

**UNIVERSITY OF THE WITWATERSRAND FACULTY OF
COMMERCE, LAW AND MANAGEMENT**

**An Exploratory study on the Performance of Business
Incubators in South Africa**

By

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requirements for the degree of Master of Management
in Entrepreneurship and New Venture Creation**

Supervisor: Professor Boris Urban

ABSTRACT

This study explores the worth of state sponsored Business Incubators to the South African economy in respect of job creation and enterprise development. Using The Innovation Hub Management Company (TIHMC)'s Maxum Business Incubator as a case study, and employing mixed methods, this non experimental longitudinal research undertakes to interrogate the quality of service rendered by one of South Africa's premier enterprise development facilities and its contribution to employment generation since its formation in 2000. The study surveys Pre - Incubatees, Incubatees and Post - Incubatees and interviews key informants in the TIHMC management to unravel this relatively under-researched area. The results show that the TIHMC Maxum Business Incubator has nurtured up to 81 firms which in turn have provided a combined total of 821 jobs between 2000 and 2011 - constituting 0.10% of the 800,000 employment opportunities generated by the Gauteng Provincial Government within the same period. However, the results also indicate that a range of services, particularly business skills, planning, financial management and book-keeping training require vastly improved technical expertise to sustain the incubated firms' market potentials. Further, the TIHMC needs to develop accessible information management systems and evaluative tools to enable regular performance appraisals, beneficiary feed-back and tracking of success stories in order to improve its strategic visions. The study's ambitions were to inform the TIHMC management's future plans and to contribute more generally to informed national discourses, policy making and academic inquiry into the efficacy of the novel notion of Business Incubation and its value to developing world contexts.

DECLARATION

I, Francine Mambwe Chama Chirambo, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in Entrepreneurship and New Venture Creation (MMENVC), Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Francine Mambwe Chama Chirambo

Signed at

On the Day of 2014

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1. CHAPTER 1: INTRODUCTION

1.1 Introduction

The idea of *Business Incubation* is still novel to the developing world context (Almubartaki, Al-karaghoulis & Busler, 2010; Vanderstraeten, Matthyssens & van Witteloostuijn, 2012; Khalil & Olafsen (no date.p.75).The existence and viability of such initiatives in Africa and particularly in South Africa, is poorly documented and is characterised by lack of empirical research to inform academic or policy interventions regarding their value to the economy to a great extent (ibid).

Regardless, the notion seems to hold potential for contributing to enterprise development and employment creation, the result of which would bode well for an economy such as South Africa's, where there is a dire need to generate human development opportunities for the larger part of the population (Prinsloo, 2004; UNDP HDR, 2013).

In an attempt to better understand the rationale, nature and value of the notion of business incubation to modern economies therefore, this researcher, adopting a *case study* approach, explores the historical and contemporary imperatives of the phenomena, tracing the origins of the idea and its metamorphosis from western capitalism in addition to discussing the economic conditions that have necessitated its development.

The study proceeds to discuss incubator classifications and the advent of such initiatives globally and in South Africa, the workings of *The Innovation Hub Management Company (TIHMC)*'s "*Maxum*" *Business Incubator* - which is the case study in this regard – before subsequently unfurling the methodology and findings.

The choice of the *TIHMC Maxum Business Incubator* is a considered one, as the entity, evidently, represents an important part of the history of Business Incubation in South Africa, having been one of the first institutions established to advance this notion more than a decade ago. Secondly, the *TIHMC Maxum*

Business Incubator is a State Owned Enterprise (SOE) whose ambitions not only reflect the broader government scheme of catalysing employment generation in the economy; but also, in the context of this study, provide a fairly substantial basis to begin to comprehensively understand the worth of such initiatives more generally. Thirdly, while this study focuses on a specific case study [in this case TIHMC]; and attempts to understand its strategic visions, purpose and model employed, it is perhaps self-apparent that there is a broader implication to the results that emanate from this endeavour given particularly the inadequacy of information in this area. Therefore, this information is assumed to have national policy import even though the study itself does not primarily claim generalizability based on the outcomes of a single case.

In this regard, it can be noted that the Maxum Business Incubator is a reasonably strategic candidate as a case study because of the following key factors:

- It is one of the first incubators of its kind to have been established in South Africa;
- It is one of the longest surviving incubators in South Africa;
- Given that it is a State Owned Enterprise (SOE), it provides us a unique opportunity to understand whether its existence is predicated purely on state support and not, essentially, on market-based innovation.
- Lastly, it is a fairly interesting proposition, at least to this scholar, to establish an empirical basis upon which decision makers in the state and SOEs may centre their strategic visions regarding the value of these investments.

Embracing the concept of triangulation, the study employs mixed methods, that is, a quantitative research design with closed-ended questionnaires as the principal tools, supported by a qualitative component with key informant interviews. The study, hence, elicits the perceptions of Incubatees and management of TIHMC Maxum Business Incubator on the facility's performance and thereby develops a *reasoned conclusion* of the value of such

initiatives to the economy. The detailed methodology for exploring these phenomena is explained in Chapter Three of this dissertation. The study is informed by dual economy theoretical models originally inspired by Lewis (1954) to explain the causal relationship between entrepreneurship and economic development. These models have experienced further scholarly development over the years (Murphy, Schleifer and Vishny, 1991; Zenou, 2007; De Paula and Scheinkman, 2007 all authors cited in Urban, 2008) with the more recent adaptations emphasising entrepreneurial ability as the main focus in the development economics of entrepreneurship. The general thrust of these theoretical models is to argue that not all individuals should allocate their talent toward becoming entrepreneurs but that those with high entrepreneurial ability should be the ones to assume this function or be supported to become successful entrepreneurs as such (Barreira, Dhlwayo, Luiz, Naudé & Urban, 2008, p.108). This implies the creation of a controlled environment where carefully selected individuals are nurtured to direct their creative resources to a particular field and optimised to contribute positively to the economy – a process which has been loosely termed Business Incubation.

1.2 Purpose of the study

Specifically, therefore, the purpose of this *case study* is to contribute new knowledge to academia and the market on the value of state owned Business Incubators in revitalising the economy of a nation. To this end, the study seeks to measure the key outcomes of The Innovation Hub Management Company (TIHMC)'s "Maxum" Business Incubator since its inception in 2000 to 2011, in order to garner indicative evidence of its worth to the local market.

1.3 Context of the study

The study is unique to TIHMC as no research has been conducted since its inception in 2000. The study seeks to offer an insight review of the efficacy of state owned Business Incubators; in particular, the value of the Maxum Business Incubator to the market by tracking its performance over an 11 year

period. Consequently, information on at least 40 companies that were incubated at the Maxum Business Incubator (i.e. companies that graduated as well as those that did not, from each five year phase 2000 – 2005; and 2006 – 2011) was obtained and analysed.

1.4 Problem Statement

1.4.1 Main problem

A substantial investment is being made into state owned incubators in South Africa; however, their efficacy in terms of impact on enterprise development and sustainability is not well understood. It is noted by Ndabeni (2009) for instance, that the 1995 White Paper on National Strategy for Development and promotion of Small Businesses - the first attempt at a comprehensive policy and strategy for SMMEs - opened opportunities for previously disadvantaged black populations to access finance, markets, technology, capacity building and institutional strengthening. However, the impact of this 'investment' needs to be assessed and appreciated.

The main problem is therefore stated as follows:

Quantify the value of state owned Business Incubators in terms of their key outcomes to assess their worth to the local market.

Key words: Business Incubator, Performance indicators, Entrepreneurship, Job creation, Economic development

1.4.2 Sub-problems

The first sub-problem relates to understanding the impact of South African, State owned-managed incubators on new enterprise creation.

The second sub-problem relates to the sustainability of new enterprises that entered the market in the period under study (i.e. 2000 to 2011)

The third sub problem focuses on the value added to the market by the graduant enterprises, that is, in terms of quantifying the number of employment opportunities created. The opportunities generated will be categorised as follows:

- Employment created in incubated/affiliated firms
- Opportunities created in graduated firms
- Indirect jobs.

1.5 Significance of the study

Evidently, this study explores largely uncharted terrain owing to limited academic inquiry into the phenomena globally and particularly in Africa (Almubartaki, Al-karaghoul & Busler, 2010; Khalil & Olafsen, no date.p.75; Vanderstraeten, Matthyssens & van Witteloostuijn, 2012).

Its significance lies in the prospect that it may provide guidance in understanding the efficacy of state owned Business Incubators both to the South African government in general and to management at TIHMC in particular. For the South African economy, the key indicators focus on the role performed by incubators in fostering the spirit of entrepreneurship and in providing guidance and a favourable environment to start-ups. For TIHMC, the key indicators can be used as standards to assess the efficacy of its Maxum Business Incubator.

In conducting this study, this researcher recognises the necessity and complexities associated with studying incubator performance globally in equal measure. For instance, Ramluckan (2010), in his studies funded by the Department of Trade and industry (DTI) examining various categories of incubators in South Africa, notes the great diversity of such centres and the disparate performance levels associated with them. He is however instructive in asserting that the incubator terrain is one that requires further exploration to foster informed approaches to sustaining them and enabling growth.

This dearth of knowledge on incubation is further acknowledged by other authorities in the field such as Al-Mubarak and Wong (2011) whose works unfortunately, are confined to Europe. It is notable, however, that they too recognise the imperative of developing new knowledge in this realm, particularly ranged at comparing regional contexts or, for that matter, mining new data on specific geographical zones. Interestingly, they make a strong case for cross-regional comparative studies to expand the know-how in this seemingly nascent area of learning and enterprise development.

Ramluckan (2010)'s works however foreground the problem in a more succinct fashion. He details a considerable menu to be examined in this regard when he posits that there is need for comprehensive case studies of incubators which have either succeeded or failed; group studies focusing on specific sectors; and studies on incubators in specific regions or towns. The lessons to be learned thereafter from incubator efforts from other African countries would be deemed valuable to the entire Business Incubator project globally. Similarly, Khalil and Olafsen (no date, p.80) recommend that the effectiveness of incubators should be evaluated in earnest in developing countries as they are relatively new. Schwartz (2011) underlines the existence of a lacuna in this area when he notes that "knowledge regarding the performance of incubated ventures after they have (successfully) completed their incubation is almost non-existent" (p.491). The scholar further states how important the tracking of the performance of incubated ventures is, after successfully completing their incubation period as this would result in the understanding of the overall effectiveness of BI initiatives. The importance of this exploration, given this problem context, cannot therefore be over emphasised.

1.6 Delimitations of the study

As stated in the introduction, the study does not purport to undertake a comprehensive nation-wide exploration. Rather, the general thrust is to use the outcomes of a state owned incubator by applying a set of internationally tested performance-based indicators elucidated in Chapter 2 (section 2.9) of this report and developing an analytical, empirical basis to gauge its potential. The results

will likely be of value to the market, the state and the TIHMC management. In this sense, the study provides for lessons-learning, evidence-based cross-pollination as well as potential for course-correction for similar entities in the country and possibly elsewhere.

1.7 Abbreviations

Business incubators – BIs

State Owned Enterprise – SOE

The Innovation Hub Management Company - TIHMC

Department of Trade and Industry - DTI

National Business Incubation Association – NBIA

Strategy Map for Economic Development Incubators - SMEDI

Balanced Scorecard for Economic Development Incubators – BSEDI

1.8 Assumptions

This researcher assumed that TIHMC management would cooperate in the provision of data and enable unfettered access to senior management, mid-level managers and knowledge management staff directly linked to the Maxum Business Incubation programme. The mutual benefit to be derived from this project by both TIHMC and the researcher, in this regard, was assumed to be the key motivator to anchor these assumptions as such. It was also anticipated that the respondents would reflect reasonably accurate perspectives on incubation and their experiences and that the required sample size would be obtained.

1.9 Organisation of Chapters

The research report is organised as follows: Chapter One – Introduction and Problem Statement ; Chapter Two Literature review and Research questions ; Chapter Three Research Methodology ; Chapter Four Presentation of results and finally Chapter Five Discussion pertaining to the results, conclusions and recommendations.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

As elucidated in Chapter One, the idea of *Business Incubation* is still new to the developing world context and particularly to the African continent and South Africa.

To fully appreciate the relevance of the notion of Business Incubation to modern economies, this chapter reviews literature on the evolution of the concept and provides a historical background and an analytical overview of its supposed significance to the contemporary economic architecture, tracing its beginnings in western capitalist societies.

Further, it explains the main types of Business Incubators that have emerged thus far and the economic conditions that have catalysed their metamorphosis in western economies and in South Africa. The chapter provides an initial insight into the profile of the TIHMC Maxum Business Incubator, its strategic vision and recruitment criteria, framed against the brief history of Business Incubation in South Africa. The chapter, in addition, discusses the limitations experienced by scholars in understanding incubators and their value to the market, particularly in South Africa, where the idea and experience is relatively new. Finally, the chapter provides a reasoned conclusion which explains why it is critical to have an understanding of Business Incubation, its strategic value to employment creation, entrepreneurship and business development.

2.2 Background discussion: Understanding the nexus between entrepreneurship and economic development

Because this entire study aims to contribute to new knowledge on the worth of state sponsored Business Incubators to the economy, it is, perhaps, logical to foreground a discussion on the relationship between entrepreneurship and economic development before venturing into the substantive matters of

Business Incubation as such. Theoretical models suggest that the causal linkage between entrepreneurship and economic development is bi-directional; entrepreneurship can affect development positively or negatively. The positive elements include firm growth which helps to create employment, among other benefits (Barreira et al., 2008, p.105). The negative aspects take the form of illegal trade and self-serving profitable activities which are usually socially destructive (ibid). Some forms of entrepreneurship are deemed totally unsuitable for economic growth such as *survivalist* and *necessity entrepreneurs* who may play poverty alleviation functions rather than an employment generation role. These characteristics are associated with developing-world contexts in the main. It is argued further that economic development can influence the quality of entrepreneurship on the other-hand, by providing the institutional architecture relevant to growth - regulatory frameworks, rule of law, protection of property rights, the quality of formal wage employment, educational facilities and the appropriate level of financial development (ibid). It stands to reason therefore that a favourable institutional setting builds confidence in the prospective entrepreneur to invest his/her resources in a particular venture, knowing full well that there is recourse in law for instance.

Barreira et al., (2008, p.101) are instructive in asserting that to understand the role of an entrepreneur in economic development and growth, one must delve into the history of the structural transformation of under-developed economies and the function of the entrepreneur therein. In this regard, scholars have attempted to explain the structural transformation of under-developed economies using, inter alia, '*unified growth models*' which are closely linked to the *dual economy models* inspired by Lewis (1954 cited in Barreira et al., 2008).

Historically, the transition from the pre-industrial or Malthusian era (which was subsistent in character) to the post-industrial era (termed the 'Solow' or era of modern growth), is signified by a change from technology based on land, to technology focussed on physical and human capital (Hansen & Prescott, 2002 cited in Barreira et al.,2008). The advent of new technology called for specialisation and large markets, which were eventually provided for by population growth and rapid urbanisation. This changing technological and

human context led to families investing more in the quality of their offspring instead of quantity, enabling economic growth as a result (Galor & Maov, 2001 cited in Barreira et al., 2008). It is notable that Barreira et al., (2008, p.101) highlight the low levels of entrepreneurial ability and a dearth of exploitable opportunities as one of the fundamental problems of the Malthusian era. In time, specialisation led to the generation of new knowledge and innovation, accelerating the diffusion of new technologies; catalysing investment in human capital and thereby facilitating a change in the parental (household) strategy of focussing on the quality of familial life instead of quantity. It is understood hence, that as population density grew as a consequence of urbanisation; and as societies experienced advancement in basic technologies in the agricultural and transport sectors, there was a corresponding increase in opportunities. In short, the distinct phases of structural economic transformation have been characterised as 1) the era of the traditional subsistence state, 2) the pre-industrial era (Malthusian) and 3) the post-industrial era (solow or era of modern growth). The stages of growth are punctuated by a transition from land-based technologies to technology based on physical and human capital accumulation. It is noteworthy that the transformation also necessitated new skills and specialisation thriving on the existence of large markets signified by population growth and urbanisation (Barreira et al, 2008: 100-101).

Recent scholarly attempts to expand Lewis (1954 cited in Barreira et al.,2008)'s model such as those by Gries and Naude (2008 cited in Barreira et al.,2008), began to integrate entrepreneurship into the development economics discourse more succinctly with the aim of bridging the gulf between the two disciplines. While adhering to Lewis (1954)'s categorisation of a traditional sector and modern sector, they distinctly identify and articulate the roles of micro-foundations, rendering a differentiation between *mature* and *start-up entrepreneurs*, between *large* and *small firms* and *necessity* and *opportunity-driven entrepreneurs*. In this model, entrepreneurs are recognised as creators of new ventures capable of absorbing surplus labour from the traditional sector and providing innovative, intermediate inputs to final-goods producing firms.

Hence, they not only increase productivity but employment as well in both the modern and traditional sectors (Barreira et al., 2008, p. 102).

Perhaps, it is Zenou (2007 cited in Barreira et al., 2008)'s adaption of the dual economy theoretical model that is best suited to the framing of this discussion, for it does not define duality in terms of a traditional and modern economy but rather contextualises it within the realities of modern-day developing country conditions, which are relevant to contemporary South Africa as well. Zenou (2007) distinctly categorises modern developing economies as constituting an *informal sector* comprising self-employed individuals (entrepreneurs) and a *formal sector* composed of mainly wage-employed persons and punctuated by high unemployment. It is noted that in Africa the informal sector accounts for between 20% and 80% of non-agricultural employment, conditions which may generate varied forms of entrepreneurship. The general characteristic of the formal sector is wage employment and high unemployment. The informal sector, on the other hand, is occasioned by job-seekers who may create their own firms or gain employment in informal family owned companies. A related and useful theoretical consideration is rendered by Murphy et al., (1991 cited in Barreira et al., 2008, p.102-103)'s model as well as Nelson and Pack (1999 cited in Barreira et al., 2008): Their adaption of the dual economy model emphasises *entrepreneurial talent or ability* as the basis for enabling growth. They argue that talent or ability is related to firm size and growth in the economy. The scholars contend that without entrepreneurial ability the returns to physical and human capital are low. Firstly, it is implicit in this model that persons or firms of demonstrable entrepreneurial ability can be nurtured (Incubation). Secondly, it is posited that in order to achieve growth, significant investment in complex production methods, specialisation and technological intensity are required, with growth and productivity being catalysed by knowledge accumulation. To this end, the generation and subsequent commercialisation of new knowledge is central to enterprise development. Innovation in this sense can also be understood as a pivot in generating employment and economic growth (Barreira et al., 2008, p. 103-105). This approach is underlined by recent trends by governments in Africa to invest in science parks and provide research and development subsidies enabling

university-private sector cooperation to emerge (Barreira et al., 2008) – the TIHMC in South Africa, being a prime example.

2.3 The advent of Business Incubators

Broadly speaking therefore, Business Incubators (BIs) have been defined as organisations that provide protected environments for business start-ups (Buys & Mbewana, 2007). Campbell (1999 cited in Bhabra-Remedius & Cornelius, 2003) observes that incubators were devised to address market failures such as inequitable access to capital, information and lack of relevant business advice to small business. The scholars define a Business Incubator as a facility providing favourable *controlled conditions* to aid the growth of new ventures.

In similar vein, the United Nations Economic Commission for Europe UNECE (2012, p.49) describes Business Incubation as a “systematic way to support the establishment and growth of a new company”. Buys and Mbewana (2007) also affirm that Business Incubation is a program that organises the process of creating successful new enterprises, by offering prospective entrepreneurs a comprehensive and combined range of services which include the following:

- Temporary floor-space made available on a flexible and affordable basis;
- Common services that include secretarial support and shared use of office equipment hands-on business mentoring;
- Access to specialised assistance such as research and development (R & D); support and venture capital and networking activities operating as a reference point inside the premises among entrepreneurs and outside to the local community.

The National Business Incubation Association (NBIA) provides, perhaps, an even more descriptive notion of Business Incubation detailing its strategic intent and alluding to its economic worth as such:

“...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 program financially viable and freestanding.” (National Business Incubation Association, 2009).

These definitions, despite their seemingly varied nature, all converge around common factors such as: strategic support, provision of office space, business mentoring, shared resources (secretarial and office equipment) and networking activities. Hence, regardless of their geographical location, historical background or seemingly varied primary purpose in some cases, there are common strands that tether the notion of Business Incubation to a mutual goal – *stimulating growth*, which has been generally measured in terms of employment creation, profit generation and sales growth (Bhabra-Remedius & Cornelius, 2003).

2.4 Origin of Business Incubators

Although the origin of Incubators as defined in contemporary times is somewhat contestable, some of the first evidence of something approximating modern entities can be traced back to the Batavia Industrial Centre in New York, founded by Joseph Mancuso in 1959 (Brown, Harrell & Regner , 2000 cited in Al-Mubarak and Wong, 2011). Mancuso established this centre as a privately owned for-profit hub out of economic necessity (Burger, 1999 cited in Al-Mubarak and Wong, 2011). He allowed tenants to rent building space based on their needs and permitted them to share the expenses of various office services. Mancuso used this strategy of expense-sharing based on needs in the hope of finding enough tenants to guarantee a viable occupancy rate; that is, generate a profit for his investment.

As the idea gained currency, it was gradually adopted as more people became aware of Mancuso's business strategy and its potential impact on job creation in the community. However, the Mancuso initiative was still under-developed and would not, in all appearances, approximate the role of modern Business Incubators.

In their exploration, Bhabra-Remedius and Cornelius (2003) suggest that scholars only 'picked up' the phenomena for empirical research in the 1980s, the period in which the fundamental principles defining incubators had materialised in the literature.

In this regard, Burger (1999 cited in Al-Mubarak & Wong, 2011) asserts that the first formal incubator was only established in 1980 when the *Rensselaer Polytechnic Institute* created an incubation program for its students, faculty and community residents who had a desire to start their own businesses. Thereafter, modern incubators started emerging during the recession that occurred in the early 1980s (Clark & Minor, 2000 cited in Al-mubartaki et al., 2010) where a number of large corporations were shut down causing mass unemployment. One infers from this, that the distinct feature of Business Incubation in the 1980s was its *reactive nature*. It appears to have been essentially a response to an unexpected economic down-turn which desperately required innovative means to sustain or create new job opportunities.

Therefore, as more of these entities materialised, the general public began to view them as a means to alleviate economic distress through reconstruction and operation of idle manufacturing buildings to generate income for investing parties and to create new job prospects (Clark & Minor, 2000 cited in Al-Mubarak & Wong, 2011).

The incubators were not uniform in appearance and purpose however. The incubator-types ranged from non-profit entities that aimed to contribute to economic development, university-based facilities seeking to commercialise products of scholarly research, profit-orientated privately sponsored initiatives and public sponsored incubators which focussed on creating job opportunities by nurturing potential employers (Campbell & Temali, 1984; Udell, 1990) (Table

1). In the case of South Africa, Ndabeni (2008) identifies two distinct incubator types - *Technology Stations* and *Business Incubators* which have both been established to promote economic growth, particularly in the high-tech Small, Medium and Micro-sized Enterprises (SMMEs) sector.

2.5 Types of incubators

TABLE 1: Classification of Incubators by Campbell and Temali (1984) in Udell (1990)

Incubator type	Main objective
Non-profit incubators	Targeted economic development
University-related incubators	Assist in the commercialization of Science and technology produced by university research
Privately sponsored incubators	Generate profits
Publicly sponsored incubators	creating jobs by creating employers

Source: Benjamins (2009)

Although incubators have been classified in different categories with differing objectives, it is interesting to note that scholars have found *no major variation* in the types of services they provide to their clients in recent times (Allen & McCluskey, 1990 cited in Benjamins, 2009).

In general therefore, commercialising new technologies from universities, diversifying local economics, serving minority entrepreneurs and creating jobs is what incubation programmes seek to achieve. Incubators are being established to assist companies flourish for particular markets like biotechnology or the arts. From a purely theoretical standpoint therefore, it can be stated that incubators endeavour to perform a significant role in the development and growth of the local, regional or national economy by aiding business development and expansion, through helping to develop markets and creating jobs.

Because of the centrality of universities globally in the innovation of Business Incubators, it is perhaps necessary to illuminate the role of tertiary institutions in developing this idea. Lalkaka (no date) reinforces this discussion by positing that the majority of Business Incubators in South Africa are linked to academic institutions of higher learning or research parks.

In the beginning, technical universities in the western hemisphere embraced the notion of Business Incubation purely from an academic standpoint, that is, providing a platform for innovation to occur and catalysing the free contestation of market-based ideas. However, with time, concerns about academic institutions 'soiling' their hands with commercial pecuniary interests gave way to a focus on technology transfer instead of outright commercialisation (Zedtwitz, 2003). The first technology transfer establishments can be traced back to 1970: Then, Universities tended to provide or build office space for entrepreneurial-minded researchers and students (ibid). Since 2001, the general characteristic of university incubators has been to foster collaboration between scientists in academia and industry. 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. As Zedtwitz (2003) notes, these activities are often carried out in close collaboration with the local technology-transfer office, since the intellectual property naturally belongs to the university and has to be licensed by the entrepreneur before commercialisation.

2.6 Evolution of Business Incubation in South Africa

Ndabeni (2008) suggests that the incubation process in South Africa in particular is a recent phenomenon and is still in an embryonic phase.

In general, literature indicates that Business Incubation is characteristic of post-apartheid South Africa with substantial evidence of its existence materialising in the late 1990s. Ndabeni (2008) suggests that the incubation process in South Africa in particular is a recent phenomenon and is still in an embryonic phase. Historically, Apartheid South Africa promoted large enterprises using oppressed black labour and was hostile toward the development of SMMEs especially for the African population (Ndabeni, 2009). Small scale producers were consigned to generating inferior products catering for the lower end of the market. This resulted in suppressed entrepreneurship and human capital development. However, following the transition to a democratic state in 1994, the de-racialization of the economy and the subsequent launch of the SMME strategy in 1995, which recognised small business as potential for job creation, poverty eradication and economic development, more opportunities were opened up for all South Africans (ibid). Organised, de-racialized and inclusive enterprise development processes can therefore be deemed, as posited by Ndabeni, to have taken root after 1994.

At present, South Africa has not less than 20 incubators sustaining entrepreneurs in sectors ranging from horticulture, construction, chemicals, ICT, biotechnology, metal fabrication, furniture manufacturing to platinum beneficiation. The bulk of these are state supported facilities, either sponsored by national government or provincial and local government (Business Incubation in Sub-Saharan Africa, no date).

Ndabeni (2008) affirms that despite the limited literature on Business Incubators, the existing data provides important insights into the nature and workings of these facilities in the country. He notes for instance that South

Africa's two incubation types – the *Technology Stations* and *Business Incubators* – are ranged at catalysing economic growth in the high-tech Small, Medium and Micro-sized Enterprises (SMMEs) sector. The Technology Stations programme was developed by the Department of Science and Technology to strengthen and accelerate the interaction between Technikons and SMMEs. The Technology Stations' activities include, inter alia, research, development and application of new technologies, technology transfer, troubleshooting, quality advisory service, product development, simulated production units, testing services and secondment of staff and students (Business Referral & Information Network, 2004 Cited in Ndabeni, 2008).

TABLE 2 : Schematic representation of technology stations in South Africa (Ndabeni, 2008)

Technology Station/Technikon	Focus	Province
Technikon Pretoria	Electronic and electrical engineering	Gauteng
Peninsula Technikon	Clothing and textiles technology	Western cape
Free state Technikon	Metal and manufacturing	Free State
Port Elizabeth Technikon	Automotive components	Eastern cape
North West Technikon	Chemistry and chemical engineering	North West
Vaal Triangle Technikon	Composit materials	Gauteng
Mangosuthu Technikon	Chemistry and chemical engineering	KwaZulu Natal
Technikon Northern Gauteng	Automotive	Gauteng

Technology Incubators focus on the physical facilities and incubation. Their key objectives are economic growth, sustainable employment, technological innovation and technology transfer, and making South African SMMEs internationally competitive. An important element of the incubation movement in South Africa is the Godisa programme (Setswana – 'nurturing or helping to grow'), a South African initiative located at the Council for Scientific and Industrial Research campus of the University of Pretoria. The programme is made up of Godisa Centres, which comprise a Pilot Innovation Support Centre,

a Pilot Technology Demonstration Centre and several technology incubators (Ndabeni, 2008).

TABLE 3 : Technology Incubators in South Africa (Ndabeni, 2008)

INCUBATOR	FOCUS	PROVINCE
Gauteng Software Incubator	Software	Gauteng
Acorn Incubator	Life Science Technologies	Western Cape
Brainworks Incubator	ICT and Electronics	Gauteng
eGoli Biotechnology Incubator	Commercialisation of life sciences, research, products, services and technology platforms	Gauteng
South African Chemical Technology Incubator	Downstream chemical manufacturing SMMEs	Eastern Cape
Timbhale Incubator	Export based cut flower and Nutraceuticals	Mpumalanga
University of Pretoria Incubator	High-technology	Gauteng
The Innovation Hub	High-technology and start-up companies at the leading edge of the new economy	Gauteng
Mpumalanga stainless Initiative	Manufacturing	Mpumalanga
KwaZulu Natal Innovation Support Centre	Technology commercialise skills development	KwaZulu Natal
Zenzele Technology	Small scale mining	Gauteng

2.7 The Innovation Hub's Maxum Incubator

One of the most significant state owned and managed incubation facilities in the post-apartheid era was the Maxum Business Incubator programme, established as a TIHMC initiative in 1999 prior to the establishment of TIHMC as a legal entity. The Maxum Business Incubator was set up in partnership with the University of Pretoria (UP) and the Council for Scientific and Industrial Research (CSIR). The objectives of the incubator were aligned to those of its two partners, the UP and the CSIR. These objectives included technology transfer with spin-outs for the UP and the CSIR; job creation and wealth generation for the Gauteng Provincial Government (GPG). The incubator focused on high-tech start-up companies in the fields of Information and Communications Technology (ICT), Biosciences, Electronics, Smart Materials and Advanced manufacturing. The aim was to lure these companies to take up residency at The Innovation Hub (Sawers, 2011).

In its formative years, the Incubator adopted an informal entry process, informed by a Consultant's assessment of the requirements for the incubation services which included the potential for growth of the companies or Incubatees as they were referred to. The Maxum Business Incubator provided subsidised office space, free access to meeting rooms, internet access and telephony, and reception services. Coaching and mentoring services were outsourced to Consultants (ibid).

It was not until 2003 that the TIHMC established formal processes including the formulation of lease agreements, entry-exit criteria; formal mentorship sessions, among other services. Given the period in which the TIHMC was established, that is, the post-apartheid era, it is notable that the first five firms that enlisted to join the Maxum Business Incubator were white-owned. Upon recognition of the fact that black owned business sought the same support but lacked the capacity

to develop business plans owing to historical reasons of deprivation, the TIHMC decided to introduce a Pre-Incubation programme to 'bridge the gap' (Sawers, 2011). Therefore, it is important to note that the Maxum Business Incubator, at this formative stage, focussed on two programmes; *Pre-Incubation* and *Incubation* based on the realisation of the economic disparities occasioned by historical imperatives under apartheid, which incapacitated the black population in many areas of human development.

Hence, the six month Pre-Incubation programme prioritised young black entrepreneurs assisting them to develop business plans and finalise their product offerings to reach what was termed 'prototype stage' (ibid). Upon the completion of this phase, the Pre-Incubatees would be assessed to determine whether they had qualified for the full incubation programme. It was envisaged that at least 50% of the graduating Pre-Incubatees would qualify for the incubation programme (The performance of this phase of the programme, was not evaluated from initial indications and will be an element in this exploratory study). The Pre-Incubation programme hereafter focussed on business development and shepherded entrepreneurs to conclude their business concepts by defining their product offering and determining its market acceptance (Sawers, 2011). The incubation programme on the other hand was ranged at supporting start-up companies to establish themselves and flourish. TIHMC hence prioritised the establishment of a firm foundation for Incubatees upon which a sustainable business would leverage high growth potential (ibid).

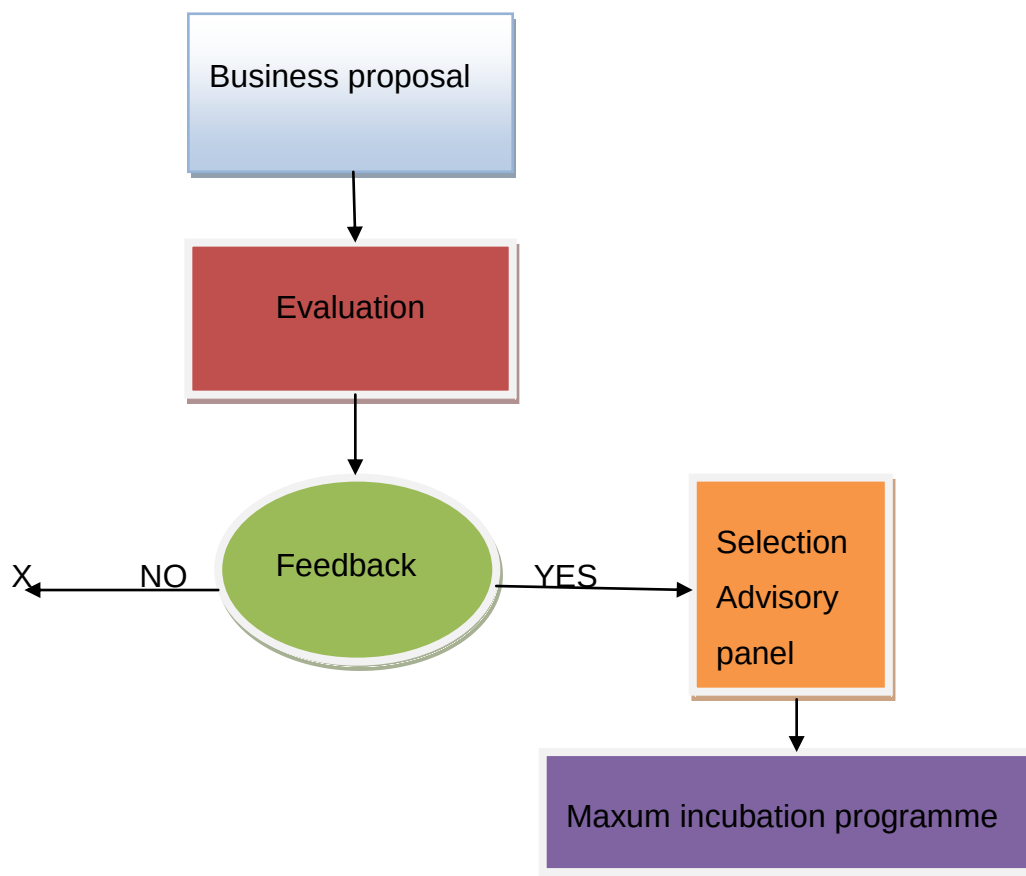


FIGURE 1: INCUBATION ENTRY PROCESS (TIHMC, 2003)

To this end, the Maxum Incubator offered the following services:

- Flexible leases;
- Comprehensive ICT infrastructure including telephones, bandwidth, internet and email access, and data storage facilities;
- Receptionist;
- Advice from business mentors, venture capitalists and legal professionals;

- Networking with established companies and like-minded innovators through regular events;
- Facilitated access to sources of funds through existing relationships;
- Media exposure and brand support;
- Access to knowledge centre; and
- State- of- the- art meeting, restaurant and catering facilities.

Maxum Royalty Plan

At present, the Maxum supports start-up companies (Incubatees) that have inadequate resources for investment overheads with subsidies on rental rates for office space and meeting rooms, in addition to extending business mentorship services (TIHMC, 2003). Upon graduation, Post-Incubatees are expected to pay for these services in the form of a royalty fee of 2% of the annual turnover for the equivalent period that it participated in the incubation programme (ibid).

When the African National Congress (ANC) launched its 2009 manifesto, the need for job creation was magnified further leading to more emphasis on pre-incubation by the TIHMC Maxum Business Incubator in its subsequent strategies (Sawers, 2011).

Consequently, at present, the Maxum Incubator has three programmes, namely, *Pre-Incubation*, *Incubation* and *Post Incubation*. The entry and exit criteria for each programme, including admission process are set out in the tables below (Tables 4,5,6,7 & 8):

TABLE 4 : Criteria for entering/exiting the Pre-Incubation programme (TIHMC, 2011).

Criteria for entering the pre-incubation programme	
1.	Technology-enabled business concept with an innovative component
2.	The technology must fall within TIHMC's focus areas, i.e ICT, Clean and Green technology and Biotechnology
3.	The Applicant to the pre-incubation programme must have the following attributes: • a sound understanding of the technology • entrepreneurial aptitude and mindset or potential • high potential of establishing viable business with high growth potential
Criteria for exiting the pre-incubation programme	
	A viable business opportunity substantiated by: • Proof of concept/prototype/fully developed concept ready for implementation • Letters of interest from 3 paying customers • Business plan indicating sustainability and growth possibilities If no evidence of achieving the above, participant exits the programme

TABLE 5 : Criteria for entering the Incubation programme (TIHMC, 2011).

Criteria for entry into the business incubation programme	
1.	The Applicant must have a viable business plan that demonstrate high growth potential of the business venture
2.	The business must be technology enabled i.e products/services/process delivered via a technology platform
3.	Potential for innovation must be evident
4.	Business must be registered and have already generated income; must have made sales; or attracted funding for establishing and starting the venture
5.	The business/technology must be aligned with TIHMC's focus area
6.	The potential to attract a niche market or a feasible plan for entering an existing or new market
7.	Willingness to pay royalty fees
8.	Intellectual property protection and management strategy
9.	Commitment to attend incubation coaching/training and networking sessions at Maxum

TABLE 6 : Criteria for exiting the Business Incubation programme (TIHMC, 2011).

Criteria for exiting the business incubation programme	
1.	Profitability attained and prospects for sustainable growth
2.	Customer base of two or more paying customers
3.	Benefits of remaining in the programme are minimal

TABLE 7: Criteria for exiting the Post-Incubation programme (TIHMC, 2011).

Criteria for exiting the post-incubation programme
Decision panel CEO; CFO, GM, Skills & Incubation; Maxum Manager; GM: Corporate Affairs & Business Development; TIH Sector specialist; External Business Advisor and representative from funder (IDC, SPII, TIA, VC, GEP)

TABLE 8: Selection/Admission process to the Maxum Incubator programme (TIHMC, 2011).

Selection/Admission processes to Maxum Incubator	
1.	Submission of a business proposal
2.	Preliminary evaluation of a business proposal by the evaluation committee based on the selection criteria for pre-incubation or business incubation or post-incubation programme
3.	Selection of the business proposal
4.	Presentation of the selected business proposal to the evaluation committee
5.	A decision to grant admission of the Applicant into the incubator
6.	Entry of the Applicant into either the pre-incubation or business incubation or post-incubation based on the evaluation outcomes.
7.	Exit

2.8 TIHMC Maxum Incubator curriculum

The Maxum Incubator offers a curriculum focussed on the development of business plans for Pre- Incubatees, identifying market opportunities, sustained mentorship programmes, financial and marketing strategies and accessing private and public financing for business plans. The central thrust of the incubation programme is to bolster the capacities of start-ups to establish themselves in the market, improve their business plans, lure new investment, utilise virtual support services and leverage networks of business service providers offered by the TIHMC. Termed 'after care' for graduates, this support system is designed to enable new firms achieve 'a soft landing' by continuing to exploit the Maxum Business Incubator's services including access to markets in countries where the TIHMC has agreements with other countries. The programme also facilitates exports development capacities (Figure 4). The incubation process, by and large, is anticipated to prepare graduates for a highly competitive market (TIHMC, 2011).

	PRE-INCUBATION	BUSINESS INCUBATION
Characteristics	• A 6 to 9 months programme with focus on assisting entrepreneurs to develop their preliminary technology and business ideas, concepts and plans into a viable business that clearly identifies a market opportunity on which a sustainable business can be developed. Entrepreneurs who meet their development milestones before the 9 month duration will be allowed to graduate from Pre-Incubation and every case will be treated on its own merits. Only on special cases will entrepreneurs be allowed to continue in Pre-Incubation beyond the 9 month period. • A series of milestones agreed upon at entry are used to determine the progress of the Incubatees. Mentors are allocated to the Pre-Incubatees to fast-track the development of the business plan and graduation to the main Incubation programme. • TIHMC professional resources, mentors and networks of business service providers help the Pre-Incubatee learn and adopt good management practices, business planning, financial, marketing, Human resources, IP management, Strategic planning and assistance in securing private and public finance for the business plan.	• A 1 to 3 year programme designed to assist start-up companies grow and establish themselves in a market based on a viable business plan and appropriate team. The focus is on getting and increasing sales, refining the plan, strengthening the team, assist the companies attract further rounds of investment. • Companies in this programme will benefit from affordable facilities and services such that they can focus on developing their core business. • TIHMC professional resources, mentors and networks of business service providers assist and guide the Incubatee Company through the growth phase of getting sales into the market. • The support is 'hands on support' not 'life support' with the overriding aim being to move the Incubatee to a point where they are no longer dependant on the services of the Business Incubation environment or when Business Incubation can no longer help them. • In order to expand the catchment for gazelles, the Maxum Incubator will provide virtual services on a case to case basis, provided that it will not compromise the quality of Incubation support.

Figure 2A: Summary of the Pre-Incubation and Incubation support (TIHMC Incubator Strategy, 2011)

	PRE-INCUBATION	BUSINESS INCUBATION
Output	The output of the Pre-Incubation programme will be: • A clearly defined value proposition; • A viable business plan that clearly demonstrates market need, unique selling point, identified market target via market segmentation methodology feasibility, market potential based on market feedback and making a first sale, business development/marketing management; letters of intent from at least 3 clients who are willing to pay for the product/ service/ process before graduating into the Business Incubation programme either as resident or virtual clients; • An appropriate team to successfully launch the business based on the assessment of entrepreneurial aptitude; • Clearly articulated IP protection and management strategy for their idea; • Prototype/Proof of concept of the idea.	The output of the Incubation programme will be: • A clearly defined value proposition demonstrated by market demand for the products/ services/ processes; • A strong business plan which the Incubatee has utilised to establish a market presence; • A strong and appropriate team able to raise further rounds of funding and successfully launch a profitable and sustainable business; • A strong intellectual property management strategy.

Figure 2B: Summary of the Pre-Incubation and Incubation Output (TIHMC Incubator Strategy, 2011)

POST – INCUBATION	
Characteristics	• This programme offers “after – Care’ to graduates from the Incubation Programme, as well as other established companies that require specialised business and other support services. • The package of services offered include access to market through soft-landing opportunities for companies that wish to establish a strong presence in Gauteng or develop exports for their products and services into countries where TIHMC has cooperation agreements, including IASP members.
Output	• The output of the Post-Incubation Programme will be competitive companies with defined and established systems that position them for expansion and growth in global markets.

Figure 3: Summary of the Post-Incubation support and output (TIHMC Incubator Strategy, 2011)

2.9 The challenge of measuring the performance of Business Incubators

Owing to a growing market interest in the notion of Business Incubation globally and in South Africa in particular, the demand for rigorous and workable evaluation frameworks to gauge the efficacy of these entities is reported to have increased substantially in the past few years (McMullan, Chrisman and Vesper, 2001 cited in Vanderstraeten et al., 2012). Evidently, incubator performance measurement is still in its infancy and substantial literature illustrating the worth of Business Incubators to the economy is lacking in this regard (Yu & Nijkamp, 2009 and Phan, Siegel & Wright, 2005 all authors cited in Vanderstraeten et al., 2012).

Nonetheless, it is important to reiterate at the onset that incubation literature suggests that ‘growth’ in this field is generally measured in terms of employment growth, profit growth and sales growth (Bhabra-Remedius & Cornelius, 2003).

To this end, it is striking that initial attempts at incubator performance measurement appeared to occur in a wide variety of ways, with little consensus on the most suitable framework.

Research on performance measurement of incubators has its roots in organisational theory and strategic management (Murphy et al., 1996, P. 15 cited in Bhabra-Remedius & Remedius, 2003). Three key approaches epitomise the first organisational theory-based frameworks as such:

- **The goal approach**; focussed on measuring performance based on the goals set by organisations. However, the approach experienced difficulties because organisations had different objectives and cross-firm comparison was therefore not possible.
- **The systems approach**; attempted to compensate for the frailties of the goal methodology by considering the simultaneous achievements of multiple generic performance aspects. This also did not adequately cover all factors concerning incubator performance.
- Finally, the **multiple constituency approach** sought to interrogate the extent to which the firm fulfilled the agenda of stakeholders (Thompson, 1967; Penny & Goodman, 1997 cited in Bhabra-Remedius & Cornelius, 2003).

These organisational perspectives were later integrated by strategy researchers in the 1980s, the period which is suggested by incubation literature to have first experienced serious attempts at examining the phenomena. As a result, researchers endeavoured to develop performance measures reflecting multiple hierarchical constructs (Venkatraman & Ramanyan, 1986 cited in Bhabra-Remedius & Cornelius, 2003). The early frameworks tended to measure financial performance and organisational effectiveness, with the latter variable gauged in terms of product quality and market share. However, because financial data was problematic to obtain from small firms, non-financial operational measures were later devised, forming what was deemed a suitable

basis for building an evaluative framework to measure the performance of start-ups (Bhabra-Remedius & Cornelius, 2003).

To this end, Mian (1997) proposes a complex performance framework similar to that illuminated by Bhabra-Remedius & Cornelius (2003). Mian (1997)'s framework is based upon four approaches which are *goal approach, system resource approach, stakeholder approach and internal process approach*.

On the other hand, Barbero, Casillas, Ramos and Guitart (2012), observe that some researchers have produced complex models for the evaluation of an incubator which are said to be sensible and consider the many issues at hand. Accordingly, the evaluation model proposed by Bigliardi, Dormio, Nosella and Petroni (2006) is based on six elements: *patrimonial structure, internal development, repercussion in the territory, economic and financial aspects, human resources and technical-scientific productivity and international and interregional relationships*.

However, Barbero et al., (2012) assert that complex models are not apt for the evaluation of studies consisting of larger samples such as those considered by Allen and McCluskey (1990) and Aerts, Matthyssens, and Vandenbempt (2007 cited in Vanderstraeten et al., 2012) which comprise 127 and 104 incubators respectively. Further afield, Siegel et al., (2003) suggest *survival rate, employment growth and Research and Development (R&D) activity* as the three key essential indicators for gauging incubator efficacy. Nonetheless, they note that many incubation studies still use a *venture survival rate* either as the only indicator or as part of a set of indicators.

Vanderstraeten et al., (2012) are, perhaps, far more instructive in discussing the problematic of incubator measures. Recognising that a clearly structured overview of what is available in academic literature in the area of incubator performance measurement is lacking, they underscore Neely (2005)'s suggestion to examine performance measurement at both the individual and systemic level. They observe that some performance systems either fail to include strategic objectives or do not recognise the difference between short, medium and long-term results. These imperfections reinforce the search for an

accessible, comprehensible and balanced performance evaluation scheme that translates an incubator's mission, vision and strategy into clear goals and measures (Vanderstraeten et al., 2012).

Echoing Tangen (2004), Vanderstraeten et al., (2012) note that an "ideal" measurement system takes into account the following output prerequisites:

- The framework that supports strategic objectives has an appropriate balance; and guards against sub-optimisation;
- The framework should have a limited number of performance measures;
- The framework should have performance measures with comprehensible specifications.

Taking into account the intricacies of incubation performance measurements therefore, and in order to address the gaps that emanated from their own study, Vanderstraeten et al. (2012) translated Kaplan and Norton (1992; 2000 cited in Vanderstraeten et al., 2012)'s *strategy map* and *balanced scorecard* to the incubator context and developed the *Strategy Map for Economic Development Incubators (SMEDI)* as well as the *Balanced Scorecard for Economic Development Incubators (BSEDI)*. These tools incorporate numerous incubator performance measurement perspectives and link an incubator's long term strategic goals, medium term objectives and short term measures.

In their assertions, Vanderstraeten et al., (2012) argue further that the strategy map and balanced scorecard are not only theoretical constructs that might be able to fill the gaps in the existing incubator performance literature, but that these tools can certainly be translated to a real incubator setting. "For each long-term strategic objective, the SMEDI visualises the appropriate medium-term strategic goals" (Vanderstraeten et al., 2012. p.16). The scholars further posit that the empirical analysis relating to the SMEDI tool reveals that, despite their not-for-profit focus, financial sustainability is essential for these incubators.

TABLE 9: Strategy Map for Economic Development Incubators (SMEDI) – (vanderstraeten et al., 2012)

“First long term strategic objective “structurally stable tenant portfolio” entails the need to develop a physically stable tenant portfolio, requiring tenants in different development phases.

Second long term strategic objective is “value creation”. From a customer perspective, it is important to offer proactive and in-depth services.

Third long term strategic objective is “efficiency”. The pressure to work in a more efficient way requires a permanent search for explicit formats and standardized procedures as well as a focus on potential synergies with external experts and incubators to offer services that are only sporadically needed.

The fourth long-term strategic objective is “entrepreneurship and business development”.

The four strategic pillars of the SMEDI are translated into short-term measures and thresholds; and presented in the final BSEDI (Vanderstraeten et al., 2012) (Table 10 below).

TABLE 10: Balanced Scorecard for Economic Development Incubators (BSEDI) – (Vanderstraeten et al., 2012)

To measure indicators relating to the financial perspective of the BSEDI, the incubator can measure income from rent, income from paid services, and income from subsidies and/or sponsorship. Income from rent can be evaluated by examining total cash flows, but also by assessing the incubator's occupancy rate. It is suggested that the incubator should try to reach an occupancy rate of 85 per cent, and to receive most income from rent to avoid being too dependent on income from paid services.

One of the measures involving the customer perspective is tenant satisfaction. Periodically (for example, half-yearly) tenant meetings are appropriate. Such meetings can be organized in groups or individually. The first has the advantage that complaints or suggestions coming from a large number of tenants are uncovered in only one meeting. The latter has the advantage that individual needs can be discussed in greater detail.

The following two measures examine how the incubator stimulates knowledge transfer. First, the number of organized contact moments between tenants can be counted. Examples are tenant presentation seminars, formal discussion groups, receptions or team-building activities. Given the fact that all kinds of meetings can stimulate knowledge transfer, incubators should try to organize this on a monthly basis. Second, the architectural infrastructure of an incubator is of utmost importance for facilitating "accidental" contact. Tenants should come across each other as much as possible. This can be stimulated by offering pleasant gathering rooms where tenants can meet. Objectively measuring such accidental contacts is not an easy job.

The creation of an entrepreneurship and business development platform can be evaluated by listing the number of networking events, such as seminars,

workshops and business plan competitions that are organized, the number of participants, their affiliation and the topics of these events.

The internal business processes perspective, it is necessary to measure tenant satisfaction about internal processes such as the selection process, the incubator's knowledge about company development phases or the accessibility of external experts.

To measure external networking, the incubator could count the number of external experts affiliated to the incubator.

Resource sharing with other incubators can be measured by counting the number of fellow incubators the focal incubator has close connections with.

Innovation and learning - Measuring whether the incubator continuously tries to improve its processes, services offered or ways to establish and develop new companies and small businesses can be done by counting the number of networking events such as conferences, workshops and seminars incubator employees participate in."

Upon the examination of various incubator performance measures, it is interesting to note that while the field of Business Incubation does seem to lack the precise tool kit to unravel the underlying factors that could provide greater insight into the institutions, it is apparent that existing frameworks are open to adaption. Vanderstraeten et al., (2012) for instance suggest the SMEDI and BSEDI frameworks could be adapted to the specific situation of each not-for-profit economic development.

By examining the BSEDI framework in the context of this study therefore, it is certain that it provides a comprehensive outline of how to evaluate incubator performance from the Pre-Incubatee stage to the Post-Incubatee phase, encompassing systemic, non-financial operational performances, financial and individual perspectives.

It emphasises for example the importance of developing a physical portfolio for Incubatees or 'stable tenant portfolio' as a necessary element, the need for

value creation defined by proactive engagement and provision of substantial services; efficiency and the application of standardised procedures and enabling synergies with external experts, as characteristics that can be measured. It also provides guidelines as to how income can be measured [i.e. by examining total cash flows and occupancy rates], in addition to suggesting the 85 percent threshold that would enable the incubator not to be solely dependent upon services for the bulk of its income.

Further, it provides for the assessment of entrepreneurship and business development through gauging the number of business development platforms created, such as seminars, workshops and business plan competitions. Finally, the framework not only enables the assessment of individual perceptions (tenant satisfaction) but also provides for the evaluation of the external networking variable through enumerating the number of external experts an incubator has engaged.

To recap, while from Tangen (2004) and Bhabra-Remedius and Cornelius (2003) we can appreciate the fact that measuring the performance of BI's is challenging owing to the limited evaluative frameworks in the field, it is gratifying to learn that tools thus far developed are adaptable and can be applied to varied cases. Kaplan and Norton (1992; 2000 cited in Vanderstraeten et al., 2012) are particularly instructive in pioneering a strategy map and balanced scorecard to the incubator contexts to aid the empirical exploration of these entities. Further, Tangen (2004) is fairly assertive in suggesting the development of evaluative frameworks of an institutional nature as opposed to individualised tools. It is noted that most of the proposed tools are not comprehensive, merely focussing on a limited number of variables. However, it is Vanderstraeten et al., (2012)'s SMEDI and BSEDI frameworks that present a more holistic evaluative tool, fashioned to measure short term, medium term and long term objectives and outcomes as such; including financial, non-financial operational aspects, systemic, structural and individual perspectives. Against this background, this researcher has elected to adopt the SMEDI/BSEDI frameworks to assess the performance of the TIHMC Maxum Incubator because of their relatively comprehensive nature and its ambition to gauge a longer term dimension to a

large extent, in addition to factoring in beneficiary perceptions and short term institutional goals.

2.10 Conclusion of Literature Review

To summarise, this chapter reveals that a number of fundamental gaps exist in Business Incubation literature. This lacuna is motivation enough for emerging scholars to begin to make empirically grounded contributions to industry and academia to further the potential of these fledgling initiatives. It is understood from the works of scholars across the globe (Brown et al., 2000 cited in Al-Mubarak & Wong, 2011; Burger, 1999 cited in Al-Mubarak & Wong, 2011; Clark & Minor, 2000 cited in Al-Mubarak et al., 2010; Ndabeni, 2008), that incubators are a relatively recent innovation, hardly spanning three decades and are for all intents and purposes, creatures of the great recessions of the 1980s. The exact time-frames and attributions as to the founding father of these entities are somewhat contested. On the one hand, Brown et al., (2000) identify Joseph Mancuso, of the Batavia Industrial Centre located in Batavia, New York as the pioneer. Burger (1999), on the other hand, is convinced that the first formal incubator was only established in 1980 when Rensselaer Polytechnic Institute created an incubation program for its students, faculty and community residents who had the ambition to venture into their own businesses. Brown et al., (2000) argue that it was Joseph Mancuso who must be credited with establishing this facility in 1959, given his innovative use of cost-sharing strategies which spawned similar ventures across America and eventually the world. The tension between scholars notwithstanding, both arguments enable us make an informed approximation of when the incubation industry actually began – the second half of the 20th century.

We have also learned from the literature review that empirical inquiry in this area is limited and largely consigned to Europe and the United States of America. In Africa, the BI is hardly an innovation with a firm grounding.

South Africa, however, has begun to develop more data in the field, but hardly enough to render a comprehensive pattern that could inform scholarship and industry as the true value of BI to the economy. The work of Ndabeni (2008) is

instructive in this regard and points to the need to create more knowledge – decidedly, the key ambition of this exploratory study.

2.10.1 Research Questions:

Given the fore-going, it is imperative to revisit the sub problems and briefly discuss them within the context of the theoretical considerations articulated thus far, before presenting the research questions:

2.10.1.1 First sub-problem

The first sub-problem relates to understanding the impact of South African, State owned-managed incubators on new enterprise creation.

Here, it is necessary to remind ourselves that the dual economy theoretical models aim to establish causality between entrepreneurship and economic development and suggest a bi-directional relationship between the two spheres. While entrepreneurship is deemed to affect economic development (by creating employment for example), the reverse is also plausible (that economic development creates institutional structures that facilitate the growth of entrepreneurship). However, not all forms of entrepreneurship can be said to make a positive contribution because they are either illegal, tax evasive or harmful to society. Others are *survivalist* and *necessity entrepreneurs* who may play poverty alleviation roles rather than an employment generation function, particularly in developing world contexts. Categorising and profiling Incubatees and incubator types to be studied therefore becomes essential in this study. The first sub problem essentially allows for the interrogation of the nexus of economic development with entrepreneurship (i.e. institutional architecture facilitating entrepreneur growth), which is implicit in the structure of research questions 1:

Research Question 1:

How many companies have graduated from the Maxum Business Incubator and entered the market (Enterprises created)?

2.10.1.2 Second sub-problem

The second sub-problem relates to the sustainability of new enterprises that entered the market in the period under study (i.e. 2000 to 2011). From a theoretical standpoint, this sub-problem can be related to Murphy et al., (1991 cited in Barreira et al., 2008, p.102-103)'s as well as Nelson and Pack (1999 cited in Barreira et al., 2008)'s adaptations of the dual economy theoretical models which emphasise *entrepreneurial talent or ability* as the basis for enabling growth. Again, it is important to recap that their arguments stress the need to select persons who exhibit high growth potential in entrepreneurship for further development, as this skill is not universally present in all individuals. Empirically, the argument is shored up by the emergence of state sponsored science parks which link university innovations with the private sector to commercialize ideas. The scholars posit that the notion of *ability* is linked to firm size and growth in the economy. To this end, it can be noted that the idea of Business Incubation, as evidently applied by the TIHMC, involves an established selection criterion which ostensibly identifies this inherent talent in Pre-Incubatees cognisant of the need to nurture viable Incubatees that are able to contribute to economic growth. The framing of Research Questions 2 and 3 are informed by this theoretical imperative as such.

Research Question 2:

How many of the enterprises that graduated from Maxum Business Incubator are still operating?

2.10.1.3 Third sub-problem

The third sub problem focuses on the value added to the market by the graduant enterprises, that is, in terms of quantifying the number of employment opportunities created. The opportunities generated will be categorised as follows:

- Employment created in incubated/affiliated firms
- Opportunities created in graduated firms
- Indirect jobs.

Research Question 3

How many job opportunities have been created: in incubated/affiliated firms; in graduated firms and indirectly?

In general, it is the view of this researcher that the discussion in this chapter and the research questions so posed, present an extremely attractive prospect to unravel this under-explored phenomena, which, from the available evidence, holds the potential to make a substantial contribution to the South African economy.

In conclusion therefore, it is important to reiterate that the value of this literature review to the study lies in the affirmation by some of the few but authoritative explorers of this industry about the dire need for fresh – if not more – knowledge on the performance and value of BIs to national economies by and large. For South Africa, the case is even more apparent given that the country already hosts at least 20 of these entities whose fundamental aim is ranged at generating entrepreneurship, business development and job creation for a market in dire need of expanding employment opportunities for its people. In this regard, the TIHMC Maxum Business Incubator, established in the post-apartheid era, lends itself to exploration primarily because it presents a rare opportunity to understand the worth of these initiatives, particularly, the incubator-category sponsored by the state, to the economy in terms of job creation and enterprise development. This researcher envisages, hence, that

the results of the study will contribute to informed decision making by TIHMC management and state policy makers to enable course-correction, future planning or any other appropriate interventions.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The discussion in Chapter 2 provides a foundation for the understanding of the metamorphosis of Business Incubators in modern economies and their supposedly key role in employment creation and enterprise development more generally. It is noted that while there is a level of tension amongst scholars regarding who pioneered this idea in a practical sense, the underlying argument suggests that the initiatives have mainly responded to changing economic contexts, particularly in the 1980s when a global recession catalysed entrepreneurial-minded entities, such as the Renssealer Polytechnic Institute to fashion a new approach to profit making and employment generation (Burger, 1999).

The Chapter also distinctly argues that Business Incubators, despite appearing to work toward similar ends in some ways, do not always have the same shape or form. Various categories exist, with varied objectives but there is, ostensibly, no major difference in their fundamental aim – stimulating growth. The incubator categories include not-for profit entities which are pre-occupied with contributing to development, university-based entities seeking to commercialise academic innovation; privately sponsored set ups motivated by profit-making and public incubators whose main purpose would be to create job opportunities by nurturing future employers. It is also noted that South Africa has witnessed the tentative progression of the idea of Business Incubation, with one of the most significant being The Innovation Hub Management Company (TIHMC)'s Maxum Business Incubator, categorised as a state sponsored initiative.

Having reviewed the evolution of the notion of Business Incubation in Chapter 2, this Chapter presents the methods and research instruments to be employed in exploring the case of the TIHMC Maxum Business Incubator.

3.2 Research methodology

Pursuant to this objective, the study utilises mixed methods, incorporating both quantitative information from the Pre-Incubatees, Incubatees and Post-Incubatees collected by means of a survey; as well as qualitative information on strategic issues and expectations from corporate heads garnered through key informant interviews.

To ensure that the qualitative and quantitative approaches are linked therefore, this researcher adopted the concept of *triangulation*, where a convergence of the results from both the qualitative and quantitative approaches is required to shore up variables of interest. The technique of triangulation was devised to optimise a variety of inter-complimentary methods to correct their respective shortcomings (Mouton & Marais, 1996,p. 91). In this regard, this study embraces this form of multiple operationism to ensure that the inherent weaknesses of either method are minimised or eliminated as such.

In other words, the questions and issues addressed in the closed-ended questionnaires were closely related to the thematic questions in the open-ended questionnaires. In this way, the study, although essentially examining a single case, endeavoured to assume structural coherence with a larger context. Further, because multiple sources of data were used, the evidence was linked to the variables of interest to reinforce the researcher's arguments where relevant. Babbie and Mouton (2008, p.272) have termed this notion *convergence*. The scholars are instructive in this regard as they posit that emerging patterns in the qualitative and/or quantitative data may be matched with the theory or in alternative predictions. *Pattern-matching* enhances validity, they argue, when patterns in the emerging data correspond. The two scholars also highlight the linkage between *pattern-matching* and *explanation-building*: - the latter relates to the creation of explanations about the case based on the patterns that emerge from the interviews or open-ended and closed-ended questions.

To this end, this research was non-experimental, and made use of both primary and secondary data. It was also a longitudinal study that utilised the Maxum

Business Incubator's data from inception in the year 2000 to 2011. The specific methods employed are as follows:

- i. **Desk Study Review:** Constitutive instruments, strategic plans, project documents, progress reports, financial statements, brochures, selection criteria, policies and procedures were among a large volume of official records analysed. Illustrative examples were drawn through content analysis of relevant documents to provide deeper insights into the short term, medium term and long term objectives and performance more broadly, of the TIHMC Maxum Business Incubator. Desk review also enabled the identification of key perspectives on entrepreneur and business development approaches in the first five years and subsequently in the period leading up to the present day.
- ii. **Key Informant Interviews:** In-depth face-to-face and telephonic interviews were conducted with the current TIHMC management staff, specifically, the General manager (CEO's office), Business Development manager and former Senior Manager: Incubation. As not all experiences of the TIHMC Maxum Business Incubator reflecting the period under study (2000-2011) are stored in documentary format, this researcher opted to garner in-depth data from long serving senior members of staff who were capable of providing corroborated information on the ambitions and performance of the incubator as such.
- iii. **Semi-structured Interviews:** a *semi-structured questionnaire* addressing, as necessary, the relevant project themes was designed. Open-ended semi-structured questionnaires were administered to the Maxum Business Incubator's senior managers who were purposively sampled.
- iv. **Survey:** Four different types of questionnaires were administered electronically to Pre-Incubatees, Incubatees and Post-Incubatees. A separate questionnaire was sent to Incubatees who exited the Maxum BI

program that is, those that were deemed not to have met the program requirements by the TIHMC or were financially stable and did not therefore need to be incubated. The purpose of this was to obtain the perceptions of all categories of beneficiaries of the TIHMC Maxum Business Incubator, in order to fully assess *tenant satisfaction* with the services of this facility as well as collect the specific performance-related data which would enable us understand how Post-Incubatees have fared in terms of job creation for instance.

3.3 Research Design

The research was conducted in the form of an electronic survey for the quantitative part of the study.

As indicated earlier, the research design was in the form of a case study. Essentially, case studies are valuable because they enable scholars to gather a wide range of information in a concentrated fashion – leading to a substantially wealthy plethora of knowledge. Detailed information from case studies provides valuable insights for problem solving, evaluation and strategy (Cooper & Schindler, 2011, p.142). Although case studies cannot be generalised to the rest of the country and have been maligned as not meeting the minimal requirements for comparison, a well-designed case study can provide a major challenge to a theory and provide a source of new hypotheses and constructs simultaneously (Cooper & Schindler, 2011, p.142). As this is a novel area utilising information from a single institution (that is, TIHMC) which has potential to inform strategies within a nascent industry, there is great value in adopting a case study approach. As stated previously therefore, the study did not primarily purport to generalise its findings to a national scale but attempted to provide an in-depth insight into the workings of one of the country's prime incubation facilities, extrapolate vital lessons that can be showcased to national forums for cross pollination purposes; and inform strategies of institutions with similar dispositions. In this way, and as explained in sections 3.8.1 and 3.8.2 of this report, this researcher argues that the results may have external validity.

3.4 Population and sample

3.4.1 Population – Case site

The research was conducted at the Maxum Business Incubator of The Innovation Hub Management Company (TIHMC). Established in 2000, TIHMC is Africa's first internationally accredited Science and Technology Park and a member of the International Association of Science Parks (IASP). It is also known as the leading knowledge – intensive business cluster in South Africa. The mission of TIHMC is to "promote the socio-economic development and competitiveness of Gauteng through innovation by:

- Creating new business opportunities and adding value to mature companies in high-tech sectors;
- Fostering entrepreneurship and incubating new innovative companies;
- Generating knowledge based companies and jobs;
- Building attractive spaces for emerging knowledge workers; and
- Enhancing the synergy between industry, government, academic and research institutes" (<http://www.theinnovationhub.com/index>).

The Maxum Business Incubator at TIHMC provides incubation programmes enabling an environment where start-ups from the knowledge-intensive sectors including sustainable development, green economy information and communications technology (ICT), biosciences, electronics and advanced manufacturing and materials are fast-tracked to compete in the global village (<http://www.theinnovationhub.com/index>).

3.4.2 Sample and sampling method

The sample population was segregated into three subpopulations (strata), that is; Pre-Incubatees, Incubatees and Post Incubatees; consistent with the stratified random sampling procedure. Stratified random sampling, as elucidated

by Cooper and Schindler (2011p. 379) provides a researcher the opportunity to do the following;

- 1) Increase the sample's statistical efficiency,
- 2) Provide adequate data for analysing various strata; and
- 3) Enable different research methods and procedures to be used in different strata.

For the purposes of this research, a total of 40 companies that were nurtured by the Maxum Business Incubator from each phase (2000 – 2005; and 2006 – 2011 respectively) were selected based on stratified random sampling (Table 11). The sampling frame was designed to be an enumeration of companies that were incubated at TIHMC BI which included Pre-Incubatees, Incubatees and Post Incubatees. Information from the TIHMC covering the period 2000-2011 was collated to develop the sampling frame. The sample constituted 40 randomly selected firms. Of these, 26 firms or respondents answered the questionnaires administered to them by this researcher.

To be included in the sample, the entrepreneur should have gone through any of the incubator process phases at TIHMC. Current and former staff that had demonstrable knowledge and experience in the Maxum Business Incubator was included in the sample as indicated in the table below.

TABLE 11: PROFILE OF RESPONDENTS

RESPONDENT	NUMBER OF RESPONDENTS
TIHMC	3
Pre- Incubatees	10
Incubatees	10
Post – Incubatees	10
Exited – Incubatees	10

3.5 The research instrument

The 'google drive' online survey was used to collect the relevant data. The questions contained in the questionnaires were framed on the basis of prior studies supported in the literature review. In particular, the questionnaires were constructed on the approach and studies conducted by Vanderstraeten et al., (2012). The first questionnaire was directed at TIHMC management and responded largely to research question 1 [*How many companies have graduated from the Maxum Business Incubator and entered the market (Enterprises created)?*]. The second and third questionnaires were primarily directed at Incubatees and Post-Incubatees respectively, as their main aim is to address the research questions 2 [*How many of the enterprises that graduated from Maxum Business Incubator are still operating?*]; and 3 [*How many job opportunities have been created: in incubated/affiliated firms; in graduated firms and indirectly?*]. The questionnaires also addressed how the Incubatees experienced the services at the Maxum Business Incubator and engaged the beneficiaries on the matter of sustainability of the new enterprises. Although parts of these questions were posed to TIHMC management, this researcher felt that more substantial information would be gleaned from the Incubatees themselves based on their experiences.

3.6 Procedure for data collection

An open-ended questionnaire was used to elicit the opinions of Corporate heads to gather qualitative information on strategic issues and expectations (Refer to Appendix A).

Data was also collected by means of a document review (of company policy and strategic documents), while beneficiary (Pre-Incubatee, Incubatee and Post Incubatee) perceptions were captured using closed-ended questionnaires. (Refer to Appendix B, C and D).

The Google drive survey tool was used to administer an online questionnaire to the respondents. The email was accompanied by a covering letter explaining

the nature, purpose and objectives of the survey (Refer to Appendix H). The covering letter assured respondents of their privacy and anonymity as well as this researcher's adherence to the Wits Code of Ethics for Research on Human Subjects. Upon receipt of respondent's feedback, this researcher proceeded with the analysis of the data.

3.7 Data analysis and interpretation

To assess scale reliability and validity, statistical software known as SPSS was used. It is important to state here that this researcher did not compute Cronbach's alpha as the scale did not contain an underlying construct which is the assumption for Cronbach's alpha's measure of internal consistency. Data was instead analysed using the Kruskal Wallis test (Appendix G; Tables 15 and 17), a non-parametric test based on the ranked data since the information collected did not meet the requirements of a parametric test. This test allows for comparisons of more than 2 independent groups, that is, enabling researchers to compare 2 or more scores that emanate from different groups. In this regard, this researcher used the Kruskal Wallis test to compare the scores from the 3 groups (Pre-Incubatees, Incubatees and Post-Incubatees) in order to ascertain how they varied or converged. In addition, the excel application software was employed to analyse the data of the 3 groups of respondents. Frequency charts, histograms, means and medians for individual groups were plotted to compare scores within the groups and between the 3 groups. The qualitative data was used to obtain the in-depth experiences of management through the 11 year period in relation to the BI programme. The results of the qualitative research were used to compare, support and/or contextualise the outcomes of the quantitative element.

3.8 Validity and reliability

To enhance the quality of the study, validity and reliability were taken into account. This is important to reduce the possibility of obtaining incorrect findings and consequential flawed interpretations.

The reliability of a study is defined as the ability of a measure to produce the same results under the same conditions (Field, 2009, p.792). According to Cooper and Schindler (2011), a measure is reliable to the degree that it supplies consistent results.

It is noted also that validity has been defined as an indication of whether an instrument measures what it sets out to measure (Field, 2009, p.795). Cooper and Schindler (2011) are instructive in that they make a link between validity and reliability: They posit that while reliability is a necessary contributor to validity, it is not a sufficient condition for it. Reliability has to do with the accuracy and precision of a measurement procedure while validity is the extent to which a test measures what we actually seek to assess (p.280).

3.8.1 Internal validity

Mouton and Marais (1996) elaborate upon this concept, explaining that internal validity is used to denote that a study has generated accurate and valid findings of the specific phenomena which have been studied. This entails that the data collected are accurate and reliable; that the analyses are relevant for the type of data gathered; that the constructs are measured in a valid manner; and that the final conclusions are supported by the data (ibid). Consistent with this requirement, this study, from conceptualisation, operationalisation, data collection and analysis and interpretation, has ensured that the research process centralises the considerations of validity. This had been done through the adaption and use of evaluative frameworks – the SMEDI/BSEDI - and research instruments which are designed to measure precise incubator performance indicators such as in employment growth, survival rate of Incubatees, value creation, strategic goals and tenant satisfaction with internal business processes including quality of knowledge products and the Incubator's knowledge about company development phases and accessibility to experts. The research instrument elaborated in sections 3.6 and 3.7 of this chapter captures the *specific* variables to be measured using multiple methods, allowing for the convergence of qualitative and quantitative data around variables of

interest. In this way, conclusions will be supported by relevant data and internal validity will be enhanced.

3.8.2 External validity

External validity follows internal validation and is therefore an advanced stage in the research process (Mouton & Marais, 1996). It is notable that to achieve external validity, the results of the research should be generalisable to all similar cases. In other words, the external validity of research findings is the data's ability to be generalised across person, settings and times (Cooper & Schindler, 2011). External validity therefore denotes generalisation, which is deemed an inductive process of extrapolating beyond the data collected (ibid, p.219).

As indicated in section 3.2 of this report, this researcher will identify *emerging patterns* in the qualitative and/or quantitative data to build *explanations* on the results which can be extrapolated to a wider plane. As stated earlier, from Babbie and Mouton (2008, p.272), we learn that *Pattern-matching* enhances validity if patterns in the emerging data correspond for instance. In this case, the dearth of information on Business Incubation enables a study such as this to expose the efficacy or lack thereof of a major state-sponsored Business Incubator which will likely provide lessons to similar facilities in South Africa and abroad. This is especially so in the case of South Africa, where the bulk of the Incubators are state-supported and will therefore be able to share experiences in terms, for example, of what the best criteria are for selecting Incubatees; or the most effective entrepreneurship and business development strategies or indeed, forms of network-building and knowledge transfer, to mention a few. In this sense, the researcher assumes that the findings have a claim to external validity.

3.9 Limitations of the study

The study was reliant upon the documentation that was provided by TIHMC, interviews with the incubator manager, former incubator employees and availability of a sample of entrepreneurs who are currently incubated and who

have already graduated from the incubator. Although an arrangement with TIHMC Management and Incubatees to contribute was reached, interview cancellations occurred which necessitated further efforts to replace or re-arrange meetings, impacting on time. However, every effort was made to ensure respondents honoured agreed arrangements.

This researcher is cognisant of the possibility of interviewer bias affecting the collection and interpretation of data, particularly in the conduct of face to face interviews. However, Rajendran (2001) is instructive in his assertions that the use of mixed methods minimises or even eliminates the potential for the results to be coloured by the interviewer's bias. The data collected from this inter-complimentary approach hence is highly likely to eliminate bias arising from this researcher's closeness to the practice of incubation.

3.10 CONCLUSION

To conclude, the study finds that Vanderstraeten et al., (2012)'s *Strategy Map for Economic Development Incubators (SMEDI)* as well as their *Balanced Scorecard for Economic Development Incubators (BSEDI)* evaluative frameworks are the best suited to measuring the performance of the TIHMC Maxum Business Incubator, following an assessment of the tools available to conduct this form of research in this field. The BSEDI framework in particular covers systemic, non-financial operational factors, financial and individual perspectives of Incubators and therefore presents the more holistic and relevant outline to employ in this study. The study employs mixed methods – that is, both quantitative and qualitative approaches framed around the notion of triangulation – to explore the case of the TIHMC Maxum Business Incubator. While recognising that external validity is not usually demonstrated from a single case, this researcher underlines the importance and uniqueness of the notion of Business Incubation in South Africa, and how, arising from this novelty, the lessons learnt could be show-cased nationally, thereby enabling not

only the TIHMC management but also policy makers in government to make informed decisions on the trajectory of state-sponsored BIs in the country. The study presents its findings in Chapter 4 and provides a synthesis of quantitative and qualitative outcomes of the research conducted using the methods elaborated in this Chapter. It later engages in a more in-depth discussion of the results and their implications. Chapter 5 will present the recommendations, informed by the results and analyses in the previous Chapters.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

To recap, the fundamental aim of this research was to develop a plethora of knowledge on the worth of the state-sponsored incubators to the economy in respect of job creation. To this end, the case study sought to garner management and Incubatee perceptions of the services provided by TIHMC Maxum Business Incubator and the extent to which they enabled the graduant firms to directly or indirectly generate or sustain job opportunities. A total of 40 companies that were incubated at TIHMC Maxum Business Incubator were selected for this non-experimental longitudinal study covering the period between 2000 and 2011. Of the 40 firms, 26 companies responded to the questionnaires administered by this researcher. The research employed mixed methods framed around the concept of triangulation to link the outcomes of the quantitative aspects of the study with the qualitative elements.

Utilising the methodology elucidated in Chapter 3 therefore, this chapter presents the results of the case study thematically, that is; closely linking respondents' perceptions to the three respective research questions explained in section 2.10 of Chapter 2.

Each of the three main research questions represents a theme under which a set of related Incubatee and TIHMC management responses are presented. The results are organised essentially to present responses by each category of respondents as well as provide a basis for comparison between the three main categories of Incubatees to cross-cutting questions. This is important in this researcher's view because it will give an indication of whether the opinions of the TIHMC Maxum Business Incubator's services are shared or varied between the groups, or ultimately, whether they reflect, to a degree, the short and long term objectives of the TIHMC Management. The results are clustered under each of the three research questions and appropriately sub-titled to reflect the sub theme being interrogated. The key elements encapsulated under each research question are as follows:

1. Results pertaining to research question 1: *[How many companies have graduated from the Maxum Business Incubator and entered the market (Enterprises created)?]*

This section presents the analysis of official records of TIHMC Business Incubator and actual number of graduated firms verified by the researcher in the period under study (2000-2011). These results are largely informed by key informant interviews with TIHMC management and hard data obtained during this study.

2. Results pertaining to research question 2: *[How many of the enterprises that graduated from Maxum Business Incubator are still operating?]* The results capture the perceptions of Pre-Incubatees, Incubatees and Post-Incubatees garnered from the survey in respect of how TIHMC BI programme facilitates/enables the launch and sustainability of new enterprises. These results include perceptions of respondents regarding the business skills training and post incubation support services such as access to grants, seed and venture capital funding offered by the TIHMC that may directly or indirectly foster new enterprise development as well as survival.

3. Results pertaining to research question 3 *[How many job opportunities have been created: in incubated/affiliated firms; in graduated firms and indirectly?]*. This section specifically presents the results from the survey and interviews with Post Incubatees and TIHMC management respectively on direct/indirect jobs created as a result of the incubation support processes. This includes responses from respondents to the usefulness of specific services provided by the TIHMC BI such as advice of staff recruitment and financial management, in addition to a quantification of the number of jobs created.

Finally, comparisons are presented on cross-cutting perspectives across the categories of respondents, particularly on the usefulness of incubator services to fostering entrepreneurship and the incubation of new companies, to allow for a more comprehensive analytical overview of the overall beneficiary assessment of the TIHMC BI performance.

4.2 Demographic profile of respondents

The study initially targeted 40 companies that had graduated or were being incubated by the TIHMC Maxum Business Incubator during the period of study 2000-2011. However, 26 companies, hereto referred to as respondents, participated in the study. The sample represents four categories of respondents; 1) Pre-Incubatees – a cohort that was introduced to support the historically disadvantaged South Africans who, apparently, did not have the capacities to undertake the formative incubation programme of the first five years; 2) Incubatees, who are in the mainstream programme of the TIHMC 3) Post-Incubatees – the graduant firms that are expected to create and sustain job opportunities. In the course of the study however, this researcher found that there was a fourth category of respondents whose perceptions might also provide useful insights on the nature, value and relevance of the TIHMC services. This category essentially represents firms that did not ‘graduate’, who, for one reason or other, failed to complete the five year incubation period and therefore ‘exited’ prematurely. The researcher has categorised these as ‘Exited Incubatees’ for the purposes of the study. The perceptions of the Exited Incubatees were recorded to obtain a sense of why some participants in the TIHMC programme may not have completed the incubation process. Lastly, it is important to remind ourselves that this study uses mixed methods and therefore benefits from qualitative information from TIHMC management. The management respondents are represented by TIHMC General Manager and Maxum Business Incubator project managers. The researcher, in respect of this, found that the TIHMC does not have an established information management system which would preserve institutional memory systematically through the period of study. As a result, the researcher relied heavily on the perceptions of long serving senior managers and relevant strategic policy documents, reports and official records.

4.3 Results pertaining to Research Question 1

[How many companies have graduated from the Maxum Business Incubator and entered the market (Enterprises created)?]

As illustrated in section 2.10.1 of Chapter 2, Research Question 1 responds to the first sub problem which fundamentally allows for the interrogation of the relationship between economic development with entrepreneurship (i.e. institutional architecture facilitating entrepreneur growth). From a practical point of view, this research attempted to directly structure questionnaires that would help quantify the contribution of the Maxum Business Incubator to the introduction and sustenance of new firms in the market. Therefore the research instruments implicitly enquired into this imperative: The fundamentals of the four questionnaires administered to Pre-Incubatees, Exited Incubatees, Incubatees, and Post -Incubatees are similar in the main, as they seek to assess the TIHMC Maxum Business Incubator's strategic vision and mission and services aimed at creating entrepreneurship and incubating new innovative companies (TIHMC, 2000). As discussed in Chapter 2, part of the TIHMC's objective is to generate knowledge-based companies, provide attractive spaces for emerging knowledge workers and enhancing synergy between industry, government, academic and research institutions (ibid). The researcher, therefore, in eliciting responses to the instrument fashioned around the three research questions, ensured that all the respondents provided feedback on the quality of the services and support systems extended to the firms before, during and after the incubation programme – as relevant. While the questionnaires for all four categories of respondents converged around common issues related to the quality of services provided, there were slight variations to suit specific experiences of each category of respondents. For example, research question 1, and the instrument supporting it, was largely tailored to TIHMC Management and Post-Incubatees because the aim was to determine how many new companies the Maxum Business Incubator had successfully graduated and entered the market. However, the conditions under which they were incubated, was a response required of all categories of respondents as this tests the TIHMC's objective of 'fostering entrepreneurship'. The data for this aspect of the

results was largely extrapolated from the official records of the TIHMC and perceptions of Incubatees. In respect of Research Question 1 therefore, the fundamentals were:

- The number of Pre-Incubatees envisioned by the TIHMC to be incubated in the 2000-2011 period.
- The verifiable number of Post-Incubatees nurtured in the 2000-2011 period.
- Length of the Incubation programme

It is noteworthy that the application of the BSEDI/SMEDI frameworks also necessitated a related inquiry into the issues pertaining to the sustenance of the TIHMC Maxum Incubator. These include: rentals and occupancy rates in the incubator to the extent that records exist.

4.3.1 FINDINGS: Companies incubated between 2000 and 2011

It is important to foreground the strategic intent of the TIHMC when it first established the Maxum Business Incubator - which was to enroll 10 new ventures each year, with the aim of maintaining a total of 30 firms 'at any given time' in the residential incubator growth programmes (Sawers, 2011). But in order to maintain these levels, it was noted that a large pool of Pre-Incubatees needed to be nurtured and if at least 40% of the participants qualified for the incubation programme, 26 entrepreneurs would be selected to participate in the incubation programme (ibid). Had the TIHMC maintained the 10 firms per year admission rate, it would have incubated a cumulative total of 110 firms over the first 11 years.

However, this study finds that the Maxum BI enrolled a total of 81 companies between 2000 and 2011. Of the firms that were incubated between 2000 and 2009, 31 (38.27%) have since collapsed. The total number of companies that were eventually incubated by 2011 was 50 (61%). Further, this study finds that although the TIHMC envisaged to have enrolled 10 firms to the incubator each year, evidence shows that the Maxum Business Incubator managed to admit an

average of 7 firms annually. It is notable from Table 12 that in the years 2001 and 2010 no firms enrolled with the TIHMC while in 2008 the Incubator admitted nearly twice the expected annual intake at 17 firms. This number doubled in 2009 with Incubatees numbering 21 in a single year.

TABLE 12: Summary of companies incubated in the Maxum BI between 2000 and 2011(Self, 2014)

Year the company joined the Incubator	Total number of companies that joined the Incubator
2000	6
2001	0
2002	3
2003	7
2004	2
2005	9
2006	4
2007	5
2008	17
2009	21
2010	0
2011	7
Total	81

TABLE 13: Number of Incubated companies between 2000 and 2011 which later collapsed or not traceable (Self, 2014)

Period of Incubation	Companies that have collapsed	Lost contact
2000	2	0
2002	2	1
2003	3	1
2004	0	1
2005	3	0
2006	1	0
2007	2	1
2008	4	1
2009	6	0
Intake could not be determined	3	0
Total number of companies lost	26	5

This researcher's document review and interviews with TIHMC management indicates that the incubator charges R70 per square meter of office space. The maximum size of the office space is 20 square meters. It was found that rental charges have not been adjusted since 2009 (Makanye, 2014). This researcher's findings further suggest that the occupancy rate of the incubator has fluctuated between 70% and 100% in the 11 years of the TIHMC BI's existence. In relation to this, it is interesting to note that the BSEDI framework suggests that for an incubator to avoid being over - dependent on paid services for sustainability, it must ensure that it attains at least an 85 percent occupancy rate to draw extra income from rentals. In this sense, TIHMC BI could be deemed to have been within range of the threshold set by the BSEDI framework. As the aim of the study was not to primarily determine the financial viability of TIHMC necessarily, but rather to evaluate its performance in terms of services rendered, this researcher elected to focus the inquiry on the substantive matters concerning the conditioning of the Incubatees for the market.

In this regard, to contextualise the initial findings on this study, it was found necessary to probe the TIHMC management further on the extent of success in enabling the Incubatees to enter the market and survive. To this end, a semi-structured questionnaire was administered to elicit the relevant response and was framed as follows: *According to your records, 81 Pre-Incubatees and Incubatees were enrolled between the period of 2000 and 2011. How many of these Incubatees graduated?*

Based on the TIHMC official reports provided, the firms that successfully graduated and entered the market between the year 2000 and 2011 were 17 in total as indicated in Figure 4.

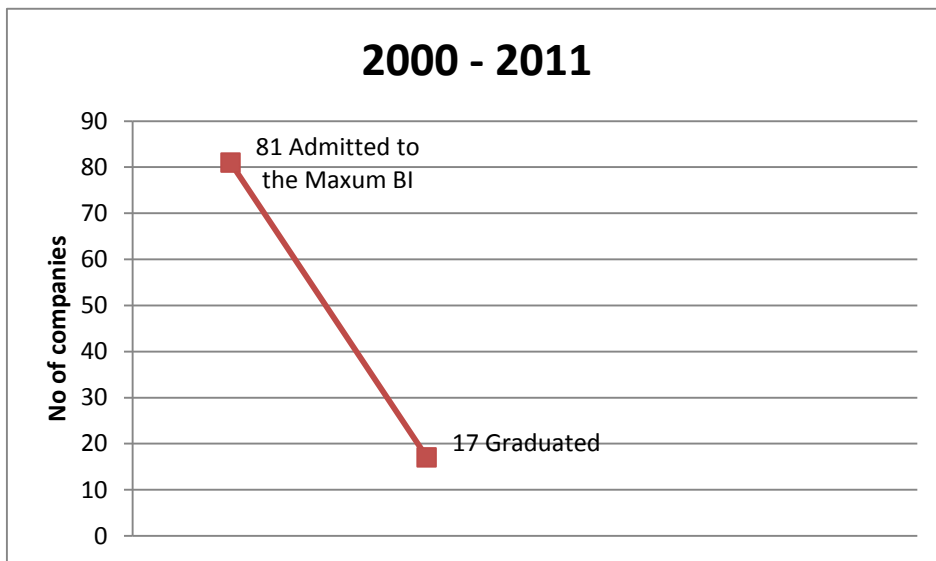


Figure 4: Companies that graduated between 2000 and 2011(Self, 2014).

In very succinct terms, the findings to research question 1 confirm that the TIHMC Maxum Incubator has successfully graduated firms into the market. The results on the contribution of these firms to the job market are to be presented under the outcomes to research question 3 in section 4.5 of this chapter. The findings thus far lend themselves to further inquiry in terms of the reasons for the ‘collapse’ or ‘exiting’ of 31 firms, which is a substantial figure. Chapter 5 will hence discuss this in greater detail by contextualising these findings within the rubric of the training regime offered by the TIHMC in its formative years and the subsequent criteria adopted in 2009 – and the extent to which it conditions start-ups to endure market pressures. It is notable in this regard that pre-incubation in the pilot phases of this project was *virtual* but was later *institutionalised in a physical sense* (Sawers, 2011).

4.4 Results pertaining to Research Question 2

As stated in Chapter 2, the second sub-problem pertains to the sustainability of new enterprises that entered the market in the period under study (i.e. 2000 to 2011). The related research question was: *How many of the enterprises that graduated from Maxum Business Incubator are still operating?*

It is important to state here that the research instrument was designed to interrogate key aspects of post incubation support provided by the TIHMC, including networking with industry and the areas in which the incubator's support was considered most critical to short term and long term survival of incubated firms. The key elements in the research instruments were:

- The content of the TIHMC Incubation programme.
- The Usefulness of TIHMC Incubator support (including business. planning, training, financial management, advice on development of new products, networking and other professional services).
- The ability of the business to launch outside of the TIHMC Business Incubator (as a result of TIHMC training).
- Availability and quality of Post-Incubation (e.g. Access to grants, seed and venture capital funding and advice on development of new products and services).
- Length of operation of Post-Incubatee.
- Areas of business launch in which the incubator was deemed most critical for the survival of Incubatees.

4.4.1 Understanding the usefulness of the TIHMC BI curriculum content

In order to fully appreciate whether or not the training played a role in enabling the Post-Incubatees to survive the competitive market to which they were introduced, it is perhaps necessary to again briefly examine the content of the TIHMC BI programme in addition to eliciting responses from the programme participants as such. To this end, management was asked: *What was the curriculum content for Pre-Incubatees and Incubatees?*

The curriculum, as discussed in section 2.8 of Chapter 2 of this report covers the fundamentals including support for the development of viable business

plans for Pre-Incubatees, identifying market opportunities, sustained mentorship programmes, financial and marketing strategies and accessing private and public financing for business plans. The main incubation programme seeks to strengthen the ability of start-ups to establish themselves in the market, refine their business plans, attract new investment, utilise virtual support services and leverage networks of business service providers provided by the TIHMC. This support system is extended to Post-Incubatees in what is termed 'after care' for graduates. The Post-Incubation support is tailored toward enabling the new firms to achieve 'a soft landing' by continuing to exploit relevant TIHMC services including access to markets in countries where the TIHMC has agreements with other countries. As stated in section 2.8 of Chapter 2, the programme also facilitates exports development capacities. Ostensibly, this programme should enable to a great extent, the graduates to survive the rigors of a largely capitalist environment.

4.4.2 Rating the services of the TIHMC Maxum Business Incubator

To test the quality of the programme, the study elicited the perceptions of all three categories of respondents, that is, the Pre – Incubatees, Incubatees and Post-Incubatees. As stated, understanding the 'conditioning' of the programme participants, will most likely provide a better informed analyses of why graduant firms survive or collapse. As elucidated in Chapter 2 section 2.9 this is consistent with the BSEDI framework which holds that in order to assess internal business processes, it is necessary to measure tenant satisfaction about internal processes for instance, the *selection process*, incubator's knowledge about company development phases or *accessibility to external experts*.

To this end, Pre- Incubatees and Incubatees were asked about whether the Maxum business selection process was fair and transparent with a rating of 1 being '*Strongly disagree*' and 5 '*Strongly agree*'. It is important to state that this question was not administered to Post-Incubatees because they would have

enrolled in the formative years of the TIHMC, when there were no established entry criteria. 25% of the Pre-Incubatees and Incubatees scored 3 on the 5 point Likert Scale while 40% rated the process with a 4; 35% assigned a score of 5 ('strongly agree'). The dominant view, which could be aggregated, suggests therefore that 75% regarded the process as fair and transparent.

Further, all three categories of respondents (Pre-Incubatees, Incubatees and Post-Incubatees) were asked about '*value creation*' or more specifically on the quality of the services rendered by TIHMC BI, in accordance with the SMEDI framework. The question was posed as such: *Rate the usefulness of the following Incubator services you have received from Maxum? (Rating 1=Not at all useful and 5=Extremely useful)*. The graphs below present perceptions of each category of respondents separately, starting with the perceptions of Pre-Incubatees, Incubatees and Post-Incubatees - in that sequence - before providing a comparative perspective (Figures 5, 6 and 7).

Rating access to grants, seed and venture capital funding” service

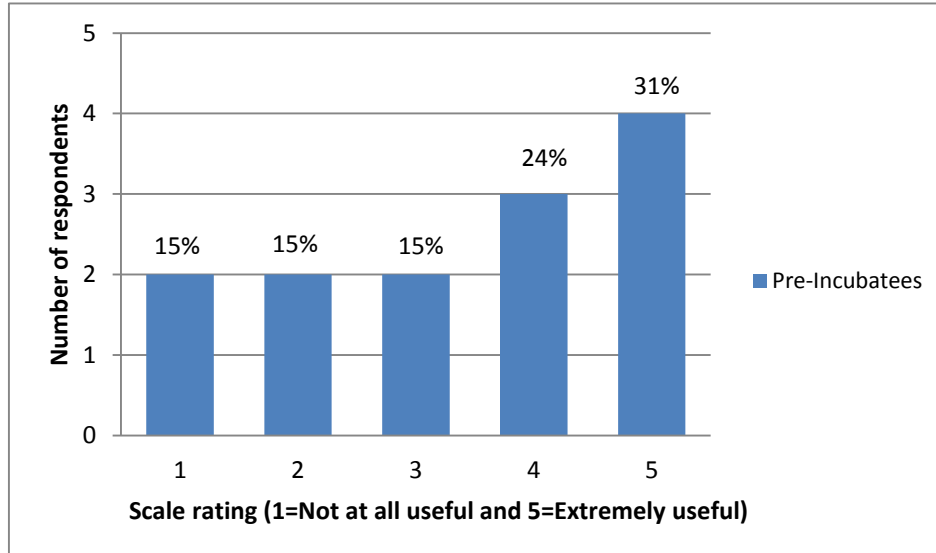


Figure 5 : Pre-Incubatee perceptions of the “Access to grants, seed and venture capital funding” service.

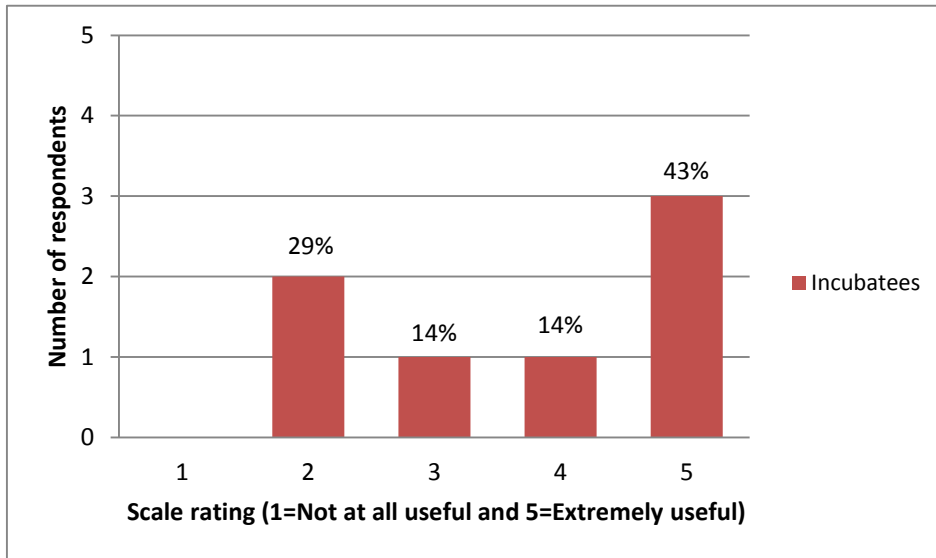


Figure 6: Incubatee perceptions of the “Access to grants, seed and venture capital funding” service.

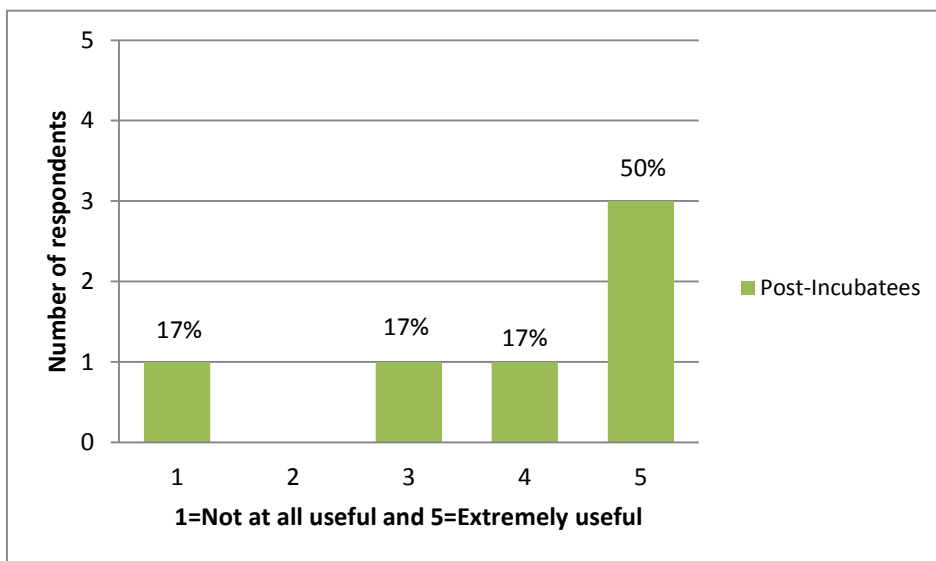


Figure 7: Post - Incubatee perceptions of the “Access to grants, seed and venture capital funding” service.

Figure 8 indicates generally that the dominant view amongst Pre-Incubatees was that the TIHMC service relating to accessing grants, seed and venture capital is useful (23%) or extremely useful (31%). If the two upper scale scores are aggregated, we can surmise that 54% of respondents approved of the service. However, the same question posed to Incubatees produced a slightly

different outcome: 14 % found it ‘*useful*’ while 43% rated it as ‘*extremely useful*’. Although 57 % of respondents among Incubatees scored on the upper end of the scale, it is perhaps worth interrogating their relatively weaker perception of the same service. The Post-Incubatees provide a slightly stronger rating of the service, at 17% (useful) and 50% (extremely useful), possibly because of the greater need for financing services that comes with entry into the market. These aspects will be further discussed in Chapter 5.

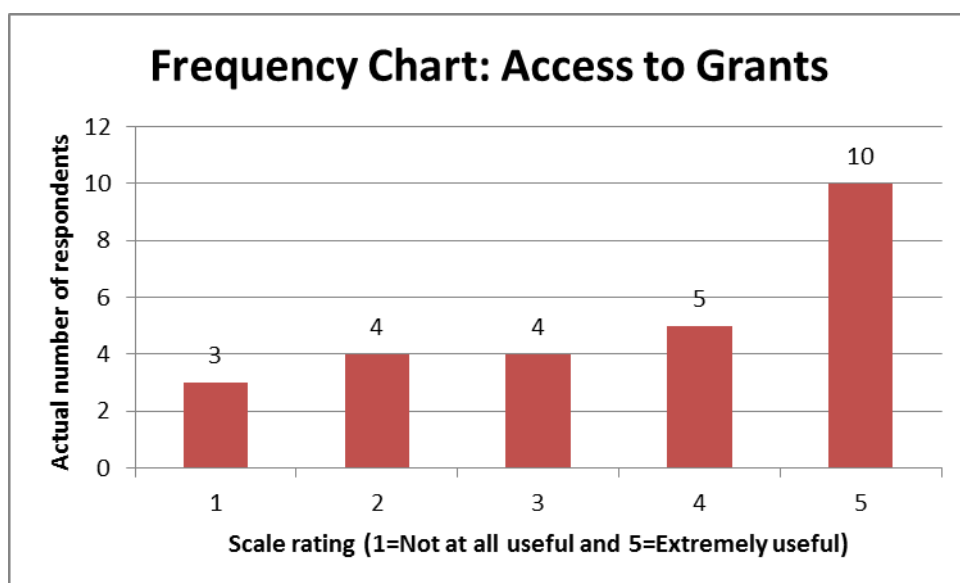


Figure 8: Combined perceptions of the “Access to grants, seed and venture capital funding” service.

The respondents were further probed on the quality of the practical aspects of the TIHMC training beginning with services related to business planning and forming a company.

4.4.2.1 Rating business planning and ‘forming a company’ service

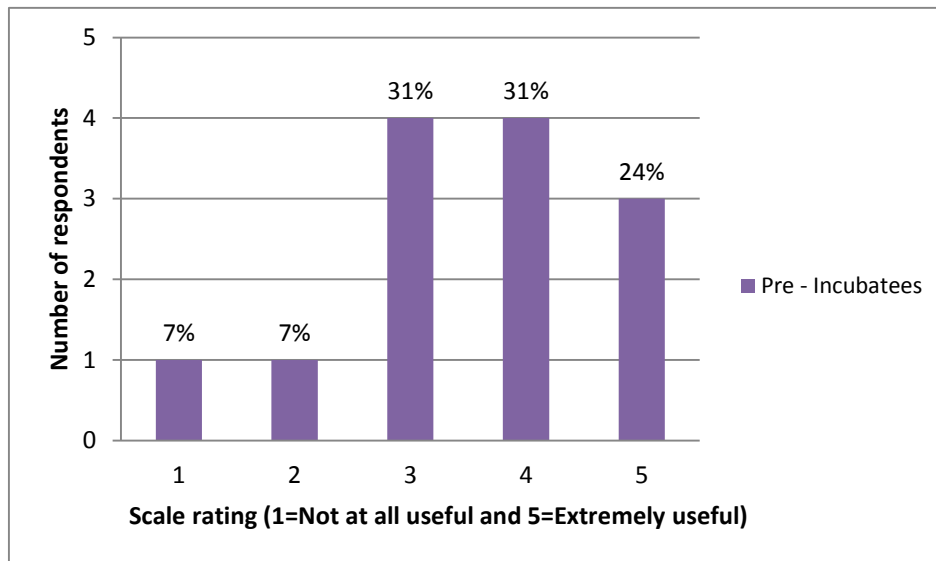


Figure 9: Pre-Incubatee perception of the “Business planning and forming a company” service.

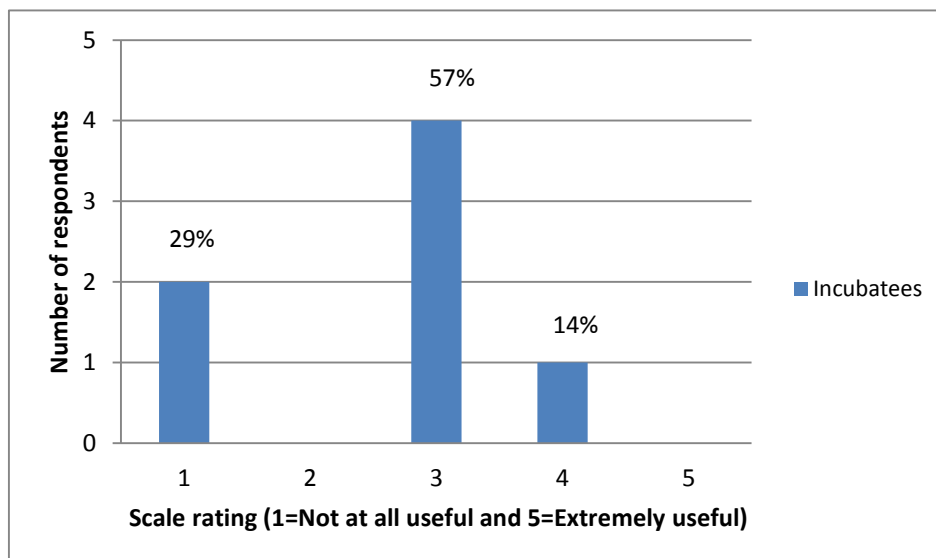


Figure 10: Incubatee perceptions of the “Business planning and forming a company” service.

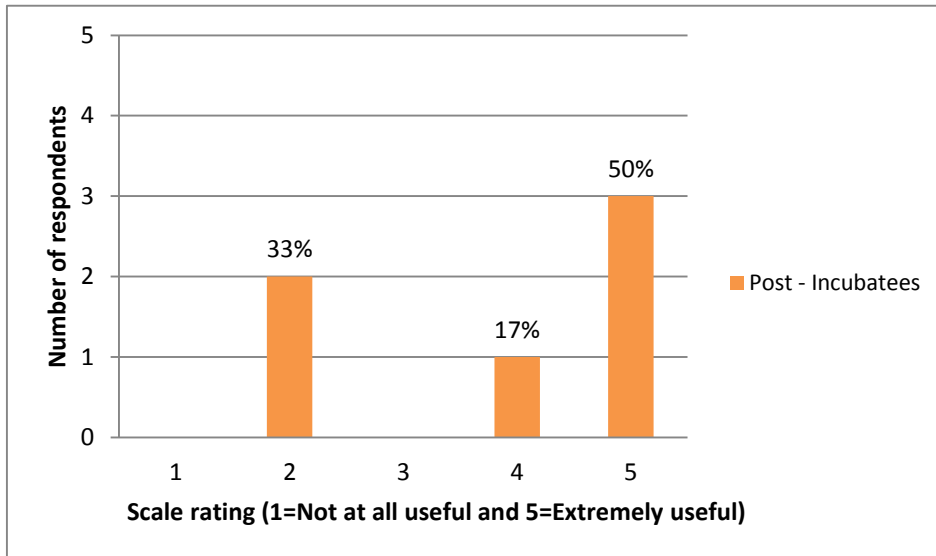


Figure 11: Post - Incubatee perceptions of the “Business planning and forming a company” service.

It is striking that Incubatees gave a relatively poor rating of the business planning training provided by TIHMC – in effect, none of the respondents scored 5 (extremely useful) and only 14% thought the quality deserved a rating of 4 (Figure 10). However, 31 % of Pre-Incubatees thought the training was ‘*extremely useful*’ and 24% rated it as ‘*useful*’. Post-Incubatees similarly rated the incubator business planning services relatively higher, with 50% considering it ‘*extremely useful*’ and 17 % ‘*useful*’ (Figure 11). A possible explanation would be that the three groups experienced different quality of training at different periods of participating in the programme. The three categories of participants will therefore have a different appreciation of the quality and usefulness of the training particularly, since, some had already entered the market at the time of the study (Post-Incubatees) and could therefore frame training experiences with the contemporary business environments; while others were yet to be fully exposed (Pre-Incubatees and Incubatees) to those conditions. The substantial and related perspectives to this result will be further interrogated in the next chapter, taking into consideration the available data from TIHMC and associated documentation.

Considering the relatively low rating of the business planning services, which is an essential cog in the preparation of a future entrepreneur, it was imperative to continue to expose the TIHMC Programme to further scrutiny. In this regard, this researcher endeavored to elicit the opinions of all available categories of participants in the Maxum Business Incubator over the 11-year period on the quality of Pre-Incubation services. As observed in the literature review, the Pre-Incubation programme became a particularly important part of the TIHMC in its formative stages upon the realization that historically disadvantaged candidates were not initially catered for, and therefore were unable to grasp the intricacies of business development in comparison to other more privileged ethnic groups. The pre-eminence of the Pre-Incubation aspect of this programme was hence deemed essential to the understanding of how or whether the TIHMC training provided the appropriate capacities to new entrepreneurs to survive the rigors of the market. The respondents were therefore asked to rate the TIHMC Maxum Incubator's Pre-Incubation services.

4.4.2.2 Rating the TIHMC Maxum Incubators' Pre – Incubation Services

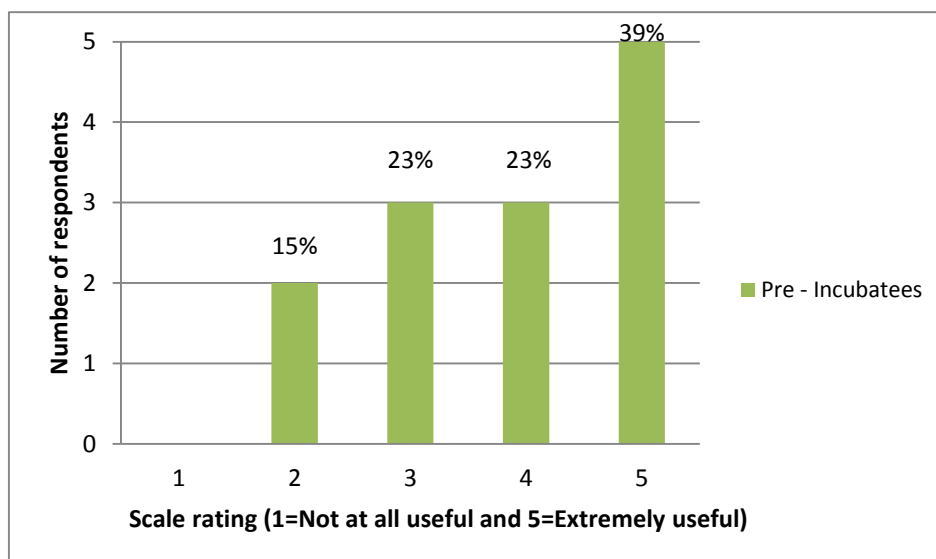


Figure 12: Pre - Incubatee perceptions of the “Pre – Incubation Services”

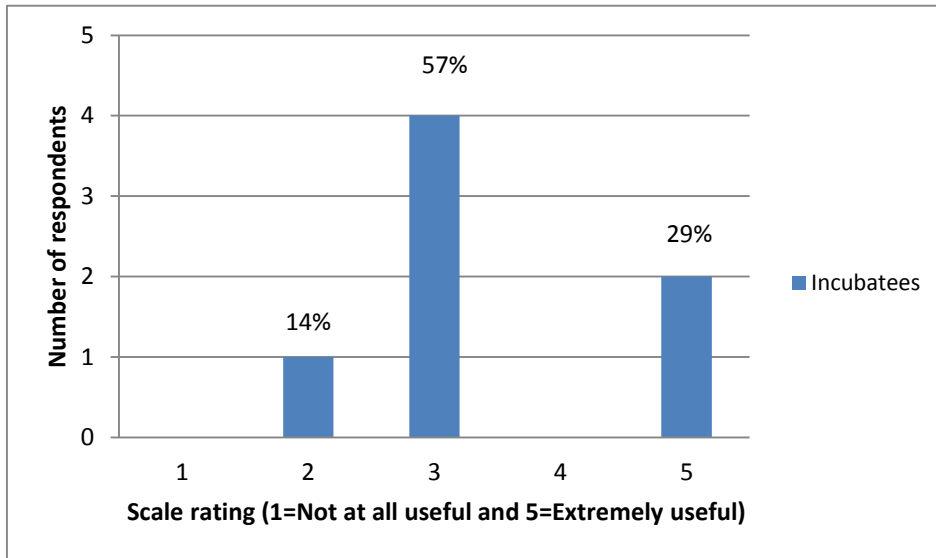


Figure 13: Incubatee perceptions of the “Pre – Incubation” Services

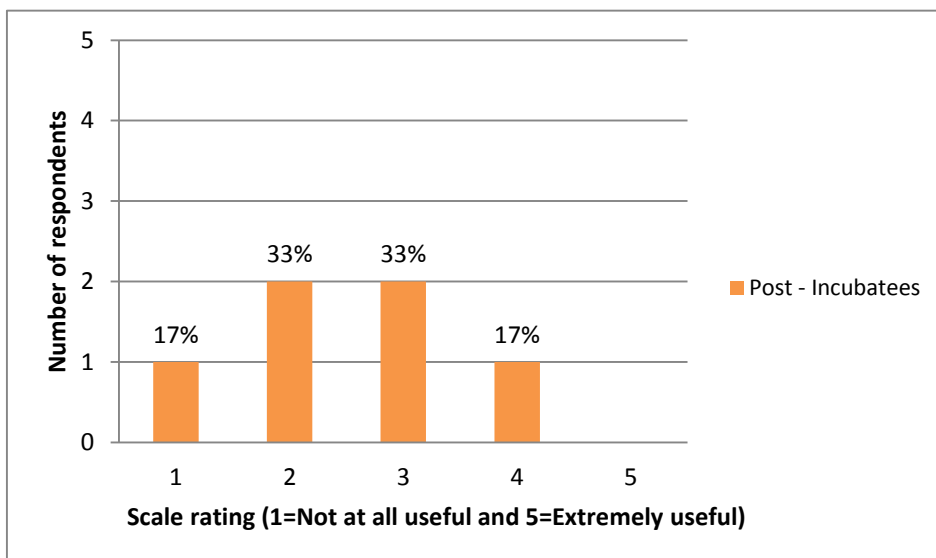


Figure 14: Post - Incubatee perceptions of the “Pre – Incubation” Services

Figures 13 and 14 indicate that Incubatees and Post-Incubatees rated the Pre-Incubation services in general, relatively poorly. For Incubatees, only 29% gave the service a maximum score while the Post-Incubatees rated it even lower with only 17% scoring a rating of 4 and none scoring 5. The Pre-Incubatees on the

other hand, provided a more favourable outlook with 39% scoring 5 and 23% rating the service at 4. The explanation for this disparity in perception is likely due to the fact that Incubatees and Post-Incubatees have a plane for comparison, having measured their experience in the *Pre-Incubation phase*, against the realities of the *Incubation programme* – and of course the market (in the case of the Post-Incubatees).

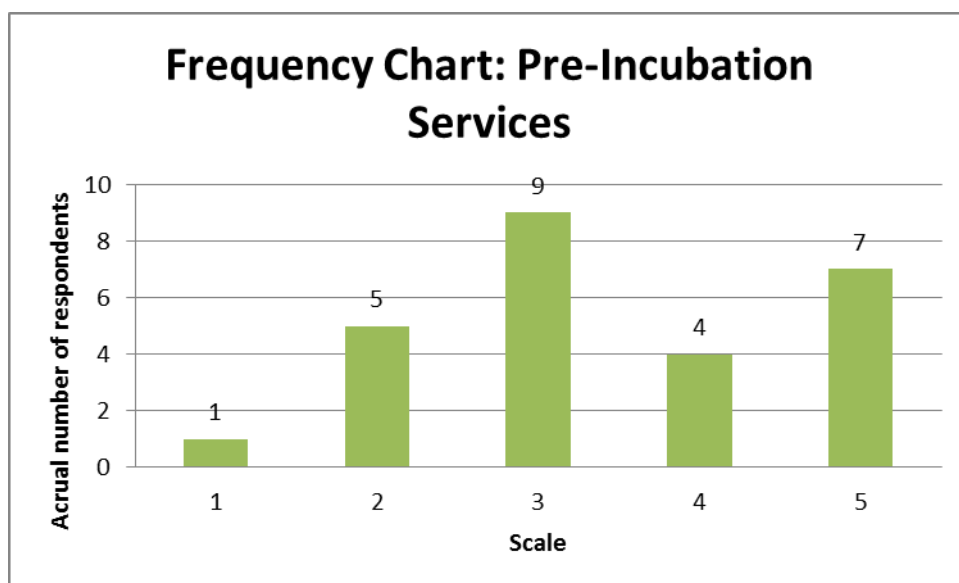


Figure 15: Combined perceptions of the “Pre – Incubation” Services.

4.4.2.3 Rating Training to develop Business Skills” service

It is notable also that respondents gave a relatively poor score when asked to rate “*Training to develop business skills*” (1=Not at all useful and 5=Extremely useful). As with the rating on business planning, the pattern is similar. Pre-Incubatees provided the highest scores with 46% scoring 4; and 23%, 5. However, Incubatees gave a lower rating with 43% scoring 4 and only 14% scoring 5. The Post-Incubatees generally disapproved of the quality of training altogether, with none of them giving any scores in the 4-5 scale. Only 33% gave it an average rating, while the rest is below average (Figures 16, 17 and 18).

To further gauge this range of services, Pre-Incubatees and Incubatees were asked to rate how useful the interactive sessions offered by TIHMC were on a 5 point Likert scale with 1 being *'Not at all useful'* and 5 *'Extremely useful'*. The question was framed as follows: *"Part of The Innovation Hub's approach is to hold regular interactive sessions with other entrepreneurs and market leaders. How useful is this service?"* 5% gave this service a score of 2; 30% assigned a score of 3 while 25% and 40% assigned a score 4 and 5 respectively. In response to whether the seminars and workshops provided by the Maxum Business Incubator were useful to the needs of the individual Incubatee; 40% of Pre-Incubatees and Incubatees (combined scores) found these seminars and workshops *'not useful'* while 60% found them *'useful'* or *'extremely useful'* (score of 4 and 5 combined on the Likert Scale).

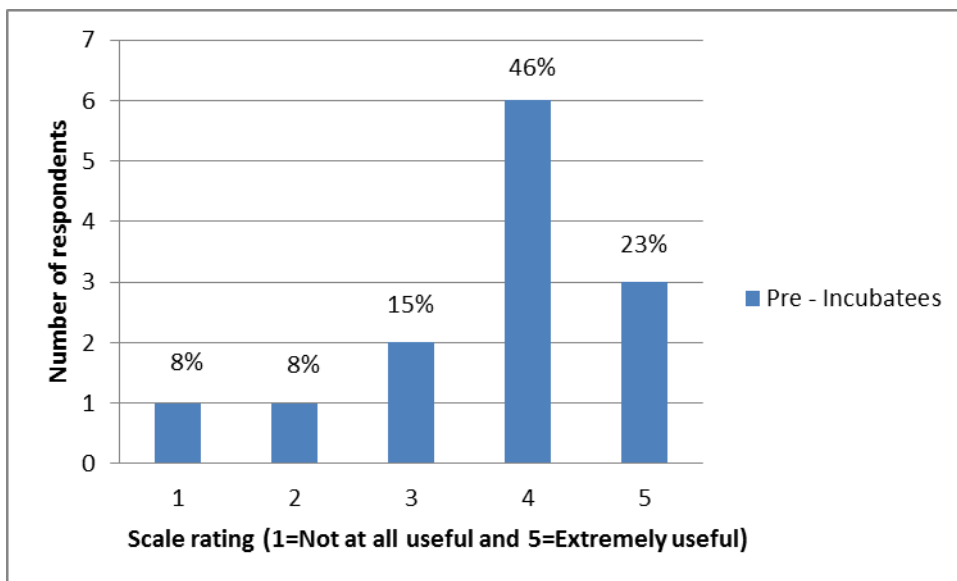


Figure 16: Pre – Incubatee perception of the “Training to develop Business Skills” service

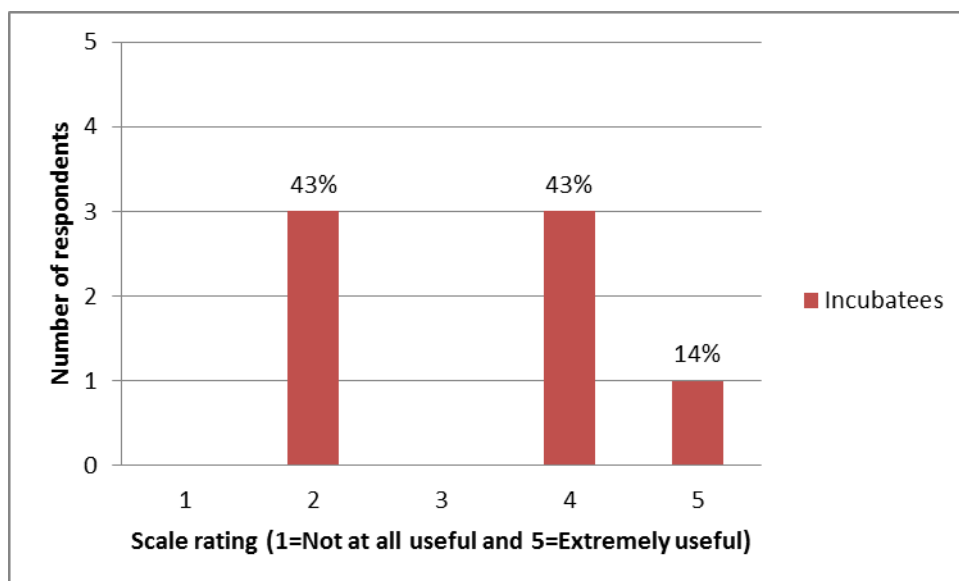


Figure 17: Incubatees' perception of the "Training to develop Business Skills" service

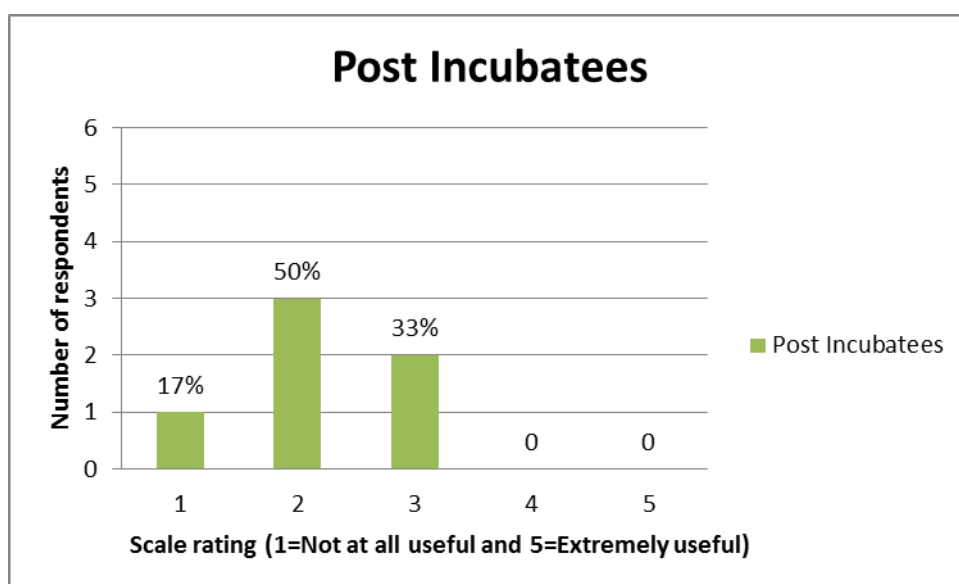


Figure 18: Post – Incubatees' perception of the "Training to develop Business Skills" service.

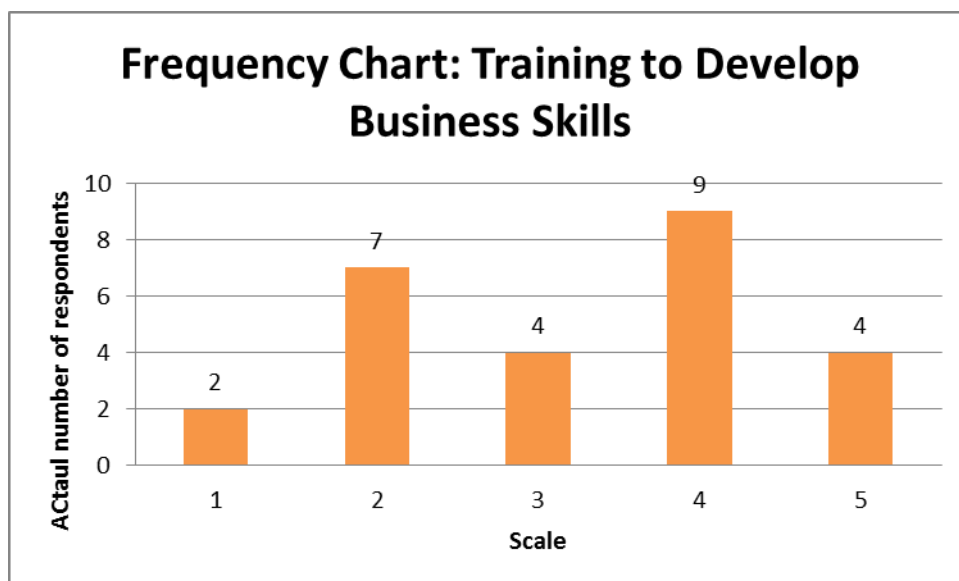


Figure 19: Combined perceptions of the “Training to develop Business Skills” service.

4.4.2.4 Rating the usefulness of the financial management and book keeping training

A similar trend is evident in the ratings of other critical services that should enable the new enterprises to enter the market and survive competition. When asked to rate the usefulness of the *financial management and book keeping training*, respondents exhibited similar sentiments as with other three services above. What is perhaps more distinct in these ratings, is the more negative slant of the Pre-Incubatees - none of whom gave the service a rating of 5. Instead, 15% rated it at 4 and 30% at 3. The scores trend downwards when the question is posed to Incubatees: 14% rated it at 4; 28% at 3 and none gave a 5 rating. Significantly, 66% of Post-Incubatees gave the service the lowest rating of 1; while only 16% thought of it as ‘*useful*’ (4). None of the respondents deemed the service ‘*extremely useful*’. (Figures 20, 21 and 22).

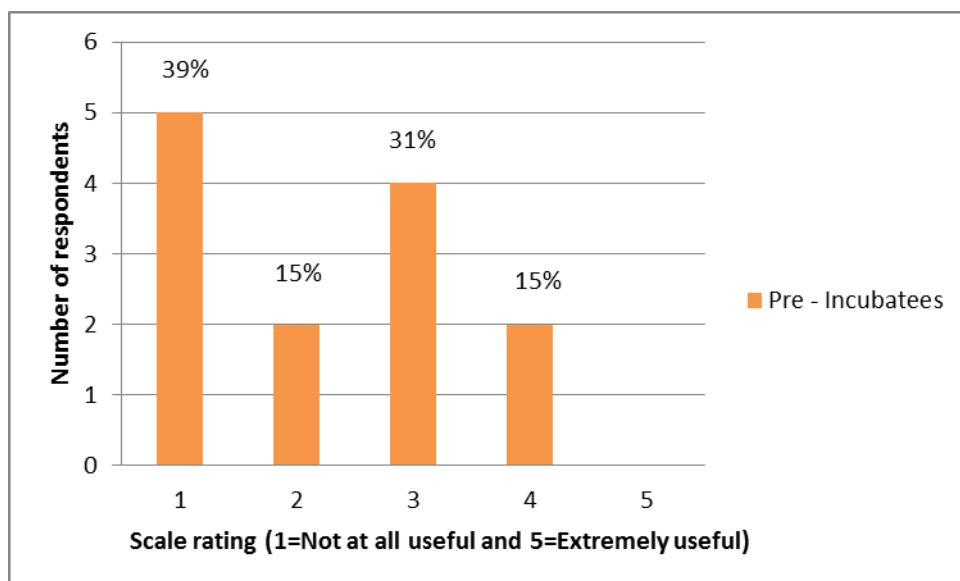


Figure 20: Pre –Incubatees' perception of the Financial Management / Bookkeeping

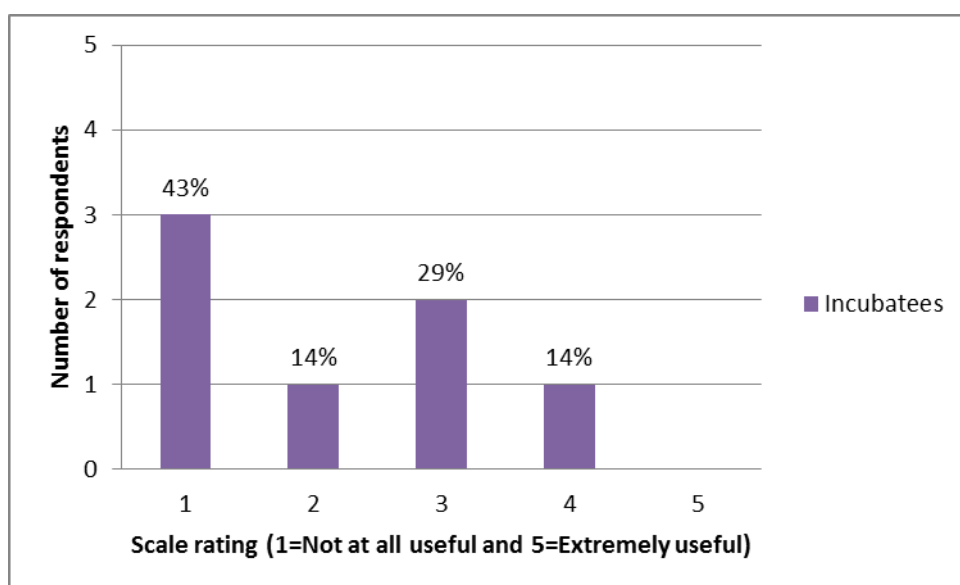


Figure 21: Incubatees' perception of the Financial Management / Bookkeeping

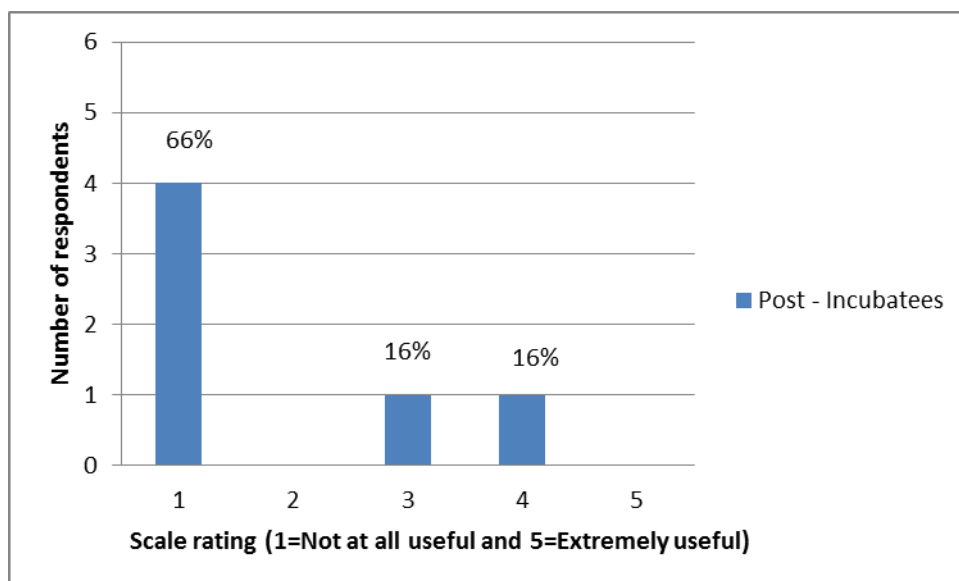


Figure 22: Post-Incubatees' perception of the "Financial Management /Bookkeeping" service

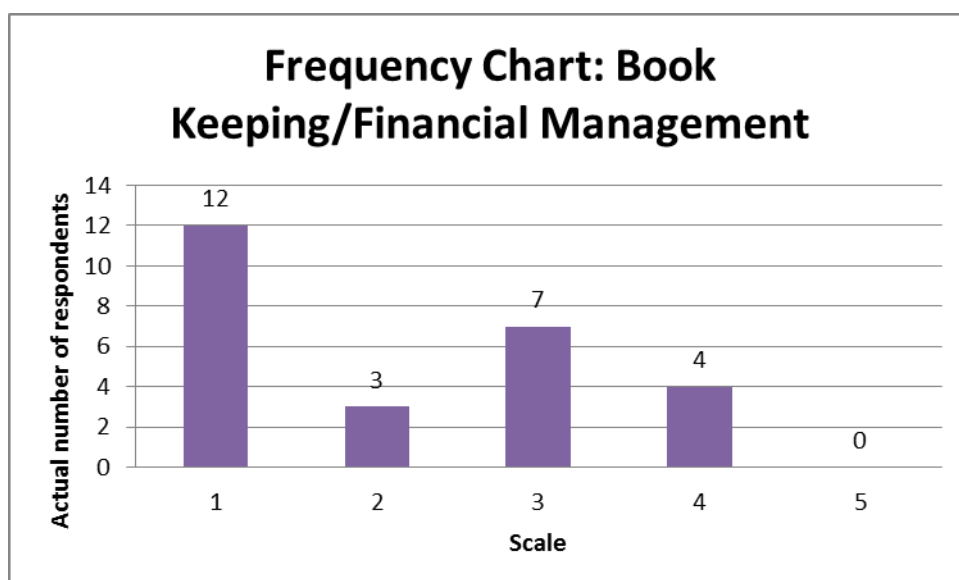


Figure 23: Combined perceptions of the 'Financial Management /Bookkeeping" service.

4.4.2.5 Rating ‘advise on development of new products and services’

The appreciation of advice from TIHMC to the three categories of Incubatees was higher amongst the Pre-Incubatees than the Incubatees and Post-Incubatees. Again, this may be explained by the longer experience with the incubation process by the latter two categories and exposure to the market realities. 46% of the Pre-Incubatees rated the TIHMC “*advice on development of new products and services*” at 4 and 5 compared to 43% Incubatees and 34% Post-Incubatees. Figures 24, 25 and 26 show that the combined perceptions of the three categories of respondents reflect a dominant negative score.

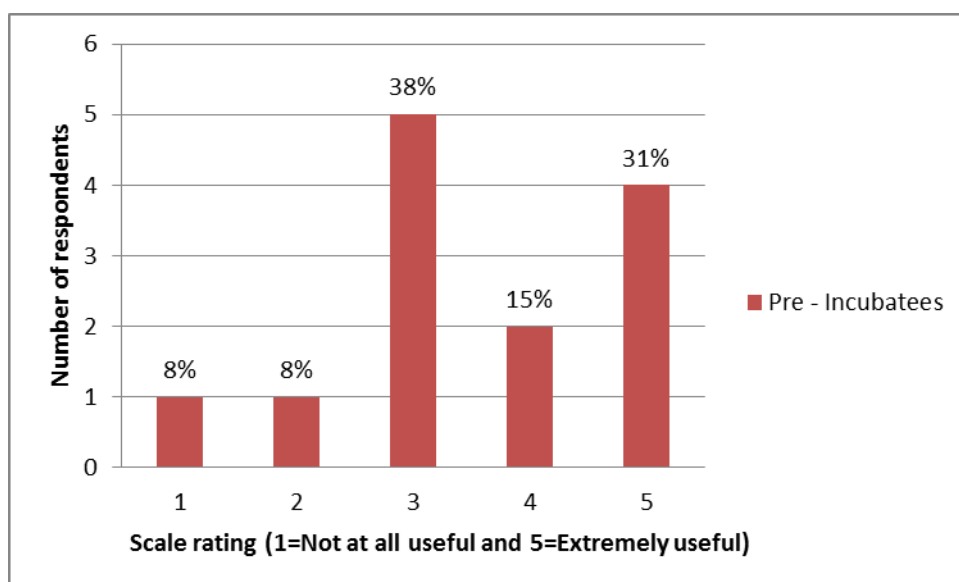


Figure 24: Pre-Incubatees’ perception of the “Advice on development of new products and services” service.

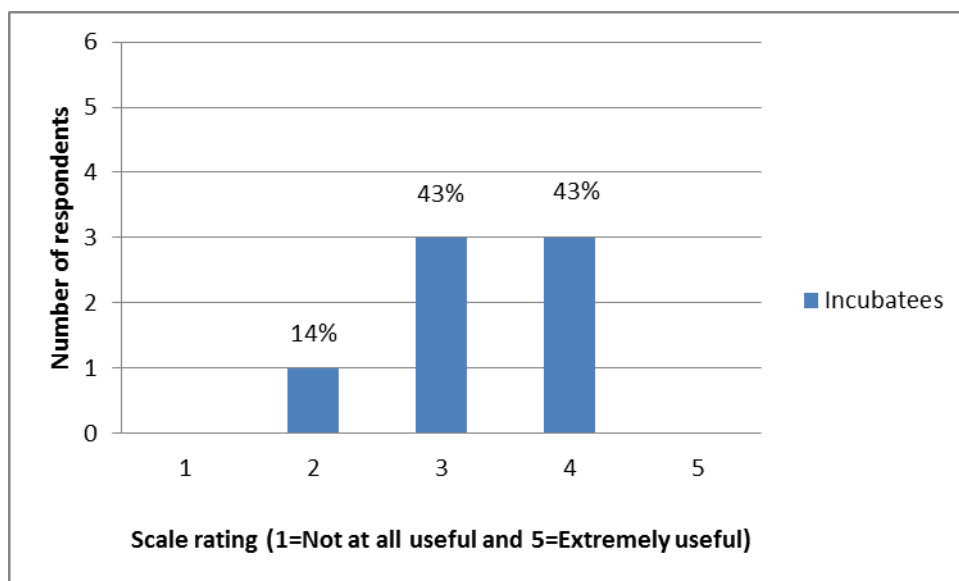


Figure 25: Incubatees' perception of the "Advice on development of new products and services" service.

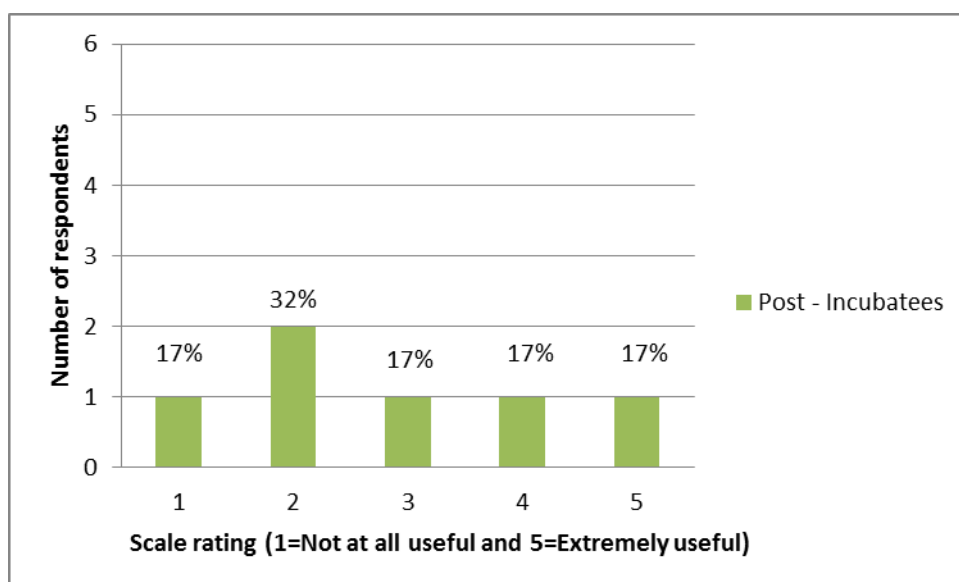


Figure 26: Post-Incubatees' perception of the "Advice on development of new products and services" service.

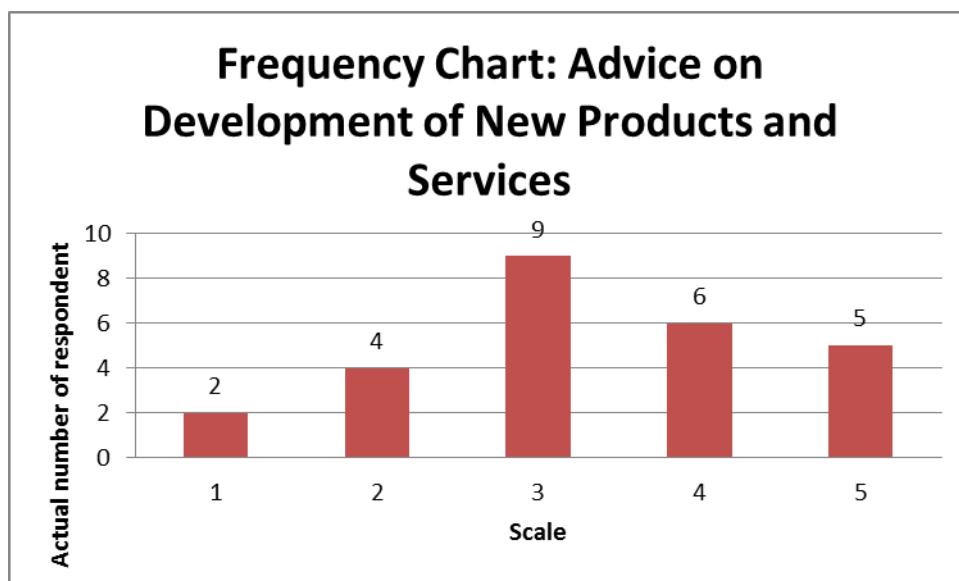


Figure 27: Combined perceptions of the “Advice on development of new products and services” service.

4.4.2.6 Rating Other Professional Services provided by TIHMC

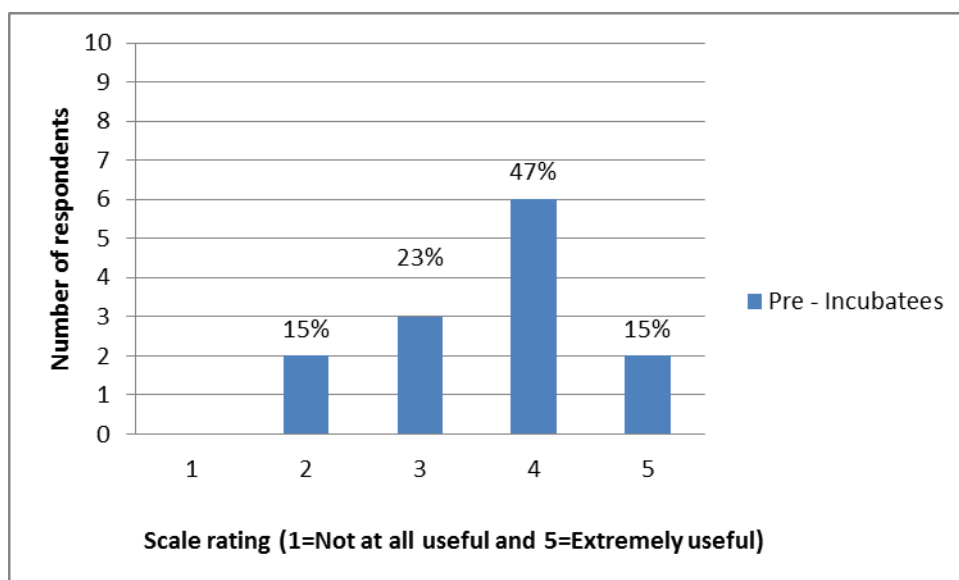


Figure 28: Pre – Incubatees’ perception of Other Professional Services

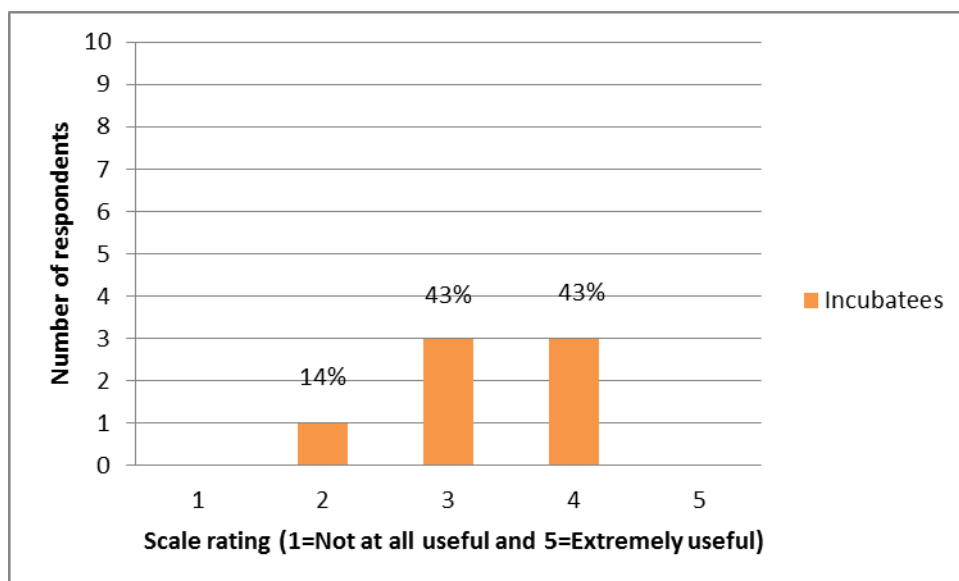


Figure 29: Incubatees' perception of Other Professional Services

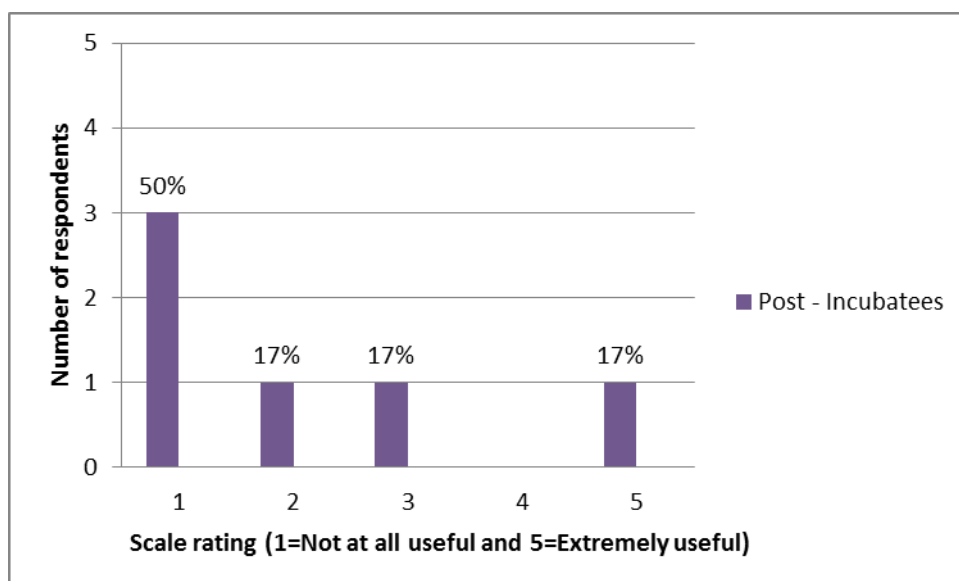


Figure 30: Post – Incubatee perceptions of 'Other Professional Services'.

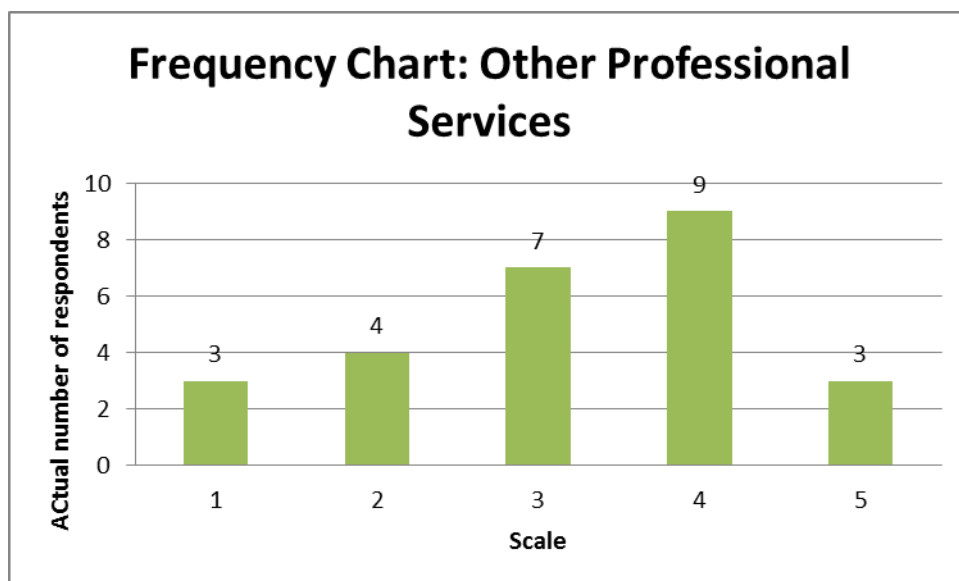


Figure 31: Combined perceptions of the "Other Professional Services".

4.4.2.7

TABLE 14 : Individual questions with Means and Standard Deviations

Descriptive Statistics					
Research Questions	N	Mean	Std. Deviation	Minimum	Maximum
Rate the usefulness of the following Incubator services you have received.					
1. Access to grants seed and venture capital funding	26	3.58	1.447	1	5
2. Business planning and forming a company	26	3.35	1.294	1	5
3. Pre-Incubation services	26	3.42	1.206	1	5
4. Training to develop business skills	26	3.23	1.243	1	5
5. Bookkeeping/Financial Management	26	2.12	1.177	1	4
6. Advice on development of new products and services	26	3.31	1.192	1	5
7. Other professional services	26	3.19	1.201	1	5
8. Advice on recruitment of staff and personnel management	26	2.54	1.303	1	5

The questions contained in the 3 questionnaires administered to the Pre-Incubatees, Pre-Incubatees and Post – Incubatees (Question 8 in Appendix B and C and Question 5 in Appendix D) were posed on the basis of a 5 point Likert type scale where 1 = Not at all useful and 5 = Extremely useful.

The following were rated above the mean of 3 by all the 3 groups:

- Access to grants seed and venture capital funding
- Business planning and forming a company
- Pre-incubation services
- Training to develop business skills
- Advice on development of new products and services
- Other professional services

On the other hand *'bookkeeping/financial management and advice on recruitment of staff and personnel management'* were rated below the mean of 3 by the same groups.

4.5 Results pertaining to Research Question 3

Ahead of presenting the outcomes of the survey of research question 3, it is imperative to reiterate that the third sub problem focuses on the value added to the market by the graduant enterprises, that is, in terms of quantifying the number of employment opportunities created. *[How many job opportunities have been created: in incubated/affiliated firms; in graduated firms and indirectly?].*

It was explained in Chapter 2 that the opportunities created would be categorised as follows:

- Employment created in incubated/affiliated firms
- Opportunities created in graduated firms
- Indirect jobs.

To this end, the respondents who constituted TIHMC management and Post-Incubatees were interrogated on the following inter-related perspectives:

- Length of incubation period
- How long the enterprise was in operation
- Type of Post-Incubation support provided by TIHMC
- Importance of TIHMC support to company performance
- Usefulness of specific TIHMC services(e.g. planning, forming a company, Pre-Incubation services, business planning, financial management)
- Usefulness of advice on recruitment of staff and personnel management
- Number of employees

The Post - Incubatee is the end product of the TIHMC incubation process and is therefore central to the measurement of the Maxum Business Incubator's contribution to the market. Ahead of interrogating the Post-Incubatees on the substantive issues of performance (quality of services and job creation) hence,

it is imperative to ascertain the length of time they have spent in the incubator. This is to eliminate any possibility that some of the higher performers may have had either an unfair advantage in terms of the period made available to them in terms of accessing the TIHMC services. To this end, the preamble to this part of the study begins with a somewhat rudimentary question: *How long did it take you to graduate from the incubator?*

From Figure 32, it is evident that Post - Incubatees spent between 3 to 5 years in the TIHMC BI programme. Here it needs to be reiterated, as noted in the literature review that when TIHMC was formed, there was no Pre-Incubation period which meant that the programme was completed within a three year period. Based on these findings, it can be stated that 50 % of the respondents in this study have attended incubation and another 50% has experienced both Pre-Incubation and Incubation phases. The scope of this study may not necessarily yield data on which of the two categories have fared better in the Post-Incubation phase; however, the benefit of this piece of data is that it may also explain why the ratings on Pre-Incubation services by Post-Incubatees has been relatively lower than any other category – they would not have had first-hand experience of the service.

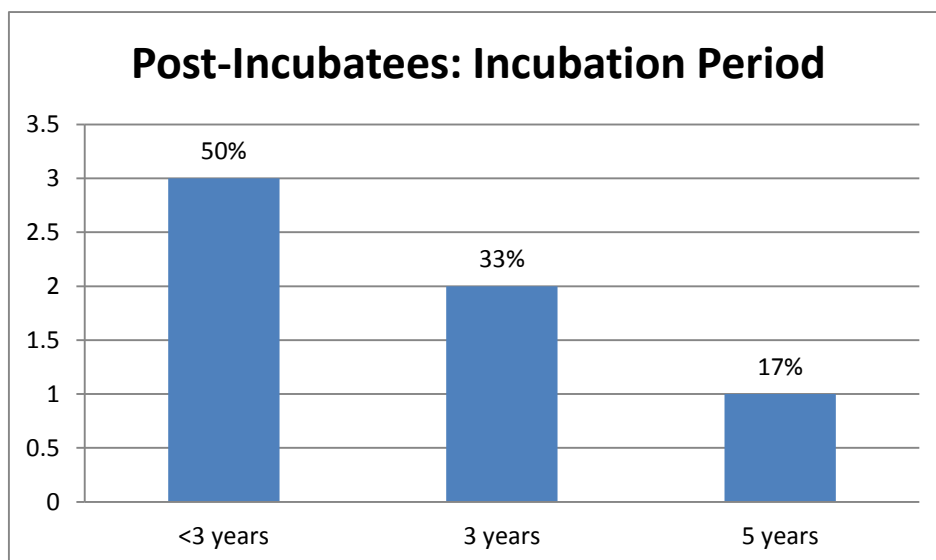


Figure 32: Post – Incubatees' length of incubation

As unveiled in the results to research question 1, 17 Post-Incubatees are still operating out of the 81 that are on record as having been incubated by the TIHMC Maxum BI. Part of the researcher's endeavor in this study was to ascertain whether the firms that were incubated still exist, in addition to them being viable. In this regard, when asked how long their businesses had been operating, 67% responded that they had been in existence for more than 5 years. 33% indicated they had existed for more than 10 years.

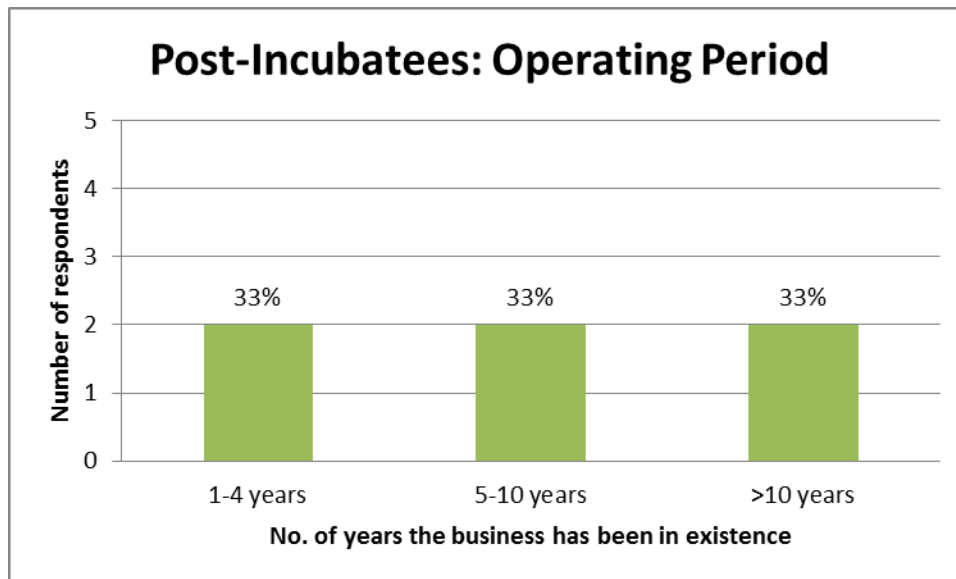


Figure 33: Post –Incubatees operating period

But perhaps the most critical aspect of this inquiry remains the measure of TIHMC ‘after care’ services, which are ostensibly aimed at assisting the Post - Incubatees achieve ‘a soft landing’ in the market. The Post-Incubatees were hence asked: *What level of support has the Maxum Business Incubator provided since you graduated? Rating (1= No support at all and 5 = A lot of support).*

The results show that the TIHMC did provide some form of ‘after care’ support although the services are not highly rated (none of the respondents scores 5). For the TIHMC, this result is indicative of the affirmation of a level of appreciation of post- graduate activities but not their excellence. It is, doubtless, an area, which the TIHMC management may wish to further strengthen going forward.

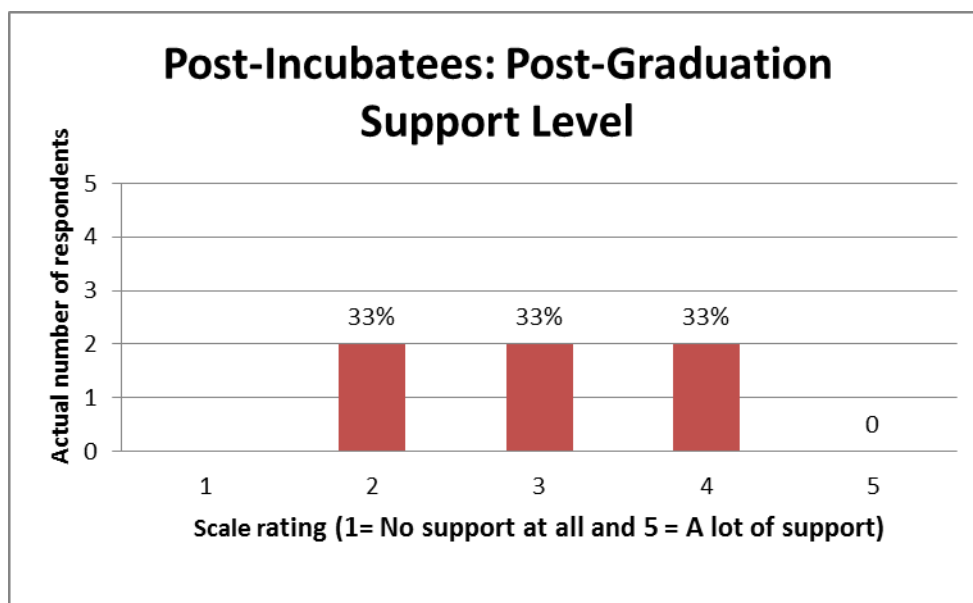


Figure 34: Post-Incubatees support received from the Maxum BI

Further to this line of inquiry, respondents were asked more specific questions relating to critical services provided by the TIHMC beginning with *networking support*. We remind ourselves that literature and documentation from TIHMC indicates that the company facilitates Post-Incubatee access to their international partners in countries where they have agreements (Sawers, 2011). In response to the question, 50% of the Post-Incubatees indicated that they received ‘*a lot of support*’ from the TIHMC’s Maxum BI in post-graduate networking support services (4-5 score)(Figure 35).

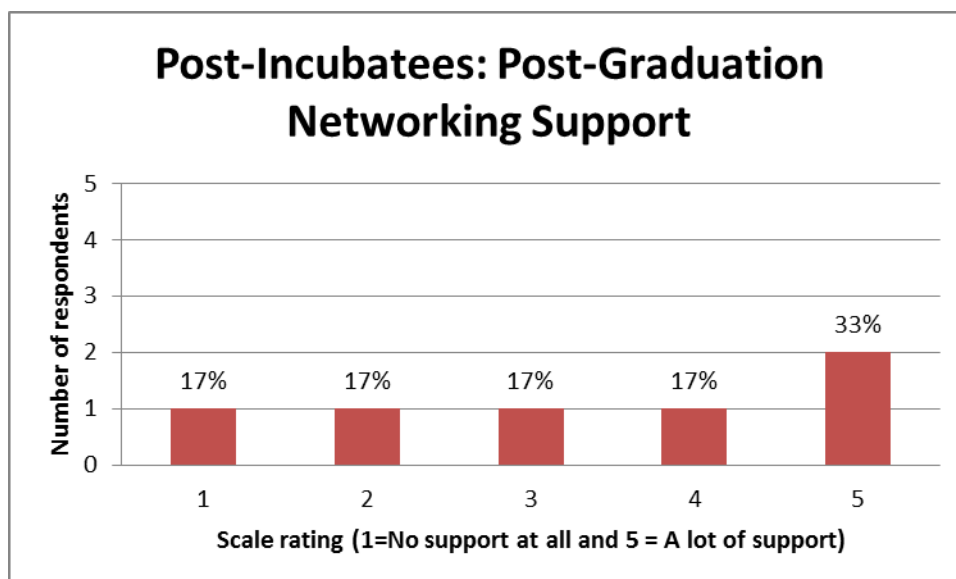


Figure 35: Level of support pertaining to Networking received from the Maxum BI

Interestingly also, 67% of the Post-Incubatees approve of '*post-graduation reputation support*' provided by the TIHMC Maxum BI, indicating that they received '*a lot of support*' as illustrated in Figure 36.

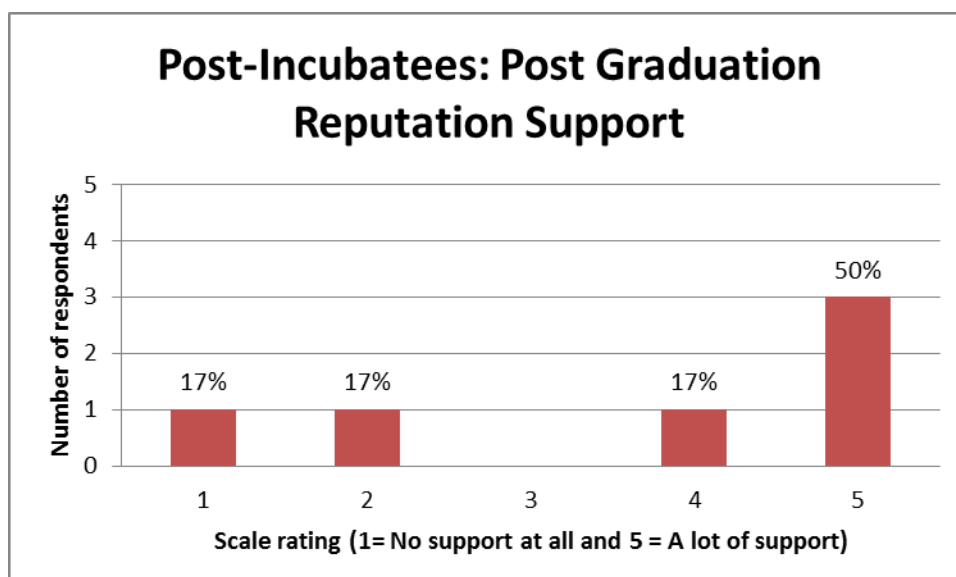


Figure 36: Support received by the Post-Incubatees pertaining to their company's reputation.

When asked: *How important was the Maxum Business Incubator to the company's performance?* The dominant view amongst the respondents (67%) was that their firms would not have survived or existed without the support of the TIHMC Maxum Business Incubator (Figure 37). When the question is reversed, and posed as: *Would the firm have succeeded without Incubator support?* 50% of the respondents agreed. 33 % believed the Maxum's support was not critical (giving a rating of 3, Figure 39) and a similar number scored 4 on the scale. This finding seems to suggest that while there is generally a mixed view of the services provided by the TIHMC Maxum BI, and despite the indication in most cases of a relatively negative appreciation of the services rendered, the underlying opinion amongst the graduates of the Maxum Business Incubator is that it has either played a role in their survival or certainly has been a necessary component in their success.

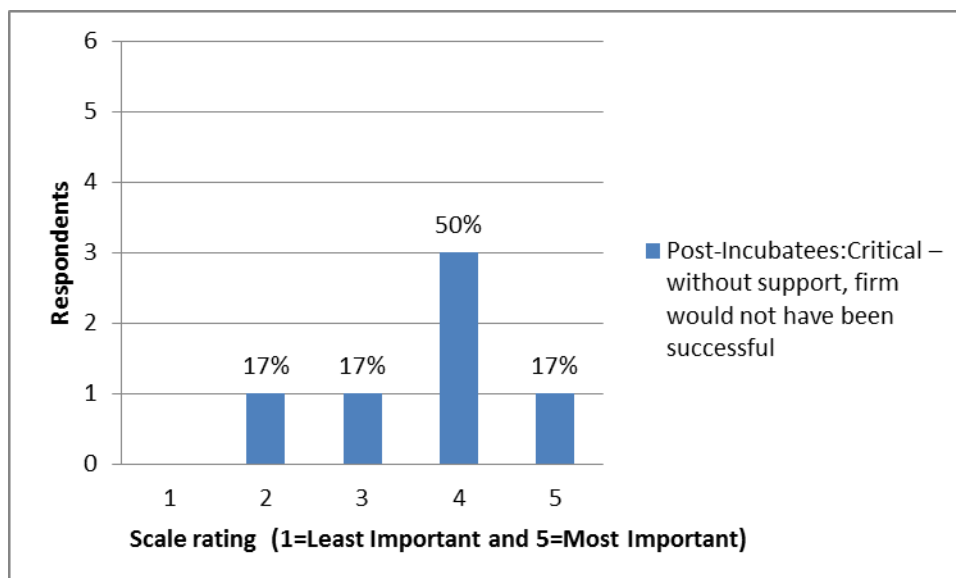


Figure 37: Importance of the Maxum BI to the company's performance.

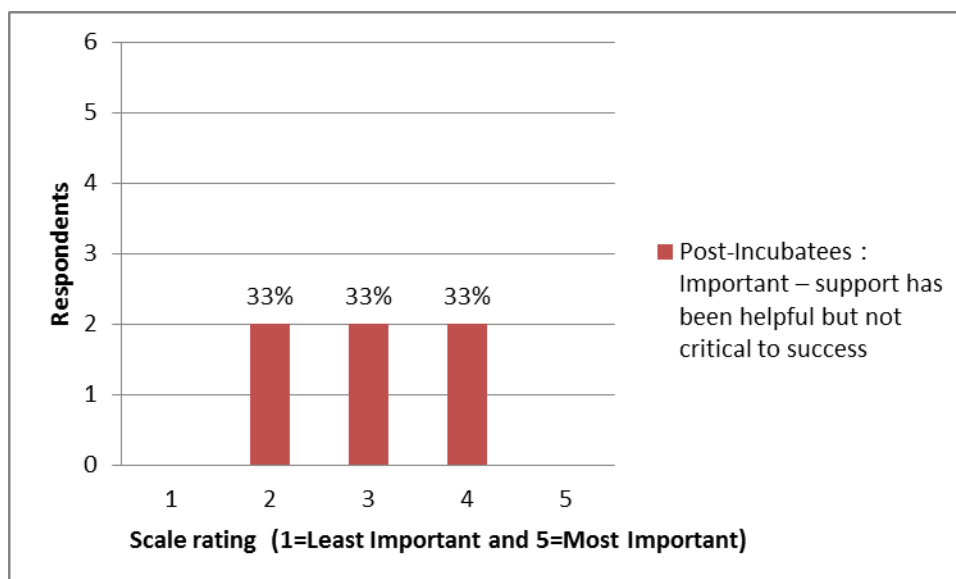


Figure 38: Importance of the Maxum BI

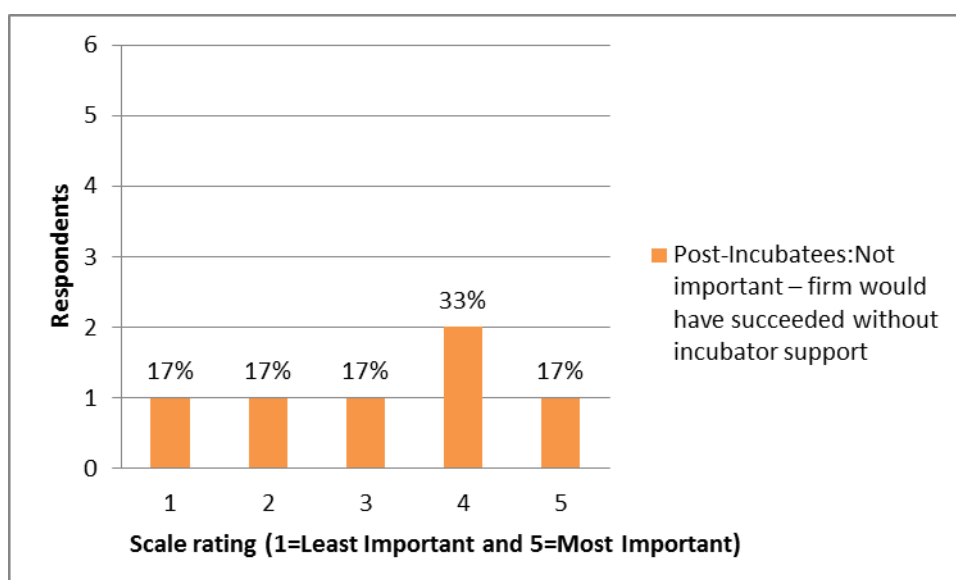


Figure 39: Importance of the Maxum BI

It is, at this point, critical to remind ourselves that the ultimate goal of the study was to establish the contribution of state sponsored incubators to the economy in terms of job creation. Before embarking on that aspect of the study, the researcher deemed it necessary to first interrogate the respondents on the value they attached to the advisory services provided by the TIHMC Maxum Business Incubator on staff recruitment, given that this relates directly to the job

creation imperative. To this end, all three categories of respondents (Pre-Incubatees, Incubatees and Post-Incubatees) were asked to rate the “*advice on recruitment and personnel management*” service.

The Incubatees provided the highest score: 57% of them scored 4-5; while 46 % of Pre-Incubatees scored 4-5. The Post-Incubatees had an extremely poor appreciation of the advice rendered on staff recruitment and personnel management. 50% of the Post-Incubatees rated the service as ‘*not useful at all*’ while 33% gave a ‘*not useful*’ rating (2). In short, 83% of Post-Incubatees found minimal value in this service (Figures 40,41 and 42).

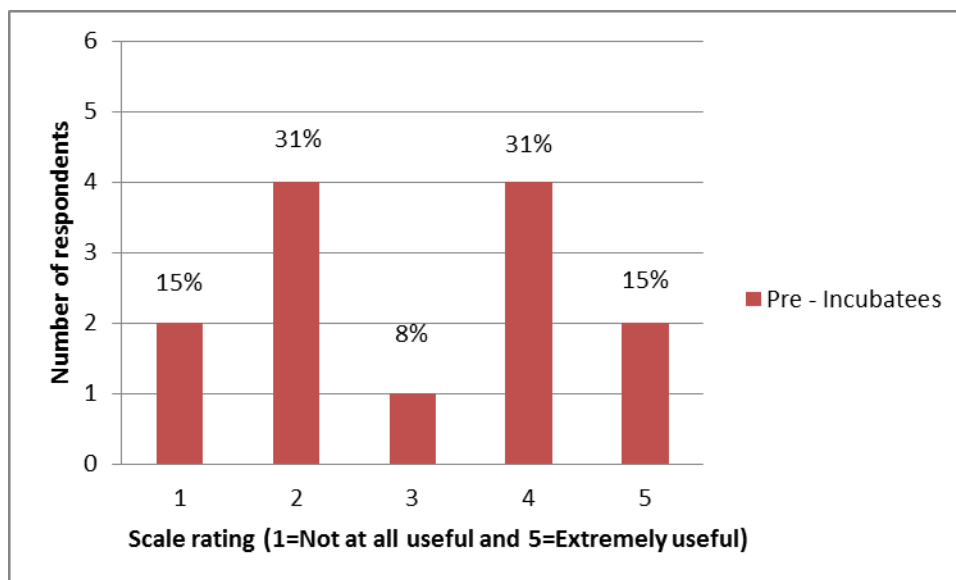


Figure 40: Pre-Incubatees perceptions of the “Advice on recruitment and personnel management” service.

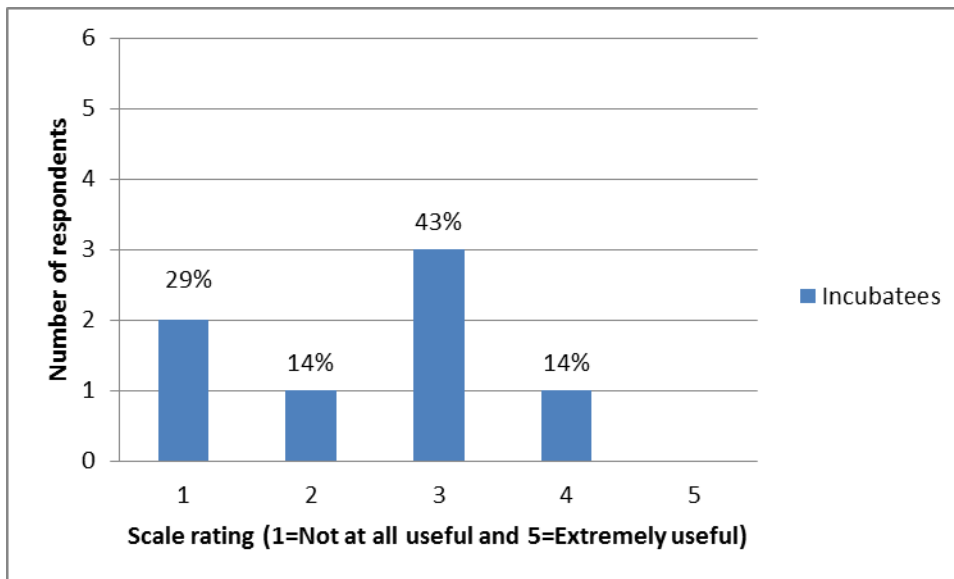


Figure 41: Incubatees' perception of the "Advice on recruitment and personnel management" service.

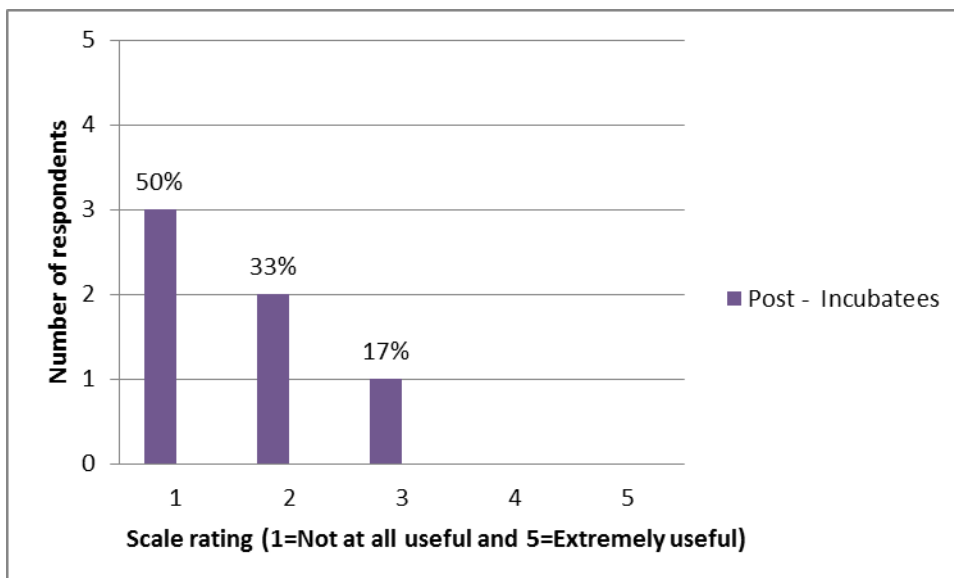


Figure 42: Post - Incubatees' perception of the "Advice on recruitment and personnel management" service.

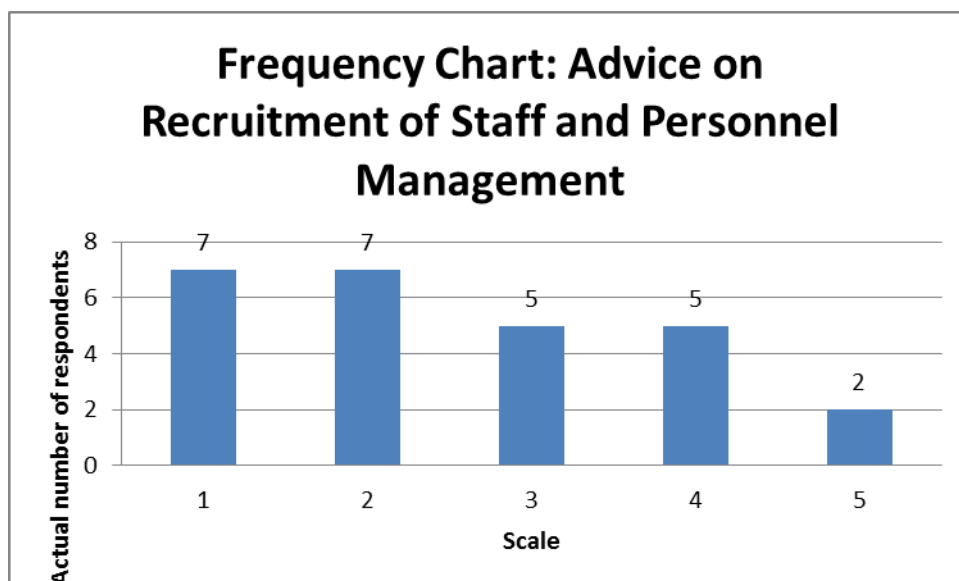


Figure 43: Combined perceptions of the “Advice on recruitment and personnel management” service.

4.5.1 Job creation by firms incubated by TIHMC Maxum Business Incubator between 2000 to 2011

Despite the relatively low rating of the ‘*advice on staff recruitment and personnel management*’ service by Post-Incubatees, and generally by the other categories of respondents, it is notable that the findings of this study are that the companies incubated by TIHMC BI produced 821 jobs between 2000 and 2011. This translates into 0.10% of the total number of jobs created by the Gauteng Provincial Government (GPG) between 2000 and 2011, which numbered 800,000 in absolute terms (Mokonyane, 2014).

TABLE 15 : TOTAL NUMBER OF JOBS THAT WERE CREATED BY PRE-INCUBATEES, INCUBATEES AND POST – INCUBATEES BETWEEN 2000 AND 2011.

Year company was admitted to Maxum BI	No. of jobs created by each intake
2000	78
2001	0
2002	0
2003	601
2004	0
2005	14
2006	9
2007	20
2008	42
2009	43
2010	0
2011	14
Total number of jobs created	821

Self (2014)

While there is no direct indication as to whether these jobs might have been created with or without the support of the TIHMC Maxum BI, inferences may be drawn from the responses to the question: *How important was the Maxum Business Incubator to the company's performance?* We recall that the dominant view amongst the respondents was that the TIHMC Maxum BI either played a part or a critical role in the company's survival or performance.

Based on this, one can conclude that the range of services provided by the TIHMC Maxum BI have directly or indirectly contributed to either job creation or job sustenance amongst the surveyed incubated firms.

4.6 Summary of the results

To summarise, we learnt from the findings pertaining to research question 1 that the TIHMC Maxum Business Incubator enrolled a total of 81 firms between 2000 and 2011. Of these, 31 'collapsed' or exited the incubator and according to records, have generally ceased to exist. 50 firms are still in existence and 17

of them have graduated and are operating with a level of viability, seemingly, in the market.

While the findings largely based on the perceptions of Pre-Incubatees, Incubatees and Post-Incubatees have more or less affirmed the notion that the TIHMC Maxum BI has played a part in their success albeit with different levels of appreciation, it seems certain that a range of the services rendered may require further improvement.

The findings suggest that there is a difference in the manner in which Pre-Incubatees on the one hand; and Incubatees and Post-Incubatees on the other, experience and appreciate the services of the TIHMC Maxum BI. The Post-Incubatees are particularly negative about the quality of Pre-Incubation services and their contribution to their respective companies' capacities to compete in the market. This is logically related to the fact that they would not have been participants in the Pre-Incubation programme, which was introduced nearly five years after the establishment of the TIHMC as an institution. The current Post-Incubatees, therefore, have only experienced two phases of the programme- Incubation and Post graduate services (although they may have second hand knowledge of the nature of the Pre-Incubation process).

The trend in the perceptions from the three categories of respondents generally show a rather modest appreciation of the services provided by the Maxum BI but inferentially, there is need to improve the quality in several critical areas. The most notable is the quality of business skills and planning training, financial management and book keeping and some post graduate services.

Lastly, it is interesting to note that despite the poor rating by Post-Incubatees of the Maxum BI's advice on staff recruitment and personnel management service, inferentially, it can be concluded that their participation in the BI process may have contributed to their sustained capacity to create jobs. This inference is based on the indication by Pre-Incubatees, Incubatees and Post -Incubatees that the TIHMC Maxum BI played a role – and in some cases, an 'important'

role in rendering the existence and performance of their firms. To this end, it is logical to assume that the 821 jobs created can be attributed at least in part to the support provided by the Maxum BI – its short-comings notwithstanding.

CHAPTER 5: DISCUSSION OF RESULTS, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

Chapter 4 has unveiled the results pertaining to research questions 1, 2 and 3 based on a survey, desk review and key informant interviews conducted with the respondents. The Chapter presented the outcomes of the TIHMC Maxum BI's programme in terms of the number of firms incubated; the rating of the quality of services provided by participants in the programme and the quantification of jobs created directly or indirectly by the incubated firms. These outcomes speak to the ambitions of the study which seeks to establish the contribution of state owned Business Incubators to the economy, using the TIHMC Maxum Business Incubator as a case study.

This chapter, in furtherance of this objective, will begin to provide a more contextualised discussion on the implications of these findings framed against the literature review and theoretical models discussed therein.

The chapter will illuminate the outcomes of Chapter 4 by critically analysing the results, compared and contrasted with the results of internal (TIHMC) evaluative processes in order to rationalise the perceptions of Incubatees.

5.2 Discussion pertaining to Research Question 1

It is pertinent to note that the TIHMC Maxum Business Incubator has endeavored to demonstrate its worth to the market through successfully nurturing emergent firms through an 11 year period as indicated by the 81 companies incubated in the 2000-2011 phase. These outcomes, on the face of it, support the dual economy theoretical models inspired by Lewis (1954), particularly adaptations advanced by Murphy et al., (1991 cited in Barreira et al., 2008, p.102-103) and Nelson and Pack (1999 cited in Barreira et al., 2008) which underline *entrepreneurial talent or ability* as the basis for enabling growth.

The models implicitly recognise the need to identify and nurture persons or firms with entrepreneurial ability and to invest in these entities in order to accrue benefits in terms of employment and economic growth. They argue that talent or ability is related to firm size and growth in the economy (Barreira et al., 2008, p.103-105).

The incubated firms provide a basis to begin to gauge the worthiness or lack thereof, of the state owned incubators to the economy in terms of job creation hence. However, poor data capturing systems, noted in an internal Strengths Weaknesses Opportunities and Threats (SWOT) analysis conducted at TIHMC (Sawers, 2011), are still apparent in the present day and do not enable an exhaustive investigation into the reasons why 38% of the incubated firms ceased to exist for example – whether the failure was directly related to the quality of support services rendered by the Maxum BI or a case of inability on the part of the Incubatees. For the same reasons, available data does not sufficiently provide for tracking success stories or disaggregating information in terms of ethnic composition/ownership as such. The Sawers Report (2011), in this regard, takes note of ‘the need for experienced black business owners and entrepreneurs’ to be incubated (direct observation by this researcher found that Post-Incubatees were largely white while Pre-Incubatees are mainly black, despite this not being the focus of the study). To this end, the TIHMC Maxum Business Incubator, it was found in this study, does not have Key Performance Indicators (KPIs) against which progress could be scientifically measured.

The generalised results, overall, present a positive outcome of the TIHMC Maxum BI programme, as out of an envisaged enrolment rate of 10 firms per year, the company was able to sustain a 7 firm enlistment rate on average during the 2000-2011 periods.

5.3 Discussion pertaining to Research Question 2

Research question 2 endeavored to measure perception of the three categories of respondents, the Pre-Incubatees, Incubatees and Post-Incubatees, in respect

of the range of support services provided by the Maxum BI. The key areas of interrogation were:

- The content of the TIHMC Incubation programme.
- The Usefulness of TIHMC incubator support (including business planning, training, financial management, advice on development of new products, networking, other professional services).
- The ability of the business to launch outside of the TIHMC Business Incubator (as a result of TIHMC training).
- Availability and quality of post incubation (e.g. Access to grants, seed and venture capital funding and advice on development of new products and services).
- Length of operation of Post-Incubatee

It is notable that the respondents were critical of key services of the TIHMC, which include “*advice on development of new products and services, business skills training, financial and book keeping training, advice on recruitment of staff and personnel management and post graduate services*”. This finding correlates with the observation by the SWOT analysis conducted in 2011 (Sawers, 2011) which listed the lack of linkages with technical experts at the University of Pretoria and CSIR to the Maxum BI as one of the institution’s main weaknesses. The report also identified the undeveloped mentorship network and a shortage of requisite skills amongst the Maxum Team as major deficits. Interviews with TIHMC management conducted by this researcher however suggest that numerous sessions with Incubatees were conducted by mentors. Sessions were conducted on a one-on-one basis (individually) once a month, 12 times yearly (Maleho, 2014).

In addition, this researcher also found, during interviews and document reviews, that an activity termed *Innov8* was introduced for Incubatee networking purposes – essentially by creating space for cross pollination, dialogue and lessons learning between and among various entrepreneurs and experts. Further, with the benefit of a study conducted by the Canadian International

Development Agency (CIDA) on cluster formations in the different regions such as Kwa-Zulu Natal (Durban), Cape Town, and Johannesburg, the TIHMC was able to set up this space to enable smaller firms to collaborate and therefore counter the preponderance of large multinationals in Johannesburg which, ostensibly, tended to eclipse the SMMEs in this sector. The Innov8, it was found, was formed as a network of ICT companies in this area (Maleho, 2014). Also, during the period under study, the TIHMC outsourced services and training programs to companies referred to as Knowledge Partners. TIHMC indicated that it had a chat room called *‘the Chill room’* specifically for the Incubatees designed to stimulate knowledge transfer among the Incubatees. It was also intended to create an environment away from the office where Incubatees could interact with other entrepreneurs to share knowledge and ideas (ibid).

This researcher’s general observation is that the respondents in this case study, although projecting somewhat different levels of appreciation per category provide a sense of *convergence* with previous findings emanating from the SWOT analysis conducted at TIHMC in 2011(Sawers, 2011). The weakness in the training is inferred in the consistently low rating of services, particularly by Incubatees and Post-Incubatees, who would presumably have more market exposure than the Pre-Incubatees. The results suggest that the TIHMC should re-examine its support systems, including evaluating the frequency and number of experts assigned to respond to the need of their beneficiaries in its next strategic plans for the Science Park.

5.4 Discussion pertaining to Research Question 3

Although the Post-Incubatees have generally been the more critical of the three categories of respondents, it stands to reason to assume that this is a result of their relatively high levels of experience with incubation and exposure to the market. It is notable, however, they were more positive about the quality of the post graduation reputation support (67% scoring 4-5) and post graduation

network support services (50% scoring 4-5) which is indicative of the efficacy of these outputs at the time of the study. Presumably, as alluded to in Chapter 4, the access provided by the TIHMC to cross border markets is a possible explanation for this positive inclination (Sawers, 2011).

What is surprising is that while on the one hand the TIHMC can be triumphalist in terms of the number of jobs created by the incubated firms –a total of 821 which translate into 0.10% of the total number of jobs created by the Gauteng Province - the respondents attach minimal value to the advice it provides on staff recruitment and personnel management. This might imply that the respondents do not directly attribute the jobs created to the TIHMC support. However, if we take into account their response to the question: *How important was the Maxum Business Incubator to the company's performance?* Sixty seven percent (67%) indicated that their firms would not have survived or existed without the support of the TIHMC Maxum BI. When the question was reversed and posed as: *Would the firm have succeeded without Incubator support*, 50% of the respondents agreed. In other words, it is reasonable to conclude that TIHMC Maxum BI has played a key role at one stage or in one aspect or other, in the evolution of the incubated firms, which may have had an indirect or direct bearing on the final outcome – job creation.

A closer examination of the job statistics related to the incubated firms shows a salient feature which could easily be misleading: 600 of these jobs were created by a single company. This researcher has established that the company manufactures school paraphernalia and supplies the education department.

Secondly, while the number of incubated firms is recorded as 81, it is important to note that only 17 of these companies graduated and that during the 2000 to 2011 period 38% of the firms collapsed. The reasons for this collapse are not documented and the data capturing system does not, as earlier observed, enable the tracking of these individual cases.

This lends itself to further interrogation by management to find out why this service seems to have a minimal impact on the beneficiaries.

5.5 Conclusion to the study

This study's ambition was to explore the worth of state owned incubators to the economy, in respect of job creation particularly. The research was informed by dual economy theoretical models inspired by Lewis (1954 cited in Barreira et al.,2008) and particularly by later adaptations by scholars such as Zenou (2007 cited in Barreira et al.,2008) who contextualised developing world economies as constituting informal and formal sectors characterised by high unemployment which reflect varied forms of entrepreneurships. Cognisant of the suggested causal and bi-directional linkage between entrepreneurship and economic growth, this researcher presented a discussion on how in modern economies, controlled conditions facilitated by appropriate legal and institutional architecture (such as a Business Incubator) can help to nurture and catalyse the abilities and capacities of individuals and firms with entrepreneurial ability to contribute to job growth, among other benefits. After an extensive, exploratory discussion, and recognising the dearth of information in this area of study, the report unfurled the evolution of the notion of Business Incubation and its metamorphosis in South Africa. It was noted that insufficient data existed on the performance of BIs in this country and in Africa more generally. Therefore the ambition was to contribute new data and insights into the phenomenon. The research utilised the Vanderstraeten et al., (2012)'s SMEDI and BSEDI frameworks which encompass relevant indicators such as value creation, long term entrepreneurship and business development, external networking, tenant satisfaction and innovation and learning. These elements were reflected in the research instruments developed for the study. To this end, the case of the TIHMC Maxum Business Incubator was proposed and explored based on three key questions:

1. How many companies have graduated from the Maxum Business Incubator and entered the market (Enterprises created)?
2. How many of the enterprises that graduated from Maxum Business Incubator are still operating?

3. How many job opportunities have been created: in incubated/affiliated firms; in graduated firms and indirectly?

The research results pertaining to research question 1 and the subsequent discussion and analyses reveal the number of firms that were incubated in the 2000-2011 period as well as those that graduated; and collapsed. It is further noted that the TIHMC has not established a data capturing system or mechanisms to enable the tracking of success stories. Regardless, the outcomes of this research does place into the public domain hitherto unpublished data which should hopefully provide a basis for informed discourses and decision-making on the subject of BI performance for the TIHMC management and the state.

The results and discussions arising from research question 2 provide perception-based measurements of the usefulness or lack thereof, of the TIHMC Maxum BI (tenant satisfaction). The trend in the respondents' opinions on the range of services provided by the TIHMC suggests that improvements are required in the business skills training, financial and book keeping services, advice on staff recruitment and personnel management and pre-incubation services. Access to grants, seed and venture capital funding appeared to be fair, as are the post graduate network support services, which were relatively better graded. The research noted the *convergence* of these outcomes with internal SWOT analysis report (Sawers, 2011), which identified weaknesses in BI Team skills, data capture, mentoring, funding levels and weak network/expert linkages with partner institutions such as UP and CSIR, as major impediments. This was consistent with the mixed methods approach adopted by the researcher, which sought to use the notion of convergence to strengthen the internal validity of the outcomes.

The results pertaining to question 3 confirm that the incubated companies have generated 821 jobs, which constitute 0.10% of the total employment generated by the Gauteng Province. This is important in our understanding of the 'worth' of the TIHMC BI to the economy, particularly it being a microcosm of a much larger context of state supported incubators. However, this researcher found

that 600 of these jobs are attributed to one firm. The presentation therefore, presents the outcome with a measure of caution. From the respondents, it is somewhat surprising that they rate the advice from TIHMC on staff recruitment and personnel management extremely low. This undermines the assumption that the jobs so far created can be directly linked to TIHMC. However, their response to the question on how critical the TIHMC support was to their survival, generates responses which suggest that the incubation process had benefits after all, that could be directly or indirectly linked to the final outcome – job creation.

The general conclusion to this chapter therefore is that the research could have benefitted much more from a better organised information management and KPI system. However, the data thus far collected and the analyses rendered, do, in the view of this researcher, respond sufficiently to the question at hand.

5.6 Recommendations

As indicated in Chapter 1 of this report, this research had ambitions of informing the TIHMC Maxum BI, the state and academic community. Given the lack of information of prior performance studies of note in the area of Business Incubation, this undertaking was dedicated to garnering a new plethora of information which would be relevant to a degree to a multiple stakeholders, if necessary.

The exploratory research has yielded new data but also exposed major weaknesses in the TIHMC programmes as well as raised new questions.

There are a number of key recommendations which are directed to the TIHMC as such. These are:

1. Strengthen technical support to the Maxum BI by leveraging expert involvement in training programmes, especially from South Africa's leading Universities such as the Wits Business School, existing partner institutions such as UP, CSIR and other highly rated business establishments in the country.

2. Strengthen BI training capacity in financial management and book keeping, business planning, business skills, advice on recruitment and personnel management and other relevant professional services.
3. Develop a tracking mechanism to document success stories which should be part of a broader performance measurement system. This involves the creation of an accessible information management system which profiles Incubatees and informs management of factors that enable or impede new venture development. This system will enable research and evaluations to be undertaken comprehensively and facilitate knowledgeable corporate governance.
4. Adapting BSEDI and SMEDI frameworks could help to institutionalise performance evaluation of the Maxum BI. In addition, within the framework, promoting black owned businesses should be a distinct, measurable Key Performance Indicator (KPI).
5. TIHMC should facilitate or promote cross pollination amongst state and privately owned incubators, to enable lessons learning and sharing of best practice.

5.7 Suggestions for further research

This study has, ostensibly, raised some new questions upon which further research may be required. One of the main lacunas is the absence of racially disaggregated data at the TIHMC in respect of performance levels of graduated firms. Given the history of South Africa, it is imperative that the job creation narrative reflects the aspirations of the state and the nation as far as matters of equity are concerned.

1. The recommendation to research institutions therefore, would be to undertake an in-depth study on the extent to which Business Incubators are generating jobs for historically disadvantaged people.

2. A comparative study of state versus private owned incubators to establish underlying factors that may enable success.
3. Are Business Incubators targeting women and youth entrepreneurs? If so, can they be a vehicle for social change? The condition of youth – high unemployment and involvement in crime – necessitates a deliberate approach to respond to the jobs deficit.

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APPENDIX A

SENIOR MANAGEMENT QUESTIONNAIRE

The Innovation Hub Management Company (TIHMC) set 5 goals in its formulated strategic plan for 2000 which included the development of a stable tenant portfolio, couched in 3 distinct phases: i.e. Pre-Incubation, Incubation and Post- incubation.

1. Does the Maxum incubator program conform to its strategic plan?
2. Has the program achieved its performance goals?
3. Are performance goals aligned so the program can meet clients and stakeholders' expectations?
4. Is the program operating within its budget?
5. Where is the program strong?
6. Where is it weak?
7. Was the vision ever renewed? If so, when and why?
8. How many of these pre-incubatees graduated between 2000 – 2005 and 2006 – 2011?
9. What is the selection process for pre-incubatees and incubatees?
10. What is the curriculum for ;
 - i. Pre-incubatees?
 - ii. Incubatees?
11. To your knowledge, how many of these incubatees have achieved a sustained growth (i.e. turnover, number of jobs created)?
12. What form of support – if any - is rendered to post-incubatees by TIHMC to help sustain their businesses?
13. To what extent – if at all – do you attribute their performance to the support rendered by TIHMC?
14. What are the benefits accruing to TIHMC from the Maximum Business Incubator programme?
15. What has been the occupancy rate per annum in the incubator during:
 - i. The period 2000 - 2006?

ii. The period 2006 – 2011?

16. Does the rental charge vary according to the length of tenancy?
17. What sort of criteria does management use to monitor performance of the incubator?
18. What methods does TIHMC use to obtain feedback from client companies?
19. Does the program have the right staff to meet clients' needs?
20. What sort of formal qualifications does the incubator manager have?
21. What are the main functions of the incubator's management team?
22. What percentage of management time is devoted to providing companies with advice?

APPENDIX B

PRE-INCUBATEES QUESTIONNAIRE

1. How long have you been in the Maxum business incubator?*_

2. In your view, does the Maxum business incubator provide a continuous learning environment? Rating (1= Strongly disagree and 5 = Strongly agree)*_

1 2 3 4 5

Strongly disagree	☐	☐	☐	☐	☐	Strongly agree
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3. Is the Maxum business selection fair and transparent?*_

1 2 3 4 5

Strongly disagree	☐	☐	☐	☐	☐	Strongly agree
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4. Part of The Innovation Hub's approach is to hold regular interactive sessions with other entrepreneurs and market leaders. How useful is this service? Rating (1= Not at all useful and 5 = Extremely useful)*_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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5. Is the training provided by the Maxum business incubator to prepare incubatees for the market useful?*_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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6. How would you rate The Innovation Hub's feedback mechanisms (i.e. group or individual meetings) regarding their services? *_

1 2 3 4 5

Not satisfactory	☐	☐	☐	☐	☐	Extremely good
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7. Were the seminars and workshops provided by the Maxum business incubator useful to your needs as an incubatee? *_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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8. Rate the usefulness of the following Incubator services you have received from Maxum?

Rating 1=Not at all useful and 5=Extremely useful

(1) Access to grants, seed and venture capital funding *_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(2) Business planning and forming a company * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(3) Pre-incubation services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(4) Training to develop business skills * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(5) Bookkeeping/Financial Management* _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(6) Advice on development of new products and services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(7) Other professional services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(8) Advice on recruitment of staff and personnel management * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

9. What were your reasons for locating at Maxum Business Incubator?

Rating (1= Least important and 5 = Most important)

(1) Favourable location and image * _

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(2) Quality, price and flexibility of incubator units * _

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(3) Availability of professional business services * _

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(4) Clustering and networking opportunities *...

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

APPENDIX C

INCUBATEES QUESTIONNAIRE

1. How long have you been in the Maxum business incubator?*_

2. In your view, does the Maxum business incubator provide a continuous learning environment? Rating (1= Strongly disagree and 5 = Strongly agree)*_

1 2 3 4 5

Strongly disagree	☐	☐	☐	☐	☐	Strongly agree
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3. Is the Maxum business selection fair and transparent?*_

1 2 3 4 5

Strongly disagree	☐	☐	☐	☐	☐	Strongly agree
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4. Part of The Innovation Hub's approach is to hold regular interactive sessions with other entrepreneurs and market leaders. How useful is this service? Rating (1= Not at all useful and 5 = Extremely useful)*_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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5. Is the training provided by the Maxum business incubator to prepare incubatees for the market useful?*_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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6. How would you rate The Innovation Hub's feedback mechanisms (i.e. group or individual meetings) regarding their services? *_

1 2 3 4 5

Not satisfactory	☐	☐	☐	☐	☐	Extremely good
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7. Were the seminars and workshops provided by the Maxum business incubator useful to your needs as an incubatee? *_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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8. Rate the usefulness of the following Incubator services you have received from Maxum?

Rating 1=Not at all useful and 5=Extremely useful

(1) Access to grants, seed and venture capital funding *_

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(2) Business planning and forming a company * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(3) Pre-incubation services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(4) Training to develop business skills * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(5) Bookkeeping/Financial Management* _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(6) Advice on development of new products and services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(7) Other professional services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(8) Advice on recruitment of staff and personnel management * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

9. What were your reasons for locating at Maxum Business Incubator?

Rating (1= Least important and 5 = Most important)

(1) Favourable location and image * _

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(2) Quality, price and flexibility of incubator units * _

1 2 3 4 5

Least Important	☐	☐	☐	☐	☐	Most Important
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(3) Availability of professional business services * _

1 2 3 4 5

Least Important	☐	☐	☐	☐	☐	Most Important
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(4) Clustering and networking opportunities * _

1 2 3 4 5

Least Important	☐	☐	☐	☐	☐	Most Important
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APPENDIX D

POST-INCUBATEE QUESTIONNAIRE

1. How long did it take you to graduate from the incubator?*_

- ☐ Under 3 years
- ☐ 3 years
- ☐ 4 years
- ☐ 5 years
- ☐ Over 5 years

2. What is the likelihood that you would have been able to launch the business outside of the incubator?

- ☐ Very unlikely
- ☐ Fairly unlikely
- ☐ Can't decide/ neutral
- ☐ Fairly likely
- ☐ Very likely

3. In what area of the business launch was the incubator most critical?*_

- ☐ Market access
- ☐ Capital finance
- ☐ Business planning
- ☐ Other:

4. Impact on enterprise sustainability (i.e. the long term survival of new businesses)

1. Are you still operating as an enterprise?*_

- 1. ☐ Yes
- 2. ☐ No

2. If yes, how long has your business been operating for? *_

- ☐ Under 1 year
- ☐ 1 – 4 years
- ☐ 5 – 8 years
- ☐ 7 – 10 years

- ☐ Over 10 years

3. What level of support has the Maxum business incubator provided since you graduated? *Required Rating (1= No support at all and 5 = A lot of support)

	1	2	3	4	5	
No support at all	☐	☐	☐	☐	☐	A lot of support

4. What type of support after graduation has been provided in terms of networking with incubator alumni?*_

	1	2	3	4	5	
No support at all	☐	☐	☐	☐	☐	A lot of support

5. What type of support has been provided in terms of reputation as a graduate of the incubator? *_

	1	2	3	4	5	
No support at all	☐	☐	☐	☐	☐	A lot of support

6. How many people are currently employed in your company?

- ☐ 1 – 3 persons
- ☐ 4 – 6 persons
- ☐ 7 - 10 persons
- ☐ Over 10

4. How important was the Maxum business Incubator to the company's performance?

Rating (1= Least important and 5 = Most important)

(1) Critical – without support, firm would not have been successful *_

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(2) Important – support has been helpful but not critical to success*_

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(3) Not important – firm would have succeeded without incubator support *_

1	2	3	4	5
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Least Important	☐	☐	☐	☐	☐	Most Important
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5. Rate the usefulness of the following services you received from Maxum business incubator?

Rating (1= Not at all useful and 5 = Extremely useful)

(1) Access to grants, seed and venture capital funding * _

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(2) Business planning and forming a company * _

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(3) Pre-incubation services * _

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(4) Training to develop business skills* _

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(5) Bookkeeping/Financial Management* _

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(6) Advice on development of new products and services* _

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(7) Other professional services* _

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(8) Advice on recruitment of staff and personnel management * _

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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6. What were your reasons for locating at Maxum Business Incubator

Rating (1=Least Important and 5=Most Important)

(1) Favourable location and image * _

1 2 3 4 5

Least important	☐	☐	☐	☐	☐	Most important
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(2) Quality, price and flexible of incubator units * _

1 2 3 4 5

Least important	☐	☐	☐	☐	☐	Most important
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(3) Availability of professional business services * _

1 2 3 4 5

Least important	☐	☐	☐	☐	☐	Most important
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(4) Clustering and networking opportunities * _

1 2 3 4 5

Least important	☐	☐	☐	☐	☐	Most important
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APPENDIX E

EXITED INCUBATEES QUESTIONNAIRE

1. How long were you in the Maxum business incubator?*

2. In your view, did the Maxum business incubator provide a continuous learning environment? Rating (1= Strongly disagree and 5 = Strongly agree)*_

1 2 3 4 5

Strongly disagree	☐	☐	☐	☐	☐	Strongly agree
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3. Was the Maxum business selection fair and transparent?*_

1 2 3 4 5

Strongly disagree	☐	☐	☐	☐	☐	Strongly agree
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4. Part of The Innovation Hub's approach is to hold regular interactive sessions with other entrepreneurs and market leaders. How useful was this service? Rating (1= Not at all useful and 5 = Extremely useful)*_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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5. Was the training provided by the Maxum business incubator to prepare incubatees for the market useful?*_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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6. How would you rate The Innovation Hub's feedback mechanisms (i.e. group or individual meetings) regarding their services? *_

1 2 3 4 5

Not satisfactory	☐	☐	☐	☐	☐	Extremely good
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7. Were the seminars and workshops provided by the Maxum business incubator useful to your needs as an incubatee? *_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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8. Rate the usefulness of the following Incubator services you received from Maxum?

Rating 1=Not at all useful and 5=Extremely useful

(1) Access to grants, seed and venture capital funding *_

1 2 3 4 5

Not at all useful	☐	☐	☐	☐	☐	Extremely useful
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(2) Business planning and forming a company * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(3) Pre-incubation services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(4) Training to develop business skills * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(5) Bookkeeping/Financial Management* _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(6) Advice on development of new products and services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(7) Other professional services * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

(8) Advice on recruitment of staff and personnel management * _

	1	2	3	4	5	
Not at all useful	☐	☐	☐	☐	☐	Extremely useful

9. What were your reasons for locating at Maxum Business Incubator?

Rating (1= Least important and 5 = Most important)

(1) Favourable location and image * _

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(2) Quality, price and flexibility of incubator units * _

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(3) Availability of professional business services * _

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

(4) Clustering and networking opportunities * _

	1	2	3	4	5	
Least Important	☐	☐	☐	☐	☐	Most Important

5. Why did you exit the Incubation program?

- ☐ Profitability attained and prospects for sustainable growth
- ☐ Customer base of two or more paying customers
- ☐ Benefits of remaining in the programme were minimal
- ☐ Had a viable business opportunity
- ☐ Other:

APPENDIX F

TABLE 16: Consistency matrix

Research problem: A substantial investment is being made into government-managed incubators In South Africa; however, their efficacy in terms of impact on enterprise development and sustainability is not well understood.					
Sub-problem	Literature Review	Hypotheses or Propositions or Research questions	Source of data	Type of data	Analysis
Understanding the impact of South African, government-managed incubators on new enterprise creation.	Buys and Mbewana (2007) Ndabeni (2008) Ramluckan (2010)	How many companies have graduated from Maxum Business Incubator and entered the market (Enterprises created)?	Open-ended questionnaires; Key informative interviews and document review (of company policy and strategic documents)	Qualitative & quantitative	Thematic & statistical summaries
Sustainability of new enterprises that entered the market.	Vanderstraeten et al.,(2012) Lalkaka (no date) McMullan et al., (2001)	How many of the enterprises graduated from Maxum Business Incubator are still operating?	closed-ended questionnaires plus numerical counts for research question	Quantitative	Summary statistics

Research problem: A substantial investment is being made into government-managed incubators In South Africa; however, their efficacy in terms of impact on enterprise development and sustainability is not well understood.					
Sub-problem	Literature Review	Hypotheses or Propositions or Research questions	Source of data	Type of data	Analysis
Job opportunities have been created: in incubated/affiliated firms; in graduated firms and indirectly?	Vanderstraeten et al.,(2012)	How many job opportunities have been created: in incubated/affiliated firms; in graduated firms and indirectly?	closed-ended questionnaires	Quantitative	Kruskal Wallis

APPENDIX G

Table 17: Kruskal Wallis test comparison of the Pre-Incubatee, Incubatee and Post-Incubatee groups (df=2)

	1. Access to grants, seed and venture capital funding	2. Business planning and forming a company	3. Pre-Incubation services	4. Training to develop business skills	5. Bookkeeping/ Financial Management	6. Advice on development of new products and services	7. Other professional services	8. Advice on recruitment of staff and personnel management
Chi-Square	.560	3.629	4.778	6.417	.585	1.366	4.915	4.187
Df	2	2	2	2	2	2	2	2
Asymp. Sig.	.756	.163	.092	.040	.746	.505	.086	.123

a. Kruskal Wallis Test

b. Grouping Variable: Group

Table 17 shows the test statistics, H for the Kruskal-Wallis test, its associated degrees of freedom (in this case we had 3 groups so the degrees of freedom are 3 - 1 or 2) and the significance. The significance values are .456, .163, .092, .746, .505, .0086 and .123 and are higher than .05. However, one significant value of .040 is lower than 0.05.

APPENDIX G

TABLE 18: Kruskal –Wallis Test

Research Questions	Ranks		
	Group	N	Mean Rank
1. Access to grants seed and venture capital funding	1	13	12.46
	2	7	14.14
	3	6	15.00
	Total	26	
2. Business planning and forming a company	1	13	14.58
	2	7	9.07
	3	6	16.33
	Total	26	
3. Pre-Incubation services	1	13	16.04
	2	7	13.43
	3	6	8.08
	Total	26	
4. Training to develop business skills	1	13	16.31
	2	7	13.79
	3	6	7.08
	Total	26	
5. Bookkeeping Financial Management	1	13	14.27
	2	7	13.71
	3	6	11.58
	Total	26	
6. Advice on development of new products and services	1	13	14.92
	2	7	13.29
	3	6	10.67
	Total	26	
7. Other professional services	1	13	16.00
	2	7	13.64
	3	6	7.92
	Total	26	
8. Advice on recruitment of staff and personnel management	1	13	16.00
	2	7	13.14
	3	6	8.50
	Total	26	

The questions contained in the 3 questionnaires administered to the Pre-Incubatees, Pre-Incubatees and Post – Incubatees (Question 8 in Annexes 2 and 3 and Question 5 in Annexure 3) were posed on the basis of a 5 point Likert type scale where 1 = Not at all useful and 5 = Extremely useful.

APPENDIX H

Dear Respondent,

I am a student at Wits Business School completing my Master of Management in Entrepreneurship and New Venture Creation (MMENVC). My MMENVC thesis is on the efficacy of state owned business incubators in South Africa.

I am currently conducting a survey on the efficiency of the Maxum Incubator at The Innovation Hub Management Company in particular. The research will be conducted at an individual level and anonymity will be respected. The research is voluntary and the individual may withdraw at any time. The survey will take approximately 10-20 minutes to complete. Kindly respond within 2 days and let us know if you will require any feedback from the survey.

Thanking you in advance.