results on a repeated trial. In this study, reliability was assured through the use of Cronbach's alpha value, which was greater than 0.7 as recommended by van Scheers (2011:5050).

Validity is concerned with the meaningfulness of research components and it determines whether the research truly measures that which it was intended to measure (Drost 2011:114). There are various categories of measurements in validity and these include face, content, and construct (Makhbul & Hasun 2011:118). A panel of experts in entrepreneurship and small business management were requested to assess the questionnaire to check the face validity. Content validity was ascertained through a pilot study conducted prior to the main study. This

identified the sources of measurement error that would be most detrimental to useful score interpretation by experts in management sciences. Construct validity was determined through correlation analyses and regression analyses between the constructs.

4.9 DATA ANALYSIS

4.9.1 Overview of data analysis

According to Marshall and Rossmall (1990), as cited by Choto (2015:12), data analysis is the process that aims to bring about order, structure and meaning to the mass of data that are collected. Gwija (2014:38) maintains that data analysis helps the researcher ascertain whether any consistent patterns will emerge so that a reasonable conclusion or a generalisation of the findings can be made. Data are analysed and interpreted to draw conclusions regarding the research questions of interest (Bhattacharjee 2012:23). Mouton (2001:108) describes data analysis as breaking up the data into manageable patterns, themes, connections, and trends to understand the various constitutive elements of the data. The relationship between concepts and constructs is inspected to evaluate trends that can be identified or isolated.

4.9.2 Qualitative (interviews) data analysis

According to Mugobo (2013:207), the process of analysing qualitative data follows a sequence of:

- Assigning codes to the data captured from the interviews;
- Categorising themes, sub-groups and similar patterns;
- Identifying commonalities and differences; and
- Elaborating a small set of generalisations.

For the purpose of this study, the researcher utilised four steps, namely transcription, organising of data, familiarisation, and coding and themes.

4.9.3 Quantitative (questionnaire) data analysis

For this study, the Statistical Package for Social Sciences (SPSS version 25.0) software was used for data analysis. Data were then presented in the form of graphs, tables and pie charts as can be seen in the next chapter.

4.10 ETHICAL CONSIDERATIONS

4.10.1 Overview of ethical considerations

Research ethics refers to the principles of conduct governing an individual or group and concern for what is right or wrong, good or bad (Lysons & Farrington 2012:655). In this study, four research ethics were considered, namely informed consent, no harm to participants, confidentiality and anonymity, and permission to conduct the study. The issues of integrity, confidentiality of data and collection of data after obtaining permission were satisfied. A letter of introduction originating from the Faculty of Business Management at VUT was presented to business incubator managers, seeking their consent for the researcher to collect data within their organisations (see Annexure A). Firstly, the VUT Ethics Committee considered the letters of consent from incubators. Thereafter the methodology for this study was submitted to the Ethics Committee for ethical clearance and approval. After scrutiny of the methodology, the committee issued a clearance certificate to allow the study to progress. Participants in this study consented to provide data and were informed of their rights, which included the freedom to withdraw from the study at any time. In line with these considerations, the researcher handled the study with due respect for the ethical issues raised by the incubators and the sections on research ethics found in the VUT ethical policy document, which was provided before data collection commenced.

4.10.2 Formal consent from participants

The researcher firstly established rapport with prospective participants before informed consent letters were sent to them (see Annexure B, C and D). Participants were afforded time to consider the implications of the research before signing the consent letters to indicate their willingness to participate in the study.

4.10.3 Ensuring confidentiality and anonymity

The researcher acknowledged that there were aspects of the incubators' operations which were confidential and committed to abide by the confidentiality policies of the participating incubators. All information collected from the participants was treated with the utmost confidentiality. In addition, the principle of anonymity in research was honoured to maintain the integrity of the personal views of the participants. Each participant was assigned a pseudonym to preserve their anonymity and the data they provided were not linked to their

names. The data were not disclosed to outside individuals but only shared with participants who were part of the study. All information was kept strictly confidential and no one except the researcher had access to it.

4.11 CONCLUSION

This chapter reviewed research strategy and design, as well as the theoretical objectives underpinning this study.

The chapter comprised two sections. The first section reviewed literature on interviews and questions and was followed by a discussion on population, sample frame approach and size. Research instruments and measures of trustworthiness were explored.

In the second section, data analysis and ethical considerations were examined. Ethical considerations addressed aspects such as informed consent from participants and the guarantee of confidentiality and anonymity being maintained by the researcher.

The study was conducted in two parts, one being qualitative and the other quantitative.

The next chapter, Chapter 5, presents the findings of the study.

CHAPTER 5

RESULTS AND DISCUSSION OF THE QUALITATIVE STUDY

5.1 INTRODUCTION

The previous chapter, Chapter 4, discussed the methodology and design of the study. The methodology adopted was both qualitative and quantitative to ensure triangulation, which is an accepted way of promoting the reliability of data. Since data collection was both qualitative and quantitative, two routes for data analysis were imperative—qualitative analysis for qualitative data and quantitative analysis for quantitative data. In this chapter, the researcher focuses on the qualitative analysis and results of the data, including the practical steps involved as outlined in the preceding chapter. The interview method was used for the collection of qualitative data. The data were analysed using content and thematic approaches, which are discussed individually. The findings are linked to the review of existing literature.

5.2 PRE-TESTING OF THE QUALITATIVE INTERVIEW GUIDE

As stated in the previous paragraph, the collection tool for qualitative data was interviews. To ensure its reliability, it was first pre-tested using a pilot study. A comprehensive literature review on business incubation framework informed the improvement of the interview guide (Ramluckan 2010:15). Following the approach of Choto *et al.* (2014:97), the interview guide was scrutinised by the researcher's promoter and supervisor to ensure content validity and reliability. Based on the input from the supervisors, slight adjustments were effected to the interview guide. Thereafter, a pre-test of the interview guide was conducted with two participants in order to enhance the reliability and the proper sequence of the interview questions (Onwuegbuzie & Johnson 2006:49). The interview guide (see Annexure E) comprised questions on factors inhibiting performance of business incubators, key requirements for effective business incubators and challenges for business incubators.

5.3 ANALYSIS OF INTERVIEW RESULTS

5.3.1 Sample composition

Nine semi-structured, in-depth interviews were conducted between April and May 2018. The participants were nine business incubator managers. Of the nine participants, six (67%) were males and three (33%) were females. Only one of the participants was between 30 to 40 years

of age, five were between 40 to 50 years of age and three were between the ages of 50 to 60 years. Further analysis showed that four of the participants had worked in business incubation for less than five years, whilst five participants had worked in business incubation for periods ranging between five and eight years. Four of the participants were holders of a Bachelor’s degree, two held an Honours degree, two had Masters’ degrees and one participant was the holder of a Doctorate as their highest qualification. Table 5.1 provides the participants’ demographic information. Pseudonyms were used to safeguard respondent confidentiality and anonymity.

Table 5.1: Participant demographics

Participant Name	Position	Gender	Age Group	Employment Period (Years)	Highest Qualification
Khulile	Director	Male	40-50	4	Masters
Pulane	Director	Female	50-60	5	Doctorate
Samson	Programme Manager	Male	30-40	4	Masters
Sanele	Centre Manager	Male	50-60	8	Bachelors
Mary	Director	Female	40-50	6	Honours
Oscar	Centre Manager	Male	40-50	3	Bachelors
Shelly	Director	Female	50-60	6	Honours
Bongile	Centre Manager	Male	40-50	3	Bachelors
Tony	Centre Manager	Male	40-50	5	Bachelors

5.3.2 Emerging themes

The focus of the interviews was on the effective creation of business incubators. The interviews were based on six broad questions that were structured around:

- Business incubator evolution/awareness;
- Business incubator framework;
- Key requirements for effective business incubators;
- Factors inhabiting performance of business incubators;
- Challenges of business incubators; and
- The characteristics contributing to successful start-ups.

Based on these interview focus areas, the participants provided valuable insights into business incubators. The analysis of interview transcripts resulted in four themes that shed light on the business incubator framework.

To reduce repetition of information and enhance consistency, the findings in this study were integrated, as proposed by Gustaffson, Hassmén, Kenttä and Johansson (2008:800). In the following section, the researcher discusses the important themes that emerged from the study. In addition, relevant quotes from the respondents' answers are utilised to clarify the emergent themes. The interview guide included topics that were identified through the literature review and the survey explored elements from the business incubation literature. These elements generated four themes as listed below:

- Incubator prerequisites;
- Situational analysis;
- Operational processes/incubation strategy; and
- Operational outputs.

Thematic analysis (TA) is one of the most common forms of analysis in qualitative research. The purpose of TA is to identify patterns of meaning (themes) across a dataset that provides an answer to the research question being addressed. Themes are patterns across datasets that are important to the description of a phenomenon and are associated with a specific research question. In this study, the themes were extracted by using a word repetition technique through which dominant ideas were identified from frequently used words.

Table 5.2 summarises key excerpts emanating from the interviews, including the sub-themes and main themes that were derived from the interview transcripts.

Table 5.2: Excerpts, categories and themes from the in-depth interviews

Excerpts from in-depth interviews	Sub-categories	Categories	Theme
<p>“...physical or virtual facility that aids the development of early stage SMEs through providing temporary business support services aimed at building viable independent businesses...helps SMEs overcome the challenges they face at the early stage.”</p> <p>“...provision of support in the form of coaching; infrastructure; market linkages and access to finances.”</p> <p>“...business knowledge is crucial as it is the biggest influencer of incubator performance...”</p> <p>“...possession of traits such as being self driven, self-directed and willing to learn from experts’ collaboration, sourcing finance, expertise and infrastructure advertising.”</p>	<ul style="list-style-type: none"> • Concept mapping • Concept fundamentals • Conceptualisation • Knowledge essentials • Entrepreneurial traits 	<ul style="list-style-type: none"> • Intellectual essentials • Ideation • Value proposition 	<p>Incubator Prerequisites</p>
<p>“The incubation landscape in South Africa is at a development stage compared to the international incubators. The SA incubators are busy emulating what other international incubators are doing without them coming up with their own way of incubating.”</p> <p>“...incubation programme in South Africa is less popular when compared to other countries in BRICS.”</p> <p>“Most of the SMEs are not aware of incubation programme support. The reason is that most of the community members are not entrepreneurs and prefer being employed than starting their own business” “...incubation programme needs to be centrally administered and controlled.”</p>	<ul style="list-style-type: none"> • Positioning • Analysis of business environment • Sector specification • Identification of target SMEs/incubatees • Government support 	<ul style="list-style-type: none"> • Situational/ environmental interpretation • Identification of incubation opportunity 	<p>Situational analysis</p>
<p>“In our area we visit the community and make presentations of our services. Thereafter, people use of services and offerings.”</p>	<ul style="list-style-type: none"> • Marketing • Outreach strategy • SME selection criteria 	<ul style="list-style-type: none"> • Network building • Incubation strategy 	<p>Operational processes/</p>

<p>“Establishing goals and strategies, policies, organisation and culture, relationship contracts and arrangements, setting business processes, roles, tools, systems, objectives and measures and incentives, incubatee induction strategy and policy, incubator operational support strategy & policy, incubatee exit strategy & policy, incubatee post exit support, financial support, subject matter experts, infrastructure, relevant markets, scarce skills plan, financial stability, good governance, funding, meeting the incubatee’s expectation.”</p> <p>“...offering a one stop shop, which is training, business development support and funding under one roof...”</p>	<ul style="list-style-type: none"> • SME exit criteria • Governance structure • Legal compliance • Sustenance strategy • Revenue generation model • Define monitoring and evaluation • Launch incubation 		<p>incubation strategy</p>
<p>“The impact of our business incubation programmes are measured by the number of sustainable businesses that graduate successfully, the number of jobs created, increase in income generated and improvement in the standard of living of the community members.”</p> <p>“Surveys, sales records and jobs created.”</p> <p>“As an incubator it is my responsibility to develop incubatees. The incubatees and the incubator signs a contract before the incubation starts; it my responsibility to make sure that I develop the incubatees.”</p> <p>“Mentor feedback, monitoring of KPI’s like turnover and employment, achievement of milestones in learning programme, growth in personal entrepreneurial competencies.”</p>	<ul style="list-style-type: none"> • Success essentials • Accountability • Follow ups 	<ul style="list-style-type: none"> • Measurement of outputs 	<p>Operational outputs</p>

The sub-categories and categories were further refined into main themes through the process of axial coding, as illustrated in Figure 5.1.

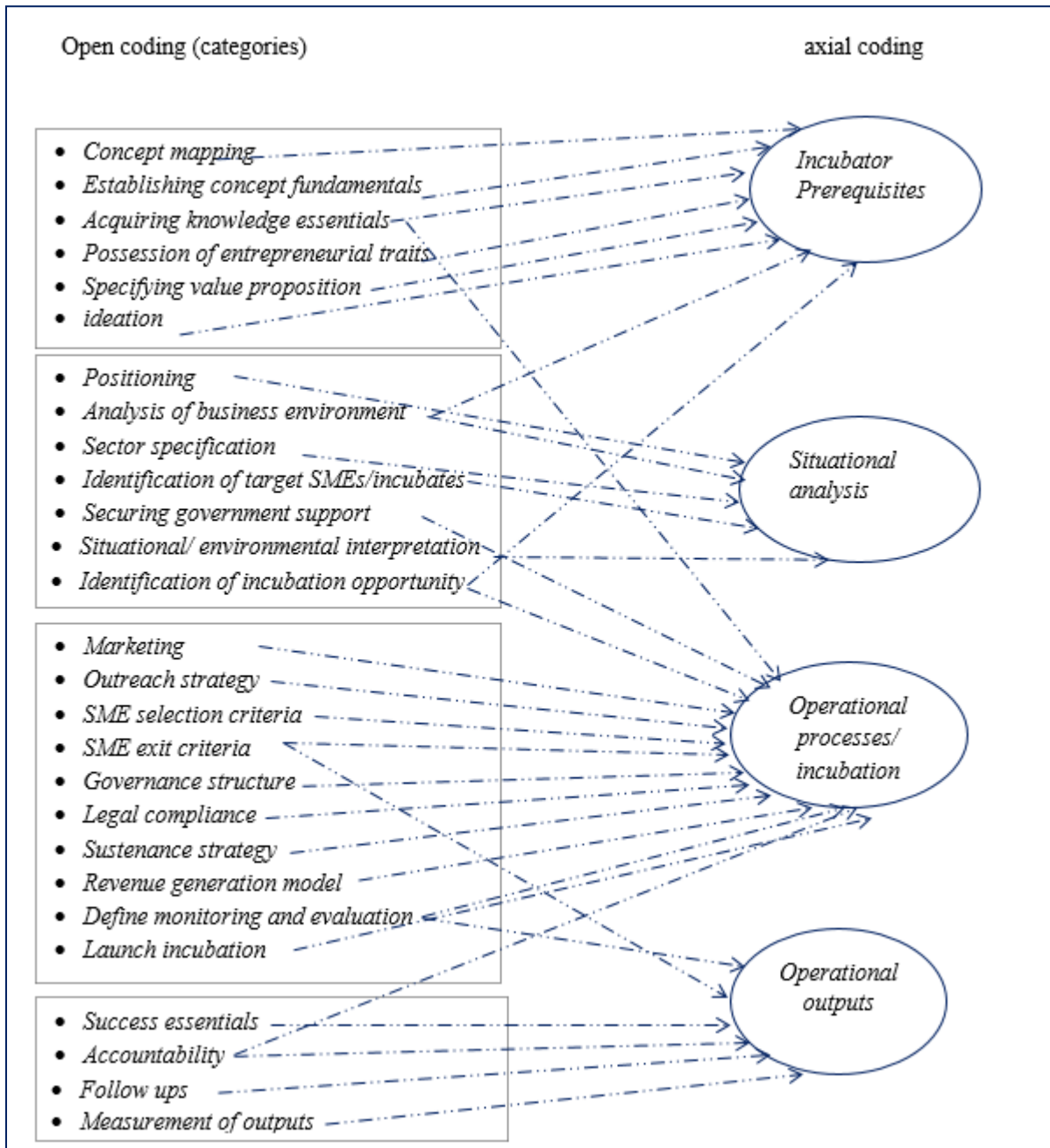


Figure 5.1: Refinement of categories into themes

Source: Author's own construct

Four themes emerged from the analysis of interviews as shown in Figure 5.1 above. These themes are incubator prerequisites, situational analysis, operational processes/incubation strategy, and operational outputs. In the following sections, each of the emergent themes are

discussed as they offer a foundation for the development of a framework for the start-up of business incubator businesses in South Africa. The theoretical underpinnings of each theme are provided after each corresponding theme.

5.4 DISCUSSION OF THEMES

5.4.1 Theme 1: Incubator pre-requisites

The empirical objectives of this study were: (1) to analyse the existing framework for the creation of incubators in South Africa; (2) to determine factor components of a business incubation framework in the start-up phase; (3) to determine resources critical to the effective start-up of business incubators in South Africa; and (4) to investigate entrepreneurial characteristics, which contribute to the successful start-up of business incubators in South Africa. When all these four objectives are considered, it becomes noticeable that this study was formulated partly to identify incubator pre-requisites. Objectives 3 and 4, in particular, demonstrate an intention to identify these pre-requisites. These pre-requisites can be understood as essential components of the incubation framework, which is the final output expected from this study. The pre-requisites of the incubation business can be seen in extracts from the interviews. These prerequisites include:

“...physical or virtual facilities that aid the development of early stage SMEs through providing temporary business support services aimed at building viable independent businesses.” [Samson]

In addition to physical or virtual facilities, respondents also indicated that the incubator ought to have certain knowledge, key competencies and the capability to provide support as can be deduced from the following excerpt:

“.....An incubator should possess facilities run by competent, experienced staff that provide the necessary support to SMMEs at a highly vulnerable stage of their journey. This support focuses on both the ‘horse’ or business model as well as the ‘jockey’, the entrepreneur. Support is inclusive of bespoke learning; coaching; infrastructure; market linkages and access to finances.” [Shelly]

Other prerequisites on incubation can also be identified from the following excerpts:

“...business knowledge is crucial as it is the biggest influencer of incubator performance. At the core of every business incubation are business development

services that aim to strengthen business systems and strategic direction of the new start-up.” [Tonny]

In addition:

“The more knowledgeable the incubator, the better they can assist entrepreneurs not to fall in traps or lose money due to cash flow problems or over investment in non-cash generating activities.” [Pulane]

Respondents also felt that:

“Experienced incubator managers who are seasoned entrepreneurs, are not always available or affordable to employ to manage the incubators. This results in artificial business development, which is more about ticking boxes than growing businesses. Selection of the correct incubatee is also problematic. Many small businesses are selected just to achieve numbers, rather than focus on their real sustainability in the market place.”

The findings of this study reveal that people’s understanding varies on what a business incubator is. However, the majority of the participants indicated that they believe a business incubator is a business intervention programme designed to assist small, medium, and micro enterprises (SMMEs) to survive early development stages and grow into sustainable businesses.

According to Muyengwa, Dube, Battle and Masinga (2014:42), incubators provide the necessary business infrastructure with managerial skills of the entrepreneurs through strategic guidance such as reducing the relatively high failure rate of start-up and emerging enterprises and physical space. Moreover, Ramluckan (2010:33) integrates focus areas, which require that incubators should increase management support for small enterprises; promote the use of quality standards by small enterprises; improve the performance and productivity of small enterprises; improve the competitiveness of small enterprises; facilitate the acquisition and transfer of technology to small enterprises; promote entrepreneurial activity and the success of identified target groups- women and the youth; and most importantly, reduce the failure rates of small enterprises.

The preceding paragraphs indicate certain key resources that are essential for the successful set up of a business incubator as shown in Table 5.3.

Table 5.3: Resources to start up an incubator

Resources to start up an incubator
<ul style="list-style-type: none">• Capable staff (committed, experienced and inspiring)• Access to information on markets• Partnerships between public and private• Access to SMME funding; Long term, sustainable funding with little or no strings attached• Coaching/Mentoring material• Exposure to national and international SMME practice

The findings are corroborated by Dubihlela and van Schalkwyk (2014:267) who conclude that availability of funding, access to technology experience and facilities, quality of entrepreneurs, and networking, are core resources in the creation of business incubators. Furthermore, these findings align with Cullen *et al.* (2014:81), who explain that a significant number of resources, such as experienced advisory services and stringent selection criteria are necessary for development of business incubation programmes. Ndabeni (2008:264) argues that some key elements in the microenvironment are critical for effective incubation. These elements are financial support, social networking, policies and legal regulations, openness of society to innovation, geographical proximity of SMMEs, and the presence of incubators. A further argument is that of links necessary in the environment. These links relate to the networking required in the microenvironment, industry, and university networks and collaboration between government and research institutions are critical within the framework (Ndabeni 2008:266). Cullen *et al.* (2014:82) are of the opinion that administration and management of the incubator is a critical factor for success, and also critical is corporate governance involving relationships between a firm's management, board, shareholders, and other stakeholders. The chief

proposition in this regard is that for effectiveness, incubators should function according to best practices of corporate governance.

5.4.2 Theme 2: Situational analysis

The second theme-situational analysis is premised on the need for the incubator to essentially conduct environmental analysis to grasp the prevailing business environment. Knowledge of the business environment gained through situational analysis informs the incubation strategy that the incubator can adopt. The criticality of situational analysis is clear when considering the following quote from a respondent:

Understanding the individual SMME needs and addressing them to ensure growth rather than using a blanket approach. Have a clear goal as to what needs to be achieved in a specific time and having the buy-in of the SMME to work towards that goal. [Marry]

The results of the survey revealed that the participants believe that business incubation is still in developmental stages in South Africa. In addition, business incubators in South Africa are not as experienced as most business incubators in developed countries. The respondents further emphasised that some entrepreneurs are not even aware of such initiatives and have not benefited from them. The following excerpt originating from the interviews highlights business incubation as a new initiative in South Africa:

...Incubation is a very new concept in South Africa compared to the international. However, because South Africa is a very developing state is easy for us to copy all working incubation model from different countries and come with the one that will best suits our country. [Bongile]

Considering the preceding discussions from this section, the role of the government in setting economic policy and influencing the business environment of a nation becomes pertinent. This is consistent with Ndabeni (2008:259) who commented that most economic policies of both developed and developing nations entail the promotion of SMMEs. It can be posited that a framework for incubation in any country has to emphasise the primary role of government policies and regulations.

If these results are put into perspective, one can extrapolate that it is essential for incubators to prioritise awareness of their incubator programmes and the benefits they provide. As such,

business incubators advertise their services on their websites, community newspapers, and community radio stations. Some state that they also visit different communities to present their services to entrepreneurs. Marimuthu and Lakha (2015:85) found that incubator management should focus more on innovation and research and development as it contributes to the technology economy.

Situational analysis provides information that becomes the basis for setting up an incubation framework. The argument is that before the incubator can start operating, a situational analysis is important. With regard to the situation in South Africa, incubation is lagging:

...behind because the concept is not yet entrenched and there is a lack of resources to develop the concept to best international practises. [Marry]

In addition:

...International incubators are stronger than SA incubators due to the fact that they have been in existence for a much longer time. [Tonny]

When considering these excerpts, the significance of situational analysis in starting an incubation business is critical because:

... we are woefully behind countries like Brazil in number and behind First World countries like France in terms of relevance and fit. [Shelly]

Therefore:

...it depend on what works in Africa, high growth companies, success stories, employees move to middle class not business owners, in SA focus on jobs creation, small development. International focus on high growth not high tech companies. We should have an incubator model that produce successful entrepreneurs. [Sanele]

Masutha and Rogerson (2014b:141) posit that business incubators are a recent phenomenon in South Africa and that business incubation has been adopted as one vehicle for promoting the SMME economy. Thus, these authors outline the importance of developing many incubators to minimise the failure rate of small businesses. Dubihlela and van Schalkwyk (2014:265) demonstrate that in South Africa the business incubation process is a new phenomenon and it

is still evolving. This conclusion can be deduced from the following excerpts from the interviews:

Most of the SMEs in the area are not aware of incubation programme support. The reason is that most of the community members are not entrepreneurs and prefer being employed than starting their own business. In our area we visit the community and make presentations of our services. Thereafter, people make use of services and offerings. [Pulane]

Yes, we run awareness campaigns in the classes and post adverts in newspapers and strategic places around campus. [Pulane]

It can be concluded that respondents' views varied on what they consider to be an effective business incubator. Some views were common and prevailed over others. One of the most dominant views was that an effective business incubator is one that creates a supportive environment that is conducive to start-up entrepreneurs. Another leading view was that effective business incubators are those that understand the individual SMME needs and addresses them to ensure growth rather than using a blanket approach. The respondents stated that committed business incubators that understand their clients have more value in the creation of successful incubatees.

5.4.3 Theme 3: Operational processes/incubation

This study was formulated around the need to develop a framework for business incubation in South Africa. In formulating the study, the general systems theory offered an approach that underpinned the derivation of the framework. The systems view, as already shown in preceding chapters, interprets phenomena in terms of inputs, processes, and outputs. Theme 3 therefore focuses on the operations of incubators or the incubation strategy. Respondents provided information on the major processes that inform a successful incubation business. Four basic processes which could be essential are:

(i) Pre-incubation activities, (ii) selection and business development, (iii) business growth, and (iv) graduation of incubatees. [Oscar]

Various views were provided by respondents and it was necessary to categorise them into themes. Three views from three respondents are stated below to demonstrate the depth of information provided on incubation processes:

The framework will cover SMME selection processes; measuring growth/impact; contracts or administrative documents for enrolment, use of equipment/space; training/mentoring programme; funding; templates. [Pulane]

...incubation processes include: Incubatee Induction Strategy & Policy, Incubatee Operational Support Strategy & Policy, Incubatee Exit Strategy & Policy, Incubatee Post Exit Support Strategy, Finance, Subject matter experts, Infrastructure, relevant markets, scarce skills plan... [Khulile]

A condensed perspective of the processes involved in incubation can be offered as follows:

...an effective incubator ensures success by: establishing goals and strategies, policies, organisation and culture, developing and processing relationship contracts and arrangements, setting business processes, roles, tools, systems, objectives and measures and rolling out incentives, developing incubatee induction strategy and policy, incubator operational support strategy & policy, establishing incubatee exit strategy & policy, ensuring incubatee post exit support, financial support, linking with subject matter experts, providing infrastructure, establishing relevant markets, formulating a scarce skills plan, ensuring financial stability, good governance, funding and meeting the incubatee's expectations. [Marry, Khulile, Tonny]

In support of the above components, various researchers mention numerous factor components that make up an incubator such as stringent selection criteria; availability of funding; access to science and technology expertise and facilities; comprehensive business plan; quality of entrepreneurs; stakeholder support; competent and motivated management; financial sustainability; experienced advisory board; and networking and supportive government policies (Buys & Mbewana 2007:356; Diedericks 2015:84; Dubihlela & van Schalkwyk 2014:267; Lose *et al.* 2016:137).

All the respondents agreed that the development of an incubator model is extremely important because it assists incubators in servicing their incubatees effectively and efficiently. The respondents indicated that business incubators look at different approaches and adopt the best model, which will result in positive incubation process outcomes. Gozali, Masrom, Zagloel and Haron (2016:1086) posit that a model explains the variance through a number of independent success factors, namely mentoring and networking, shared services, funding and support, incubator governance, tenant entry and exit criteria, and facilities and location. Therefore, a business model allows an incubator to follow a successful business intervention process and required factor components. Sithole and Rugimbana (2014:643) outline the general systems theory with major elements of incubation such as inputs—consisting of stakeholders and

management resources, processes—consisting of combined inputs with various value services, and output—involving successful incubatee graduates with job creation and wealth creation.

The findings reveal that building partnerships with several stakeholders (private enterprise, communities, and government), actively seeking different sources of funding for sustainability, and requiring incubatees to pay for certain services, is critical in sustaining a business incubator. Ndabeni (2008:264) and Jamil, Ismail and Mahmood (2015:156) found that a significant proportion of business incubators internationally are backed by universities and government in order to maintain sustainability.

5.4.4 Theme 4: Operational outputs

The need for monitoring, evaluation, and assessing operations also emerged as a key element in the operations of incubators. This need became the mainstay for the fourth theme in establishing an incubator framework. When the responses from the participants are considered, it is clear that incubators have a broad spectrum of methods for measuring their outputs. The following excerpts show methods for determining the operational outputs and consequently informs the outputs of an incubator programme:

We do a needs analysis and then draw up an action plan with measurable short term goals. We use these SMART goals to measure progress of the SMME with resultant impact. [Pulane]

There are not really any follow up measures in place. Often small businesses fail the moment they leave the incubator due to several factors... In a previous project we achieved great impact, but now 2 years later, almost 20 percent of those who participated have closed their doors. [Marry]

The impact of our business incubation programmes are measured by the number of sustainable businesses that graduate successfully, the number of jobs created, increase in income generated and improvement in the standard of living of the community members. [Tonny]

...an incubator ensures compliance to the variance industries, market for viable product, turnover in terms of business, KPIs outlined... [Tonny]

The results show that the majority of the business incubators measure their impact on SMEs by the number of sustainable businesses that graduate successfully.

Table 5.4 lists the dominant responses provided by the respondents.

Table 5.4: Business incubator measures of impact on clients

How business incubators measure their impact on clients
<ul style="list-style-type: none">• Growth in personal entrepreneurial competencies.• Achievement of milestones in learning programme.• Employment creation.• Increase in income generated.

Ramluckan (2010:29) concurs that SEDA incubators are measured by but not limited to key performance indicators (KPIs) such as number of enterprises and jobs created, annual growth rates of enterprises, number of graduates/graduation rate percentage of tenants leaving incubators each year and revenues (income and sales) generated by incubated and graduated firms. According to Ramluckan (2010:30), criteria for an effective incubator include:

- Number of admissions leading to start-ups;
- Cost per start-up enterprise;
- Length of time required to establish an incubator;
- Start up time (that is the length of time required to start up a new business);
- Occupancy rate (percentage of incubator's space let to firms);
- Percentage of enterprises using incubator services;
- Employment created per net dollar of subsidy;
- Incubator turnover (average time of firms in the incubator and the number of firms entering and leaving the incubator);
- Financial leverage (ratio of public to private sector funding); and
- Taxes and other contributions by tenants and graduates per net dollar of subsidy.

Thus effectiveness is a measure of the goals and impacts of an incubator and sustainability (Diedericks 2015:117; Muyengwa *et al.* 2014:42; Ramluckan 2010:30).

A follow-up question was asked to find out how business incubators rate the performance of incubatees and if they would regard themselves as successful based on the incubatees' performance. The business incubators indicated that they have follow-up mechanisms in place

to measure the rate of their incubatees such as a graduating tracking tool. They stated that it is too early for them to claim success as the majority of them were established less than three years ago. However, Cullen *et al.* (2014:85) indicate that respondents were not satisfied with the quality of service that they received from an incubator programme after graduation.

A section in the interview guide sought to find out if the business incubators get any complaints from their incubatees and if so, the type of complaints they receive. Over 90 percent of the respondents indicated that they have not received any complaints from their incubatees. This could be because most of the respondents are still new in the incubation space. The few that did receive complaints indicated that incubatees usually complain about financial assistance. Business incubators are a significant tool in promoting the development of small firms and have proved effective in many parts of the world (Buys & Mbewana 2007:356).

5.5 SUMMARY OF FINDINGS FROM THE QUALITATIVE STUDY

Based on the discussions in this chapter, the following can be highlighted in summary:

- A model for the start up and operation of a business incubation programme should begin with making available certain key prerequisites, which are intellectual, infrastructural, social, network-based, financial, knowledge-based, personal traits, government support, and managerial competencies.
- The model should make provision for a situational analysis, which ensures the study of the existing environmental conditions, challenges, opportunities, threats and capabilities. The pre-incubation phase should entail identification of possible markets, sector studies, and needs analysis and establish the kind of assistance and support required by prospective incubatees in a particular area.
- Essential operational processes in incubation include recruitment policy development, selection criteria, operation strategy formulation, mentoring, training, funding, coaching, exit policy determination, setting governance structures, networking and related activities.
- Key operational outputs of incubation include successful graduates, good performance feedback from incubatees, sustained growth of both the incubator and the incubatees.

- Government support is a key element in setting up incubation programmes. It provides the environment, which could either promote incubators or inhibit their performance through an indifferent approach, or setting up a legal framework that does not promote incubation.

5.6 CONCLUSION

Premised on the need to set up a foundation for the development of a framework for business incubation in South Africa, and using qualitative data obtained from interviews, this chapter provides key themes that emerged from the data as a basis for a possible framework. The chapter considers excerpts from the interviews to derive the four themes which are discussed in this chapter.

The following chapter, Chapter 6, will advance this study by considering the results from the quantitative analysis of the questionnaire attached as Annexure G.

The conclusions of the full study and the associated output stem from the findings in the present chapter, Chapter 5, and the following chapter, Chapter 6.

CHAPTER 6

ANALYSIS AND INTERPRETATION OF QUANTITATIVE DATA

6.1 INTRODUCTION

The previous chapter discussed the qualitative analysis and results of the data, including the practical steps involved as outlined in the preceding chapter. This chapter focuses on the quantitative data presentation and discussion of findings. The findings will further enable the researcher to conclude on the research topic and suggest areas for further research. One hundred and twenty-one participants were drawn from participants who completed self-administered questionnaires. The primary purpose of this study was to develop a framework for the creation of business incubators in South Africa. The findings are presented in the form of graphs, tables, and pie charts.

6.2 RESULTS OF THE PILOT STUDY

Following the development of the questionnaire, a pilot study was conducted to assess the feasibility of conducting the study, and to test the appropriateness of the questionnaire and the adequacy of the research methodology. After feedback from the supervisor, suggestions were implemented and adjustments were made, and the revised questionnaire was pre-tested on a small scale. The pilot study was conducted by administering the questionnaire to a convenience sample of 40 respondents from the target population and the questionnaire was distributed in the first week of March 2018. The questionnaire was assessed for consistency, and four inconsistent questions were modified with corrections. Suggestions and recommendations were made in four sections and minor changes were made pertaining to word choice and language rephrasing. In addition, as recommended by Asoba (2014:53) and Bergman (2008:57), the output of the pilot study was examined by the researcher and supervisors. The purpose was to assess the structure as well as the reliability and the measurement instrument was refined to reflect the context of South African business incubators.

6.3 RESULTS OF THE MAIN STUDY

6.3.1 Demographic details of respondents (see Section A of questionnaire)

6.3.1.1 Gender

Figure 6.1 is a graphical representation of the gender distribution of the sample. Males constitute 60.3 percent (n=73) and females constitute 39.7 percent (n=48) of the sample.

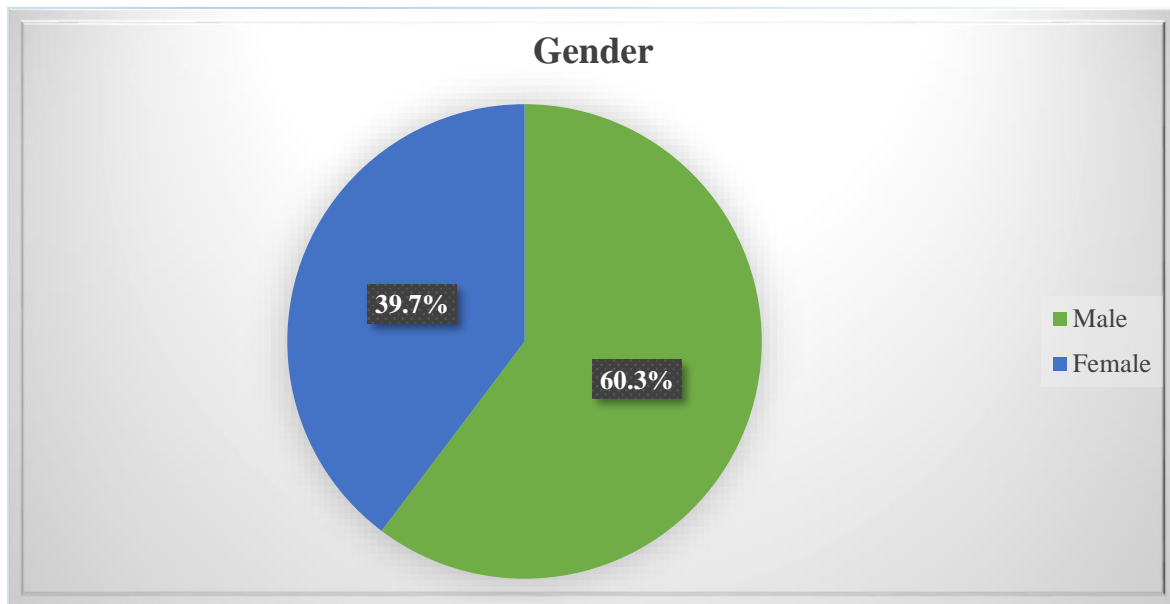


Figure 6.1: Gender of respondents

6.3.1.2 Age category

Figure 6.2 illustrates the age categories and distribution of respondents within each category. The majority (n=51: 42.1%) of the sample fell within the range of 26–35 years. The 36–45 age range comprised 35.5 percent (n=43) of the sample, while a smaller percentage (n=27: 22.3%) were 45 years and above.

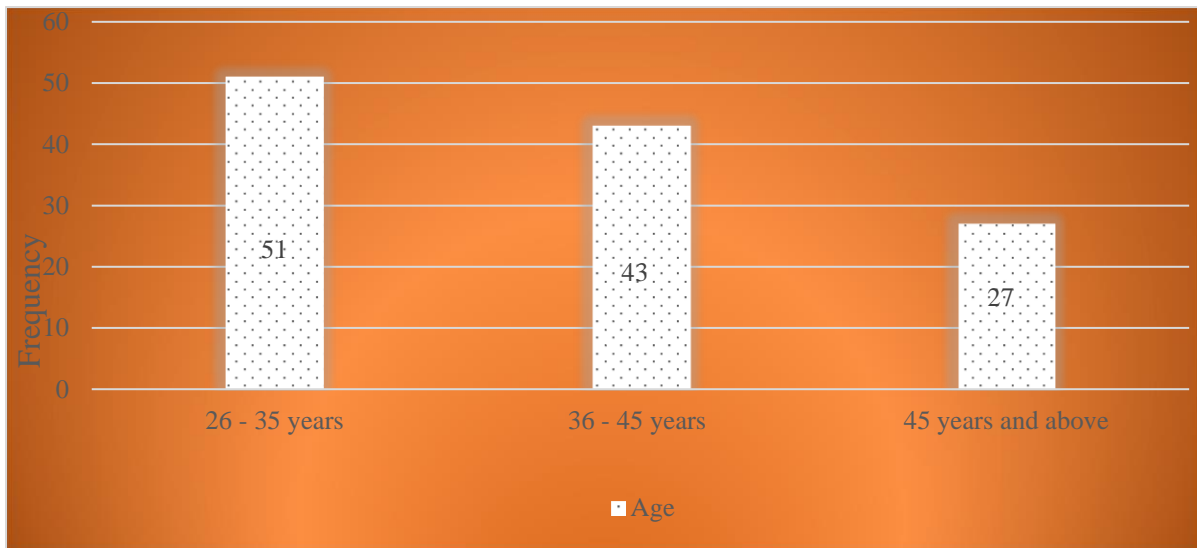


Figure 6.2: Age of respondents

6.3.1.3 Highest qualification

Figure 6.3 illustrates the respondents' highest academic qualifications. The results indicate that the majority of 62.8 percent (n=76) had a postgraduate degree, while 21.5 percent (n=26) were in possession of a diploma and 15.7 percent (n=19) had an undergraduate qualification.

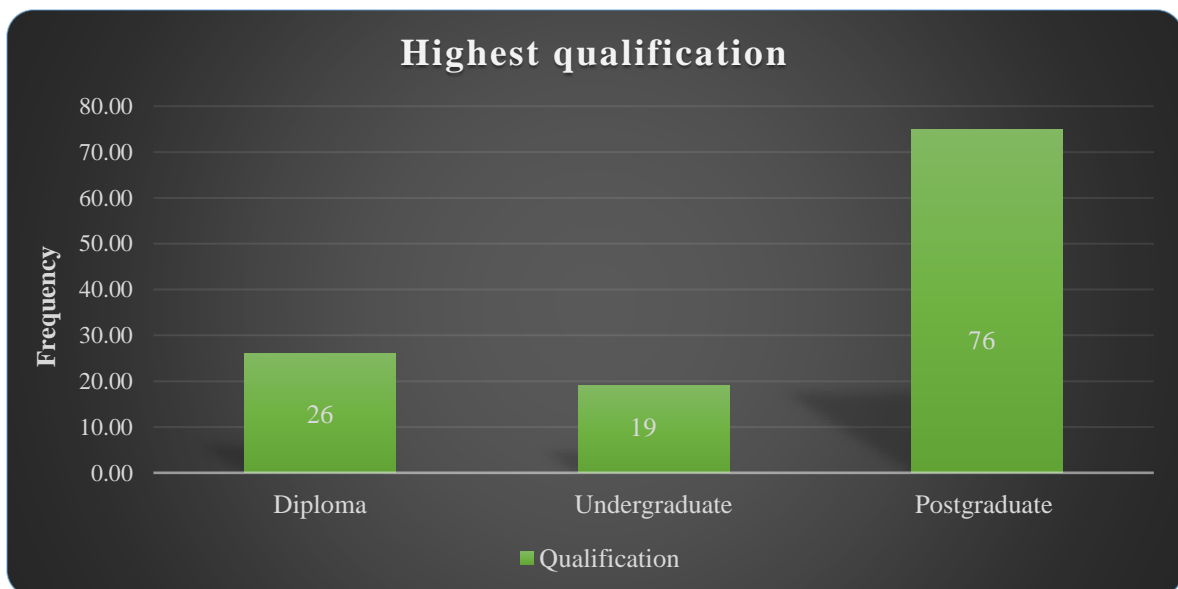


Figure 6.3: Highest qualification

6.3.1.4 Race

Figure 6.4 depicts the racial distribution of business developers, incubator managers, and specialists. Respondents were grouped into four categories, namely African, Coloured, Indian, and White.

The majority of respondents (n=78: 64.5%) were African. The results further revealed that 14.0 percent (n=17) of the respondents were Coloured, while Indian respondents made up 11.6 percent (n=14), and White respondents comprised 9.9 percent (n=12).

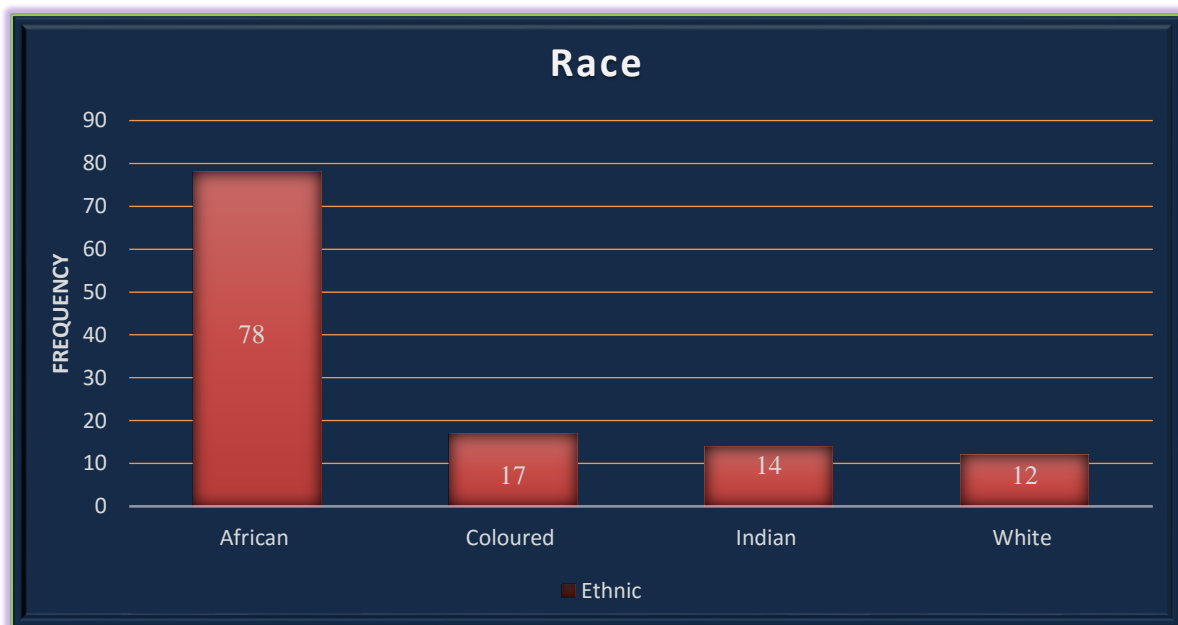


Figure 6.4: Racial distribution

6.3.1.5 Position in the organisation

Figure 6.5 illustrates the distribution of the sample according to position in the organisation.

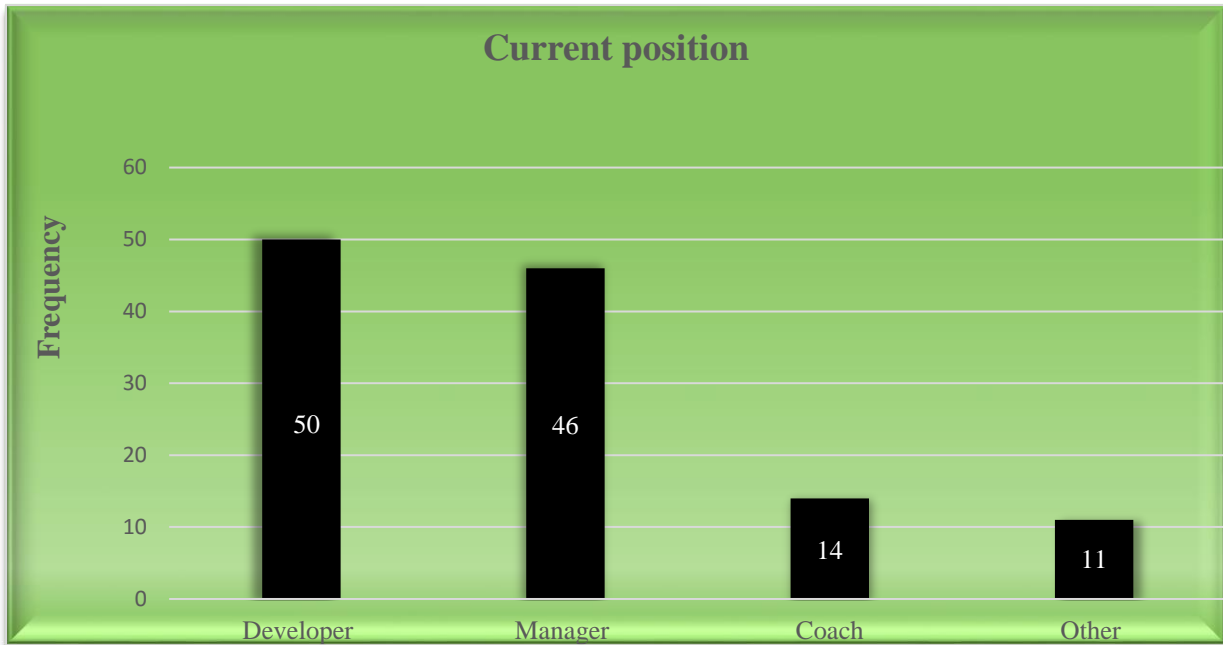


Figure 6.5: Position in the organisation

As shown in Figure 6.5, there were 50 business developers (41.3%), 46 incubation managers (38%), 14 business coaches (11.6%) and 11 individuals drawn from other business incubation units.

6.3.1.6 Experience in the industry

The business developers, business incubator managers, and specialists were asked about their length of service in the organisation. The categories were between 1 and 2 years, between 2 and 3 years, between 3 and 9 years, and 10 years and above. The results show that the majority (n=51: 42.1%) of respondents in this study had served the organisation between 3 to 9 years. Approximately 36.4 percent (n=44) of the respondents had been with the organisation between 2 to 3 years, while 14.9 percent (n=18) had served the organisation for 10 years or more. Approximately 6.6 percent (n=8) of the respondents had a length of service of between 1 to 2 years.

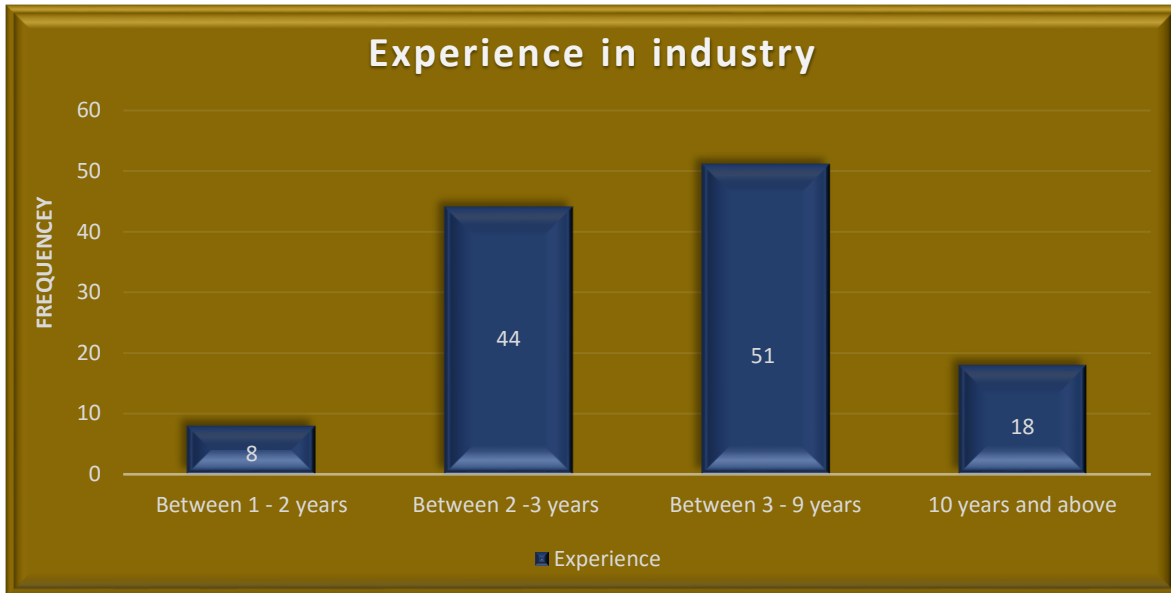


Figure 6.6: Experience in the industry

6.4 EXPLORATORY FACTOR ANALYSIS (EFA)

Exploratory Factor Analysis (EFA) is a multivariate statistical procedure that has many uses, such as reducing a large number of variables into a smaller set, it establishes underlying dimensions between measured variables and latent constructs, thereby allowing the formation and refinement of theory, and it provides construct validity evidence of self-reported scales (Williams, Onsman & Brown 2010:2). Hence, in line with principal component analysis, eigenvalues, scree plot and percentage of variance were used to extract the factors. It is considered the method of choice for interpreting self-reported questionnaires. To test the appropriateness of factor analysis, formal statistics, such as Kaiser-Meyer-Olkin's (KMO) measure of sampling adequacy and Bartlett's test of sphericity were used. Furthermore, exploratory factor analysis was conducted on the data in section B to section D of the questionnaire. The respective methods used are discussed in the sections that follow.

6.4.1 The Kaiser-Meyer-Olkin (KMO) test

Williams, Onsman, and Brown (2010:5) concur that several tests should be used to assess the suitability of the respondent data for factor analysis prior to the extraction of the factors, as these tests include the KMO measure of sampling adequacy. Thus, the values of the KMO index range from 0 to 1, with 0.50 considered suitable for factor analysis. The Kaiser-Meyer-

Olkin measure of sampling adequacy was 0.738 for the incubator prerequisites scale and 0.785 for operational processes/incubation scale. The factor analysis procedure was therefore deemed to be appropriate since all KMO values were above 0.5, which is the minimum indicated by Kaiser (1970:401).

6.4.2 The Bartlett’s test of sphericity

The Bartlett’s test of sphericity can be used to test the null hypothesis in that the correlation matrix has identity matrix variables that are uncorrelated in the population. The approximate Chi-Square was 1958.878 (df=496) for the incubator prerequisites scale, and 216.782 (df=15) for factors contributing to the operational outcomes scale. Furthermore, it is important to note that these test results were all significant at an observed significance level of 0.000, discarding the hypothesis that the population correlation matrix is an identity matrix, that is, with zero correlations. Both the Kaiser-Mayer Olkin and Bartlett’s test of sphericity are illustrated in Table 6.1. The Bartlett’s and KMO test values were above the recommended threshold and the findings show that EFA could be performed on the data.

Table 6.1: The KMO measure and Bartlett’s test results

CONSTRUCTS	KMO MEASURE	BARTLETT’S TEST		
		Approximate Chi-Square	Degrees of freedom	Significance level
Incubator Prerequisites	0.738	1958.878	496	0.000
Operational Outcomes	0.745	396.198	21	0.000

The next sections show the results of the exploratory factor analysis procedure to which the constructs were subjected.

6.4.3 Exploratory factor analysis for the incubator prerequisites scale

The factor analysis was suitable for the data set as all factor loading values were above or equal to 0.50. The percentage of variance explained, and measure guided the extraction of factors. The factor extraction procedure formed a three-factor structure. Table 6.2 shows the results of the rotated factor solution of the incubator prerequisites scale. Table 6.2 presents eight items from the factor analysis after they loaded insignificantly (<0.50) on the factors rotated solution emerging in the EFA. The factor extraction procedure produced an eight-factor structure.

Table 6.2: Eight-factor rotated structure for the incubator prerequisites scale

Item Code and Description	Factor							
	1	2	3	4	5	6	7	8
(C2) Characteristics of incubatees	.684	-.081	.145	-.035	.339	.006	.061	.145
(C3) Identification of incubation opportunity	.545	-.127	.243	.164	-.095	.422	.119	.339
(C4) Sector specification	.710	-.159	.275	.313	-.152	-.014	.093	.099
(C5) Possible impact of technology	.733	-.097	.212	.111	.074	.208	.058	-.008
(C7) Securing government support	.640	.070	-.031	.011	.103	.210	.260	-.068
(C8) Identification of networks and relationships for success	.484	.001	.362	.125	-.197	.329	.212	.098
(G1) Sufficient working capital	-.111	.648	-.030	-.216	.384	-.090	-.060	-.231
(G2) Experienced managers/developers	-.108	.743	.007	-.212	.329	-.101	-.072	-.185
(G5) Salaries and benefits to staff	.204	.669	.011	.033	-.003	.028	-.034	.283
(G6) Flexibility and committed managers	.002	.759	-.137	-.011	-.027	-.142	-.121	.113
(G7) Sustainable, efficient business operation	-.157	.739	.092	.044	.062	.154	.073	-.135
(G8) Professional development activities/learning	-.090	.619	.138	.177	-.010	.182	.211	.029
(D5) Governance structure	.186	.057	.789	.036	.012	-.005	.060	.024
(D6) Legal compliance	.194	.044	.836	-.054	-.047	-.004	.059	.100
(D7) Sustenance strategy	.161	-.041	.726	.040	.044	.313	-.078	.054
(D8) Revenue generation model	.013	-.017	.737	-.005	.169	.274	.020	.019
(J2) Support from financial institutions	-.061	-.080	-.104	.717	-.174	.278	.069	.151

Table 6.2 continued

(J3) Office space for incubates	.243	-.049	.011	.780	-.005	-.227	.150	.073
(J4) Access to technology and business facilities	.183	.171	.094	.835	-.030	-.050	.063	-.051
(J5) Entrepreneurial skills	.006	-.101	-.015	.649	.220	.093	-.304	.176
(B3) Entrepreneurial focus	-.212	.293	.151	.234	.549	-.026	.468	.063
(B8) Value proposition	.051	.239	.059	-.058	.775	.032	.187	.168
(B9) Possession of critical knowledge	.155	.036	.017	-.010	.832	.113	.133	.088
(B7) Impact of board of directors	.136	-.131	.117	-.012	-.044	.524	.469	.178
(C1) Identification of market segment/positioning	.216	.016	.155	.048	.341	.721	.100	.003
(C6) Analysis of business environment	.496	.122	.245	.047	-.154	.578	-.015	.141
(D1) Incubation strategy formation and development	.207	.129	.395	-.089	.057	.602	.047	.184
(B4) Possession of industry expertise	.182	.072	-.056	-.014	.305	.154	.666	.085
(B5) Industry experts/coaches	.158	-.054	.015	-.008	.101	.014	.806	.109
(B6) Selection and ideation	.348	-.047	.154	.168	.129	.082	.495	.358
(B1) Availability of funding	.005	-.011	.093	.065	.100	.120	.171	.879
(B2) Infrastructure and access to technology	.136	.029	.073	.156	.139	.104	.116	.827
Eigenvalue	7.046	4.017	2.684	2.304	1.593	1.509	1.253	1.188
Reliability	.827	.803	.824	.767	.791	.739	.719	.842
Total variance explained	22.019	12.555	8.387	7.199	4.979	4.716	3.917	3.713
Cumulative percentage variance explained	22.019	34.573	42.960	50.159	55.138	59.853	63.770	67.483

According to Sithole and Rugimbana (2014:643), business incubators operate in terms of input, process and output. The model has three major elements of incubation (1) Input: consists of finance, shareholder involvement and management resources; (2) Process: consists mainly of

various inputs through incubation space and variety of services; (3) Output: successful enterprises graduate with positive wealth creation and jobs.

The next section presents the naming and interpretation of each factor relating to the business incubators' prerequisites.

6.4.3.1 *The naming and interpretation of factors*

The first factor, **situational analysis** (eigenvalue=7.046), explained 22.019 percent of the total variance. This factor consists of 6 items (C2, C3, C4, C5, C7 and C8) that relate to business incubator activities contributing to small enterprise development. Situational analysis emphasises the need for the incubator to essentially conduct an environmental analysis to grasp the situation in the prevailing business environment. Hence, knowledge of the business environment gained through situational analysis informs the incubator of the best business incubation strategy to adopt. The business incubator can be a virtual or physical space, where incubatees have a supportive environment to assist them to move faster from one phase to the next through expert guidance and sometimes shared services. Dubihlela and van Schalkwyk (2014:267) found that availability of funding, access to possible impact of technology and facilities, characteristics of incubatees and identification of networks and relationships were core resources in the creation of business incubators. Government support and private institutions were established specifically to assist new businesses during their early stages, hence, to a great extent, business incubators improve/increase the probability of the success rate among start-ups.

The second factor, **key requirements for an incubator** (eigenvalue=4.017), explained 12.555 percent of the total variance and comprised six items (G1, G2, G5, G6, G7 and G8). The factor sought to determine what key resources business incubators perceive as critical to the creation of the incubator in developing economies, particularly in South Africa. Tulchin and Shortall (2008:3) identified key requirements for the successful operation of business incubation as sufficient working capital, experienced managers, professional development activities, and critical client screening. Furthermore, Ndabeni (2008:264) and Jamil, Ismail and Mahmood (2015:156) found that a significant proportion of business incubators worldwide are backed by universities and governments in order to maintain sustainability. Thus, these results reveal that building solid partnerships with several stakeholders (such as private entities, communities,

government), actively seeking different sources of funding for sustainability, and requiring incubatees to pay for certain services, is critical in sustaining a business incubator. Business incubation programmes are a significant instrument in promoting the development of small businesses and have proved effective in many parts of the world (Buys & Mbewana 2007:256). Thus, government support is a key element in setting up an incubation programme in South Africa.

The third factor, **operational processes/incubation** (eigenvalue=2.684), explained 8.387 percent of the total variance. Four items (D5, D6, D7 and D8) loaded onto this factor. In formulating the study, the general systems theory offered an approach that leads to the framework. According to Buys and Mbewana (2007:358), the key success of business incubators depends largely on the quality and experience of the management teams appointed to operate the organisation. Hence, top management should have a business background, have entrepreneurial skills, possess leadership and organisational skills, and be well-networked in the community at large (Lose *et al.* 2016:135). Furthermore, the management team should be given measurable key objectives against which the performance agreement can be monitored. In addition, incentives should be offered to managers to encourage and reward outstanding performance. Business incubators must recruit and appropriately compensate management capable of achieving the mission of the incubator (Buys & Mbewana 2007:358; Dubihlela & van Schalkwyk 2014:267). Therefore, a condensed perspective of the processes involved in incubation can be offered by providing the established goals and sustenance strategies, policies, organisation and culture, developing and processing relationship contracts and arrangements, setting business processes, roles, tools, systems, objectives and measures, revenue generation model and rolling out incentives.

The fourth factor, **factors contributing to the success of incubators** (eigenvalue=2.304), explained 7.199 percent of the total variance, and consists of four (J2, J3, J4 and J5) variables relating to the success of incubators. An incubation programme is a facility managed by competent, experienced staff that provide the necessary support to SMMEs at a highly vulnerable stage of their journey. This support focuses on both the “horse” and business model as well as the “jockey”, the entrepreneur. The support is inclusive of bespoke learning, coaching, infrastructure, market linkages and access to finances (Diedericks 2015:88). The key contributing factors to a business incubator are physical space where entrepreneurs have a

supportive environment to assist them to move faster from one phase to the next through expert guidance and sometimes shared services, with access to technology and business facilities (Ndabeni 2008:264; Lose & Tengeh 2016:371). It can be said that both sound business knowledge and experience would influence the performance of business incubators. Therefore, the management experience contributes more than just knowledge (theory) and incubation specialists have a greater understanding of the programme and provide better support and advice to incubatees. Sithole and Rugimbana (2014:642) concur that business incubators with entrepreneurial skills help emerging small businesses to survive and grow during the start-up period when they are most vulnerable.

The fifth factor, **intellective capability** (eigenvalue=1.593), explained 4.979 percent of the total variance. Three items (B3, B8 and B9) intended to address the incubator necessities. This factor consists of three items, being entrepreneurial focus, value proposition, and possession of critical knowledge. Incubation is a very new concept in South Africa when compared to the rest of the world. The impact of business incubation is shaping the entrepreneurial mindset and entrepreneurial self-efficacy among incubatees (Tilana 2015:1). Entrepreneurship is the most important solution to poverty, low economic growth and high unemployment rates in both developed and developing countries. Parsons (2004), as cited by Choto et al. (2014:1) argues that over the past centuries the South African economy has grown and developed into a much stronger, wealthier, and fairer economy. Hence, most entities agree that a business incubation programme is an economic and social programme which provides intensive support to start-up companies, and coaches them to start and accelerate their development and success through business assistance programmes (Lose 2016). The main objective is to establish successful start-up companies that will leave the incubators financially viable and freestanding. In addition, the graduate companies' outcomes are technology transfer, commercialisation of new technologies and wealth creation for economies.

The sixth factor, **administrative capabilities** (eigenvalue=1.509), explained 4.716 percent of the total variance. This factor consists of four items (B7, C1, C6 and D1) measuring overall response implementation of administrative activities. The impact of board of directors, identification of market segment/positioning, analysis of business environment, incubation strategy formation and development, embrace the administrative capabilities of business incubation. In South Africa, business incubators need to appoint effective boards of directors

committed to the incubator's mission (Buys & Mbewana 2007:358). Most incubators in South Africa and Africa are centred on technology hubs, which makes incubation weak in the sense that technology hubs are mainly located in major capital cities and towns that have the infrastructure to cater for urban entrepreneurs. Tengeh and Choto (2015:154) are of the view that the success of an incubation programme is dependent on the quality of entrepreneurs being incubated and the market positioning of an incubator. Entrepreneurs must have a desire to succeed, be prepared to take calculated risks and a willingness to learn. Thus, in order for entrepreneurial ventures to contribute fully to the economy, there is a need for support from these business incubators

The seventh factor, **market forces engineering** (eigenvalue=1.253), explained 3.917 percent of the total variance. The factor comprised three items (B4, B5 and B6) that are manifestations of inputs between incubators and incubatees that have a positive effect on the market orientation of the business. There are three main market forces engineering in incubation, namely possession of industry expertise, industry experts/coaches, and selection and ideation. Smit, Cronje, Brevis and Vrba (2007:17) cite the following critical interpersonal skills affirming the existence of incubation:

- The ability to work as team;
- Leading people;
- Effective communication with useful information and better service;
- Problem solving;
- Motivating people;
- Understanding people's behaviour; and
- Resolving conflicts.

Therefore, the intervention addresses mentorship for aspiring young entrepreneurs, assisting young entrepreneurs into organising themselves into co-operatives and providing technical knowledge as well as financial support to young entrepreneurs.

The eighth factor, **strategic resourcing** (eigenvalue=1.188), explained 3.713 percent of the total variance. This factor consists of two items (B1 and B2) measuring the business incubators' strategic roles. The conventional approach to financing a business incubation model is that of

the state-owned incubation model, where a government agency funds and monitors a business incubator (Tengeh & Choto 2016:153). The Small Enterprise Development Agency (SEDA) has identified a need to create more funding and a platform where everything related to technology business incubation can be deliberated, shared, explored and better serviced (SEDA 2016:1; Lose, Maziriri & Madinga 2016:18). Thus, business incubation has been identified as a powerful tool to support and sustain small businesses and boost the economy. As a result, SEDA and the Department of Small Business Development (DSBD) hosted the inaugural South African Business Incubation Conference (SABIC) whose main agenda discussed incubation as a vehicle for economic prosperity. Moreover, infrastructure and advanced access to technology is one of the strategic resources an incubator should have to improve incubation services.

6.4.4 Exploratory factor analysis for the operational outcomes scale

The factor extraction through principal component analysis for the incubator operational outcomes scale is reported on in Table 6.3 and shows that two factors were extracted. One item (E1) was discarded because it had a factor loading of less than 0.5.

Table 6.3: Two-factor rotated structure for the incubator operational outcomes scale

ITEM CODE	Description	Factor	
		1	2
E5	Number of incubatees graduated	.744	.399
E6	Number of jobs created	.767	.343
E7	Number of SMMEs established	.890	.013
E8	Number of clients supported	.873	.033
E2	Follow ups	.079	.814
E3	Measurement of outputs	.105	.878
E4	Financial stability/turnover generated by SMMEs	.238	.748
Eigenvalue		3.485	1.553
Reliability		0.863	0.778
Total variance explained		49.787	22.184
Cumulative percentage variance explained		49.787	71.971

Table 6.3 shows that two factors were extracted in the EFA. The two factors contributed to 71.98 percent of the variance in incubator operational outcomes. Factor 1 consisted of four items (E5, E6, E7 and E8), was labelled as **incubator performance** and contributed to 49.78 percent of the variance. Ramluckan (2010:29) concurs that SEDA business incubators are measured by key performance indicators (KPIs), such as number of enterprises and jobs created, annual growth rates of enterprises, number of graduates/graduation rate-percentage of tenants leaving incubator each year and the revenues (income and sales) generated by incubated and graduated firms. Business incubators: Sahay and Sharma (2009:94) assert that business incubators are organisations that aim to accelerate the successful development of entrepreneurial enterprises through the provision of business support in the form of resources, services and business network contacts. For entrepreneurial ventures to fully contribute to the economy, there is a need for support from these business incubators. Factor 2 consisted of three items (E2, E3 and E4), was labelled as **monitoring and evaluation** and contributed 22.18 percent of the variance. The need for monitoring, evaluation, and assessing operations also emerged as a key element in the operations of business incubators. Furthermore, it is important

to reiterate that business incubation literature suggests that turnover growth, numbers of jobs established and clients supported are generally a measure of incubation impact. However, the approach experienced difficulties because organisations had different objectives and cross-firm comparison was therefore not possible (Chirambo 2014:33). In addition, incubators normally have follow-up mechanisms in place to measure the success rate of their incubatees, such as a graduating tracking tool, growth-wheel and virtual incubation services. Incubation services normally continue for three years and after incubatees become virtual entrepreneurs. However, a study conducted by Cullen *et al.* (2014:85) reports that respondents were not satisfied with the quality of service that they received from an incubator programme after graduation.

6.5 DESCRIPTIVE STATISTICS FOR RESEARCH CONSTRUCTS

6.5.1 Situational analysis

The first factor extracted in the EFA under incubator prerequisites is situational analysis. The results of the descriptive statistics for situational analysis are presented in Table 6.4.

Table 6.4: Descriptive statistics for situational analysis

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
C2	Characteristics of incubatees	-	3 (2.5%)	20 (16.5%)	76 (62.8%)	22 (18.2%)	0.670	3.97
C3	Identification of incubation opportunity	-	-	20 (16.5%)	62 (51.2%)	39 (32.2%)	0.683	4.16
C4	Sector specification	-	1 (0.8%)	26 (21.5%)	50 (41.3%)	44 (36.4%)	0.774	4.13
C5	Possible impact of technology	-	-	16 (13.2%)	70 (57.9%)	35 (28.9%)	0.633	4.16
C7	Securing government support	-	5 (4.1%)	27 (22.3%)	58 (47.9%)	31 (25.6%)	0.805	3.95
C8	Identification of networks and relationships for success	-	-	10 (8.3%)	58 (47.9%)	53 (43.8%)	0.631	4.36
Overall scale							0.699	4.122

Table 6.4 details the results of the incubator prerequisites analysis. On item C2, which relates to the view that a business incubator situational analysis consists of characteristics of incubatees, 62.8 percent (n=76) of respondents indicated that it was extremely important, supported by a mean score of $\bar{x}=3.97$; $SD=0.670$. Also, 18.2 percent (n=22) of respondents felt it was extremely important, 16.5 percent (n=20) indicated it was moderately important and only 2.5 percent (n=3) responded that the situational analysis was merely somewhat important.

Regarding item C3, on the view that one of the incubator's situational analyses consists of identification of incubation opportunity, 51.2 percent (n=62) of respondents saw it as a very important situational analysis, and a mean score of $\bar{x}=4.16$; $SD=0.683$ further confirmed this result, which highlights the degree of importance. Moreover, 32.2 percent (n=39) regarded it as extremely important, while 16.5 percent (n=20) indicated it was moderately important. On Item C4, the majority of respondents (n=50: 41.3%) considered sector specification as very important in the business incubator, which is supported by a mean score of $\bar{x}=4.13$; $SD=0.774$. A further 36.4 percent (n=44) felt it was extremely important, 21.5 percent (n=26) saw it as moderately important and only 0.8 percent (n=1) indicated that it was somewhat important.

On the possible impact of technology in training incubatees (item C5), 57.9 percent (n=70) of respondents viewed it as very important, supported by a mean score of $\bar{x}=4.16$; $SD=0.633$. In addition, a significant 28.9 percent (n=35) felt it was extremely important, while only 13.2 percent (n=16) saw it as moderately important. The results of the analysis on securing government support for business incubators (item C7) show that a significant 49.9 percent (n=58) of respondents believe that securing government provision is very important, supported by a mean score of $\bar{x}=3.95$; $SD=0.805$. A further 25.6 percent (n=31) of the respondents indicated that securing government support is extremely important, while 22.3 percent (n=27) felt it was only moderately important and 4.1 percent (n=5) saw it as somewhat important. In terms of item C8, which relates to the view that a business incubator's situational analysis consists of identification of networks and relationships for success, 47.9 percent (n=58) of the respondents indicated that it was very important, supported by a mean score of $\bar{x}=4.36$; $SD=0.631$. In addition, 43.8 percent (n=53) of respondents saw it as extremely important and 8.3 percent (n=10) felt it was moderately important.

Knowledge of the business environment gained through situational analysis informs which incubation strategy the incubator can adopt. The results of the survey revealed that the participants believe that business incubation is still in the developmental stages, and agree that situational components enable them to reduce potential threats to the incubation process. According to Marimuthu and Lakha (2015:82), incubator management should focus more on the analysis of business environment, innovation, research and development as it contributes to the technology economy. Thus, situational analysis provides necessary information, which forms the foundation for setting up an incubation framework. Masutha and Rogerson (2014b:141) outline the importance of developing many incubators to minimise the failure rate of small businesses.

The preceding paragraphs highlight certain key situational analyses that are essential for the creation of a business incubator.

6.5.2 Key requirements for an incubator

The second factor extracted in the EFA under incubator prerequisites is key requirements for an incubator. The results of the descriptive statistics for key requirements are reported on in Table 6.5.

Table 6.5: Descriptive statistics for key requirements

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
G1	Sufficient working capital	5 (4.1%)	5 (4.1%)	19 (15.7%)	38 (31.4%)	54 (44.6%)	1.068	4.08
G2	Experienced managers/developers	4 (3.3%)	5 (4.1%)	19 (15.7%)	39 (32.2%)	54 (44.6%)	1.031	4.11
G5	Salaries and benefits to staff	-	2 (1.7%)	13 (10.7%)	64 (52.9%)	42 (34.7%)	0.694	4.21
G6	Flexibility and committed managers	1 (0.8%)	1 (0.8%)	8 (6.6%)	72 (59.5%)	39 (32.2%)	0.673	4.21
G7	Sustainable, efficient business operations	1 (0.8%)	1 (0.8%)	8 (6.6%)	70 (57.9%)	41 (33.9%)	0.680	4.23
G8	Professional development activities/learning	-	-	13 (10.7%)	67 (55.5%)	41 (33.9%)	0.629	4.23
Overall scale							0.796	4.18
G4 (Infrastructure) and G9 (Self-sufficient) were eliminated during the factor analysis.								

Table 6.5 details the results of the key requirements for an effective business incubator. For item G1, the results show that a significant proportion of respondents (n=54: 44.6%) believed that sufficient working capital was a very important requirement, supported by a mean score of \bar{x} =4.08; SD=1.068. Furthermore, 31.4 percent (n=38) of the respondents agreed that it was extremely important for an incubator to have working capital, while 15.7 percent (n=19) felt it was of moderate importance. Interestingly, 4.1 percent (n=5) indicated it was somewhat important and 4.1 percent (n=5) felt it was not an important requirement. Regarding Item G2, which relates to the view that business incubators must have experienced managers/developers, 44.6 percent (n=54) deemed it extremely important to have experienced practitioners, supported by a mean score of \bar{x} =4.11; SD=1.031, and a further 32.2 percent (n=39) considered it a very important requirement. On item G5, the majority of respondents (n=64: 52.9%) believed that salaries and benefits to staff members was a very important requirement, which is supported by a mean score of \bar{x} =4.21; SD=0.694. A further 34.4 percent (n=42) agreed that it was an extremely important requirement, 10.7 percent (n=13) of the participants considered

it to be moderately important, while only 1.7 percent (n=2) felt it was somewhat important. On the key requirement that an incubator should have flexibility and committed managers (Item G6), 59.5 percent (n=72) of respondents indicated that it was a very important requirement, supported by a mean score of $\bar{x}= 4.21$; $SD=0.673$. In addition, 32.2 percent (n=39) viewed it as an extremely important requirement, 6.6 percent (n=8) saw it as moderately important, 0.8 percent (n=1) indicated it was only somewhat important and one respondent (0.8%) stated it was not important.

Concerning the business incubator key requirement of sustainable and efficient business operations (item G7), the majority of respondents (n=70: 57.9%) agreed that sustainability is a very important requirement, confirmed by a mean score of $\bar{x}=4.23$; $SD=0.680$. A further 33.9 percent (n=41) identified it as an extremely important requirement. Some respondents (n=8: 6.6%) viewed it as moderately important while 0.8 percent (n=1) indicated it as somewhat important and 0.8 percent (n=1) considered it not important. On item G8, which relates to the key requirement of professional development activities/learning in the business incubator, 55.5 percent (n=67) indicated that it was very important requirement, supported by a mean score of $\bar{x}= 4.23$; $SD=0.629$, 33.9 percent (n=41) of respondents considered it as extremely important to the incubation framework and 10.7 percent (n=13) felt it was only moderately important.

These requirements can be understood as essential components of the incubation framework, which is the outcome expected from this study. In support of the above key requirements, Diedericks (2015:84), Hutabarat and Pandin (2014:376), and Tietz, Anholon, Cooper Ordonez and Quelhas (2015:21) mention numerous key requirements that influence the creation of business incubators, for example: stringent selection criteria, experienced managers and developers, sustainability, efficient business operations, sponsorship, strategic flexibility, innovation, sufficient working capital, monitoring of the graduated companies, professional development activities, and learning.

6.5.3 Operational processes/incubation

The third factor extracted in the EFA under incubator prerequisites is operational processes/incubation. The results of the descriptive statistics for operational processes/incubation are reported on in Table 6.6.

Table 6.6: Operational processes/incubation: descriptive statistics for incubator prerequisites

Item code	Item description	Not critical	Critical to a lesser extent	Neutral	Very critical	Highly critical	Standard deviation	Mean (\bar{x})
D5	Governance structure	-	-	6 (5.0%)	60 (49.6%)	55 (45.5%)	0.586	4.40
D6	Legal compliance	-	-	7 (5.8%)	63 (52.1%)	51 (42.1%)	0.592	4.36
D7	Sustenance strategy	-	-	10 (8.3%)	60 (49.6%)	51 (42.1%)	0.627	4.34
D8	Revenue generation model	-	-	2 (1.7%)	57 (47.1%)	62 (51.1%)	0.585	4.40
Overall scale							0.598	4.38

Table 6.6 above details the results of the analysis on the perceptions of business incubator operational processes. For item D5, the majority of respondents (n=60: 49.6%) believed that it was very critical for business incubators to have governance structure, which is supported by a mean score of \bar{x} =4.40; SD=0.586, while 45.5. percent (n=55) agreed that it was extremely critical. Only 5.0 percent (n=6) remained neutral on this point.

On the statement that a business incubator ought to be legally compliant (item D6), 52.2 percent (n=63) indicated this as a very critical component, sustained by a mean score of \bar{x} = 4.36; SD=0.592. In addition, 42.1 percent (n=51) of respondents felt it was highly critical and 5.8 percent (n=7) remained neutral. Concerning the statement about whether sustenance strategy plays an important role in the incubation process (item D7), a significant proportion of respondents (n=60: 49.6%) indicated it was a very critical operational strategy, which is confirmed by a mean score of \bar{x} =4.34; SD=0.627. Furthermore, 42.1 percent (n=51) felt it to be a highly critical factor component to have sustenance strategy in the incubator while 8.3 percent (n=10) of the respondents remained neutral. Pertaining to the analysis on the revenue generation model of business incubators' operational process (item D8), the results indicate that the majority of respondents (n=62: 51.1%) believed that a revenue generation model is highly critical, supported by a mean score of \bar{x} =4.50; SD=0.534. A further 47.1 percent (n=51)

of the respondents viewed the revenue generation model as very critical, while only 1.7 percent (n=2) were neutral.

In formulating the study, the general systems theory offered an approach that underpins the derivation of the incubation framework. Thus, the systems view, as already shown in preceding chapters, interprets phenomena in terms of inputs, processes, and outputs. Respondents provided information on the major processes that inform a successful incubation business, such as incubation strategy formation and development, governance structure, selection and exit criteria of incubatees, business training, monitoring, and evaluation. In support of the above components, Buys and Mbewana (2007:356), Diedericks (2015:84), Dubihlela and van Schalkwyk (2014:267), and Lose *et al.* (2016:137) mention numerous factor components that make up a business incubator. For example, some factor components mentioned are stringent selection criteria, availability of funding, access to science and technology expertise and facilities, revenue generation model, legal compliance, stakeholder support, competent and motivated management, financial sustainability, experienced advisory board, networking, and supportive government policies.

6.5.4 Factors contributing to the success of incubators: descriptive statistics for incubator prerequisites

The fourth factor extracted in the EFA under incubator prerequisites is factors' contribution. The results of the descriptive statistics for factors' contribution are reported on in Table 6.7.

Table 6.7: Factors contributing to the success of incubators: descriptive statistics for incubator prerequisites

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
J2	Support from financial institutions	-	-	14 11.6%	64 52.9%	43 35.5%	0.646	4.24
J3	Office space for incubatees	2 (1.7%)	1 (0.8%)	17 (14.0%)	58 (47.9%)	43 (35.5%)	0.813	4.15
J4	Access to technology and business facilities	-	1 (0.8%)	9 (7.4%)	55 (45.5%)	56 (46.3%)	0.660	4.37
J5	Entrepreneurial skills	-	1 (0.8%)	6 (5.0%)	58 (47.9%)	56 (46.3%)	0.626	4.40
Overall scale							0.686	4.29
J1 (Quality of incubatees) and J6 (Passion and commitment) were eliminated during the factor analysis.								

Table 6.7 details the results of the key factors that contribute to the success of business incubators. On item J2, support from financial institutions, a significant number of respondents (n=64: 52.9%) viewed this as a very important factor in contributing to a successful incubator, supported by a mean score of \bar{x} =4.24; SD=0.646. A further 35.5 percent (n=43) of the respondents indicated it was extremely important for an incubator to have the support of financial institutions, while 11.6 percent (n=14) felt it was of moderate importance. Regarding item J3, office space for incubatees, 47.9 percent (n=58) felt it was important to have office space for entrepreneurs in the incubation programme, supported by a mean score of \bar{x} =4.15; SD=0.813. A further 35.5 percent (n=43) viewed this item as very important, 14.0 percent (n=17) believed it was moderately important, 0.8 percent (n=1) saw it as somewhat important, and 1.7 percent (n=2) felt it was not important.

Item J4 relates to the view that one of the contributing factors to the success of an incubator is its access to technology and business facilities. A significant 46.3 percent (n=56) of respondents viewed it as an extremely important contributing factor, and a mean score of \bar{x} =4.37; SD=0.660 confirmed this result, which highlights the degree of importance. A further 45.5 percent (n=55) indicated that access to technology and business facilities is very important

to the incubator, 7.4 percent (n=9) felt it was moderately important, and only 0.8 percent (n=1) saw it as somewhat important.

On item J5, a significant number of respondents (n=58: 47.9%) indicated that entrepreneurial skills were a very important contributor to a business incubator's success, which is supported by a mean score of $\bar{x}=4.40$; $SD=0.626$. A further 46.3 percent (n=56) saw it as extremely important to have entrepreneurial skills, a mere 5.0 percent (n=6) viewed it as moderately important, and 0.8 percent (n=1) felt this factor was only somewhat important.

In formulating the study, the general systems theory offered an approach that underpins the development of the business incubation framework. Thus, the systems view, as already shown in preceding sections, interprets factors that contribute to the success of business incubators. Respondents provided information on the major factors contributing to the success of business incubators such as support from financial institutions, access to technology and business facilities and development, entrepreneurial skills, office space for incubatees, and research and development with university links and human resources. In support of the above factors contributing to the success of incubators, Buys and Mbewana (2007:356), Diedericks (2015:84), Macheke and Smith (2013:2001), and Nafukho and Muyia (2010:96) argue that access to science, funding and technology, business skills, networking, and stakeholders are factors which contribute to business success and business sustainability. According to Chang and Rieple (2013:225), necessary skills for small businesses include personal and entrepreneurial skills, effective communication, and personal maturity. Thus, a business incubator requires all the necessary entrepreneurial maturity skills to develop small firms.

6.5.5 Intellectual capability: descriptive statistics for incubator prerequisites

The fifth factor extracted in the EFA under incubator prerequisites is intellectual capability. The results of the descriptive statistics for intellectual capability are reported on in Table 6.8.

Table 6.8: Intellectual capability: descriptive statistics for incubator prerequisites

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
B3	Entrepreneurial focus	-	-	12 (9.9%)	52 (43%)	57 (47.1%)	0.660	4.37
B8	Value proposition	-	-	10 (8.3%)	51 (42.1%)	60 (49.6%)	0.641	4.41
B9	Possession of critical knowledge	-	-	7 (5.8%)	52 (43.0%)	62 (51.2%)	0.606	4.45
Overall scale							0.856	4.41

Table 6.8 details the results of the analysis concerning the statement about a business incubator having entrepreneurial focus in assisting entrepreneurs (item B3). The majority of respondents (n=57: 47.1%) identified this as an extremely important factor, which is confirmed by a mean score of \bar{x} =4.37; SD=0.660. A significant 43 percent (n=52) felt this was very important while only 9.9 percent (n=12) of the respondents felt it was of moderate importance. The results of the analysis on the value proposition of business incubators' prerequisites (item B8) show that the majority of respondents (n=60: 49.6%) believe that a value proposition is extremely important, supported by a mean score of \bar{x} =4.41; SD=0.606. A further 42.1 percent (n=51) of the respondents agreed that a value proposition is very important, while 8.3 percent (n=10) felt it was of moderate importance. Regarding item B9, which relates to the statement that a business incubator prerequisite is critical knowledge of the ecosystem, 51.2 percent (n=62) indicated that it was extremely important, supported by a mean score of \bar{x} = 4.45; SD=0.606. A significant 43.0 percent (n=52) of respondents believed this aspect was very important, while only 5.8 percent (n=7) thought it was moderately important. One of the empirical objectives of this study was to determine resources critical to the effective start-up of business incubators in South Africa. The above results show that the majority of business incubator managers agree that incubator prerequisites enable them to consistently minimise and manage real or potential risks occurring within the incubation process. Muyengwa *et al.* (2014:42) report that business incubators provide the necessary business infrastructure with managerial skills and assist

entrepreneurs through strategic guidance such as entrepreneurial focus, reducing the relatively high failure rate of start-ups, emerging enterprises, and physical space.

6.5.6 Administrative capabilities: descriptive statistics for incubator prerequisites

The sixth factor extracted in the EFA under incubator prerequisites is administrative capabilities. The results of the descriptive statistics for administrative capabilities are reported on in Table 6.9.

Table 6.9: Administrative capabilities: descriptive statistics for incubator prerequisites

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
B7	Impact of board of directors	-	2 (4.1%)	12 (9.9%)	63 (52.1%)	41 (33.9%)	0.764	4.16
C1	Identification of market segments/positioning	-	-	14 (11.6%)	60 (49.6%)	47 (38.8%)	0.658	4.27
C6	Analysis of business environment	-	-	16 (13.2%)	69 (57%)	36 (29.8%)	0.637	4.17
D1	Incubation strategy formation and development	-	-	14 (11.6%)	49 (40.5%)	58 (47.9%)	0.683	4.36
Overall scale							0.696	4.24

Table 6.9 details the results of the analysis regarding the statement on whether a board of directors plays an important role in forming a business incubator (Item B7). A significant proportion of respondents (n=63: 52.1%) indicated it was a very important prerequisite, which is confirmed by a mean score of \bar{x} =4.16; SD=0.764. A further 33.9 percent (n=41) indicated it was an extremely important input to have directors in the incubator, 9.9 percent (n=12) of the respondents believed it was only moderately important, while 4.1 percent (n=2) responded that it was somewhat important. Regarding the analysis on the identification of market segments/positioning (item C1), the results show that the majority (n=60: 49.6%) of respondents believed that the identification of market segments/positioning is very important, supported by a mean score of \bar{x} =4.27; SD=0.658. Furthermore, 38.8 percent (n=47) of the respondents agreed that it was extremely important and only 11.6 percent (n=14) felt this item

was of moderate importance. The results of the analysis of business environment (item C6) show that a significant 57 percent (n=69) of respondents believe that analysis of business environment is very important, supported by a mean score of $\bar{x}=4.17$; $SD=0.637$. A further 29.8 percent (n=36) of the respondents indicated that analysis of business environment is extremely important, while 13.2 percent (n=16) felt it was only moderately important.

Item D1 indicates that 47.9 percent (n=58) of respondents felt that incubation strategy formation and development is highly critical for the incubation framework, while 40.5 percent (n=49) saw it as a very critical operational component for an incubator, and only 11.6 percent (n=14) were neutral. The mean score of $\bar{x}=4.36$; $SD=0.683$ emphasises how critical it is.

6.5.7 Market forces engineering: descriptive statistics for incubator prerequisites

The seventh factor extracted in the EFA under incubator prerequisites is market forces engineering. The results of the descriptive statistics for market forces engineering are reported on in Table 6.10.

Table 6.10: Market forces engineering: descriptive statistics for incubator prerequisites

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
B4	Possession of industry expertise	-	1 (0.8%)	15 (12.4%)	58 (47.9%)	47 (38.8%)	0.699	4.25
B5	Industry experts/coaches	-	-	11 (9.1%)	62 (51.2%)	48 (39.7%)	0.630	4.31
B6	Selection and ideation	-	1 (0.8%)	14 (11.6%)	57 (47.1%)	49 (40.5%)	0.695	4.27
Overall scale							0.675	4.28

Table 6.10 details the results of the analysis regarding item B4, which pertains to one of the incubator prerequisites being possession of industry expertise, 47.9 percent (n=58) of respondents felt it was a very important input and a mean score of $\bar{x}=4.25$; $SD=0.699$ confirmed this result, which highlights the degree of importance. A further 38.8 percent (n=47) believed it was extremely important to the incubator, while 12.4 percent (n=15) indicated moderate

importance and only a single respondent (n=1: 0.8%) felt it was slightly important. In terms of item B5, the majority of respondents (n=62: 51.2%) believed that it was very important to have industry experts/coaches in the business incubator, which is supported further by a mean score of \bar{x} =4.31; SD=0.630. A significant 39.7 percent (n=48) agreed that it was extremely important while only 9.1 percent (n=11) regarded this aspect as moderately important.

Regarding the statement that a business incubator should have a selection and ideation of incubatees (item B6), 47.1 percent (n=57) indicated that it was very important, sustained by a mean score of \bar{x} = 4.27; SD=0.695. In addition, a significant 40.5 percent (n=49) of respondents indicated extreme importance, 11.6 percent (n=14) felt it was of moderate importance, while only 0.8 percent (n=1) felt it was somewhat important. Nafukho and Muyia (2010:96) argue that possession of industry expertise, technology, business skills, networking, and stakeholders are factors which contribute to business success, and business sustainability and critical knowledge are critical for effective incubation programmes.

6.5.8 Strategic resourcing: descriptive statistics for incubator prerequisites

The eighth factor extracted in the EFA under incubator prerequisites is strategic resourcing. The results of the descriptive statistics for strategic resourcing are reported on in Table 6.11.

Table 6.11: Strategic resourcing: descriptive statistics for incubator prerequisites

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
B1	Availability of funding	-	-	2 (1.7%)	49 (40.5%)	70 (57.9%)	0.531	4.56
B2	Infrastructure and access to technology	-	1 (0.8%)	2 (1.7%)	44 (36.4%)	74 (61.2%)	0.574	4.58
Overall scale							0.553	4.57

Table 6.11 details the results of the analysis on the perceptions of business incubators prerequisites. Item B1 indicates that 57.9 percent (n=70) of the respondents believe that availability of funding is extremely important and is an essential component of the incubation framework, while 40.5 percent (n=49) felt it was very important. Only 1.7 percent (n=2) felt

availability of funding was of moderate importance. The mean score of $\bar{x}=4.56$; $SD=0.531$ emphasises the level of importance. Pertaining to business incubators having the necessary infrastructure and access to technology to service incubatees (item B2), 61.2 percent ($n=74$) of respondents indicated that it was extremely important, supported by a mean score of $\bar{x}= 4.58$; $SD=0.574$. Only 1.7 percent ($n=2$) of respondents felt this was of moderate importance while one respondent (0.8%: $n=1$) was not convinced of its importance. Ndabeni (2008:264) argues that financial support, possession of industry expertise and critical knowledge in the microenvironment are critical for effective incubation programmes. The preceding paragraphs essentially emphasise key resource inputs that are essential for the successful set up of a business incubator.

6.6 DESCRIPTIVE STATISTICS FOR BUSINESS INCUBATOR OPERATIONAL OUTCOMES SCALES (SEE SECTION D OF QUESTIONNAIRE)

6.6.1 Performance indicators: descriptive statistics for incubator operational outcomes

The first factor extracted in the EFA under incubator operational outcomes is performance indicators. The results of the descriptive statistics for performance indicators are reported on in Table 6.12.

Table 6.12: Performance indicators: descriptive statistics for operational outcomes

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
E5	Number of incubatees graduated	-	1 (0.8%)	18 (14.9%)	64 (52.9%)	38 (31.4%)	0.691	4.15
E6	Number of jobs created	-	1 (0.8%)	8 (6.6%)	68 (56.2%)	44 (36.4%)	0.622	4.28
E7	Number of SMMEs established	-	1 (0.8%)	6 (5.0%)	68 (56.2%)	46 (38.0%)	0.606	4.31
E8	Number of clients supported	-	-	10 (8.3%)	66 (54.5%)	45 (37.2%)	0.612	4.29
Overall scale							0.623	4.26
E1 (Accountability) was deleted during factor analysis.								

On item E5, the majority of respondents (n=64: 52.9%) considered the number of incubatee graduates from the incubation process as very important, which is supported further by a mean score of \bar{x} =4.15; SD=0.691, while 31.4 percent (n=38) agreed that it was extremely important to have graduates. A further 14.9 percent (n=18) of the participants felt it was moderately important and a mere 0.8 percent (n=1) felt this output was only somewhat important.

Regarding the statement that the primary objective of business incubators is to create jobs (item E6), 56.2 percent (n=68) indicated that it was a very important outcome, supported by a mean score of \bar{x} = 4.28; SD=0.622. In addition, a significant proportion of respondents (n=44: 36.4%) believed it was an extremely important outcome, while 6.6 percent (n=8) felt this output was only moderately important and 0.8 percent (n=1) indicated somewhat important. Concerning the foundation of business incubator phenomenon to establish new SMMEs (item E7), the majority of respondents (n=68: 56.2%) saw creating new firms as a very important outcome, which is confirmed by a mean score of \bar{x} =4.31; SD=0.606. In addition, 38.0 percent (n=46) indicated it was an extremely important output, 5.0 percent (n=6) felt it was moderately important and only 0.8 percent (n=1) indicated it as somewhat important. Regarding Item E8, which relates to the operational output that a business incubator supports a number of clients through business development, 54.5 percent (n=66) indicated that it was a very important

outcome, supported by a mean score of \bar{x} = 4.29; SD=0.612. A further 37.2 percent (n=45) of respondents agreed that it was an extremely important output and 8.3 percent (n=10) saw it as moderately important.

6.7 MONITORING AND EVALUATION: DESCRIPTIVE STATISTICS FOR INCUBATOR OPERATIONAL OUTCOMES

The second factor extracted in the EFA under incubator operational outcomes is monitoring and evaluation. The results of the descriptive statistics for monitoring and evaluation are reported on in Table 6.13.

Table 6.13: Monitoring and evaluation: descriptive statistics for incubator operational outcomes

Item code	Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important	Standard deviation	Mean (\bar{x})
E2	Follow ups	-	-	22 (18.2%)	60 (49.6%)	39 (32.2%)	0.699	4.14
E3	Measurement of outputs	-	-	14 (11.6%)	59 (48.8%)	48 (39.7%)	0.661	4.28
E4	Financial stability/ turnover generated by SMMEs	-	-	9 (7.4%)	59 (48.8%)	53 (43.8%)	0.619	4.36
Overall scale							0.660	4.26
E1 (Accountability) was deleted during factor analysis.								

Table 6.13 details the results of the analysis of the insights into business incubator outcomes. Regarding the operational output on the follow-ups (item E2), the results show that the majority of respondents (n=60: 49.6%) viewed follow-ups (feedback) as very important, supported by a mean score of \bar{x} =4.14; SD=0.699. A further 32.2 percent (n=39) of the respondents agreed that it was extremely important, while 18.2 percent (n=22) felt that this item was of moderate importance. On item E3, which relates to the view that business incubators have a broad spectrum of methods for measuring their outputs, 48.8 percent (n=59) of respondents indicated that it was very important to measure the outcomes, supported by a mean score of \bar{x} =4.28; SD=0.661, while 11.6 percent (n=14) felt that this items was only moderately important. Regarding item E4, which pertains to the view that one output of the incubation process consists

of financial stability/turnover generated by SMMEs, 48.8 percent (n=59) viewed this as a very important outcome. A mean score of $\bar{x}=4.36$; $SD=0.619$ further confirmed this result, emphasising the degree of importance. A further 43.8 percent (n=53) considered financial stability/turnover generated by SMMEs extremely important to the incubator impact, while 7.4 percent (n=9) felt it was only moderately important.

The need for business incubators to monitor, evaluate, and assess operations emerged as a key element in the operations of incubators. An analysis of the responses from the participants indicated clearly that incubators have a broad spectrum of methods for measuring their outputs. The above results show that the majority of business incubators agree that incubator operational output is necessary to measure the impact and the number of sustainable businesses that graduate successfully. According to Ramluckan (2010:30), some criteria for an effective incubator include number of admissions leading to start-ups, length of time required to establish an incubator, clients supported, occupancy rate, percentage of incubator's space let to firms, percentage of enterprises using incubator services, employment created per net dollar of subsidy, incubator turnover (average time of firms in the incubator and the number of firms entering and leaving the incubator), financial leverage (ratio of public to private sector funding), taxes and other contributions by tenants and graduates per net monetary unit of subsidy. Thus, effectiveness is a measure of the goals and impacts of an incubator and its sustainability (Ramluckan 2010:30; Muyengwa *et al.* 2014:42; Diedericks 2015:117). The majority of respondents indicated that they have follow-up mechanisms in place to measure the rate of their graduated incubatees, such as a graduating tracking tool. However, Cullen *et al.* (2014:85) found that respondents were not satisfied with the quality of service that they received from an incubator programme after graduation.

6.8 CONCEPTUAL FRAMEWORK FOR THE STUDY

Arising from the analysis of quantitative data is the framework shown in Figure 6.7.

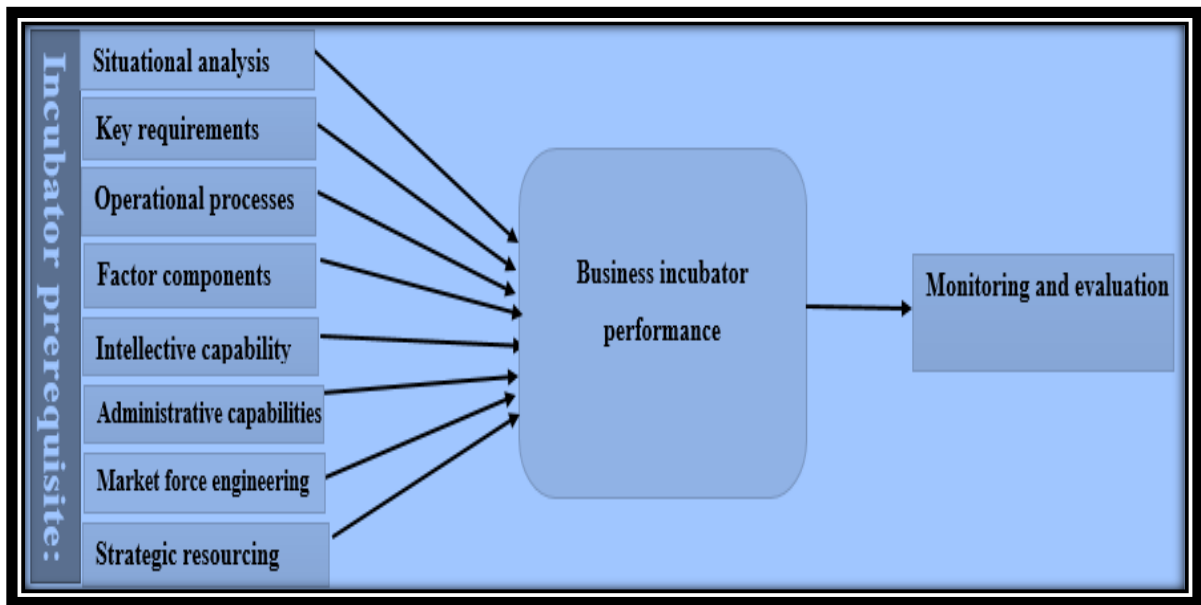


Figure 6.7: Conceptual framework

The primary objective of this study was to develop a framework for the creation of business incubators in South Africa. The framework presents incubator prerequisites as the predictor construct. This construct has eight sub-components, which are situational analysis, key requirements, operational process, factor components, intellective capabilities, administrative capabilities, market force engineering, and strategic resourcing. The relationships between these constructs were tested using Pearson Correlations and Regression analysis.

6.9 CORRELATION ANALYSES

According to Gogtay and Thatte (2017:78), correlation analyses is a term used to represent the association or relationship occurring between two (or more) variables, “thus it is that single value or number which establishes a relationship between the two variables being studied”. In this research, the Pearson’s correlation coefficient which measures the degree to which two or more variables are related (Gogtay & Thatte 2017:80), was used to determine the association between incubator prerequisites, incubator business performance and monitoring and evaluation. Moreover, Pearson’s coefficient of correlation represented by “r” and Pearson’s correlation was used. Therefore, Pearson’s coefficient of correlation parameters are indicated by $r=0.000$ =no correlation; $r=0-2.9$ = low correlation; $r=3-4.9$ moderate; $r=5-6.9$ strong; $r=7>$

very strong; and $r=1$ = perfect correlation. The results of the correlation analysis are presented in Table 6.14.

Table 6.14: Correlations between constructs

Factors	SA	KR	OP	SF	IC	AC	MFE	SR	IBP	ME
SA	1.00	-	-	-	-	-	-	-	-	-
KR	-.180	1.00		-	-	-	-	-	-	-
OP	.425**	.032	1.00	-	-	-	-	-	-	-
SF	.353**	-.144	.064	1.00	-	-	-	-	-	-
IC	.089	.338**	.155	.016	1.00	-	-	-	-	-
AC	.629**	.076	.502**	.104	.283**	1.00	-	-	-	-
MFE	.416**	.026	.172	.165	.458**	.455**	1.00	-	-	-
SR	.278**	-.034	.167	.267**	.322**	.305**	.380**	1.00	-	-
IBP	.255**	.252**	.229*	.197*	.196*	.202*	.112	.306**	1.00	.
ME	.405**	.050	.372**	.169	.013	.400**	.177	.139	.402**	1.00

N=121 ** Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed) *low $r=0.10-0.29$; ** moderate $r=0.30-0.49$; *** strong $r=0.50-1.0$.
 SA= situational analysis, KR= key requirement, OP= Operational process, SF= Factor components, IC= Intellective capabilities, AC= Administrative capabilities, MFE= Market force engineering, SR= Strategic resourcing, IBP= Business incubator performance and ME=Monitoring and evaluation.

Nguegan (2017:107) asserts that inter-factor correlations illustrate the associations amongst the key variables and positive inter-factor correlations are perceived between the seven independent variables. In this study, the notion is to elaborate on how relationships may arise between the notable variables. Thus, the correlation occurs between situational analysis and administrative capabilities ($r = 0.629^{**}$; $p < 0.01$), while the weakest correlation is between intellective capabilities and monitoring and evaluation ($r = 0.013$; $p < 0.01$). Hence, this shows a significant improvement in one of the independent variables that leads to the strengthening of the other variables (Nguegan 2017:108).

6.9.1 Correlations between incubator prerequisites and incubator business performance

The correlation matrix (Table 6.14) indicates a moderate positive association ($r=0.255$; $p<0.01$) between situational analysis and incubator business performance. There was another moderate

positive association ($r = 0.252$; $p < 0.01$) between key requirements and incubator business performance. These results imply that increases in any of the key requirements results in increases in incubator business performance. These results are consistent with Ramluckan's (2010:27) findings, who conducted an exploratory study on the performance of the SEDA business incubators in South Africa. His study concluded that business incubators should increase the performance and productivity of small enterprises, improve management support for small enterprises, promote the use of quality standards by small enterprises, improve the competitiveness of small enterprise prerequisites, promote entrepreneurial activity and the success of identified target groups (women and the youth); and most importantly, reduce the failure rates of small enterprises. Muyengwa *et al.* (2014:43) report that knowledge of the business environment gained through incubator prerequisites and performance informs the incubation strategy. For example, that the incubator can adopt incubators in to provide the necessary business infrastructure, with managing skills of the entrepreneurs through strategic guidance such as reducing the relatively high failure rate of start-up and emerging enterprises and physical space. The main objective here is to identify how business incubator prerequisites benefit small business performance, and business incubation is a crucial mechanism to support growth-oriented entrepreneurs. These prerequisites can be understood as essential components of the incubation framework. Marimuthu and Lakha (2015:84) found that incubator management should focus more on research and development and innovation as it contributes to the technology economy.

6.9.2 Correlations between key requirements and incubator business performance

The correlation matrix (Table 6.14) indicates a moderate positive association ($r = 0.252$; $p < 0.01$) between key requirements and incubator business performance, in the business incubation ecosystem. Shortall (2008:3) identified key requirements for the successful operation of business incubation, namely sufficient working capital, experienced managers, professional development activities and critical client screening. However, studies conducted by Ndabeni (2008:264) and Jamil, Ismail and Mahmood (2015:156) found that a significant proportion of business incubators worldwide are backed by universities and government in order to maintain stability. Ndabeni (2008:264) maintains that some key elements in the microenvironment are critical for effective incubation and these elements are financial support, social networking, sustainability, efficient business operational policies and legal regulations,

openness of society to innovation, geographical proximity of SMMEs, and professional development activities/learning. A further argument is that of links necessary in the environment. Therefore, business knowledge is crucial as it is the influencer of business incubator performance, and business development services aim to strengthen the business systems and strategic direction of the new start-up. In support of this, Dubihlela and van Schalkwyk (2014:267) conclude that access to funding, access to advanced technology and relevant facilities, quality of incubatees, and research and development, are key resources in the creation of business incubators.

6.9.3 Correlations between operational process and incubator business performance

The correlation matrix (Table 6.14) indicates a moderate positive association ($r = 0.229^*$; $p < 0.01$) between operational process and incubator business performance in the business incubation process. These results imply that increases in the operational process result in an increase in incubator business performance. As this study deals with the factor components that make up an incubator, the results indicate a relationship between the variables, which means sustenance strategy, governance structure, availability of funding and revenue generation models are the key variables in the operational process (Diedericks 2015:84). In support of this, Dubihlela and van Schalkwyk (2014:267) conclude that business incubators must be aware of operational support strategy and policy within the incubation programme in order to be effective in providing the services to their incubatees. Gozali *et al.* (2016:1087) assert that an incubation model explains the variance through a number of independent success factors, namely incubator governance, tenant entry and exit criteria, mentoring and networking, shared services, funding and support, and revenue generation models. In formulating the study, the general systems theory offered an approach that underpins the derivation of the framework. The systems view as previously discussed interprets phenomena in terms of inputs, processes and outputs. In support of this notion, Sithole and Rugimbana (2014:643) outline the general systems theory with major elements of incubation such as inputs, which consist of stakeholders and management resources; processes, which consist of combined inputs with various services and output and involve successful incubatee graduates, jobs created and wealth generation. It is therefore important to develop a business incubation model that supports and promotes small firms.

6.9.4 Correlations between factor components and incubator business performance

The correlation matrix (Table 6.14) indicates a moderate positive association ($r = 0.197^*$; $p < 0.01$) between factor components and incubator business performance. These results imply that increases in any of the factor components results in increases in incubator business performance. Conversely, factor components will lead to an increase in incubator business performance. Generally, most incubators work through relationships with various stakeholders such as sponsors, government agencies, financial institutions, entrepreneurs and the business incubator's management (Masutha & Rogerson 2014b:145). In support, business incubators provide backing to SMEs, equipping them with the necessary skills, resources and a conducive environment in which to run their businesses, and office space for incubatees, especially during the start-up phase of a business (GIBS 2009:22). Therefore, without adequate funding only a few start-up firms can transform into successful businesses and have the ability to create an incubator to raise capital for its clients by granting funding through angels or venture capital; access to finance increases the chances of success (Lose 2016:28). An incubation programme depends on a number of factors for it to be perceived as successful. One of these factors is business facilities, business management, and entrepreneurial skills such as planning, organising, leading and controlling. According to Lose and Tengeh (2016:372), the lack of entrepreneurial skills are likely to inhibit both business incubators and incubatees in South Africa.

6.9.5 Correlations between intellectual capabilities and incubator business performance

The correlation matrix (Table 6.14) indicates a moderate positive association ($r = 0.196^*$; $p < 0.01$) between intellectual capabilities and incubator business performance. These results imply that increases in any intellectual capabilities results in increased incubator business performance. According to Botha, Nieman and van Vuuren (2006:2), entrepreneurship is the most important solution for poverty alleviation, unemployment and low economic growth in both developed and developing countries. Thus, the performance of entrepreneurs is based on starting a new business and staying focused, with innovative ideas. The value proposition is to ensure a solid management team and build internal entrepreneurial capacity in key business disciplines through training and formal skills development. The intellectual capabilities factor will result in facilitating the development and growth of small businesses to contribute to

inclusive and shared economic growth with job creation through public and private sector procurement (SEDA 2017:38). In support of this, business incubators are recognised as possessing critical knowledge and infrastructure for pursuing enterprise development. They are organisations that form the linkages between funders of small enterprise development and its beneficiaries by providing an enabling environment that is conducive for business start-ups (Tilana 2015:6). Thus, efforts to improve the enterprise development and incubation programme should lead to better business performance in the incubator ecosystem.

6.9.6 Correlations between administrative capabilities and incubator business performance

The correlation matrix (Table 6.14) indicates a moderate positive association ($r = 0.202^*$; $p < 0.01$) between administrative capabilities and incubator business performance. These results imply that increases in any administrative capabilities result in increases in incubator business performance. In South Africa, most public business incubators are registered as independent entities, either as a Section 21 or a non-profit business or trust and members are responsible for appointing non-executive directors and an incubator manager (Masutha & Rogerson 2014:147). On the contrary, a similar study conducted by Buys and Mbewana (2007:358), found

...only a weak correlation between support from an experienced advisory board and incubator success; this could simply be that advisory boards have not yet made an impact because of the early stage of incubation in South Africa, or it might indicate that advisory boards are currently ineffective; incubators need to appoint effective boards of directors committed to the incubator's mission.

Thus, the identification of market segments/positioning of a business incubator is crucial for the development of small firms. Tengeh and Choto (2015:154) are of the view that the success of an incubation programme is dependent on the quality of entrepreneurs being incubated and incubation strategy formation in developing entrepreneurs, analysis of business environment and willingness to acquire resources. Therefore, the business incubator input such as administrative capabilities should be realised as the key factor in the incubation model.

6.9.7 Correlations between market force engineering and incubator business performance

The correlation matrix (Table 6.14) indicates a moderate positive association ($r = 0.112$; $p < 0.01$) between market force engineering and incubator business performance. These results imply that increases in any market force engineering results in increases in the incubator business performance. In support of this view, access to industry expertise, facilities, entrepreneurial skills, the influence of networking skills in government-funded business incubators on effective incubation, are perceived market force engineering (De Beer 2011:3). The primary expectation of the business incubation programme is to provide industry experts with relevant coaches to incubated clients. Hence, “the central feature of such incubators is that start-up coaches support resident entrepreneurs to leverage the venture capital industry, assist with the development of business plans and inculcate basic management and business practices” (Chirambo 2014:17). Furthermore, South Africa is still recovering from its socio-political history, particularly the segregation, job discrimination towards different race groups and the effects of apartheid education. In the incubation selection and ideation processes the qualifying small enterprise must be owned by a black South African as defined by the Department of Trade and Industry (DTI) Codes of Good Practice on Broad-Based Black Economic Empowerment (BBBEE). The enterprise must be owner-managed and be registered as a legal entity, to address the political injustices of the past (Muyengwa *et al.* 2012:42). Hence, market force engineering has a positive impact on incubator business performance.

6.9.8 Correlations between strategic resourcing and incubator business performance

The correlation matrix (Table 6.14) indicates a moderate positive association ($r = 0.306$; $p < 0.01$) between market strategic resourcing and incubator business performance. These results imply that increases in any strategic resourcing results in increased incubator business performance. It is important to note that all business incubators are financially stable and successful in South Africa (Ramluckan 2010:18). Business incubators face the challenge of obtaining funds and sponsorships for shortages when servicing incubatees, as most incubators are not self-sufficient (Scaramuzzi 2002:28; Grimaldi & Grandi 2005:115; Buys & Mbewana 2007:357; Al-Mubarak & Busler 2010:19; Dubihlela & van Schalkwyk 2014:267; Sithole & Rugimbana 2014:653; Lose *et al.* 2016:136). Therefore, business incubator management should ensure that their daily operations are visible to the communities and relevant

stakeholders to encourage awareness of through which financial injection commitment to the incubator practices will be created. An incubator's success lies in its ability to market the incubation programme and services effectively to attract potential incubatees (Choto *et al.* 2014:96; Diedericks 2015:87). One of the strategic resources an incubator should have is infrastructure and access to technology. According to Adelowo, Olaopa and Siyanbola (2012:172), small firms have limited access to advanced technology facilities. Thus, business incubators must provide relevant business services and equipment to potential and incubated clients (Ndedi 2009:467).

6.9.9 Correlations between incubator business performance and M&E

The correlation matrix (Table 6.14) indicates a moderate positive association ($r = 0.402$; $p < 0.01$) between incubator business performance and monitoring and evaluation. These results imply that increases in incubator business performance and monitoring and evaluation results in increased incubator business performance. The study was based on the performance of the SEDA business incubators; key performance indicators (KPIs) or metrics are utilised in creating a framework for the performance of a business incubator. Thus, the number of incubatees graduated, the number of jobs created, number of SMMEs established and the number of clients supported, are known as key incubator business performance indicators (Ramluckan 2010:29; Chirambo 2014:33; Lose 2016:70). The incubation programme has strict admission and exit rules which are designed to ensure that the incubator concentrates its efforts on helping innovative, fast-growth business start-ups that are likely to have a significant impact on job creation and ensuring a reasonable turnover from the tenants (Adegbite 2001:157). In this study, the monitoring and evaluation consists of follow-ups and measurement of incubation outputs and financial stability/turnover generated by SMMEs. Thus, the need for an incubator to assess performance, monitor, and evaluate emerged as key elements in incubator business performance. An analysis of the responses from the participants indicated clearly that incubators have a wide range of methods for measuring their outputs. The above results show that the majority of business incubators agree that business performance or operational output is essential in measuring the impact and the number of businesses that graduate successfully. Thus, M&E allows a measure of the impact of an incubator (Diedericks 2015:117). As the study indicates, they measure the rate of their graduated small businesses by using a graduating tracking tool and success stories.

The next section discusses the results of the regression analysis.

6.10 REGRESSION ANALYSIS

The regression technique or regression analysis is a statistical technique used to model in determining a linear relationship between two continuous variables to predict what will happen (Gogtay & Thatte 2017:78). In support of this notion, Nguegan (2017:114) asserts that to determine the linear relationship between two or more variables, the regression analysis technique should be utilised.

Age and educational qualifications of respondents were entered into the regression model as the control variables to monitor their influence on the relationship between incubator prerequisites and performance in the incubation process. As revealed in Table 6.15, age was statistically insignificant ($\beta=0.93$; $t=1.040$; $p=0.301$), which depicts that it did not exert an influence on incubator business performance. Likewise, the educational qualifications were statistically insignificant ($\beta=-0.102$; $t=-1.184$; $p=0.239$), which demonstrates that they did not exert an influence on incubator business performance. Therefore the two control variables, namely age and educational qualifications did not influence the relationship between incubator prerequisites and performance in the incubation process.

Table 6.15 presents the regression model summary for incubator prerequisites and performance in the incubation process in South Africa.

Table 6.15: Regression Model 1: Incubator prerequisites and performance

Independent Variables: Incubator prerequisites	Dependent Variable: Incubator Business Performance					Tol	VIF
	Unstandardised Beta	Standard Error	Standardised Beta	T	Sig (p)		
(Constant)	.393	.736	-	.533	.595	-	-
(A2) Age	.063	.061	.093	1.040	.301	.848	1.180
(A3) Educational qualifications	-.066	.056	-.102	-1.184	.239	.919	1.088
Situational analysis	.241	.125	.233	1.924	.057**	.463	2.160
Key requirements	.305	.088	.331	3.474	.001*	.744	1.343
Operational process	.156	.111	.139	1.401	.164	.691	1.447
Factor components	.215	.089	.213	2.408	.018*	.862	1.160
Intellective capabilities	-.004	.103	-.004	-.041	.967	.639	1.565
Administrative capabilities	-.054	.120	-.052	-.452	.652	.503	1.987
Market force engineering	.024	.105	.025	.232	.817	.594	1.682
Strategic resourcing	.025	.099	.024	.257	.797	.748	1.338

R=.505^a; R squared=.255; Adjusted R squared=.188; F=3.773, Tol=Tolerance; VIF-Variance inflation factor.
*p<0.05; **p<0.10

The results of the regression analysis (Table 6.15) indicate that incubator prerequisites (adjusted $R^2=0.188$) explained approximately 19 percent of the variance in incubator business performance. The study considered the possibility of multicollinearity problems. Tolerance and the variance inflation factor values were utilised to determine the effects of multicollinearity. According to Nguegan (2017:115), multicollinearity occurs in a scenario in which two or more of the independent variables are correlated, which causes odd results between the independent and dependent variables. Thus, tolerance values measure the strength of the association or relationship (influence) between one independent variable with the other independent variables and should be $T > 0.5$ (O'Brien 2007:673). The same author also mentions that the variance

inflation factor (VIF) is a measure of the impact of collinearity amongst the variables under consideration in a regression model and should ideally be: $VIF < 10$. Consequently, in this study, tolerance and VIF values for all independent variables did not indicate any serious multicollinearity and threat and were within recommended limits. The specific tolerance and VIF values are conveyed in each regression model and deliberated thereafter (Mafini 2015:130). As shown in the table, TOL values ranged between 0.473 and 0.919, which were all below the recommended minimum cut off value of 0.4. In addition, VIF values ranged between 1.088 and 2.160, which were below the maximum recommended value of 10. Therefore, there was no indication of multicollinearity in the regression model. An analysis of the results show that only one incubator prerequisite (key requirements) was statistically significant ($\beta=0.331$; $t=3.474$; $p=0.001$) in predicting business incubator performance (IBP). This result demonstrates that key requirements influences or leads to IBP. In order to improve IBP, emphasis must be placed on ensuring that key requirements are both efficient and effective. This result is consistent with previous results by Shortall (2008:3), who indicated that key requirements, namely: sufficient working capital, professional development activities and critical client screening are important for incubators. Perhaps this result is meaningful in developing a South African business incubation framework that will fully realise the need of small enterprise. Due to the high failure rates of SMEs, incubation is the vehicle to minimise the failure. Factor components were also statistically significant ($\beta=0.213$; $t=2.408$; $p=0.018$) in predicting IBP. This result demonstrates that factor components also influence and lead to IBP. In order to improve IBP, emphasis must be placed on ensuring that business incubator factor components are both resourceful and operative. This result is consistent with previous results by Muyengwa et al. (2014:42), who conclude that business incubators provide the necessary business infrastructure such as managerial skills, strategic guidance, funding, physical space and networking. Therefore, before creating a business incubator it is important to consider the above factor components.

The results of the regression analysis in Table 6.16 indicate that business incubator performance (adjusted $R^2=0.144$) explained approximately 15 percent of the variance in performance monitoring and evaluation. An analysis of the results shows that business incubator performance was statistically significant ($\beta=0.388$; $t=4.595$; $p=0.000$) in predicting performance monitoring and evaluation of IBP. This result demonstrates that incubator performance influences or leads to incubation output monitoring and evaluation (M&E). In

order to improve M&E, emphasis must be placed on ensuring that the incubator performance process is relevant and effective. This result is consistent with previous results by Chirambo (2014:33), who indicated that incubator business performance is determined by the number of jobs created, turnover generated, small businesses created, incubatees exiting the programme and clients supported (Ramluckan 2010:29). Conceivably, these findings are attributed to be drivers of a successful incubation programme and key performance indicators.

Table 6.16: Regression Model 2: Business incubator performance, monitoring and evaluation

Independent Variables: Business Incubator Performance	Dependent Variable: Performance Monitoring and Evaluation					Tol	VIF
	Unstandardised Beta	Standard Error	Standardised Beta	T	Sig		
(Constant)	2.557	.374	-	6.842	.000	-	-
Business Incubator Performance	.400	.087	.388	4.595	.000*	1.000	1.000
R=.388 ^a ; R squared=.151; Adjusted R squared=.144; *Sig. p<0.05; F=21.114, Tol=Tolerance; VIF-Variance inflation factor							

6.11 CHAPTER SUMMARY

The purpose of this chapter was to analyse the data collected from the participants using a structured and semi-structured questionnaire and to discuss these outcomes. It is important to note that the analysis of the demographic details of participants show that all groups of respondents are sufficiently represented in this study. Furthermore, an analysis of the respondents' perceptions show that they are fulfilled with their incubation prerequisites such as situational analysis, key requirements, operational processes, factor components, intellectual capabilities, administrative capabilities, market force engineering, strategic resourcing, business incubator performance and monitoring and evaluation. Correlation analysis indicates that these incubation process key requirements show a positive association with the dependent variables of incubator business performance. In the regression analysis, the results predict that incubator prerequisites influence the incubator's performance, which leads to the outcomes in monitoring the performance. Small firms encountering challenges should join an incubation programme to generate business growth through competitiveness and self-sustainability.

CHAPTER 7

PROPOSING A FRAMEWORK FOR THE EFFECTIVE CREATION OF BUSINESS INCUBATORS IN SOUTH AFRICA

7.1 INTRODUCTION

In the previous chapter, the quantitative results of the study were presented and discussed. The questionnaires that were used in the previous chapter were derived from the results of Chapter 5 (qualitative findings), depicting the general systems theory (input, process and output). Drawing on the two previous chapters containing the qualitative and quantitative results, this chapter proposes a framework for the effective creation of business incubators in South Africa. The general systems theory was adopted to show the inter-relationships of effective business incubators and the key requirements. To effect the general systems theory, the research problem was conceptualised and analysed by using the general systems theory to develop a conceptual framework.

7.2 A GENERAL SYSTEMS THEORY FRAMEWORK FOR THE PROBLEM

It should be borne in mind that the research problem revolved around the absence of a business incubation framework. Following the literature review, three key distinctions in incubation programmes were noted, being: key incubator requirements, incubation practices, and incubation outcomes. The general systems theory and conceptual images were outlined in the previous chapter.

Figure 7.1 depicts the key elements, factor components, and relationships between the concepts of this study. The key elements of the framework are analysed and the framework arising from the analysis of qualitative and quantitative data is shown.

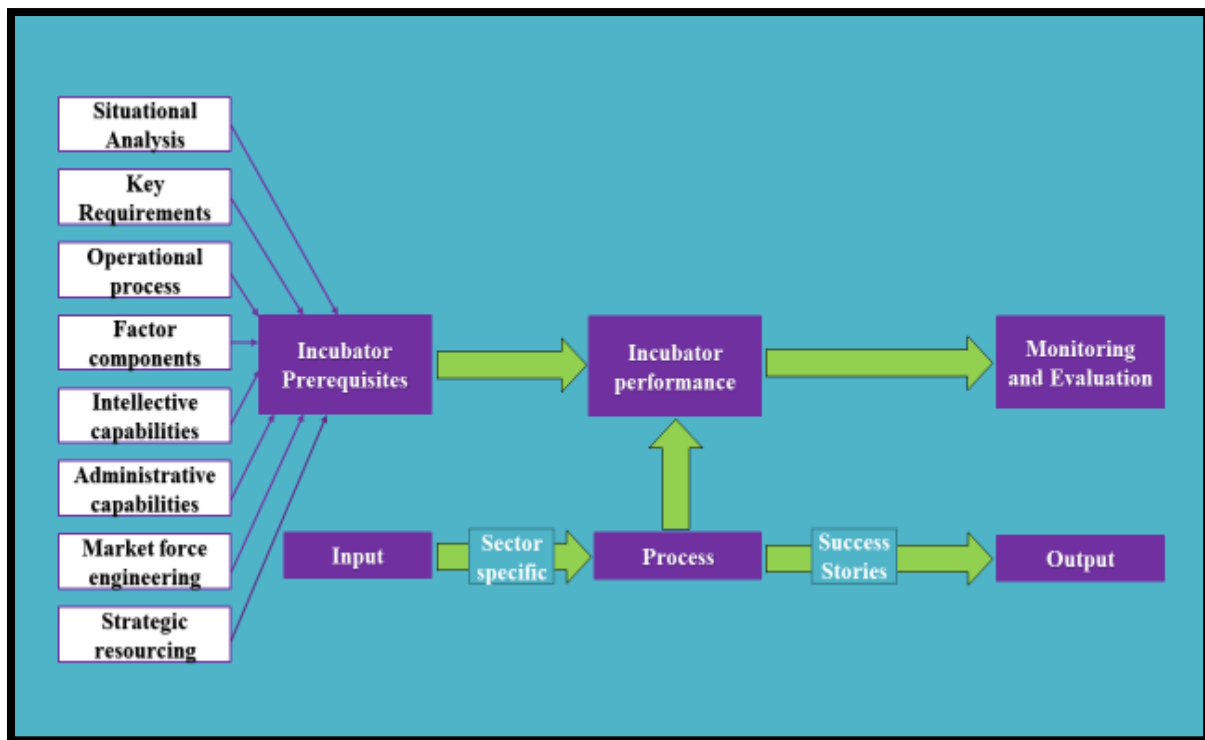


Figure 7.1: The integrated conceptual framework for the effective creation of business incubators in South Africa

Source: Author’s own construct

The main purpose of this study was to develop a framework for the creation of business incubators in South Africa. The framework presents incubator prerequisites (inputs—entry of incubatees) as the predictor construct. This construct has eight sub-components, which are situational analysis (incubatees’ characteristics), key requirements, operational process, factor components, intellective capabilities, administrative capabilities, market force engineering, and strategic resourcing (impact) with KPIs. The business incubator performance (process—industry coaches, governance structure, and entrepreneurial focus), which in turn leads to monitoring and evaluation (output—graduation phase, impact, and follow-ups). The relationships between these constructs were tested and these concepts are discussed below.

7.3 BUSINESS INCUBATOR PREREQUISITES (INPUT)

Two of the empirical objectives of this study were to determine resources critical to the effective creation of business incubators in South Africa and to investigate entrepreneurial

characteristics contributing to successful creation of business incubators in South Africa. Through reflection on these two objectives, it becomes clear that this study was formulated partly to identify incubator prerequisites. These objectives, in particular, demonstrate the intention to identify these prerequisites. These prerequisites should be understood as essential components of the incubation framework, which is the final output expected from this study. The prerequisites of incubation business are apparent in extracts from the interviews. These prerequisites comprise the following:

a) First factor – situational analysis

This factor consists of six items, namely characteristics of incubatees, identification of incubation opportunity, sector specification, possible impact of technology, securing government support, and identification of networks and relationships for success (Ramluckan 2010:33; Muyengwa *et al.* 2014:42). Furthermore, the qualifying incubatees are assisted with aligning their businesses to good governance practices and legal requirements, and formulating a customised business strategy.

b) Second factor – key requirements for an incubator

These are sufficient working capital, experienced managers and developers, salaries and benefits to staff, flexibility and committed managers, sustainable, efficient business operations, and professional development activities with learning (Buys & Mbewana 2007:356).

c) Third factor – operational processes for incubation

This third factor comprises governance structure, legal compliance, sustenance strategy, and a revenue generation model. Business incubation management should have a business background, have organisational and entrepreneurial skills, possess leadership qualities, and be well networked in the community at large (Lose *et al.* 2016:135). In support of this view, Marimuthu and Lakha (2015:82) concur that incubator management should focus more on research and development innovation, as it contributes to the technology economy.

d) Fourth factor – factors contributing to the success of business incubators

This factor consists of support from financial institutions, office space for incubatees, access to technology and business facilities, and entrepreneurial skills (Ndabeni 2008:264; Lose & Tengeh 2016:371). Hence, business incubators with the necessary entrepreneurial skills support

emerging small businesses to survive and grow during the start-up period (Sithole & Rugimbana 2014:642).

e) Fifth factor – intellectual capability

Intellectual capability encompasses entrepreneurial focus, value proposition, and possession of critical knowledge. As mentioned above, the impact of the incubation programme is shaping the entrepreneurial mind-set and entrepreneurial self-efficacy among incubatees (Tilana 2015:1). Thus, entrepreneurship is the most important tool in reducing poverty, improving economic growth, and minimising the high unemployment rates in South Africa.

f) Sixth factor – administrative capabilities

The influence of board of directors, identification of market segment or positioning, analysis of business environment, incubation strategy formation and development, embrace the administrative capabilities of business incubation (Buys & Mbewana 2007:358; Tengeh & Choto 2015:154).

g) Seventh factor – market forces engineering

This comprises possession of industry expertise, industry experts or coaches, and selection and ideation. According to Smit *et al.* (2007:17), the ability to work as team and interpersonal skills affirm the existence of incubation.

h) Eighth factor – strategic resourcing

Strategic resourcing encompasses availability of funding and infrastructure, and access to technology (SEDA 2015:1; Tengeh & Choto 2016:153).

Therefore, an effective business incubator ensures success by establishing strategic resources, policies, organisational culture, and developing and processing incubation tools. In addition, the pre-incubation phase consists of qualifying incubatees that are assisted with aligning their businesses to good governance practices and legal requirements, and formulating a customised business strategy (plan). The stakeholders should trust and believe that the initiative is designed to benefit the scientific community, the industry, and ultimately, civil society as a collective. This will be achieved by communication, consultation, representation, and management of key decision-making processes within the incubator.

7.4 BUSINESS INCUBATOR PERFORMANCE (PROCESS)

The business incubation period is generally three years, although literature indicates that the incubation process is normally two years. The objective of this study was to demonstrate the incubation process. The business incubator performance (process) can be understood as a critical factor component of the incubation framework, which is one of the final outputs expected from this study. The general systems theory offers an approach that leads to the derivation of the framework (shown in preceding Figure 7.1), and interpreting phenomena in terms of inputs, processes, and outputs. The performance (process) of business incubation includes number of incubatees graduated, number of jobs created, number of SMMEs established, and number of clients supported. The majority of South African business incubators are measured by KPIs such as number of enterprises and jobs created, clients supported, number of graduates or tenants leaving the incubator each year and the revenue (income and sales) generated by incubatees (Ramluckan, 2010:29). The main aim of business incubators is to accelerate the successful development of entrepreneurial enterprises through the provision of business support services (Sahay & Sharma 2009:94). In support of the above factor components, Dubihlela and van Schalkwyk (2014:267), Diedericks (2015:84) and Lose *et al.* (2016:137) mention numerous factor components that are involved in the incubator process. These include mentorship, availability of funding, access to science and technology expertise and facilities, quality of entrepreneurs, stakeholder support, competent and motivated management, experienced business advisors, networking, and supportive government policies. The most important principle in the model is effective and efficient operations as intended by its strategic goal and objective. Therefore, the incubation model allows an incubator to follow a successful business intervention process and the required key factor components. Gozali *et al.* (2016:1087) concur that an incubation model explains the variance through a number of independent success factors, namely shared services, tenant entry and exit criteria, management resources, and facilities and location.

7.5 INCUBATION MONITORING AND EVALUATION (OUTPUT)

The need for monitoring and evaluation emerged as a key element in the operation of business incubators. The monitoring and evaluation (output) should be understood as the third essential component of the incubation framework, which is the final output expected from this study. The monitoring and evaluation of incubation business is apparent in extracts from both

methods. Monitoring and evaluation include follow-ups, measurement of outputs and financial stability or turnover generated by SMMEs. Chirambo (2014:33) reports that incubation literature suggests that turnover growth, numbers of jobs established, and clients supported are generally a measure of incubation impact. Business incubators measure their success on clients' growth such as personal entrepreneurial competencies, achievement of milestones in learning programmes, employment creation, and increase in income generated. However, Cullen *et al.* (2014:85) report that respondents were not satisfied with the quality of service that they received from an incubator programme after graduation. Business incubators do have follow-up mechanisms in place to measure the progress of their incubated firms, such as a graduation tracking tool.

7.6 BUSINESS INCUBATOR KEY PERFORMANCE INDICATORS

The STP supports technology business incubators and the Centre for Entrepreneurship Rapid Incubator (CfERI) across South Africa serves 18 different industries. It recorded a collective client/SMME turnover of R2 198 billion over the last three years, creating 7 878 jobs over the same period. The SEDA incubation programme supports over 3 000 small businesses every year, making it the biggest incubation programme in South Africa (SEDA 2018:42). Furthermore, SEDA over the last two years has expanded its leadership in the incubation ecosystem in South Africa with the establishment and support of the following national and regional knowledge platforms: the Southern Africa Business Technology Incubation Association (SABTIA), the Southern Africa Business Incubation Conference (SABIC), and the Incubation Governance Management Development Programme (IGMDP).

Table 7.1 below outlines the generic KPIs of incubators supported by the STP.

Table 7.1: Output key performance indicators

Outputs
KPIs
New SMMEs established
Number of clients in pre-incubation programme
Number of clients in incubation programme
Number of clients supported
Number of students trained
Number of clients graduated
Number of clients exited
Percentage of SMMEs that survived 1 st year
Percentage of SMMEs that survived 2 nd year
Number of IPs registered
Percentage of SMMEs that showed improved business skills
Percentage of SMMEs that have access to incubator infrastructure and technology
Percentage of SMMEs linked to markets/access to markets
Percentage of SMMEs linked to funding/access to funding
Permanent jobs created
Temporary/seasonal jobs created
Funds raised (Rands million) for SMMEs
Total SMME turnover at start of quarter
Total SMME turnover at end of quarter

Table 7.1 continued

Forex earned by SMMEs (Rand value)
New foreign clients with whom business has been secured
Black SMMEs established
Youth SMMEs established
Women SMMEs established
Women-owned clients supported
Youth-owned clients supported
Percentage of Black SMMEs established
Percentage of youth SMMEs established
Percentage of women SMMEs established
Percentage of Black-owned clients supported
Percentage of women-owned clients supported
Percentage of youth-owned clients supported

Source: SEDA 2016

Table 7.1 depicts key performance indicators that business incubators use to monitor and evaluate the incubation programme’s impact. These KPIs have an impact on incubator prerequisites, performance, and monitoring and evaluation (graduation). While this view has been mentioned in some of the literature, in particular regarding fourth generation incubators, it has been developed and advanced extensively (Khalid *et al.* 2014:396). Thus, the improvement of a framework for business incubators assists in alleviating the failure of SMMEs, as the unemployment rate remains high, regardless of the efforts by government agencies (Choto *et al.* 2014:94). The current study, therefore, aims to develop a business

framework for the effective creation of business incubators in South Africa, which could facilitate improvements in numerous areas of the economy.

7.7 THE INCUBATION PROGRAMME MODEL FOR SMALL ENTERPRISE ESTABLISHMENT

The business incubation model for small enterprise establishment is linked to the current model. The current model consists of pre-incubation, incubation, and post-incubation. This interesting model is a generic incubation and not limited to a specific sector. The model is suitable for all business clients, irrespective of their business focus. The aim was to develop a framework that supports entrepreneurial skills and business mentorship. The minimum business incubation period is three years. Figure 7.2 below proposes the ideal model for business incubation.

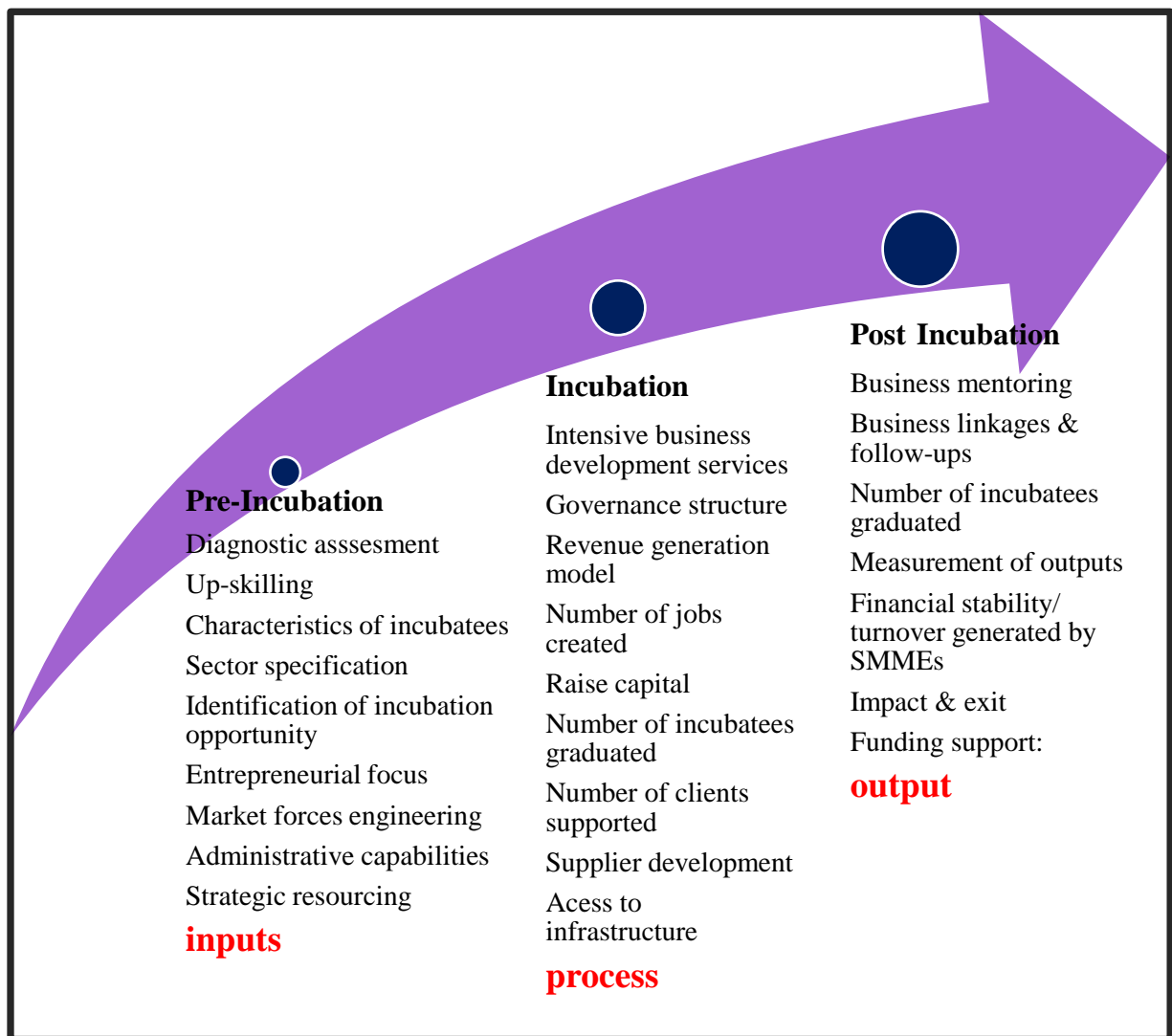


Figure 7.2: The incubation programme model for small enterprise establishment

Source: Author's own construct

Figure 7.2 depicts the key arguments advanced by this study. The business incubation model focuses on the fundamental design and the creation of strong partnerships, with the aim of creating environments and support programmes that are conducive to small enterprise development. Based on the literature review using general systems thinking, a conceptual framework was developed for this study. The reviewed literature indicates that the role of the incubator is to minimise the risk of failure and increase the probability of success of incubated enterprises (Gozali *et al.* 2015:125). Hence, the significant incubation programme impact is in

the long-term success of incubatees and is usually apparent after graduation. The existing clients contribute through their growth and job creation potential. On the other hand, firms will create significant revenue for owners of the business.

7.8 CHAPTER SUMMARY

The evolution of a study of this nature required an appropriate theoretical framework to analyse the relevant key concepts. While drawing from the literature on business incubators from an international standpoint, this chapter explored the South African overall incubation ecosystem. The choice of a general systems framework as a relevant theory was based on the incubation programme application and practice. In addition, several business incubation models that depict incubation functions are based on the systems approach. Furthermore, a justified concept of incubator prerequisites, performance, and monitoring and evaluation emerged because of the systems philosophy. Thus, a conceptual framework was developed, which covers the business incubation process.

The following chapter concludes this study and makes recommendations.

CHAPTER 8

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

Chapter 7 proposed a framework for the effective creation of business incubators in South Africa. Drawing from the literature and results of this thesis, a brief summary of the preceding chapters and recommendations for business incubation practice is proposed. The study has achieved the primary research objective, which was to develop a framework for the creation of business incubators in South Africa. This final chapter reflects on and summarises the thesis.

8.2 A BRIEF SUMMARY OF THE PRECEDING CHAPTERS

A brief summary of the contents of the preceding chapters in this thesis follows.

Chapter 1

Chapter 1 sets out the foundation for the study and provides a background. The significance of the study and the key questions pertaining to the research are addressed. This is followed by a justification of problem statement, the empirical objectives, a brief theoretical overview of the study, and a conceptual framework of the general systems theory. The research design and methodology employed in the study are outlined and the reliability of the study is scrutinised.

Chapter 2

Chapter 2 reviews the existing business incubator theory. The literature review highlights research issues or questions, which were fully addressed in the previous chapter. The key definition and evolution of business incubators is discussed in depth, to support the research question. The study analyses the existing framework for the creation of business incubators from one generation to another, as well as the general systems perspective of business incubation. Business pre-start essentials and the current types of business incubators are discussed. The importance of business incubation programmes to small business development is outlined.

Chapter 3

The aim of Chapter 3 was to review literature on the factors inhibiting performance of business incubators and the future direction of business incubators. Inhibiting factors include access to qualified staff, lack of entrepreneurial skills, access to advanced technology-based prototype facilities, access to funding and sponsorship, geographical dispensation to incubatees, lack of commitment by entrepreneurs, government policies, mentorship, stakeholder support, quality of entrepreneurs in the incubation programme, competent and motivated management team, networking, and financial sustainability. The challenges faced by entrepreneurs before joining incubator programmes are explored. These include lack of necessary skills, lack of access to finance for expansion and diversification, competition, business support services, access to better equipment and technology transfer, access to networking, access to mentorship and business training, market access, lack of access to bookkeeping, and poor product or service quality. Furthermore, characteristics contributing to the successful start-up of a business incubator are noted. These include proximity to an incubator, feasibility study, availability of funding to entrepreneurs, quality of entrepreneurs, successful incubatees and graduates, supportive government policies, stakeholder strategies, innovative management teams, advisory boards, financial sustainability, selection criteria and relevant networking.

Chapter 4

Chapter 4 focuses on the explanation of the philosophical basis of the objectives of the study, which include both ontological and epistemological perspectives of the objectives set for the study in Chapter 1. Pertaining to the research strategy and design, a mixed method approach was adopted. The mixed method approach encompassed both probability and non-probability sampling methods. For the qualitative portion of the study, non-probability sampling using the purposive technique was utilised. For the quantitative aspect, probability sampling, using a simple random technique was undertaken. Probability sampling was deemed appropriate for this study because it provided an estimation of precision. Thus, participants of the study had an equal chance of being selected. For the quantitative portion of the study, 200 coaches and enterprise development practitioners were selected. Therefore, the estimated number of elements in the population was $N=200$, while 121 usable questionnaires were returned. Data validity and reliability are discussed, as well as the research ethics considered in this study

Chapter 5

This chapter contains the data analysis and discussions on qualitative data. Since data collection was both qualitative and quantitative, two routes for data analysis were imperative. The qualitative data were obtained from personal interviews and grouped according to themes that emerged from the findings of the study. Drawing from the analysis and interpretation, findings were presented in tabulated format. Nine semi-structured in-depth interviews were conducted between April and May 2018. The participants comprised nine business incubator managers. Of the nine participants, six (67%) were male and three (33%) were female. Only one of the participants was between the ages of 30 to 40 years, while five were between 40 to 50 years old and three were between 50 to 60 years of age. Pertaining to the highest qualifications of participants, four held a Bachelor's degree, two had an Honours degree, two had a Master's degree and one participant had attained a Doctorate.

Chapter 6

The data were presented according to the research questions and questionnaire structure. The second stage of data collection involved the administration of questionnaires to coaches and enterprise development specialists employed to handle the day-to-day incubation functions of incubators. A pilot study was conducted to assess the feasibility of this study, and to test the appropriateness of the questionnaire and the adequacy of the research methodology. After feedback from the supervisor, suggestions were implemented and adjustments were made. The pilot study was conducted by administering the questionnaire to a convenience sample of 40 respondents from the target population and was distributed in the first week of March 2018. For the purposes of the quantitative portion of the study, a total number of 200 coaches and enterprise development practitioners were selected. Each incubator has approximately four incubator practitioners, and there were 50 STP centres. Therefore, the estimated number of elements in the population for the quantitative part of the study is $N=200$. To maintain the 95 percent confidence level (5% error margin), the ideal sample size calculated was 132. The response distribution was 127 (96%) of which 121 were considered usable.

Chapter 7

Drawing on the two previous chapters containing the qualitative and quantitative results, this chapter proposed a framework for the effective creation of business incubators in South Africa. Therefore, the primary objective of the study was achieved. The general systems theory was

adopted to show the inter-relationships of effective business incubators and the factor components that make an incubation programme work.

8.3 CONCLUSIONS BASED ON THE THEORETICAL OBJECTIVES

This section discusses the conclusions of the theoretical objectives of the study.

8.3.1 Conclusions drawn from the review of literature on the definition and evolution of business incubators

The first theoretical objective of the study was to discuss the literature that focused on the evolution of business incubators and is addressed in Chapter 2 of this thesis. Evidenced from definitions in Chapter 2, it is clear that there is no standard definition for a business incubator. This is mainly because business incubators vary by type and by purpose, and cater to different regional specifications and needs. Among the various definitions of business incubators is the view that a business incubator is an organisation designed to accelerate the growth and success of entrepreneurial companies through an array of business support resources and services. These could include physical space, being virtual, capital, technology coaching, common services, and networking connections.

The study concedes that business incubation in different forms and models is essential for local, national, regional, and global growth. This assertion is conceptualised against the backdrop of the idea that entrepreneurship is the backbone of economic growth. It emerged that there are various traces of the development and evolution of business incubators and their models of operation from classical prototypes to their modern state. In South Africa, incubation is a new phenomenon that only appeared in 1995 when the first form of a business incubator was developed by the SBDC to facilitate small business development in townships and to contribute to SME sector growth. In the townships, these forms of business incubators were known as ‘hives of industry’, having the necessary infrastructure like telephones, electricity, office space and warehousing space. The study accepts that incubation models have evolved over time. It is believed that the first generation (1980–1990) models were based on offering entrepreneurs help only when it was critically needed. Second-generation (1990–2000) business incubators were still limited in services provided compared to the generation they preceded. Third generation (2000–present) business incubators operate in highly specialised and complex environments with a wide array of innovations and ideas. The rise in technology and

entrepreneurs in both the private and public sectors has heightened the demand for social services. Furthermore, fourth generation (emerging) business incubators are described in some literature as 'virtual and post', implying that they can offer advisory support using internet communication technology and other modern communication technological services and do not necessarily have to be in-house. Therefore, it is concluded that the business incubator is a complex concept that has no single universally accepted definition and is associated with a broad array of theoretical explanations and numerous factors.

8.3.2 Conclusions drawn from the review of literature on the incubation theoretical framework

The second theoretical objective focused on conducting a literature review on the incubation theoretical framework. The technical processes involved in starting and running an incubation programme can be identified from the literature but what is lacking is a simplified framework for the operation that depicts incubation business essentials. This theoretical objective was addressed in the second chapter of this thesis. The literature emphasised that business incubators operate in a form that can be generalised within the general systems theory. The systems approach to business management has promoted the development of several management techniques such as TQM, learning organisation, MBO and business scorecards. Therefore, this study is based on the theory that the general systems approach was suitable for the business incubation model. The study found that starting a business incubation business requires certain resources, followed by processes to combine the resources and then the provision of outputs to users of incubation services. Such a narrative resembles the inputs, processes, and outputs model of the general systems theory. These inputs can be understood as essential components of the incubation framework, which is the final output expected from this study. These inputs include concept mapping, establishment of concept fundamentals, acquiring knowledge of essentials, position of entrepreneurial traits, specifying value proposition and ideation. The second stage in incubation model processes includes marketing, outreach strategy, governance structure, legal compliance, sustenance strategy, revenue generation model, defining monitoring and evaluation and strategic support. Lastly, the third stage in incubation model output includes success essentials, accountability, follow up, measurements of output, impact on employment creations and post-incubation services.

Therefore, it is concluded that the general systems theory is suitable for the business incubation theoretical framework.

8.3.3 Conclusions drawn from the literature review on the key requirements for effective business incubators

The third theoretical objective focused on conducting a literature review on the key requirements for effective business incubators, not limited to access to physical resources, office support, and access to financial resources, entrepreneurial start-up support, and access to networks. This was addressed in the second chapter of this thesis. Sufficient working capital for an incubator might be easy to find but operating capital is more difficult to access. Thus, over time, self-sufficiency and independence are critical for business incubators, especially in rural areas where the local government might not be able to provide support indefinitely. It was found that a significant proportion of business incubators worldwide are backed by universities and governments to maintain sustainability. The results reveal that building solid partnerships with several stakeholders (such as private entities, communities, and government), actively seeking different sources of funding for sustainability, and requiring incubatees to pay for certain services, is critical in sustaining a business incubator. Therefore, the key resources in business incubators are critical to the creation of the incubator in developing economies, particularly in South Africa. Government support is a key element in setting up an incubation programme in South Africa. The literature concluded that access to funding, access to advanced technology and relevant facilities, quality of incubatees, and research and development, are key resources in the creation of business incubators.

8.3.4 Conclusions drawn from the literature review on factors which inhibit and challenge the performance of business incubators

The fourth and fifth theoretical objectives focused on conducting a literature review on the factors inhibiting performance of business incubators and the challenges facing business incubators.

These were addressed in the third chapter of this study. Access to qualified staff to manage the functioning of incubators, as well as managing the growth of incubated entrepreneur-owned enterprises, are critical factors in the success or failure of business incubators. Despite considerable evidence that entrepreneurial skill is critical for the success of every business

incubator, literature suggests that a significant portion of these business incubators are unable to deliver services to entrepreneurs. This can be partially attributed to the fact that the majority of staff do not come from an entrepreneurial background and have little business experience. Business incubators in South Africa still have limited access to advanced technology-based facilities, which enhance the performance of business incubators. Hence, the traditional approach of measuring the management team of an incubator is its ability to attract sponsors and provide services to incubatees. The geographical dispensation is a significant challenge, as it is very difficult to access all survivalist entrepreneurs located in remote rural areas in Africa, especially when electricity supply is limited. One of the inhibitors to the performance of the business incubator is the quality of incubated entrepreneurs, lack of competent and motivated management teams, government policies, and financial sustainability. The literature suggests that the quality of a product produced in terms of the parameters or the characteristics of the product, has met its specifications. The specification is the minimum requirement of a product or service delivered to consumers. The specification includes uses or customer needs, safety and health hazards, requirements for national and international standards, and competitive product specification to gain market advantage.

8.3.5 Conclusions drawn from the literature review on the characteristics contributing to the creation of successful business incubators

The sixth empirical objective focused on the characteristics contributing to the successful creation of business incubators. This was addressed in the third chapter of this study. In formulating the thesis, the general systems theory offered an approach that underpins the development of the business incubation framework. The systems view, as already shown in preceding sections, interprets factors that contribute to the successful creation of business incubators. The literature review provided information on the major factors contributing to the success of business incubators such as support from financial institutions, access to technology and business facilities and development, entrepreneurial skills, office space for incubatees, and research and development with university links and human resources. This generates the conclusion that proximity to incubators, feasibility studies and quality of entrepreneurs are key contributing factors to incubation establishments. Business incubators should continue to contribute to companies so they can grow stronger, better and faster than those who are not involved in incubator programmes. Government policies exert significant influence on

technological changes, university technological transfer, financial crises, regional innovation systems, and the performance of business incubators. Hence, generally most incubators work through relationships with other stakeholders and these include sponsors, government, venture capitalists, entrepreneurs, and incubator management. The literature further indicated that selection of advisory board members should be based on a wide range of disciplines and experience available to assist companies at a reasonable cost. This leads to the conclusion that selection criteria, financial sustainability, an experienced management team, and networking is essential for entrepreneurial businesses to succeed. This study contributes to both theory and practice in several ways.

The literature review on the characteristics that contribute to the successful creation of business incubators is essential in indicating the present day situation relative to the incubation phenomenon.

8.4 REALISATION OF THE OBJECTIVES OF THE STUDY

The study achieved the three sets of research objectives that were formulated in the first chapter. These were the primary objective, theoretical objectives, and empirical objectives.

8.4.1 Realisation of the primary objective

The primary objective of the current study was to develop a framework for the creation of business incubators in South Africa. This objective was realised through the testing of the eight-factor rotated structure for the incubator prerequisites, two-factor rotated structure for the incubator operational outcomes, and three-factor rotated structure for the operational processes/incubation. Alternative and relevant questions were formulated for the study. These questions were stated in the first chapter but were extended to Chapter 6 where they were derived from literature. Testing of the questions was conducted in Chapter 6 where regression analysis was conducted to test the relationship between the dependant variable and the independent variables. The results of the analysis indicate that the framework presents incubator prerequisites (inputs—entry of incubatees) as the predictor construct. This construct has eight sub-components, being situational analysis (incubatees' characteristics), key requirements, operational processes, factor components, intellectual capabilities, administrative capabilities, market force engineering, and strategic resourcing (impact) with KPIs. The mediating construct is business incubator performance (process—industry coaches,

governance structure, and entrepreneurial focus), which in turn leads to monitoring and evaluation (output—graduation phase, impact, and follow-ups). The relationships between these constructs were tested and these concepts are discussed below.

8.4.2 Realisation of theoretical objectives

Six theoretical objectives were formulated in the first chapter of the thesis. These are:

- To conduct a literature review on the definition and evolution of business incubators;
- To conduct a literature review on the incubation theoretical framework;
- To conduct a literature review on the key requirements for effective business incubators;
- To conduct a literature review on the factors inhibiting performance of business incubators;
- To conduct a literature review on the challenges of business incubators; and
- To conduct a literature review on the characteristics contributing to successful start-up of a business incubator.

The first theoretical objective was realised in the second chapter of the thesis. This chapter used an extensive review of literature to discuss the definition and evolution of business incubators. The concept of business incubation is relatively new in South Africa and the definition of business incubation as noted in the literature is still limited. The second chapter of the thesis was also dedicated to fulfilling the second theoretical objective since extensive reviews of literature were undertaken to discuss the incubation theoretical framework. The third theoretical objective was realised in Chapter 2 when the literature concluded that access to funding, access to advanced technology and relevant facilities, quality of incubatees, and research and development are key resources in the creation of business incubators. The fourth and fifth theoretical objectives were realised in Chapter 3—the factors inhibiting performance and challenges facing business incubators. Incubators in South Africa still only have limited access to advanced technology-based facilities and the geographical dispensation makes it very difficult to access survivalist entrepreneurs who are located in remote rural areas in South Africa. One of the inhibitors to the performance of a business incubator is the quality of incubated entrepreneurs, lack of a competent and motivated management team, government policies, and financial sustainability. In addition, the formulation in Chapter 3 was instrumental

in the attainment of characteristics contributing to the successful creation of business incubators, including but not limited to: proximity to incubators, feasibility study and quality of entrepreneurs. These are some of the key contributing factors to the incubation establishment. The theoretical objectives of the study were instrumental, since the process was based on a review of literature on the proposed relationships.

8.4.3 Realisation of empirical objectives

The empirical objectives, which were set for the study are restated below.

- To analyse the existing framework for the creation of incubators in South Africa;
- To determine factor components of the business incubation framework in the start-up phase;
- To determine resources critical to the effective start-up of business incubators in South Africa; and
- To investigate entrepreneurial characteristics contributing to the successful start-up of business incubators in South Africa.

Realisation of all the empirical objectives led to primary data that were collected in each business incubator and how the data were subsequently treated. The process of data collection is articulated in the fourth chapter of this thesis. The research methodology utilised in this study, being qualitative and quantitative methods, is also detailed here. More specifically, the fifth and sixth chapter of the study deliberates on the statistical tools used to influence the collected data to achieve the first, second, third and fourth empirical objectives. The first empirical objective (analysis of the existing framework for the creation of business incubators) was realised by using simple descriptive statistics such as percentages, frequencies, graphical interpretations, and mean scores to determine the levels of satisfaction amongst the respondents. To realise the second (determining the factor components of the business incubation framework), third (determining resources critical to the effective creation of business incubators in South Africa) and fourth (investigating entrepreneurial characteristics contributing to the successful start-up of business incubators in South Africa) empirical objectives, data were analysed using multiple regression analysis in the testing of all factors formulated for the current study. Proposing a framework for the effective creation of business incubators in South Africa, necessitated by all the empirical objectives, was highlighted

extensively in Chapter 7. The business incubation framework was proposed on how the study could be translated into various factors to enhance incubation programmes amongst business incubators in South Africa.

8.5 CONCLUSIONS RELATED TO THE EMPIRICAL OBJECTIVES

Similar to the previous section on realisation of empirical objectives, the following section provides conclusions based on the empirical objectives, which were set as follows:

- To analyse the existing framework for the creation of incubators in South Africa;
- To determine factor components of the business incubation framework in the start-up phase;
- To determine resources critical to the effective start-up of business incubators in South Africa; and
- To investigate entrepreneurial characteristics contributing to successful start-up of business incubators in South Africa.

In line with principal component analysis, eigenvalues, scree plot and percentage of variance were used to extract the factors. These methods are considered to be the appropriate choice for interpreting self-reported questionnaires. Therefore, to test the appropriateness of factor analysis, formal statistics such as KMO's measure of sampling adequacy and Bartlett's test of sphericity were used. The Bartlett's test of sphericity was used to test the null hypothesis that the correlation matrix has identity matrix variables that are uncorrelated in the population. The Bartlett's and KMO test values were above the recommended threshold and the factor analysis was suitable for EFA to be performed on the data.

8.5.1 Conclusions based on the analysis of the existing framework for the creation of incubators in South Africa

In respect of the first empirical objectives, the study concludes that the general systems framework presents incubator prerequisites (inputs—entry of incubatees) as the predictor construct. This construct has eight sub-components, which are situational analysis (incubatees' characteristics), key requirements, operational processes, factor components, intellectual capabilities, administrative capabilities, market force engineering, and strategic resourcing (impact) with KPIs. The mediating construct is business incubator performance (process—industry coaches, governance structure, and entrepreneurial focus), which in turn leads to

monitoring and evaluation (output—graduation phase, impact, and follow-ups). Based on the two previous chapters containing the qualitative and quantitative results, this chapter proposes a framework for the effective creation of business incubators in South Africa. These results ought to be considered with the realisation of the research problem cited in Chapter 1. The problem was explained as business incubators face operational challenges such as geographical dispersal, the lack of funding, attracting quality entrepreneurs, unsupportive government policies, lack of entrepreneurial skills, lack of commitment, lack of advanced technological facilities, lack of competent and motivated management, which threaten the self-sustainability and long-term survival rate of business incubators in South Africa. Information generated through research is thus needed to enable business incubator operations in South Africa to overcome these challenges. The existence of a framework helps business incubators in guiding incubator performance, business incubator managers, policy objectives and specialists within the South African context.

8.5.2 Conclusions based on determining the factor components of the business incubation framework in the start-up phase

The first factor extracted in the EFA under incubator prerequisites was factor components of business incubation. The investigation revealed that the factor components of business incubation have a positive and significant effect in determining the incubation framework. An incubation programme is a process influenced by competent and experienced staff that provide the necessary support to SMMEs at a highly vulnerable stage of their journey. The results show that it is extremely important for an incubator to have the support of financial institutions. The majority of respondents felt it was important to have office space for entrepreneurs in the incubation programme. Furthermore, the third contributing factor to the success of an incubator was the access to technology and business facilities. Lastly, a significant number of respondents indicated that entrepreneurial skills were a very important contributor to a business incubator's success. The necessary requirements such as funding and technology, business skills, personal and entrepreneurial skills, entrepreneurial mindset, effective communication, networking and stakeholders are factors which contribute to business success and business sustainability, and personal maturity. A business incubator requires all the above business skills to develop SMMEs.

8.5.3 Conclusions based on determining the resources critical to the effective start-up of business incubators in South Africa

The second factor extracted in the EFA under business incubator prerequisites were key requirements for an incubator. The investigation provided the view that the significance in developing an effective incubation framework requires key critical resources. (1) The results show that a significant proportion of respondents believe that sufficient working capital is a very important requirement; (2) The results indicate that it is extremely important for business incubators to have experienced managers, business developers and experienced incubation practitioners; (3) The majority of respondents believe that salaries and benefits to staff members is a very important requirement for business incubators to function optimally; (4) On the key requirement that business incubators should have flexibility and committed managers, a significant proportion of respondents deem it a very important requirement; (5) The business incubator key requirement of sustainable and efficient business operations is considered by the majority of respondents to be a very important requirement in ensuring that an incubator is self-sustainable, and (6) Regarding critical resources, which relates to the key requirement of professional development activities and learning in the business incubator, most respondents indicated that it was a very important requirement for operating efficiently.

Hence, the key requirements that influence the creation of business incubators include, but are not limited to stringent selection criteria, incubation performance, donors, strategic resources, creativity and innovation, sufficient working capital, monitoring evaluation, professional development with experienced managers and developers, self-sustainability, efficient business operation activities, and learning activities.

8.5.4 Conclusions based on investigating entrepreneurial characteristics contributing to successful start-up of business incubators in South Africa

The second factor extracted in the EFA under business incubator prerequisites is intellectual capability. This relates to entrepreneurial characteristics, which the study found to be strongly positive and significant. Regarding the statement about a business incubator having entrepreneurial focus in assisting entrepreneurs, the majority of respondents identified this as an extremely important factor. Furthermore, the majority of respondents believe that a value proposition is extremely important for entrepreneurial characteristics contributing to the successful creation of incubators. In relation to the statement that a critical business incubator

prerequisite is having knowledge of the ecosystem, this study found a strong, positive and significant relationship to produce an incubation framework. Business incubators provide the necessary business infrastructure with managerial skills and assist the incubatees through strategic guidance. The relevant expertise, necessary business skills, networking, and stakeholder engagements are factors which contribute to incubation success. The study therefore concludes that critical resources are indeed an important antecedent factor to a business incubation programme.

8.6 RECOMMENDATIONS

The study provided an overview of the general systems framework and presents incubator prerequisites (inputs—entry of incubatees). The process construct is business incubator performance (process—industry coaches, governance structure, and entrepreneurial focus), which in turn leads to monitoring and evaluation (output—graduation phase, impact, and follow-ups). Based on the findings of the empirical study, the researcher made several recommendations to guide business incubator managers and incubatees to enhance the creation of incubation programmes in South Africa. The results of this study show that situational analysis of business incubator activities contributes greatly to small enterprise development and has a positive influence. Business incubators and incubatees should begin to work towards developing incubation strategies that will contribute to the improvement of the programme, which will in turn positively influence the performance of incubators. Therefore, it means that business incubators should invest more in incubatees that have the relevant qualities to perform within the incubator.

The results further reveal key requirements for an incubator that are critical to the creation of the incubator in developing economies. The researcher suggests that incubation managers should source sufficient working capital, experienced managers, and project specialists to ensure sustainable, efficient business operations and relevant professional development activities.

The results also show that incubation operational processes have a positive influence on governance structure, legal compliance, sustenance strategy and a revenue generation model. Therefore, it is recommended that business incubation managers recognise these elements in the incubation process as important factors in increasing the incubation performance rate.

Incubation managers should enrol for governance and legal training workshops or courses. This training should emphasise the importance of the self-sustainability of incubation programmes as the key drivers to incubator performance. The results of the study revealed that support from financial institutions, office space for incubatees, entrepreneurial skills, and access to technology and business facilities are factors which contribute to the success of incubators. It is therefore recommended in the selection process that potential incubators should possess these factors.

The results of the study reveal that intellectual capability consists of three elements, namely entrepreneurial focus, value proposition, and possession of critical knowledge. Entrepreneurship is the most important solution to social issues and the impact of a business incubation programme is shaping the entrepreneurial mindset of incubatees in South Africa. The study recommends that incubatees should have intellectual capability before joining the incubation programme. This study found that the board of directors, identification of market segment and positioning, analysis of business environment, incubation strategy formation, and development embrace the administrative capabilities positively in the incubation process. Hence, business incubators should possess administrative capabilities in servicing incubatees and entrepreneurs must have a desire to take calculated risks and a willingness to learn.

The results further show that market forces engineering in the creation of business incubators is critical in improving incubation services, namely possession of industry expertise, industry experts and coaches, and the selection and ideation. Therefore, it is recommended in the selection and ideation phase that incubators should have market forces engineering elements. One of the key factors in incubator prerequisites is strategic resourcing such as the availability of funding, infrastructure, and access to technology. In light of this, the researcher recommends that all three spheres of government and the agencies should increase funding for incubation programmes to reduce the failure rate of SMMEs.

The study results also reveals that SEDA business incubators are measured by the main KPIs such as number of enterprises and jobs created, annual growth rates of enterprises, number of graduates, graduation rate/percentage of tenants leaving the incubator each year, and the revenue (income and sales) generated by incubated and graduated firms. The researcher recommends that incubators should embark upon strategic marketing campaigns, entrepreneurs

should enrol in incubation programmes and incubators should encourage survivalist entrepreneurs to register their business formally. Lastly, this study also found that there is a need for monitoring, evaluation, follow-up, measurement of outputs and financial stability of SMMEs. Therefore, incubators should have graduating tracking tools and provide ‘virtual’ services to incubatees.

8.7 CONTRIBUTIONS OF THE STUDY

The ever-increasing importance of South African business incubators and the importance of creating SMMEs cannot be compromised. The current study developed an effective framework for the creation of business incubators in South African. This framework addresses both the theoretical and practical value of the study. A contribution is made to the existing literature on business incubators and SMMEs in South Africa, particularly in the context of developing economies. Previous researchers have focused on the role of business incubators in facilitating entrepreneurial skills, research on evaluation of the effectiveness of business incubation programs, the reasons behind entrepreneurs joining a business incubation programme and incubation programme performance has remained scant in developing countries. This study is one of the few endeavours to develop a framework for the creation of business incubators in South Africa which might be used by both business incubators and SMME practitioners in South Africa, thus contributing to the existing literature. To the extent that this study has contributed to new literature and empirical findings of business incubator ecosystems and the SMME sector, the thesis is likely to be a useful source of reference material for future research. Furthermore, this study makes a significant contribution to the business incubator process and the SME performance literature by exploring the general systems theory, incubator prerequisites (inputs – selection and ideation), and KPIs, as well as to mediate construct business incubator performance (process – incubation services), which in turn leads to monitoring and evaluation (output - exit phase, impact and success stories). The findings of this study are also important to other incubators and businesses in South Africa. Thus, these entities may use these findings as a benchmark for the best incubation model practices in South Africa. Lastly, the study explores the knowledge gap by profiling and providing insights into the evolution, challenges and future direction of business incubators in South Africa.

8.8 LIMITATIONS OF THE STUDY

Although the present study offers valuable insight into the creation of business incubators in South Africa, it has limitations that offer avenues for future research. These limitations are discussed as follows.

Firstly, it is important to state that the sample sizes used in this study were relatively small. The quantitative study comprised a conveniently selected incubator practitioner sample of 121 respondents, using a structured self-administered questionnaire, and nine semi-structured in-depth interviews were conducted.

In addition, restricting the study to SEDA-supported business incubators limited the scope of the study. Due to the restricted scope and sample sizes, restraint should be observed when generalising the results of this study. Secondly, although attempts were made to maintain representivity, the present study utilised non-probability sampling methods that included purposive and convenience sampling to select respondents. Since the questionnaire and interviews used in the surveys were self-administered, the researcher had no control of social desirability bias or the manner in which the participants responded. Future research efforts in incubation may employ probability sampling methods and multiple data collection methods to enhance the external validity of the findings.

8.9 IMPLICATIONS FOR FURTHER RESEARCH

The current study has implications for future research in business incubators. Future studies could use larger sample sizes as well as more incubation-diverse scope. This can be attained by including regions beyond South Africa, which are ready to be surveyed. The present study focused on a generic framework for the effective creation of business incubators in South Africa. As a result, the findings of this study may differ from sector-specific and existing business incubators. Future research should seek to investigate antecedents of existing and sector-specific frameworks for the effective operation of business incubators.

The current study focused on government agency-supported incubators but future research could focus on private business incubators. Furthermore, future research efforts could undertake a similar study but using a single-method approach, not the mixed method approach of qualitative and quantitative research. Comparative studies could ensure that insight that could not be captured in this study is revealed. Additionally, future studies could focus on the

relationship between SEDA mainline centres, centres for entrepreneurship and rapid incubators within higher learning institutions. Lastly, the study suggests the following for future studies:

1. The role of centres of entrepreneurship in South African universities and colleges;
2. Incubation, a vehicle for economic prosperity in Africa: A theoretical perspective;
3. The usage of government funding and resources in the business incubator;
4. Assessing the centre's staff capability to assist clients in the incubation programme and staffing decisions to promote maximum productivity;
5. A comparative study between private and public frameworks for business incubators;
6. The impact of incubation programmes on entrepreneurial intentions; and
7. A SWOT analysis of business incubators in South Africa.

8.10 FINAL REMARKS

It is widely acknowledged that business incubation programmes are an important vehicle for economic prosperity and a remedial solution to SME development in emerging economies. The purpose of this study was to develop a framework for the creation of business incubators in South Africa.

This study is arguably amongst a few to examine existing incubation models and able to develop a relevant framework for South African business incubators. The framework presents incubator prerequisites (inputs—entry of incubatees) as the predictor construct. This construct has eight sub-components, which are situational analysis (incubatees' characteristics), key requirements, operational processes, factor components, intellectual capabilities, administrative capabilities, market force engineering, and strategic resourcing (impact) with KPIs. The process construct is business incubator performance (process—industry coaches, governance structure, and entrepreneurial focus), which in turn leads to monitoring and evaluation (output—graduation phase, impact, and follow up). The latter aspect adds to the novelty in the results of this study. The study compares the results obtained from qualitative data (incubation management) and quantitative data (incubation specialist and incubation developer). Entrepreneurship is recognised for its contribution to social development and is the

most important solution for poverty alleviation, aiding economic growth and reducing unemployment in the country. Incubatees create job opportunities, as indicated in this study. Therefore, the study recommends the establishment of new business incubators within the higher learning institutions in South Africa to assist in inspiring young graduates to start their own businesses.

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ANNEXURE A: REQUEST TO CONDUCT RESEARCH



Vaal University of Technology
Your world to a better future



Faculty of Management Sciences
Department of Logistics
Tel: +27(0)16 950 6883
Fax: +27(0)16 950 9849

TO WHOM IT MAY CONCERN

Date: 9 May 2016

RE: INTRODUCTORY LETTER FOR THE COLLECTION OF RESEARCH DATA

Mr Thobekani Lose is registered for the Doctorate in Business degree at Vaal University of Technology (VUT) with student number 216166233. His thesis is entitled "A business framework for the effective start-up and operation of business incubators in South Africa." The study aims to develop a business framework for business incubators in South Africa. The main supervisor for this research is Prof. M. Dhurup.

In order to meet the requirements of the University High Degrees Committee (HDC) the student must get consent to collect data from the organisations which they have identified as potential sources of data. In this case the student will issue a questionnaire to gather relevant data.

If you agree to this, you are requested to complete the attached form (an electronic version will be made available to you if you so desire) and print it on your organisation's letterhead.

For further clarification on this matter please contact either the supervisors(s) identified above, or the Departmental Research Committee Secretary at 0169506875

Kind Regards

Signed:

Dr. Chenedzai Mafini

HOD: Logistics

t +27 (0)16 950 9520



ANNEXURE B: PERMISSION LETTER FROM BICSA



+ (27) 012 803 1222 + (27) 012 803 0849
info@bicsa.co.za www.bicsa.co.za
Unit 1, N4 Gateway Landing, 70 Banghoek Crescent, N4 Gateway Light Industrial Park, The Willows, Pretoria

30 June 2016

Head of Department

Faculty of Management Sciences

Department of Logistics

Vaal University of Technology

1911 Andries Potgieter Blvd

Vanderbijlpark

Dear Dr Chengedzai Mafini

I Ansie Potgieter in my capacity as CEO at BICSA give consent in principle to allow Mr. Thobekani Lose, a student at the Vaal University of Technology, to collect data in this company as part of his PhD research. The student has explained to me the nature of his research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Yours sincerely

A Potgieter

BICSA CEO

ANNEXURE C: PERMISSION LETTER FROM FURNTech


14 June 2016

I Ravendran Naidoo in my capacity as National Project Manager at Furntech give consent in principle to allow Mr. Thobekani Lose, a student at the Vaal University of Technology, to collect data in this company as part of his PhD research. The student has explained to me the nature of his research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference Paper	Journal Article	Research Poster
Yes	X	X	X	X
No				



Raven Naidoo
National Projects Manager



CAPE TOWN

8 Lowestoft Street, Paarden Eiland
PO Box 115, Paarden Eiland, 7420
Tel: 021 510 0088, Fax: 021 510 0090

DURBAN

63 Willowfield Crescent, Springfield Park
PO Box 74087, Rochdale, 4034
Tel: 031 579 3883, Fax: 031 579 1896

JOHANNESBURG

11 Granville Avenue, Lea Glen
PO Box 396, Maraisburg, 1700
Tel: 011 672 2185, Fax: 011 672 9210

MTHATHA

9 Timber Street, Vulindlela Heights
Mthatha, 5100
Tel: 047 531 1840, Fax: 047 531 2436

NYANGA

1023 New Eisleben Road
Nyanga, Cape Town, 7750
PO Box 115, Paarden Eiland, 7420
Tel: 021 201 7542, Fax: 021 201 7548

UMZIMKHULU

T52 Hospital Road, Umzimkhulu
PO Box 74087, Rochdale, 4034
Tel: 039 259 0993, Fax: 039 259 0995

WHITE RIVER

5 Indus Road, White River
Suite 2 Private Bag X9910, White River, 1240
Tel: 013 750 3066, Fax: 013 750 3015

Supported by:
seda
SMALL ENTERPRISE DEVELOPMENT AGENCY
an agency of the DTIC

The Furniture Technology Centre Trust: IT 1663/2000
Website: www.furntech.org.za

ANNEXURE D: PERMISSION LETTER FROM SAREBI



15 July 2016

Cnr Neil Hare & John Dryer
 Road Atlantis Industrial
 Atlantis, Cape
 Town Western
 Cape South Africa
 7349
 T (+27) 21 577 2719/ 1034
 F (+27) 21 577 1005
 info@sarebi.co.za
 sarebi.co.za

To Whom It may Concern

I **Helmut Hertzog**, in my capacity as **General Manager at Sarebi** give consent in principle to allow Mr. Thobekani Lose, a student at the Vaal University of Technology, to collect data in this company as part of his PhD research. The student has explained to me the nature of his research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	Y	Y	Y	Y
No	Y	Y	Y	Y

Supported by:




 General Manager



CITY OF CAPE TOWN
 ISIXEKO SASEKAPA
 STAD KAAPSTAD

Directors:
 DW. Damons,
 Z. Jackson,
 X. Limberg,
 M.E. Mulcahy
 Dr. VP.Ramburan,
 G. Williams,

ANNEXURE E: LETTER OF INFORMED CONSENT



Dear Sir/ Madam

Request for you to participate in a survey - questionnaire

I am a registered Doctoral student (216166233) at the Vaal University of Technology, department of Logistics. I am conducting research. The title of the research is: A framework for the effective start-up of business incubators in South Africa.

The primary purpose of this study is to deliver or develop an effective framework for start up of business incubators in South Africa.

Please be accurate, honest and complete the whole questionnaire. This will take approximately 40 minutes of your time. Should you have any questions or require additional information, please feel free to contact Dr. C Mafini at +27 (0)83 642 9215 (Co-supervisor), Prof Dhurup +27 (0)16 950 6886 (Supervisor) or myself (the researcher) at 073 561 7713.

Consent to participate in the study (Please place an X in the appropriate box only)

1) I understand that my participation in the study is entirely voluntary and that I am free to stop at any time.	Yes	No	
2) I understand that I cannot be identified by my answers and that my answers cannot be linked to me.	Yes	No	
3) I understand that I do not have to answer any question I do not wish to answer for any reason.	Yes	No	
4) I agree that the information I give may be used in research and that this research will not reveal my personal identity.	Yes	No	
5) I understand the information regarding my participation in the study and agree to participate.	Yes	No	

Thank you in advance for your co-operation in my research.

Yours sincerely

Mr. T. Lose (Researcher) Dr. C. Mafini (Co-supervisor)

ANNEXURE F: BUSINESS INCUBATOR MANAGER INTERVIEW GUIDE

Introduction:

I am greatly appreciative of you agreeing to participate in this interview. I guarantee your anonymity and confidentiality. The interview is part of a research study on experiences of business incubators in South Africa.

Business incubator evolution/ awareness:

Let me start by asking you about your understanding of the term incubator?

(a) In your opinion what is a business incubator?

(b) How does the incubation landscape in South Africa compare to international incubators?

(c) To what extent does your business knowledge influence the incubator performance?

(d) Are SMEs in the area aware of the incubation programme support? How you get them to participate?

(e) How do you measure the impact of your business incubation programs on clients?

(f) How much responsibility do you think you have in developing incubatees?

2. Business Incubator Framework:

(a) How important are the following as factor components in the incubation business?

(b) Do you believe an effective business framework can help an incubator to be successful?

Tell me about it:

(c) What are the factor components that make up an incubator framework?

(d) How important is the development of an incubator model?

3. Key requirements for effective business incubators:

(a) What is your opinion regarding an effective business incubator?

(b) What resources do you perceive as being critical to the start-up of an incubator in South Africa?

(c) What strategies do you employ to prolong the operation of an incubator once started?

4. Factors inhibiting performance of business incubators:

(a) What are the factors that impact a business incubator in South Africa?

(b) Are there any follow up mechanisms in place to rate the performance of incubatees?

Would you say your company been successful based on the performance of your incubatees?

(c) Do you receive any complaints from incubatees regarding your services? Tell me about them.

5. Challenges of business Incubators:

(a) Do you face any challenges serving incubatees? Tell me about them.

(b) What challenges do you encounter in an attempt to practice an incubation programme in South Africa?

(c) Have you ever experienced a situation whereby a client leaves the incubation without completion? Tell me about the situation, the reason behind them leaving and how did you handle the situation?

(d) In your opinion who is responsible for addressing incubator problems in South Africa?

(d) What are your recommendations for the practice of incubation programmes and role of government in South Africa?

6. The characteristics contributing to successful start-up:

(a) What entrepreneurial characteristic(s) do you perceive as contributing the most to the successful start-up of an incubator in South Africa?

(b) How do/does you/the incubator acquire the resources marked to be critical to the effective start-up of an incubator in South Africa?

ANNEXURE G: QUESTIONNAIRE

SECTION A: Demographic Profile

In this section, we would like to find out more about your personal profile. Please place a cross (X) in the appropriate block.

A1	Your gender	Male		Female	
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A2	Age category	18-25 years		26-35 years		36-45 years		45+ years	
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A3	Educational level	Diploma		Undergraduate			Postgraduate	
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A4	Race group	African		Coloured		Indian		White		Other (specify)	
----	------------	---------	--	----------	--	--------	--	-------	--	-----------------	--

A5	Current position in organisation	Developer		Manager		Coach		Other (specify)	
----	----------------------------------	-----------	--	---------	--	-------	--	-----------------	--

A6	Existence of the organisation	1-2 years		2-3 years		+5 years		10 + years	
----	-------------------------------	-----------	--	-----------	--	----------	--	------------	--

SECTION B: INCUBATOR PREREQUISITES (INPUTS)

This section requests you to provide information on the importance of certain key prerequisites for incubation. Please respond by marking the appropriate box with an X (only one answer per question).

Item code	Statement/Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important
C2	Characteristics of incubatees	1	2	3	4	5
C3	Identification of incubation opportunity	1	2	3	4	5
C4	Sector specification	1	2	3	4	5
C5	Possible impact of technology	1	2	3	4	5

C7	Securing government support	1	2	3	4	5
C8	Identification of networks and relationships for success	1	2	3	4	5
G1	Sufficient working capital	1	2	3	4	5
G2	Experienced managers/ developers	1	2	3	4	5
G5	Salaries and benefits to staff	1	2	3	4	5
G6	Flexibility and committed managers	1	2	3	4	5
G7	Sustainable, efficient business operation	1	2	3	4	5
G8	Professional development activities/learning	1	2	3	4	5
D5	Governance structure	1	2	3	4	5
D6	Legal compliance	1	2	3	4	5
D7	Sustenance strategy	1	2	3	4	5
D8	Revenue generation model	1	2	3	4	5
J2	Support from financial institutions	1	2	3	4	5
J3	Office space for incubatees	1	2	3	4	5
J4	Access to technology and business facilities	1	2	3	4	5
J5	Entrepreneurial skills	1	2	3	4	5
B3	Entrepreneurial focus	1	2	3	4	5
B8	Value proposition	1	2	3	4	5
B9	Possession of critical knowledge	1	2	3	4	5

B7	Impact of board of directors	1	2	3	4	5
C1	Identification of market segment/ positioning	1	2	3	4	5
C6	Analysis of business environment	1	2	3	4	5
D1	Incubation strategy formation and development	1	2	3	4	5
B4	Possession of industry expertise	1	2	3	4	5
B5	Industry experts/coaches	1	2	3	4	5
B6	Selection and ideation	1	2	3	4	5
B1	Availability of funding	1	2	3	4	5
B2	Infrastructure and access to technology	1	2	3	4	5

SECTION C: BUSINESS INCUBATOR PERFORMANCE INDICATORS (PROCESSES)

This section requests information on the criticality of the operations and processes of incubation. Please respond by marking the appropriate box with an X (only one answer per question).

Item code	Statement/Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important
E5	Number of incubatees graduated	1	2	3	4	5
E6	Number of jobs created	1	2	3	4	5
E7	Number of SMMEs established	1	2	3	4	5
E8	Number of clients supported	1	2	3	4	5

SECTION D: MONITORING AND EVALUATION (OUTCOMES)

This section requests information on the possible operational outcome of incubation. Please respond by marking the appropriate box with an X (only one answer per question).

Item code	Statement/Item description	Not important	Somewhat important	Moderately important	Very important	Extremely important
E2	Follow ups	1	2	3	4	5
E3	Measurement of outputs	1	2	3	4	5
E4	Financial stability/ turnover generated by SMMEs	1	2	3	4	5

THANK YOU FOR YOUR TIME TO COMPLETE THE QUESTIONNAIRE.

ANNEXURE H: LANGUAGE EDITOR LETTER (FOR PROPOSAL)

Ms Linda Scott

English language editing

SATI membership number:1002595

Tel: 083 654 4156

E-mail: lindascott1984@gmail.com

19 June 2016

To whom it may concern

This is to confirm that I, the undersigned, have language edited the **research proposal** of

Thobekani Lose

for the degree thesis for

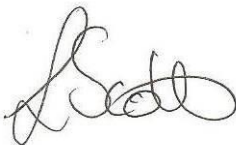
Philosophiae Doctor: Business Administration

entitled:

*A business framework for the effective creation of business incubators in
South Africa*

The responsibility of implementing the recommended language changes rests with the author of the proposal.

Yours truly,



Linda Scott

ANNEXURE I: GRAMMARIAN LETTER (FOR THESIS)

22 Krag Street
Napier
7270
Overberg
Western Cape

23 February 2019

EDITING & PROOFREADING

Cheryl M. Thomson

**A FRAMEWORK FOR THE EFFECTIVE CREATION OF BUSINESS
INCUBATORS IN SOUTH AFRICA**

**Supervisor: Prof. M. Dhurup
Co-supervisor: Prof. C. Mafini**

This is to confirm that I, Cheryl Thomson, executed the language and technical editing of the above-titled Doctoral thesis of THOBEKANI LOSE, student number 216166233, at the VAAL UNIVERSITY OF TECHNOLOGY in preparation for submission of this thesis for assessment.

Yours faithfully



CHERYL M. THOMSON

Email: cherylthomson2@gmail.com

Cell: 0826859545

Landline: 028 4233076