

A FRAMEWORK FOR DISRUPTIVE INNOVATION CAPABILITY IN BASE-OF-
THE-PYRAMID ENVIRONMENTS

by

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submitted in accordance with the requirements

for the degree of

DOCTOR OF BUSINESS LEADERSHIP

in the

GRADUATE SCHOOL OF BUSINESS LEADERSHIP

at the

UNIVERSITY OF SOUTH AFRICA

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JULY 2021

DECLARATION

I declare that '**A framework for disruptive innovation capability in base-of-the-pyramid environments**' is my own work and that all sources that I have used or quoted have been indicated or acknowledged by means of complete references.



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Date: 31st July 2021

ABSTRACT

The low-income, base-of-the-pyramid (BoP) environments which characterise many emerging economies, favour the development of successful disruptive innovations by technology-based companies, yet little is known about this phenomenon in the context of new technology-based companies (NTBCs) in South Africa. The purpose of the study was to investigate the entrepreneurial processes of NTBCs, by exploring the organisation-specific and contextual factors that influence disruptive innovation capability in South Africa's low-income environment. Following the development of a conceptual framework based on a set of qualitative propositions identified from the scholarly literature, a purposive sampling approach was used to select 20 participants in the NTBC incubation environment, to obtain their insights on the factors that enable or constrain disruptive innovation capability in low-income contexts. A semi-structured interview protocol was followed to collect data from start-up founders, business mentors and industry experts. Using the grounded theory method, the data collected were analysed through iterative coding and analysis cycles. The findings suggest that socioeconomic factors, such as the largely low-income population in South Africa, support the development of disruptive innovations. Their adoption by the market is, however, poor. Additionally, NTBCs in the local context lack an emerging-market orientation, which is crucial for the development of a disruptive innovation capability. Certain founder attributes were noted to favour the emergence of such capability, including high prior founder knowledge, strong learning capabilities, innovativeness, and passion and drive. Additionally, NTBCs face numerous challenges in developing a disruptive innovation capability, including low demand for products, poor market access, ecosystem fragmentation, and weak informational flows. On a practical level, a framework of disruptive innovation capability that highlights how NTBCs negotiate various constraining factors in the internal and external operating environments, was proposed. Theoretically, by investigating disruptive innovation capability through the lens of both resource-based and national systems of innovation theories, the study provided a holistic understanding of the internal and external factors that may influence this capability of NTBCs, in emerging economy contexts. Future work should involve a quantitative survey to further strengthen the framework developed and determine the industry scalability thereof.

KEY TERMS

Base/bottom of the pyramid; constraint-based innovations; disruptive innovations; emerging economies; entrepreneurial ecosystems; entrepreneurial innovation; national systems of innovation; new technology-based companies; resource-based perspective/view.

OPSOMMING

Die lae-inkomste-, basis-van-die-piramide (*BoP*)-omgewings wat kenmerkend is van baie ontluikende ekonomieë, bevorder die ontwikkeling van suksesvolle ontwrigtende innoverings deur tegnologie-gebaseerde maatskappye. Tog is daar min bekend oor hierdie verskynsel in die konteks van nuwe-tegnologie-gebaseerde maatskappye (*NTBCs*) in Suid-Afrika. Die doel van die studie was om die entrepreneursprosesse van *NTBCs* te ondersoek, deur verkenning van die organisasie-spesifieke en kontekstuele faktore wat ontwrigtende-innovering-vermoë in Suid-Afrika se lae-inkomste-omgewing beïnvloed. Na aanleiding van die ontwikkeling van 'n konseptuele raamwerk gebaseer op 'n stel kwalitatiewe proposisies wat uit die vakkundige literatuur geïdentifiseer is, is 'n benadering van doelbewuste steekproefneming gebruik om 20 deelnemers in die *NTBC*-inkubasie-omgewing te kies, om hul insigte te bekom oor die faktore wat ontwrigtende-innovering-vermoë in lae-inkomste-kontekste moontlik maak of beperk. 'n Halfgestruktureerde-onderhoud-protokol is gevolg om data van stigters, besigheidsmentors en kundiges in die bedryf in te samel. Die versamelde data is met behulp van die onderlegde-teorie-metode ontleed deur iteratiewe kodering- en ontledingsiklusse. Die resultate dui daarop dat sosio-ekonomiese faktore, soos die grootliks lae-inkomste-bevolking in Suid-Afrika, die ontwikkeling van ontwrigtende innoverings ondersteun. Die mark se ingebruikneming daarvan is egter teleurstellend. Afgesien daarvan, het *NTBCs* in die plaaslike konteks 'n gebrek aan 'n ontluikende-mark-oriëntering, wat onontbeerlik is vir die ontwikkeling van 'n ontwrigtende-innovering-vermoë. Daar is opgemerk dat bepaalde stigterseienskappe kan help dat sodanige vermoë te voorskyn kom, insluitende grondige voorafkennis van stigters, sterk leervermoëns, innoverendheid, en passie en ywer. *NTBCs* moet boonop talle uitdagings te bowe kom in die ontwikkeling van 'n ontwrigtende-innovering-vermoë, insluitende 'n lae vraag na produkte, swak marktoegang, ekostelselselfragmentering, en swak vloei van inligting. Op 'n praktiese vlak is die voorstel geopper van 'n raamwerk van ontwrigtende-innovering-vermoë wat uitwys hoe *NTBCs* met verskeie beperkende faktore in die interne en eksterne bedryfsomgewings omgaan. Teoreties, danksy die bestudering van ontwrigtende-innovering-vermoë deur die lens van sowel hulpbron-gebaseerde en nasionale stelsels van innoveringsteorieë, bied die studie 'n holistiese begrip van die interne en eksterne faktore wat 'n invloed op hierdie vermoë van *NTBCs* kan hê in ontluikende-ekonomie-kontekste. Daar word aanbeveel dat toekomstige studies 'n

kwantitatiewe ondersoek behels om die raamwerk wat ontwikkel word verder te versterk, en die skaalbaarheid daarvan in die bedryf bepaal.

SLEUTELTERME

Basis/bodem van die piramide; beperking-gebaseerde innoverings; ontwrigtende innoverings; ontluikende ekonomieë; entrepreneuriese ekostelsels; entrepreneuriese innovering; nasionale innoveringstelsels; nuwe-tegnologie-gebaseerde maatskappye; hulpbron-gebaseerde perspektief/beskouing.

MANWELEDZO

Mbuelo ya fhasi kha vhupo ho disendekaho vhatu vhane vha dzula kha vhushai vhuhulwanesa (BoP) vhune ha talusa ikonomi nnzhi dzine dza kha dibvelela, u fusha mveledziso ya u bveledza muhumbulo kana tshibveledzwa tshiswa wo fhelelaho nga khamphani dzo disendekaho nga thekhinolodzhi ntswa, ngeno hu tshi divhiwa zwituku nga ha tshibveleli itshi kha nyimele ya khamphani dzo disendekaho nga thekhinolodzhi ntswa (dziNTBC) Afrika Tshipembe. Ndivho ya ngudo iyi ho vha u todisisa maitele a vhubindudzi ha (dziNTBC), nga u wanulusa zwo tiwaho zwa tshiimiswa na zwivhumbi zwa nyimele zwine zwa tutuwedza vhukoni ha u bveledza muhumbulo kana tshibveledzwa tshiswa kha vhupo ha mbuelo thukhu Afrika Tshipembe. Hu tshi tevhela mveledziso ya mutalukanyo wa furemiweke wo disendekaho nga pulane dza khwalithethivi dzo topolwa u bva kha manwalwa a vhoradzipfunzo, ho shumiswa kuitele kwa tsumbonanguludzwa hu na zwe zwa sedzwa khazwo u nanga vhadzheneli vha 20 kha vhupo ha mveledziso ya dziNTBC, u wana ndivho yavho nga ha zwivhumbi zwine zwa konisa kana thivhela vhukoni ha u bveledza muhumbulo kana tshibveledzwa tshiswa kha nyimele ya mbuelo ya fhasi. Ho tevhedzwa maitele a inthaviwu dzo tou dzudzanywaho u kuvhanganya data u bva kha vhatu vho daho na mihumbulo, na vhagudisi vha re na tshenzhemo ya vhubindudzi na vhomakone vha ndowetshumo. Musi hu tshi khou shumiswa kuitele kwa u kuvhanganya na u saukanya data, data yo kuvhanganywaho yo kuvhanganywa nga kha u khouda hune ha khou dovholola na thevhekano ya musaukanyo. Mawanwa o dzinginya uri zwivhumbi zwa ikonomi ya matshilisano, zwi ngaho vhatu vhanzhi vha mbuelo ya fhasi Afrika Tshipembe, vha tikedza mveledziso ya u bveledza mihumbulo kana zwibveledzwa zwiswa. U tangedzwa nga mimaraga ndi, naho zwo ralo, a si havhudi. U dadzisa kha zwenezwo, dziNTBC kha nyimele yapo i shaya vhupo ha mveledziso ya mbambadzo, hune ha vha ha ndeme kha mveledziso ya vhukoni ha muhumbulo kana tshibveledzwa tshiswa. Zwiwe zwitaluli zwa vhatu vho thomaho na mihumbulo zwo dzhielwa ntha u fusha u bevelela ha vhukoni uhu, hu tshi katelwa thangela ndivho ya ntha ya vhatu vha u da na mihumbulo iyo, vhukoni ho khwathaho ha u guda, vhubveledzi, vhudugambilu na mafufufu. U dadzisa kha zwenezwo, dziNTBC dzo livhana na khaedu nnzhi kha u bveledza vhukoni ha u bveledza muhumbulo kana tshibveledzwa tshiswa, hu tshi katelwa thodea dza fhasi dza zwibveledzwa, u swikelela mbambadzo dzi si dzavhudi, u thithiswa ha zwi tshilaho, na u elela ha mafungo hu songo khwathaho. Kha levele ya nyito, furemiweke ya vhukoni ha u bveledza muhumbulo kana tshibveledzwa tshiswa ine

ya ombedzela uri dziNTBC dzi shandukisa hani zwivhumbi zwa zwibveledzi zwo fhambanaho kha vhupo ha u shumela ha nga ngomu na ha nga nnda, yo dzinginywa. Kha thiori, nga u tondisa vhukoni ha u bveledza muhumbulo kana tshibveledzwa tshiswa nga kha mbonalo ya vhuvhili hadzo thiori ya vhubveledzi yo disendekaho nga zwiko na sisiteme dza lushaka, ngudo yo netshedza u wana ho fhelelaho ha zwivhumbi zwa nga ngomu na nga nnda zwine zwa nga tutuwedza vhukoni uvhu ha dziNTBC, kha nyimele ya ikonomi ine ya khou bvelela. Mushumo wa tshifhingani tshidaho u fanela u katela thodiso ya khwanthithathivi u isa phanda na u khwathisa mveledziso ya furemiweke, na u dzumbulula vhukoni ha u shumisa kha ndowetshumo yeneyo.

MAIPFI A NDEME

Vhathu vhane vha tshila kha vhushai vhuhulwanesa, vhubveledzi ho disendekaho nga zwithivheli; u bveledza muhumbulo kana tshibveledzwa tshiswa; ikonomi dzine dza kha di bvelela; sisiteme ine ya tikedza nyaluwo na mabindu maswa, vhubveledzi ha sisiteme dza Lushaka; khamphani dzo disendekaho nga thekhinolodzhi ntswa; mbonalo yo disendekaho nga zwiko.

ACKNOWLEDGEMENTS

My heartfelt gratitude goes to my supervisor, Professor John Andrew van der Poll, for his time, support, guidance, and patience. I appreciate his insightful comments and questions that led me to relook my research from various perspectives and clarify my thinking.

I am thankful to the University of South Africa (UNISA), Graduate School of Business Leadership (SBL) for the opportunity to further my knowledge and contribute to the body of work on entrepreneurial innovation in low-income domains. I am grateful to the reviewers of my work-in-progress and other academics present at various colloquia for their comments and suggestions, which refined and improved this study.

I thank the SBL team, particularly, Prof Breggie van der Poll, Tumi Seopa, Busi Ramasodi and Megan Scheepers, for their support throughout this project.

A special thank you goes to my mother who is more excited about this qualification than I am. To the rest of my family and friends, thank you for the moral support and encouragement.

Finally, I would like to thank the Innovation Hub and all the participants who took part in this study for their time. This thesis would not have been possible without their invaluable insights. I wish them all the best for the future.

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RESEARCH OUTPUT

The following research output emanated from this research:

1. Dzimba, E. and van der Poll, J.A. 2019. 'Towards a Framework of Disruptive Innovation Capability in Base-of-the-Pyramid Environments'. In: Twinomurinzi, H., Mawela, T., Msweli, N. & Phukubye, P. eds. *Digital Innovation and Transformation Conference: Digital Skills 2019, Boksburg, March 29*. NEMISA. 16-29.

COMMONLY USED ABBREVIATIONS AND ACRONYMS

BoP	-	Base-of-the-pyramid (also known as the bottom-of-the-pyramid)
BRICS	-	Brazil, Russia, India, China, South Africa
CSIR	-	Council for Scientific and Industrial Research
ICT	-	Information and communications technology
IDC	-	Industrial Development Corporation
IoT	-	Internet of Things
DTIC	-	Department of Trade, Industry and Competition
NGO	-	Non-governmental organisation
NSI	-	National systems of innovation
NTBC	-	New technology-based company
PC	-	Personal computer
R&D	-	Research and development
SBL	-	School of Business Leadership
SEDA	-	Small Enterprise Development Agency
SEFA	-	Small Enterprise Funding Agency
SME	-	Small and medium-sized enterprises
TIA	-	Technology Innovation Agency
TIHMC	-	The Innovation Hub Management Company
UNISA	-	University of South Africa

1 CHAPTER 1: INTRODUCTION

Despite being endowed with abundant natural resources and a youthful population, economic growth and development in Africa is not taking place at a rate that is fast enough to significantly impact the low standards of living that most of its citizens suffer. Increasing economic development and the welfare of citizens are, therefore, important policy goals in most developing and emerging countries on the continent. Fast-growing innovative and entrepreneurial businesses have been lauded as the growth engines for economies around the world (Buckley and Davis, 2016). It has become imperative to find the appropriate formulations that can encourage the growth of these fast-growing new businesses in developing and emerging economy contexts in order to stimulate growth, employment and improve standards of living. This study seeks to explore the organisational-specific and contextual factors that enable or hinder innovation capability, particularly disruptive innovation capability, in the resource-constrained, base-of-the-pyramid (BoP) environments that are prevalent in emerging and developing economies.

This chapter presents a background to this study on innovating in resource-constrained BoP environments. A brief overview of the disruptive innovation framework as a strategic tool for the survival and competitiveness of small and medium-sized enterprises (SMEs) in emerging economies is given, with a focus on new technology-based companies in South Africa. The rationale for the study, research problem, aim, objectives, research questions and scope of the study are outlined. The chapter concludes with an outline of all the chapters contained in the thesis.

1.1 BACKGROUND TO THE STUDY

Innovation has long been considered as a vehicle for economic growth for both countries (Schumpeter, 1934; Porter, 1990; Lundvall, 2007; Autio and Levie, 2017), and organisations (Drucker, 1994; Hobday, 2005; Omri, Frikha & Bouraoui, 2015; Grant, 2018). Authors contend that innovation is a source of competitive advantage in changing and highly competitive environments (Crossan & Apaydin, 2010; Taneja, Golden-Pryor & Hayek, 2016). Innovation capability has implications for SME sustainability. However, innovation is a complicated process, with many factors governing its eventual outcome. Furthermore, the sustainability of new enterprises has always been low (Ligthelm, 2010; Al-Ansaari, Bederr & Chen, 2015), particularly in South Africa where survival rates of

new enterprises have continued to be below that of other countries at similar development and economic levels (Bowmaker-Falconer & Herrington, 2020).

Scholars have begun to question traditional models of innovation diffusion that possess the logic that innovations are typically conceived and used in advanced economies first and then trickle down to less developed economies (Govindarajan and Ramamurti, 2011; Corsi and Di Minin, 2014). The applicability of traditional models of innovation that are conceptualised in the West for developing and emerging market environments has also come under scrutiny (Soni and Krishnan, 2014; Heeks, Foster & Nugroho, 2014; Hasan, Lowe & Petrovici, 2019). This is because developing economies have unique environments characterised by resource-constraints, institutional voids, underdeveloped infrastructure, and masses of low-income consumers (Simanis and Duke, 2014; Prashantham and Yip, 2017). Institutional voids refer to the absence or under-development of formal market supporting structures such as regulatory systems, contract-enforcement mechanisms, and financial structures (Ge, Carney & Kellermans, 2019).

The unique features of developing economies call for innovation approaches that suit these unique environments. Scholars note that strategies, technologies and innovations conceptualised and initially deployed in advanced economy settings do not always successfully transfer to emerging economy settings as witnessed by the failure of many multinational corporations to make profits in developing countries (Simanis, 2012; Brem and Wolfram, 2014). There has, therefore, been growing interest in so-called resource-constrained innovation approaches that are considered to apply to developing nation and BoP environments (Brem and Wolfram, 2014; Zeschky, Winterhalter & Gassman, 2014; Agnihotri, 2015; Agarwal, Grottko, Mishka & Brem, 2017). Emerging economies have in the past been viewed as a cheap source of raw materials and labour, and eventual recipients of innovations from the West. However, they are now becoming breeding grounds for innovations that are significantly cheaper than Western equivalents by reinventing business models, production systems and distribution systems (Trott, 2017; Devang, Kruse, Parker & Siren, 2017).

The term base-of-the-pyramid or bottom-of-the-pyramid was first conceptualised by Prahalad and Hart (2002) in reference to the over four billion low-income consumers worldwide who survive on less than US\$ 2 per day. While every country in the world has a BoP populace, by far the largest concentrations of BoP consumers reside in emerging and developing economies. The seminal work by Prahalad and Hart (*ibid.*) has since

opened a whole new stream of scholarly enquiry on innovating in resource-constrained environments to cater for the needs and wants of the low-income consumers who make up the majority of the world's population (Hart and Christensen, 2002; London, 2008; Simanis, 2012; Li, 2013; Devang *et al.*, 2017; Christensen, Ojomo & Van Bever, 2017). The categorisation of who is in the BoP has been broadened to include low-income earners who survive on less than US\$ 3000 annually in local purchasing power parity (World Resources Institute, 2007; Li, 2013). These billions of consumers have often been overlooked, to their socio-economic detriment, as a potential market segment by most mainstream economic enterprises as they are deemed to have insufficient disposable incomes to be a viable market for goods and services (London, 2008; Prahalad, 2012; Alcock, 2015).

1.2 INCLUSIVE GROWTH AND JOB CREATION IN EMERGING ECONOMIES

Duttagupta and Pazarbasioglu (2021) define an emerging economy as one whose economy is progressing towards being advanced in terms of the size of its economy as measured by its nominal gross domestic product (GDP), global market access and participation, and income levels as measured by GDP per capita. Some of the countries classified as emerging nations include Brazil, China, Malaysia, India, Indonesia, Mexico, Russia, Taiwan, Thailand, Turkey, and South Africa (Organisation for Economic Co-operation and Development [OECD], 2017; Duttagupta and Pazarbasioglu, 2021).

A feature that is common to emerging economies when compared to developed or more advanced economies is the so-called income gap. This refers to the large discrepancy in incomes and living standards between the rich and the poor within these economies. Most emerging economies have a significant portion of their populations that are categorised as low-income, or BoP consumers. According to a report by the Danish International Business Development Institute [DIBDI] (2010), it is estimated that 75% of the South African population can be classified as low-income consumers living at the BoP. They survive on less than US\$ 3 000 annually in local purchasing power parity. Using this categorisation, Li (2013) notes that 80% of China's population resides at the BoP, while for India, it is as high as 98% of the total population. This highlights an underlying problem with regards to social and economic inequality and exclusion within emerging economies that can only be to the detriment of these countries. In emerging economies such as the BRICS nations (Brazil, Russia, India, China and South Africa),

inclusive development that fosters the socio-economic development of the majority of the population is recognised as an essential policy goal (Hall, Stelvia, Sheehan & Silvestre, 2012; Ndabeni, 2014; Cassiolato and Soares, 2014).

Literature suggests that mass entrepreneurship and the economic development of nation-states are complementary (Prashantham and Yip, 2017). In many countries and particularly emerging and developing economies, SMEs are seen as an engine for economic growth and job creation (Petrovska, 2015; Taneja *et al.*, 2016). It is hypothesised that mass entrepreneurship that is both sustainable and profitable will propel the poor from the fringe into mainstream economic markets through the provision of quality and cost-effective goods and services, as well as the provision of employment opportunities. This is considered as inclusive capitalism (Prahalad and Mashelkar, 2010). Inclusive capitalism enables higher standards of living for citizens and increased national productivity, which in turn leads to increased overall economic development (Porter, 1990; Momaya and Gupta, 2013). Governments in emerging economies are, consequently, emphasising mass entrepreneurship as a vehicle for economic growth. The South African Government's National Development Plan has stipulated that 11 million jobs need to be created in the economy by the year 2030, with 90% of these proposed jobs being created by the SME sector (South Africa. National Planning Commission [NPC], 2012).

While entrepreneurship is lauded as an engine for economic growth in developing and emerging economies, scholars point out that not all entrepreneurship is created equal regarding growth outcomes and poverty alleviation (Karnani, 2009; Alvarez and Barney, 2014). Policy emphasis is shifting towards the so-called gazelles, fast-growing innovative and technology-based entrepreneurs (Buckley and Davis, 2016); who develop, use, diffuse, or market new technologies as part of their product development, production, or marketing strategy (Park, 2005). It is argued that these types of small innovative companies lead to better economic outcomes as opposed to subsistence entrepreneurship (Alvarez and Barney, 2014).

According to the Global Entrepreneurship Monitor South Africa 2015/2016 report (Herrington and Kew, 2016), South African entrepreneurs struggle to survive beyond the 3 ½ year mark. The global average for new businesses succeeding beyond the 3 ½ year mark is at 7.6%. In contrast, only 2.1% of South African business start-ups reach this milestone. The data shows a consistently low level of entrepreneurial activity in South Africa compared to other emerging economies such as China, Brazil and India. A study

by Kumalo and van der Poll (2015) also found that small business failure rates in South Africa are as high as 63% overall, with most failing to survive beyond the two-year milestone. The dismal survival rates taken together with the fact the majority of South Africa's population resides at the BoP raises questions regarding the ideal strategies small entrant companies can employ for survival in this operating environment.

1.3 INNOVATING AT THE BASE-OF-THE-PYRAMID

The term frugal innovation has become an umbrella term for the innovative processes in resource-constrained environments (Pisoni, Michelin & Martignoni, 2018). Dictionary definitions of the word frugal bring to mind something economical or thrifty. Frugal innovations are said to be encouraged by a frugal mindset, follow a frugal production process, and lead to frugal innovation outcomes (Soni and Krishnan, 2014). Cunha, Rego, Oliviera, Rosado & Habib (2014) and Agarwal *et al.* (2017) define frugal innovations as innovations conceived under conditions of scarcity with an emphasis on BoP populations and emerging economies. They possess a no-frills structure as they are developed for consumers with low disposable incomes, in environments with skills, materials, institutional and regulatory constraints (Rao, 2013). The term frugal is sometimes used to refer to an approach to innovation, rather than to denote a typology of innovation (Pisoni *et al.*, 2018). For example, Brem and Wolfram (2014) define frugal as a research philosophy, rather than a research typology, that originates with the specific needs of the BoP in mind then works backwards to develop appropriate solutions that are cost-effective and are of suitable quality.

Frugal innovations have thus been re-interpreted to include various other kinds of resource-constrained innovation types such as frugal engineering (Soni and Krishnan, 2014; Vadakkepat, Garg, Loh & Tham, 2015); cost innovations (Zeschky *et al.*, 2014); bricolage and jugaad innovations (Ernst, Kahle, Dubiel, Prabhu & Subramaniam, 2015; Cunha *et al.*, 2014; Agnihotri, 2015); Gandhian innovations (Prahalad and Mashelkar, 2010) indigenous innovations (Brem and Wolfram, 2014; von Zedtwitz, Corsi and Frega, 2015); and disruptive innovations (Hart and Christensen, 2002; Christensen *et al.*, 2017). This study is focussed on disruptive innovations as a competitive strategy for small and new enterprises to employ for innovating in BoP environments.

The changes to product design and business models inherent in the disruptive innovation framework can lower costs and provide BoP entrepreneurs with opportunities and incentives to develop low-cost innovations that target an underserved or un-served

BoP populace. In so doing, the disruptive innovation framework also increases the chances of business survival by focussing business strategies and concepts on the largest consumer market in developing and emerging markets (Hang, Chen & Subramian, 2010; Wan, Williamson & Yin, 2015). The lower prices resulting from low-cost innovations are essential to unlocking the mass market segment of BoP consumers with limited disposable incomes. Furthermore, the disruptive innovation framework emphasises an inherent advantage for smaller entrants. Disruptive entrants typically target markets that are different from those being serviced by existing larger competitors and offer a different product/service proposition to those of incumbents (they target fringe markets or wholly new markets). As a result, disruptive entrants can leverage their relative market invisibility and avoid competitive battles with better resourced and larger competitors (Carayannopoulos, 2009; Markman and Phan, 2011). This study, therefore, seeks to explore the organisation-specific and contextual factors that influence the disruptive innovation capability of new technology-based companies (NTBCs) in South Africa for SME sustainability.

1.3.1 WHAT ARE DISRUPTIVE INNOVATIONS?

Professor Clayton Christensen (1993; 1997), the progenitor of the theory of disruptive innovations defines the concept as a process where a smaller company with fewer resources eventually successfully challenges established and larger competitors in a market. In so doing, the smaller company manages to overthrow the status quo of an industry. This usually happens as incumbent businesses focus on improving their products/services to cater to the needs and wants of their most demanding and profitable customer segments (Christensen, Raynor & McDonald, 2015). Downes and Nunes (2014) define disruptive innovations as products and services that normally start cheap and simple and gradually improve in quality while keeping their cost advantage until they eventually challenge established businesses. A disruptive innovation can be a technology, a product, a service or a business model (Habtay, 2012; Markides, 2013b; Christensen *et al.*, 2015). Disruption can also be a strategy that an organisation uses by specifically leveraging an enabling technology to offer low-cost, good-enough products/services to a previously underserved or un-served market (Raynor, 2011a; Sen, 2015; Wan *et al.*, 2015).

The disruptive innovation framework predicts that new entrants into an established industry do well with a disruptive strategy as their low competitive visibility and perceived

lack of legitimacy causes existing companies to initially overlook them as a competitive threat (Carayannopoulos, 2009; Markman and Waldron, 2014; Christensen *et al.*, 2015). Over time, the disruptive innovation improves in quality and performance, usually because of technological improvements in the enabling technology, until it meets the performance and quality requirements of the mainstream market while retaining its initial cost advantage (Christensen and Raynor, 2003). When the mainstream market begins to use the disruptive innovation, and the new entrant starts to take market share from incumbents then disruption will have occurred (Danneels, 2004; Christensen *et al.*, 2015). The process of disruptive innovation, therefore, disrupts the fortunes of incumbents still using the old business model or technology (Paap & Katz, 2004).

Often cited examples of disruptive innovations include: Infosys and Amazon – disruptive business model innovations, Nintendo Wii and the Tata Nano – disruptive product innovations; OYO and Expedia – disruptive service innovations; and genomics and voice over internet protocol (VoIP) – disruptive technology innovations (Christensen and Raynor, 2003; Prahalad, 2010; Yu and Hang, 2011; Devang *et al.*, 2017). An example of a successful disruptive business concept in South Africa is Capitec Bank (Cherry, 2016). Literature suggests that because the majority of China and India's populace resides at the BoP, this has led to these countries' emergence as global leaders in low-cost innovating (Govindarajan and Trimble, 2012; Wanasika, 2013; Prashantham and Yip, 2017).

Innovation, and in particular disruptive innovation, is seen as the panacea for the growth imperative that most small companies and start-ups have to deal with constantly in their formative years (Yu and Hang, 2011; Markides, 2013b; Christensen *et al.*, 2015). Scholars have suggested that disruption is the best strategy to employ to innovate effectively for enhanced business survival (Thurston and Singh, 2010; Raynor, 2011a). The disruptive innovation framework when applied to innovating at the BoP is seen to combine sustainable organisational growth with social responsibility (Hart and Christensen, 2002; Momaya and Gupta, 2013). This is congruent with the BoP approach to poverty alleviation which contends that businesses in a capitalist world order can simultaneously do well for their shareholders while also doing well for the poor, the disenfranchised, and the environment (Prahalad, 2010). Qui and Fan (2013) opine that innovation should not only be seen as a way to increase company profits, but it should also be harnessed to solve everyday problems such as poverty eradication and inclusive growth.

China and India seem to have found the right formula for enabling resource-constrained innovating as indicated by the wealth of literature and case studies on resource-constrained innovations citing Chinese and Indian companies and organisational processes. A literature review by Agarwal *et al.* (2017) found that at least 80% of the case examples in resource-constrained innovation literature to date were from China and India. Some cited examples include OYO, BGI (Devang *et al.*, 2017), Galanz, Haier and Yadea (Hang *et al.*, 2010) in China; and Suzlon, Tata Nano (Yu and Hang, 2011), Infosys, Bharti Airtel and Aravind Eye Care (Prahalad, 2010) in India.

South Africa is not showing the same trend of successfully developing globally competitive resource-constrained innovations. This is even though the South African domestic market has arguably the catalytic ingredients of a large population of low-income, BoP consumers and a relatively advanced entrepreneurial ecosystem. Thus, it is vital to explore the organisation-specific and contextual factors that enable resource-constrained innovations in other BoP markets, besides India and China, to establish how and under what conditions disruptions might occur.

1.4 RATIONALE FOR THE STUDY

The Economist (2015) touted disruptive innovation theory as the management idea of our times. It is not surprising therefore that many authors and scholars have written about and undertaken research on disruptive innovations. However, in the past, a lot of research conducted on disruptive innovations has been around the concerns of large existing businesses. Incumbents have been advised on how they can cope with attacks from disruptive entrants (Christensen, 1997; Adner, 2002; Christensen and Raynor, 2003; Habtay, 2012; Dennings, 2012; Christensen *et al.*, 2015), predict possible disruptive attacks (Paap and Katz, 2004; Danneels, 2004; Govindarajan and Kopalle, 2006; Schmidt and Druehl, 2008; Dennings, 2012; Markides, 2013b), or how they can successfully introduce their own disruptions (Christensen and Raynor, 2003; Assink, 2006; Markides, 2008; Evans, Ralston & Broderick, 2009; Thurston and Singh, 2010; Raynor, 2011b; Sandstrom, Berglund & Magnusson, 2014; Habtay and Holmén, 2014).

Previous studies have noted that the small entrants' perspective has received less attention in disruption studies (Yu and Hang, 2010; Habtay, 2012). This is even though most of the value creation activities with regards to disruption are powered by new entrants who enter markets with inferior resources but eventually disrupt established markets and competitors (Afuah, 2015). Consequently, authors have begun addressing

this gap in the literature. New entrants have been advised on how to enter markets (Carayannopoulos, 2009; Sargut and Gunther-McGrath, 2013; Ansari, Garud & Kumaraswamy, 2016); how to purposefully create potentially disruptive products (Yu and Hang, 2011; Hang *et al.*, 2011; Kohlbacher and Hang, 2011; Wan *et al.*, 2015), and how to recognise the disruptive potential of BoP markets (Li, 2013; Momaya and Gupta, 2013; Wu and Jiang, 2013; Ruan *et al.*, 2015; Christensen *et al.*, 2017). Unfortunately, the literature on disruptive innovations, especially as it pertains to its application to innovating at the BoP, is still missing the specific strategic and organisational processes that entrants employ in low-income domains where most citizens survive on less than US\$3 000 in local purchasing power parity (Li, 2013). Very little attention has been paid to the role of environmental context in enabling successful disruptive innovations (Christensen *et al.*, 2018; Millar, Lockett & Ladd, 2018).

The cross-fertilisation of research streams with regards to disruptive innovations and the BoP has begun to garner considerable academic attention. Existing literature has highlighted the applicability of the disruptive innovation framework in BoP environments (Hart and Christensen, 2002; Prahalad, 2012; Li, 2013; Markides, 2013a; Subramaniam, Ernst & Dubiel, 2015). Scholars theorise that the continued rise in fortunes of emerging economies with their large BoP populations has made emerging markets ideal markets for disruptive innovations (Yu and Hang, 2010; Habtay, 2012; Li, 2013; Momaya and Gupta, 2013; Wu and Jiang, 2013). However, studies carried out thus far have mostly focused on China and India (Hang, Chen & Yu, 2011; Tiwari and Herstatt, 2012; Prahalad, 2012; Markides, 2013; Zhou, Li & Tong, 2013; Li, 2013; Soni and Krishnan, 2014; Hang, Garnsey & Ruan, 2015), with regions like Africa and Latin America receiving little attention (Subramaniam *et al.*, 2015; Wimschneider, Agarwal & Brem, 2020). From the existing literature on disruptive innovations in BoP environments, it is not clear whether and how disruptive processes are occurring in other BoP dominant economies outside India and China. To the best of this researcher's knowledge, studies that could shed light on the extent and applicability of this phenomenon in the South African context have not yet been conducted.

Developing and emerging economies are not homogenous. The research focus on China and India offers a narrow view of resource-constrained innovation processes. Other regions such as Africa need to be investigated to come up with a more holistic framework of disruptive innovations at the BoP. This will determine the contextual and organisation-specific conditions under which disruptions are likely to emerge in resource-

constrained environments. This study will, therefore, seek to contribute to the elimination of the identified gaps in the literature highlighted. In so doing, it will contribute to the body of knowledge on disruptive innovations with a particular focus on disruptive innovations from the entrant business perspective in BoP environments.

1.5 MOTIVATION FOR NEW TECHNOLOGY-BASED COMPANY FOCUS

Park (2005) defines a new technology-based company (NTBC), also known as new technology-based firms, as an organisation involved in the use of, or investment in rapidly evolving technologies as a crucial part of its organisational strategy. Fontes and Coombs (2001) define NTBCs as young and independent organisations that participate in the development and/or diffusion of new technologies. Their success is dependent on their ability to develop, assimilate, exploit, use or diffuse new and existing technologies. However, Storey and Tether (1998) have argued that the categorisation of what companies fall under the NTBC classification is poorly conceptualised. It is not clear whether the word 'new' refers to the company, the technologies being exploited or introduced, or both. Cunha, Silva & Teixeira (2013) suggest that most scholars define NTBCs based on practical reasons and the specific requirements of their particular studies. For this study, Fontes and Coombs (2001) definition of NTBCs is more in line with the needs of the study, which is that NTBCs are young independent companies, operational for less than seven years, which participate in the development, assimilation, or diffusion of technologies as a key part of their organisational strategy.

Spencer and Kirchoff (2006) point out that NTBCs account for a large share of major innovations in an economy. Young technology-based companies, due to their innovative capabilities, are usually fast-growing. Policymakers are, therefore motivated to support their growth due to their ability to provide overall growth in new employment and development (Buckley and Davis, 2016). While disruptive innovations are not just technologies and are not limited to high-technology fields, many studies on disruptions have been focussed on high-technology industries (Sood and Tellis, 2011; Raynor, 2011b; Igami, 2015; Ansari *et al.*, 2016; Parry and Kawakami, 2017). It has been observed that disruption does not occur at the same pace across industries. Govindarajan and Kopalle (2006), in their study of 38 companies across various industries, found that there are considerably more disruptive and radical innovations in the technology and telecommunications industries compared to other sectors. In his seminal work, Christensen (1993) used a case study of the rigid disk drive industry to

conceptualise the theory of disruptive innovations. Christensen (2006) then justified the use of a case study of the disk drive industry in his seminal work by pointing out that disruption occurs much faster in high-technology industries thus making disruptions easier to assess in these highly evolutionary industries. Given the above points, it was deemed prudent to focus this study on NTBCs as they are more likely to develop disruptive innovations.

1.6 PROBLEM STATEMENT

The research problem for this study is informed by the work of previous scholars on disruptive innovations in BoP markets such as Hart and Christensen (2002), Skarzynski and Rufat-Latre (2011), Prahalad (2012), Markides (2013b), Li (2013), Subramaniam *et al.* (2015) and Christensen *et al.* (2017). They contend that the disruptive innovation framework is the most viable strategy for economic growth for emerging and developing economies.

Momaya and Gupta (2013), argue that the number of disruptive innovations produced in an economy closely reflects the entrepreneurial capabilities of local entrepreneurs in that specific economy. A study across three emerging economies: China, India and South Africa by Prashantham and Yip (2017) found that South Africa performed relatively poorly compared to China and India in fostering mass entrepreneurship and successful new businesses. Notwithstanding, existing literature shows that emerging economies are excellent breeding grounds for successful disruptive innovations (Hang *et al.*, 2011; Hang *et al.*, 2015). South Africa is one of the largest and most advanced economies on the continent. Still, it is not showing the same trend as its emerging economy counterparts like China, Brazil, and India in producing commercially viable disruptive innovations. Therefore:

Despite having a large population of low-income, BoP consumers and a relatively advanced entrepreneurial ecosystem, South African technology-based start-ups seemingly lag behind their emerging economy counterparts in developing commercially viable disruptive innovations. There is no clear understanding of the organisation-specific and contextual factors that influence a disruptive innovation capability in the South African low-income context.

1.7 RESEARCH PURPOSE

The purpose of the study was to explore a theoretical sample of participants in the South African new technology-based company incubation space for their perceptions on the organisation-specific and contextual factors that enable or hinder disruptive innovation capability in South Africa's low-income context. In so doing, develop a substantive framework of the conditions that support successful disruptive innovation development in BoP environments.

1.8 RESEARCH QUESTIONS

Given the research purpose above, the study sought to answer the following questions:

- i. What factors influence the disruptive innovation capability of NTBCs in the South African BoP environment?
- ii. How do NTBCs operating in South Africa's BoP environment evaluate competing market entry opportunities?
- iii. What are the characteristics of NTBCs that are likely to develop a disruptive innovation capability in South Africa's BoP environment?
- iv.
 - a. What challenges do South African NTBCs face in developing and commercialising viable disruptive innovations for BoP markets and;
 - b. How can these challenges be resolved?

1.9 RESEARCH OBJECTIVES

The stated research questions were answered by addressing the following research objectives, which were to:

- i. Explore the factors that influence the disruptive innovation capability of NTBCs in the South African BoP environment.
- ii. Determine how NTBCs operating in South Africa's BoP environment evaluate competing market entry opportunities.

- iii. Identify the characteristics of NTBCs that are likely to develop a disruptive innovation capability in South Africa's BoP environment.
- iv. Explore the challenges that South African NTBCs face in developing and commercialising viable disruptive innovations for BoP markets and identify solutions to these challenges.
- v. Develop a framework of disruptive innovation capability in South Africa's BoP environment.

1.10 SIGNIFICANCE OF THE STUDY

On a theoretical level, this study contributes to and extends current knowledge on the theory of disruptive innovations in BoP environments. By leveraging resource-based theories, it unpacks how technology-based entrants in BoP markets organise for the process of disruptive innovations. Very little is explored in current literature with regards to this process (Kohlbacher and Hang, 2011; Haptay, 2012; Bruton, Ketchen, & Ireland, 2013; Afuah, 2015). Furthermore, using the perspective of national systems of innovation theory, the study explores how country-specific factors influence the disruptive innovation capability of entrepreneurs with an emphasis on an emerging economy that is not the often researched Indian or Chinese markets. By examining disruptive innovation capability from the theoretical lenses of both resource-based and national systems of innovation theories, the study provides a holistic understanding of internal and external factors that influence disruptive innovation capability in BoP environments.

On a practical level, the study develops a framework that empowers new technology-based start-ups in BoP environments to successfully negotiate their specific operating environments to develop a disruptive innovation capability. Small entrant businesses can utilise the framework to shape their business strategies for disruptive capability with consideration to their particular internal constraints and their operating environment. Enterprise supporting organisations such as incubators will also benefit by understanding the factors that would enhance their efforts to nurture disruptive entrepreneurs and sustainable new industry players.

1.11 METHOD OF RESEARCH

The study employed a qualitative grounded theory methodology (Corbin and Strauss, 2015) for its ability to generate theory from qualitative data collected and to address the specific research questions of this study, which were largely exploratory. A qualitative methodology enabled the exploration of the entrepreneurial processes and contextual factors that influence a disruptive innovation capability in South Africa's BoP environment.

A substantive theory was developed based on the data collected. Theory, in the grounded theory method, is developed through a systematic process of concurrent data collection and analysis, theoretical sampling, open coding, constant comparative analysis, core category selection, theoretical saturation, selective coding, and theory integration (Oktay, 2012; Corbin and Strauss, 2015; Birks and Mills, 2019). These procedures are fully expanded on in chapter four of the thesis. By implementing these grounded theory procedures, a framework of disruptive innovation capability in BoP environments was developed as the end product of the study.

Data was collected through in-depth interviews from a theoretical sample of the study population. Contextual and perceptual information regarding the organisation-specific and contextual factors that influence a disruptive innovation capability in low-income environments was collected from the study population. The study population included the eKasiLabs and BioPark business incubation programmes of The Innovation Hub Management Company (TIHMC). The Innovation Hub Management Company is a Gauteng Provincial Government initiative that operates as an innovation agency and manages a science and technology park. The organisation is mandated to improve the socio-economic status of the citizens and competitiveness of the province. One of TIHMC's mandates is business incubation that focusses on supporting technology-based start-ups in Bio-economy, Green Economy and Smart Industries focus areas. The eKasiLabs incubation programme is focussed on support of township-based start-ups across the three focus areas while the BioPark programme concentrates on start-ups in the bio-economy sectors (health, food security and industrial biotechnology). Data collection consisted of 20 in-depth interviews with three participant groups comprising of start-up founders, business mentors and industry experts. The data collected was analysed through a grounded theory analysis process. This involves open, theoretical and selective coding cycles; and extensive memoing.

1.12 SCOPE AND DELIMITATIONS OF THE STUDY

This study confined itself to interviewing start-up founders, business mentors and experts from TIHMC's eKasiLabs and BioPark incubation programmes. As incubators of innovative and technology-based start-ups in a low-income consumer environment, TIHMC's eKasiLabs and BioPark programmes were identified as suiting the requirements of the study. Given the specificity of the study site, the results may not be transferable to other small entrant companies developing disruptive innovations in other regions of South Africa or different emerging economies. The choice of research site and study participants was motivated by the researcher's proximity to the site and study participants and resource constraints.

The study utilised a cross-sectional design to understand the disruptive innovation capability of NTBCs in South Africa at a specific point in time. Additionally, this was an exploratory study of factors that influence disruptive innovation capability in BoP environments. A qualitative grounded theory methodology was chosen for its ability to shed light and develop substantive theory based on the study's findings. Consequently, the conclusions from the research are unable to offer causal or correlational reasons regarding why some NTBCs might develop a disruptive innovation capability while others do not. This may have become apparent with a longitudinal and quantitative study design.

1.13 OUTLINE OF THESIS

This thesis has seven chapters which are organised as follows:

Chapter 1 – introduces the concepts of the base-of-the-pyramid, resource-constrained innovations, and disruptive innovations. A synopsis of the disruptive innovation framework's applicability to innovating in resource-constrained environments for the growth and sustainability of small and new enterprises was presented. The research problem was stated, and the research aim, objectives and research questions presented. The research gap, an overview of the research methodology and the study's scope were also outlined.

Chapter 2 – presents a comprehensive integrative literature review. From a theoretical standpoint, disruptive innovation capability in BoP environments was appraised from a systems theory and resource-based view perspective. A more detailed discussion of existing literature on the BoP approach, disruptive innovations, innovating in resource-

constrained environments, and the strategic dynamics of entrepreneurial market entry was presented.

Chapter 3 – based on the literature reviewed in chapter two, a conceptual framework was developed in this chapter that presents how the concepts and relationships obtained from the literature review are connected and how they are to be understood as they apply to the disruptive innovation capability of NTBCs in South Africa.

Chapter 4 – the grounded theory approach that was applied to investigate the research problem and answer the research questions and its analysis procedures is fully expanded on.

Chapter 5 – presents the research findings from the 20 in-depth interviews conducted with the study participants.

Chapter 6 – the research findings are discussed and synthesised. From this, the implications of the findings are also presented.

Chapter 7 – conclusions based on the study findings are presented, and some recommendations for practitioners, policymakers and further research are offered.

1.14 CHAPTER CONCLUSION

Chapter 1 presented a brief background and context to the phenomenon of disruptive innovation capability of new technology-based companies in the South African BoP environment. It was argued that disruptive innovations are an ideal strategic choice for small entrants seeking to innovate competitively in BoP environments. The lack of empirical work on the organisation-specific and contextual factors that influence the disruptive innovation capability of NTBCs operating in the South African BoP environment was highlighted. This study sought to fill this gap in academic literature. The research problem, aim, questions, objectives, scope, and methodological approach of the study were also outlined. The next chapter will present the theoretical foundations of the study and provide an extensive review of the literature on disruptive innovations and innovating in BoP environments, as they pertain to competitiveness and sustainability of small and new businesses.

2 CHAPTER 2: LITERATURE REVIEW

2.1 CHAPTER SUMMARY

The preceding chapter introduced and contextualised the topic and concepts under study, that of disruptive innovations and innovating in BoP environments. It was argued that there is a need to understand the organisation-specific and contextual factors that influence the disruptive innovation capability of South African NTBCs catering to the low-income consumer market. This chapter provides a review of the theories underpinning the study, in particular as they pertain to BoP environments. Emphasis is placed on evaluating existing literature with regards to the perceived competitive advantage that the disruptive innovation framework offers to NTBCs in BoP environments.

The chapter begins by presenting how the literature search was done, where the literature was found and why it was selected for inclusion. The section on theoretical perspectives presents the national systems of innovation (NSI) and resource-based view (RBV) perspectives from which disruptive innovation capability in BoP environments is examined. Literature is then reviewed that integrates BoP literature, resource-constrained innovations, and disruptive innovation theory with regards to its strategic applicability to innovating in BoP environments.

2.2 LITERATURE REVIEW METHODOLOGY

The literature review takes the form of a thematic integrative literature review. This, according to Callahan (2014) and Torraco (2016), is a broad form of research that uses multiple bodies and types of literature to address a particular phenomenon after which the literature is then synthesised and integrated in such a way that new perspectives and theories on a topic are generated.

Scholarship on disruptive innovations and on innovating at the BoP is still developing and evolving. All the literature that could be obtained on disruptive innovation theory and BoP theory since their conceptions by Christensen (1993) and Prahalad and Hart (2002) respectively, up to the present date, was assessed for potential inclusion into the review.

Extensive use was made of electronic databases such as EBSCOhost, ScienceDirect, Wiley Online, Emerald, ABI/INFORM, ProQuest, Elsevier, and Google Scholar. Emphasis was on utilising peer-reviewed journals and prominent editorially reviewed journals. Articles were also found based on reverse citation by other scholars, and

through serendipitous findings on academic networks such as ResearchGate and Academia.edu. The search keywords/phrases used were:

base/bottom-of-the-pyramid; disruptive innovations; constraint-based innovations; emerging economies; entrepreneurial innovation; entrepreneurial ecosystems; innovation strategies of new companies; new technology-based companies/firms.

Relevant textbooks on the topics and conference papers were also referred to. Trade publications, especially regarding information on the South African environment, were referenced as there is very little published material in the academic literature regarding the research problem in the South African context. Government publications such as StatisticsSA and policy documents such as the Global Entrepreneurship Monitor were also referred to for up-to-date facts and figures and global comparisons.

Literature was excluded from use in the literature review if the article title referred to disruptive innovations, but the article itself turned out to be about radical innovations, which are not necessarily disruptive. Articles were also excluded if their focus was only on incumbent business processes as the focus of this study is on the entrepreneurial processes of entrant businesses. In both disruption and BoP literature, articles were excluded if they had a corporate social responsibility or donor-centric approach to addressing poverty alleviation at the BoP as the focus of this study is on the market approach to poverty alleviation at the BoP.

2.3 INTRODUCTION

At the beginning of the last decade, much was written about the anticipated growth and emergence of African economies and the so-called African lions (Boston Consulting Group, 2010; Ernst & Young, 2011). Despite the optimism, growth on the continent has stalled. South Africa, one of the continent's largest and most advanced economies, has followed suit with consistently low levels of new entrepreneurial business sustainability (Bowmaker-Falconer & Herrington, 2020).

South Africa is classified globally as an emerging economy, meaning that it is progressing towards being advanced in terms of economic well-being, output, and infrastructure (Dutttagupta and Pazarbasioglu, 2021). However, while economic conditions and well-being are improving overall, there is still a large discrepancy in

incomes, assets, and access to services and opportunities among the various social strata within the population (Netshitenzhe, 2013; Lustig, 2016). Low-income consumers comprise what has come to be referred to as the bottom- or base-of-the-economic pyramid (Prahalad, 2012; Arora and Romjin, 2011). These are consumers who survive on less than US\$3000 in local purchasing power parity (World Resources Institute, 2007; Li, 2013). In South Africa, the BoP is estimated to comprise 75% of the total population (DIBDI, 2010).

In order to reduce inequality, it is suggested that more people should be absorbed into mainstream economic activity through quality education (Netshitenzhe, 2013), access to quality goods, services, and amenities (Prahalad, 2012; Christensen *et al.*, 2017), and access to jobs and income-generating opportunities (Prahalad and Mashelkar, 2010; Taneja *et al.*, 2016). Scholars contend that one of the most efficient ways to encourage economic growth and employment is through mass entrepreneurship (Prashantham and Yip, 2017; Petrovska, 2015), especially in the form of fast-growing innovative companies (Alvarez and Barney, 2014; Buckley and Davis, 2016).

The continuing technological shifts underway globally such as the so-called Fourth Industrial Revolution, with technologies such as blockchain, advanced robotics, cloud computing, and artificial intelligence, among others, will ensure an ever-evolving business and economic environment. This is as technologies, new and old, enhance and destroy current organisational competencies and enable entirely new business innovations. However, emerging economies have unique business operating environments that are quite different from those of developed nations. Emerging economies are characterised by low-incomes, informal businesses, poor infrastructure development, and various resource constraints (Simanis, 2012; Simanis and Duke, 2014). Several scholars including Hart and Christensen (2002); Prahalad (2010, 2012); Yu and Hang (2011); Markides (2013a); Zeschky *et al.* (2014) and Christensen *et al.* (2017) have begun looking at the best innovation type to suit this kind of environment.

Due to the differences in economic environments, innovations in emerging economies require attributes that are different from traditional innovations from developed markets. Emerging economy innovations need to place emphasis on cost-effectiveness and overcoming various resource constraints (Wimschneider, 2020). Different types of resource-constrained innovations specifically formulated for BoP environments have been suggested in existing literature under the term frugal innovations (Hart and

Christensen, 2002; Zeschky *et al.*, 2014; Soni and Krishnan, 2014; Cunha *et al.*, 2014; Agnihotri, 2015; Weyrauch and Herstatt, 2016).

This study focusses on disruptive innovations as both a strategy and innovation outcome that can be employed for competitively innovating in BoP environments. The research seeks to determine the factors that influence disruptive innovation capability in South African NTBCs. The following section examines disruptive innovation capability in BoP environments from the perspectives of national systems of innovation theory and the resource-based view.

2.3.1 THE ROLE OF LITERATURE IN THE GROUNDED THEORY METHOD

Purists of the grounded theory method such as Glaser (2011) and Corbin and Strauss (2015) advise that a literature review should not be conducted before the data collection phase as this will likely contaminate findings by forcing preconceived concepts onto the emerging theory. However, other grounded theory methodologists such as Oktay (2012), and Birks and Mills (2015) see the utility of conducting a literature review before data collection commences as it enhances the theoretical sensitivity of the researcher, that is, the ability of the researcher to be analytic. While conducting a literature review before data collection is a contentious topic in grounded theory research (Dunne, 2011; Giles, King and de Lacey, 2013; Thornberg and Dunne, 2019), the requirements of this degree programme necessitate that a literature review be conducted at the proposal stage in order to familiarise with the body of works on the phenomenon under investigation. Consequently, authors such as Urquhart (2013) advise, particularly doctoral students, to conduct a non-committal literature review. This means that the literature reviewed should be indeterminate so that emerging theory can determine the relevance of the literature. As such, the literature review for this study was an on-going process throughout the duration of the research.

2.4 THEORETICAL PERSPECTIVES

The theoretical framework provides the structure that guides research by relying on formal theory to explain the phenomenon under study and its relationships (Grant and Osanloo, 2014). To this end, Anfara and Mertz (2006) note that useful theory enlightens, provides new insights, and broadens understanding about the phenomenon being studied. A theoretical framework provides structure to the research study by explicitly

identifying the concepts and models for structuring the investigation based on existing knowledge (Merriam, 2006; Grant and Osanloo, 2014).

This study seeks to explore and determine the organisation-specific and contextual factors that influence disruptive innovation capability in South African NTBCs, identify the critical success drivers for disruptive capability, as well as identify the challenges that NTBCs in South Africa face in developing viable disruptive innovations for BoP consumers. This implies that there are factors, both internal and external, to the organisation, which might influence disruptive innovation capability. These issues will be investigated from a national systems of innovation (NSI) approach, as well as the resource-based perspective.

The NSI perspective offers explanations regarding how the external environment in which organisations exist affects their innovation outcomes and performance. The resource-based view (RBV) explains how organisations attain competitive advantage by harnessing internal resources to compete in changing competitive environments. While the NSI and RBV perspectives are divergent in their focus of what influences competitive advantage (NSI approach has an external focus, while RBV approach has an internal focus), both are relevant in offering factors that explain new business competitiveness and sustainability. Therefore, the combination of these frameworks provides a holistic explanation from which to understand entrepreneurial strategies and innovation capabilities in resource-scarce environments.

2.4.1 NATIONAL SYSTEMS OF INNOVATION

NSI literature contends that national and geographic settings in which businesses operate have a significant impact on how individual entrepreneurs behave and how ventures ultimately perform (Lundvall, 1997; Freeman, 2002; Acs, Audretsch, Lehmann & Licht, 2017; Autio and Levie, 2017). Entrepreneurs learn and gain knowledge, that is, innovativeness through their efforts and through spill-overs from their external environment. This occurs through knowledge flows and interactions with other market actors and institutions (Carlsson, 2007). The NSI framework is built on the premise that national economies vary in terms of economic organisation and institutional relationships. These differences create advantages or disadvantages for the businesses operating within these environments in terms of business processes and innovation outcomes (Trott, 2017). Thus, the external environment in which entrepreneurs operate shapes their strategies and how they innovate in that specific environment. Autio,

Kenney, Mustar, Siegel, & Wright (2014), argue that the contextual features that affect entrepreneurial innovation are an under-researched theme in the existing literature. Entrepreneurship literature has tended to focus on the characteristics of individual entrepreneurs and entrepreneurial teams while ignoring how the context in which they operate affects their behaviour and activities.

As the name suggests, NSI is based on a systemic view of innovation which holds that innovation cannot succeed in isolation and requires interaction and linkages with other interrelated components, relationships, and institutions (Niosi, Saviotti, Belon & Grow, 1993; Berkhout, Hartmann & Trott, 2010; Lundvall, 2007). O'Connor (2008) defines a system as an organisation of multiple elements in mutual interaction. This suggests an environment of interrelated components that must work together towards specific outcomes. According to Trott (2017), the interactions and interrelationships among the parts create a business environment that is unique in terms of business value systems, attitudes, and ethics. As the system is composed of parts, the individual parts can usually be adapted and fine-tuned to achieve desired outcomes.

Niosi *et al.* (1993) define a national system of innovation as a system of interacting private and public organisations, government agencies, and universities for the production of science and technology within nation-states. Lundvall (1992), in his definition, notes that these various actors and institutions interact not only to produce science and technology but also for the diffusion and use of new and economically useful knowledge. Acs *et al.* (2017) define the NSI only as a set of institutions that determines the innovative performance of national organisations through the quality of their interactions. Therefore, NSI are ecosystems composed of a variety of institutions that interact together to produce new or improved technologies, knowledge and innovations within regions or nation-states. Lundvall, Vang, Joseph & Chamanide (2009) contend that the NSI framework is a useful framework for explaining competitiveness, economic growth and development of nation-states or other geographic regions and can be used to design public policy and business innovation strategies. Foster and Heeks (2013) assert that the NSI approach is now firmly established in academic literature as an evidence-based way to understand innovation and has proven to be better than prior models at explaining the innovation outcomes of emerging and developing economies.

2.4.1.1 Components of NSI

As has already been alluded to, the NSI is comprised of components interacting with each other for economic outcomes. Acs *et al.* (2017) cite institutions such as education systems - including research capabilities, apprenticeship, and training systems - financial systems, and labour markets as components of the NSI. Lundvall *et al.* (2009) and Niosi *et al.* (1993) note the above components and include household demand, macroeconomic stability, environmental competition, informal networks, and resource availability. This, according to Lundvall (2007), is the broad definition of NSI that shows the marginal role that public policy plays in the innovation system as a whole. Individual organisations play the most important role in the innovation system through their interaction with other organisations, institutions, and knowledge structures. These interactions facilitate or hamper their innovativeness. The broad approach moves away from narrow definitions of NSI such as the Triple-Helix approach proposed by Etzkowitz and Leydesdorff (2000) and Ranga and Etzkowitz (2013) which emphasise interactions among academia/universities, industry, and government for science-based innovations only. According to Lundvall (2007), these narrow approaches have little relevance for economic performance and development in developing countries.

The components of the innovation system are interlinked through networks and connections of relationships that are necessary for organisations to innovate successfully (Freeman, 1995). The relationships are the carriers of knowledge, and interactions among actors allow for processes to evolve that generate knowledge (Lundvall, 1997). These linkages are fostered among the parts of the innovation system through financial flows, legal and policy frameworks, knowledge and informational flows, and social flows (Niosi *et al.*, 1993).

2.4.1.2 Innovation systems in developing countries

Scholars note that innovation systems in developing countries are more fragmented than those of developed economies, with some components being highly developed and others being poorly developed or missing (Liu, 2009) resulting in institutional environments that are considered unfavourable to SME sustainability (Ndabeni, 2014; Manimala and Wasdani, 2015). This represents a significant handicap for developing countries trying to foster technological change and economic development. Trott (2017) argues that developing economies can still fine-tune their innovation systems to promote

innovativeness. This requires the formation of an innovation governance framework that fosters the smooth flow of knowledge and other resources.

Developing country innovation paths do not always follow those of advanced economy ones, and sometimes skip stages altogether in a leap-frog manner (Hobday, 2005; Corsi and Di Minin, 2014). Active learning systems that develop through deliberate and consistent effort and aim at mastering and improving technologies and processes produced elsewhere (Viotti, 2002) are essential for the innovation progress of nation-states (Freeman, 2002). Therefore, a learning capability is vital for businesses in developing countries to be able to absorb, use and improve ideas from abroad (Lundvall *et al.*, 2009).

Definitions of innovations are usually associated with the introduction of new to the world products, services, or processes (Hobday, 2005). However, Viotti (2002) argues that NSI in developing countries hardly deserve that name as developing countries do not usually produce new to world innovations. They typically imitate and sometimes improve, and re-engineer absorbed technologies to suit their needs. Viotti (*ibid.*) therefore argues for national systems of learning, rather than systems of innovating, in developing countries. Hobday (2005) and Heeks *et al.*, (2014) concur and further note that prior generations of innovation models did not adequately attempt to deal with developing country conditions or address inclusive innovation imperatives.

Knowledge and learning are central concepts in the NSI approach. A learning capability has been found to be a determinant of success in the economic development of people, organisations, geographic regions and nation-states (Urban, 2010; Spender, Corvello, Grimaldi & Rippa, 2017). A learning capability is also considered to be a dynamic capability of the organisation, which can lead to sustained competitive advantage (Teece, 2007).

The NSI framework is useful in explaining the differences in the growth and competitiveness of countries and regions (Lundvall, 2007). It is also valuable in assessing the innovation capabilities of developing countries trying to catch up to advanced economies from behind the technology frontier (Hobday, 2005). Context is important to how entrepreneurs innovate in a particular environment by influencing their behaviour, information available to them, choices available and consequently, performance outcomes for their businesses (Autio *et al.*, 2014). The NSI approach is relevant for assessing the contextual factors that influence the disruptive innovation capability of South African NTBCs.

Because both contingent and internal factors influence innovation, it is also worthwhile to analyse disruptive innovation capability from a resource-based view and dynamic capabilities perspective. This theoretical standpoint will be further unpacked in the following section.

2.4.2 THE RESOURCE-BASED VIEW AND DYNAMIC CAPABILITIES PERSPECTIVE

While context is important to how entrepreneurs innovate (Autio *et al.*, 2014), the characteristics of the entrepreneur(s) and the characteristics of the resulting businesses, they form also play a role in performance outcomes. It is, therefore, essential to examine disruptive innovation capability of NTBCs from a resource-based perspective. The resource-based view provides theories that are analytical at the organisational level (Peteraf and Barney, 2003).

Disruption theory highlights a process whereby much smaller companies end up challenging and sometimes overtaking larger and better resourced existing businesses. This process involves the smaller entrant company mobilising scarce resources, critical processes, and capabilities to gain a competitive advantage. This capability is situated in the resource-based perspective. According to the resource-based view, organisations are bundles of resources and capabilities that are valuable, rare, inimitable, and non-substitutable (Barney, 1991; Grant, 2018). Resources are differentiable among organisations, and therefore, organisations with resources that are in better use can deliver higher value to consumers and achieve competitive advantage (Barney, 1991; Helfat and Peteraf, 2003; Peteraf and Barney, 2003). Organisational resources are defined as tangible or intangible assets that the organisation owns and controls (Helfat and Peteraf, 2003) and can include specific assets such as physical, human, technological, reputational, organisational, or financial resources (Grant, 2018).

Fledgeling businesses operating in emerging and developing economies face strong resource constraints. They must develop capabilities that allow them to create customer value and competitive advantage in volatile market conditions (Brem and Wolfram, 2014). Instead of being hamstrung by these resource constraints, these features of emerging markets are seen to encourage a different kind of innovation approach which requires a frugal mindset and achieves frugal innovation outcomes (Soni and Krishnan, 2014).

One of the biggest criticisms levelled against the resource-based approach is that the theory is static in nature (Peteraf, 2011). Resource-based theories assume relatively

stable product market conditions in which there are no significant market volatilities (Peteraf and Barney, 2003). This led scholars such as Foss and Knudsen (2003) to raise questions about the framework's applicability in volatile and dynamic environments or to organisations that operate in these environments such as entrepreneurial businesses, technology-based companies, and innovative companies. Because organisations hardly ever operate in stable environments, authors such as Teece and Pisano (1994) and Teece, Pisano & Shuen (1997) sought to extend the arguments of the resource-based perspective with the result being the dynamic capabilities framework.

The dynamic capabilities framework highlights how organisations in dynamic and volatile business operating environments harness internal technology, organisational skills, resources, and functional competences for competitive advantage (Teece 2018). Dynamic, in this context, refers to operating environments that are characterised by systemic technological changes, volatility in market structure (Teece *et al.*, 1997), fluctuations in product demand, the supply of raw materials and customer preferences (Jansen, Van den Bosch & Volberda, 2006). Barreto (2010) also notes that dynamic environments are global and open to international commerce and are often prone to regulatory and institutional shocks. Consequently, businesses operating in these dynamic environments need to continually evolve and realign their resources to keep pace with the changing external environment. Some companies are better at this than others, and this provides a competitive advantage. An organisation can develop capabilities by coordinating its resources to perform a specific task or activity (Grant, 2018). Thus, capabilities are the routines and processes that reconfigure organisational assets in valuable ways for competitive advantage (Teece, 2018).

Dynamic capabilities are defined as the ability to build, integrate, or reconfigure operational capabilities to address volatile business operating environments (Teece *et al.*, 1997; Helfat and Peteraf, 2003). This ability allows the organisation to systematically solve problems presenting in a changing business environment (Pandit, Joshi, Gupta & Sahay, 2017). According to Teece (2018), the ability to adapt is facilitated by the organisation's ability to develop the following capabilities:

- a. the capacity to sense and shape opportunities and threats in the operating environment;
 - b. the capacity to seize the opportunities presenting in the operating environment;
- and

- c. the capacity to reconfigure and transform organisational resources and assets to take advantage of opportunities presenting or overcome threats.

The basic premise of the dynamic capabilities perspective is that organisations can evolve by generating processes that facilitate development, change and rejuvenation of the organisation (O'Connor, 2008). Thus, businesses operating in resource-constrained and volatile BoP environments need to develop dynamic capabilities to evolve with the changing market conditions inherent in these operating environments. The ability to develop these capabilities depends on the ability of the organisation to create distinctive processes to coordinate and integrate organisational resources and assets (Teece *et al.*, 1997).

Dynamic capabilities are different from ordinary organisational resources and capabilities. According to Winter (2003) and Teece (2007), zero-level or ordinary capabilities allow the organisation to sustain itself. They, however, do not lead to a sustained competitive advantage, unless this happens by chance. On the other hand, dynamic capabilities are higher-order capabilities that influence operational capabilities by extending or modifying ordinary capabilities (Helfat and Peteraf, 2003; Winter, 2003).

Innovation capability, which Saunila, Ukko & Rantanen (2014) define as the potential of an organisation to continuously transform knowledge and ideas into innovations, has been cited as a dynamic capability that can grant a competitive advantage to an organisation (Lawson and Samson, 2001; Breznik and Hisrich, 2014). Higher-order dynamic capabilities (Winter, 2003; Teece, 2007) can facilitate the formation of routines and processes that enable the production of new products, processes, services. A study of disruptive innovation potential in Chinese SMEs by Chen, Zhu & Zhang (2017) concluded that the internal factors that influence disruptive capability include an innovation capability with regards to the entrepreneur and organisation and availability of necessary internal resources to drive disruptiveness.

Pandit *et al.* (2017) argue that developing a disruptive innovation capability, like any innovation capability, is facilitated by the organisation's dynamic capabilities. A disruptive innovation calls for the organisation to develop marketable innovations through leveraging internal and external resources, and competencies to harness potential opportunities arising in the market's white space (Assink, 2006; Pandit *et al.*, 2017). The resource-based view and dynamic capabilities approach show how would-be disruptors can gain a competitive advantage in dynamic environments by harnessing intrinsic

resources and capabilities that are idiosyncratic and inimitable, for example, by launching business models that existing businesses or other entrant rivals cannot easily replicate (Markides, 2008; Teece, 2018).

2.4.2.1 The resource-based view and strategic posture

Strategic posture reflects the strategic orientation taken by a new business to create behaviours that achieve competitiveness and business survival (Gatignon and Xuereb, 1997). Strategic orientation reflects the resources of the organisation and how they are employed and deployed. Slater and Narver (1994) and Grawe, Chen & Daugherty (2009) equate strategic orientation with business culture. Narver and Slater (1990) maintain that organisational processes enacted by an organisation in the pursuit of competitive advantage create an organisational culture that reinforces certain necessary behaviours, that is, strategic posture. Strategic orientation is relevant to how small businesses solve problems, create new capabilities, and improve performance outcomes (Al-Ansaari *et al.*, 2015).

Scholars emphasise different types of strategic orientations for various outcomes. For example, Narver and Slater (1990) and Gatignon and Xuereb (1997) emphasise market orientation for business performance, Lumpkin and Dess (1996;2001), Hughes and Morgan (2009) and Ligthelm (2010) emphasise entrepreneurial orientation for new business performance and survival. Grawe *et al.* (2009) show how a customer and competitor orientation leads to the successful creation of a service innovation capability. Wolff, Pett & Ring (2015), show how a learning orientation is required to seize opportunities in an evolving business operating environment. Govindarajan and Kopalle (2006) emphasise an emerging market orientation for developing disruptive innovations. Strategic orientation profiles are many and varied, and individual orientations are not mutually exclusive as businesses often engage in multiple sets of behaviours at the same time (Gatignon and Xuereb, 1997).

Strategic orientation plays a significant role in the types of innovations developed and commercialised by small businesses. As Gatignon and Xuereb (1997) point out, organisations with different strategic orientations bring to market innovations with different characteristics. Some organisations emphasise cutting edge technological innovations, while others emphasise market-based, customer-led innovations, depending on their strategic posture (Zhou *et al.*, 2005). This is also echoed in the disruptive innovation literature. Scholars have noted how disruptive innovation capability

is enabled or hampered by the market focus of the entrepreneur or organisation (Govindarajan *et al.*, 2011; Devang *et al.*, 2017). Hang *et al.* (2015) argue that the specific way in which disruptive innovations evolve shows that a certain amount of purposeful strategic effort is required for disruptive innovations to develop.

It is proposed that the disruptive innovation capability of NTBCs can be investigated at the nexus of internal factors like organisational resources, capabilities and strategic orientation as typified by RBV and dynamic capabilities frameworks, and contextual factors of the entrepreneurial ecosystem as characterised by the NSI framework.

2.5 CONCEPTUALISATION OF KEY TERMS

The following section will define some of the key concepts as they are used and understood in this study.

i. Base-of-the-pyramid (BoP)

This term was conceptualised and first used by Prahalad and Hart (2002) in reference to the four to five billion most impoverished people in the world who survive on less than US\$ 2 per day and thus, make up the bottom/base-of-the world economic pyramid. The definition has been expanded to include low-income consumers surviving on US\$3000, or less, in local purchasing power parity (World Resources Institute, 2007; Li, 2013). The expanded definition is used in this study.

ii. The market approach to poverty alleviation at the BoP

The market approach to poverty alleviation at the BoP contends that businesses, especially local entrepreneurs should, through their innovative activities, lead the BoP populace into the mainstream economy through the provision of quality and affordable goods and services, access to knowledge and education, and employment and investment opportunities. By creating inclusive capitalism, companies can make profits while doing social good (Prahalad, 2010).

iii. Disruptive innovation

The definition of disruptive innovation for this study is congruent with Downes and Nunes' (2014) definition which is that they are technologies, products, services or business concepts that generally start cheap and simple and gradually improve in quality while keeping their cost advantage until they eventually challenge larger incumbents. Disruptive innovations initially target a new or low-end market with products or

technologies that initially underperform in comparison with current products in the mainstream market.

iv. Disruption

Disruption describes a process where a smaller company with fewer resources successfully challenges established and larger competitors in a market to eventually overthrow the status quo of an industry (Christensen and Raynor, 2003). This occurs specifically, as existing businesses focus on improving their products or services to cater to their most demanding and profitable customers with sustaining innovations (Christensen *et al.*, 2015).

v. Disruptive innovation capability

The organisational capacity to leverage internal and external resources and competences to seek and exploit opportunities presenting in new, underserved and overlooked markets for competitive advantage by transforming knowledge and ideas into commercially valuable disruptive innovations. It is, therefore, the propensity that an organisation will develop a commercially viable disruptive innovation, product, or service.

vi. Innovation

The process of successfully producing, assimilating, and exploiting applied knowledge and learning to create something economically and/or socially beneficial in the marketplace (Zhou *et al.*, 2005).

vii. New technology-based company

Refers to new small businesses (younger than seven years), that are involved in the use, development, or diffusion of new technologies (Fontes and Coombs, 2001). These technology-based entrepreneurs do not necessarily need to develop the new technologies themselves, but their production or strategic processes must assimilate technologies to develop new customer offerings or lead to the use and diffusion of these technologies.

viii. Small and medium-sized enterprises

The definition of SMEs refers to small businesses, very small businesses and micro-businesses as stipulated in South Africa's National Small Business Amendment Act (2004) as businesses with 50 employees or less. The NTBCs in this study fall under the very small businesses category, which is a business with between 6-20 employees. The terms small business, SME, NTBC and start-up are used synonymously in this study.

The following sections present an integrated literature review on the concepts of the market approach to the BoP, innovating in resource-constrained environments and disruptive innovations.

2.6 THE BASE-OF-THE-PYRAMID

According to the Financial Times Lexicon (2018), the base-of-the-pyramid is a socio-economic concept that groups the world's low-income population who constitute an invisible and un-served market blocked by challenging barriers that prevent them from realising their human potential for their benefit, those of their families, and the society at large. The seminal work on the market approach to the BoP by Prahalad and Hart (2002) encourages business to focus on products and services targeted at the population residing at the bottom of the economic pyramid for poverty alleviation. This has since opened up a whole new stream of scholarly enquiry on inclusive innovations and innovating in resource-constrained environments to cater for the needs and wants of the low-income consumers who make up the majority of the world's population. The term bottom-of-the-pyramid has evolved to the now more commonly accepted term, the base-of-the-pyramid as authors such as Arora and Romjin (2011) highlight that the word 'bottom' used in this context can be perceived as derogatory. While Prahalad and Hart (2002) categorised the BoP as people who survive on less than US\$ 2 per day, other scholars have broadened this definition to include low-income earners who survive on less than US\$ 3 000 annually (World Resources Institute, 2007; Li, 2013) as shown in Figure 2.1.

According to a World Resources Institute report (2007), the development community tends to focus on meeting the needs of the poorest one billion people with incomes below US\$1/day. There is, however, a much larger segment of four billion people with incomes below the poverty lines of Western economies that also require attention. It is believed that these four billion people are best served with a market-oriented approach which could potentially raise their welfare levels by providing quality food, energy solutions, improved sanitation, health care, transportation, and employment opportunities (World Resources Institute, 2007; DIBDI, 2010).

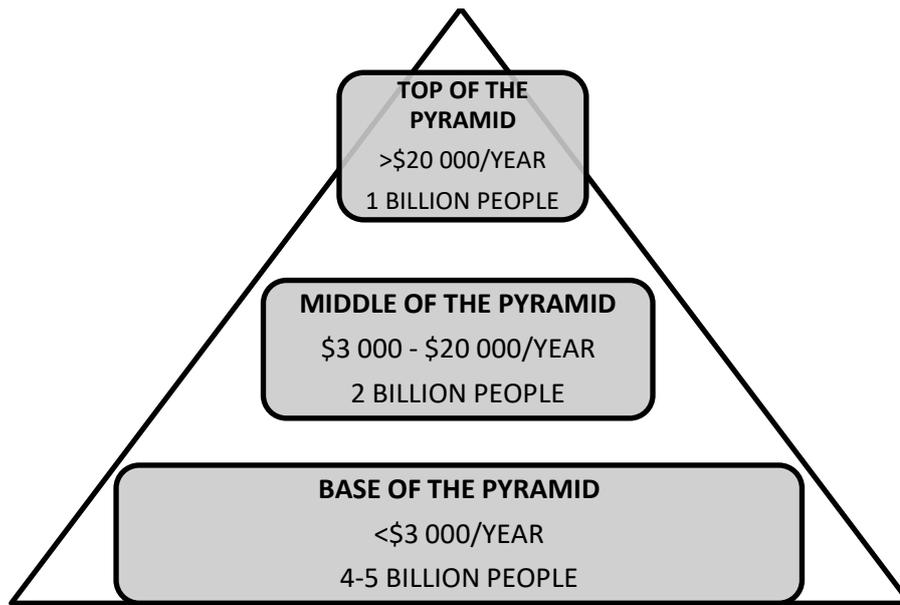


Figure 2.1: World Economic Pyramid (Adapted from: World Resources Institute, 2007)

2.6.1 THE MARKET APPROACH TO THE BASE-OF-THE-PYRAMID

Mainstream business has in the past ignored the BoP populace because of the mistaken and rather condescending assumption that people at the BoP did not need products and services beyond basic necessities. If they did, they had insufficient purchasing power to afford them (Gollakota, Gupta & Bork, 2010). As a result, the BoP is often served by small businesses that are mostly informal and unorganised, leading to uncompetitive and potentially dysfunctional markets that are to the detriment of the BoP consumer as they end up paying a so-called BoP or poverty penalty (World Resources Institute, 2007; Prahalad, 2012; Prashantham and Yip, 2017). A poverty penalty is defined as the added cost of being poor that low-income consumers suffer due to the higher prices they typically end up paying for goods and services. The higher prices are due to, for example, inefficient markets, local monopolies, inferior quality of goods and the extra amount of time and energy consumers have to expend to get these goods and services due to poor access and distribution (Prahalad, 2012).

Prahalad (2012) contends that formal business can potentially generate profits by creating products that specifically cater to the masses at the BoP. His work highlights that what the BoP consumers lack in purchasing power they makeup for in sheer numbers. Additionally, consumers at the BoP often aggregate their incomes with similarly situated people and purchase products as a group (Gollakota *et al.*, 2010). This

income aggregation behaviour is typical in many BoP environments, including South Africa, with the concept of 'stokvels'.

Following the seminal work by Prahalad and Hart (2002), scholars such as London, (2008); Markides (2013b); Simanis (2012); Simanis and Duke (2014); Rangan, Chu & Petkoski (2011); Karnani (2009), Heeks *et al.* (2014) among others, have been studying BoP market dynamics in order to foster inclusion of the BoP population into the mainstream economy with provision of affordable healthcare, education, housing, quality food, transportation, etc. Despite these efforts, the BoP consumer continues to be economically underserved and dependent on subsistence and informal livelihoods (Wanasika, 2013). BoP scholarship has as a result evolved from making a fortune at the BoP as per Prahalad and Hart (2002) to making a fortune together with the poor; that is, mutual creation of value (Prahalad, 2012; Wanasika, 2013; Rahman, Amran, Ahmad & Taghizadeh, 2014; Christensen, Ojomo & Van Bever, 2017). Thus, to foster the economic inclusion of BoP populations, companies in low-income environments should act not only out of a profit motive but also actively seek to raise their BoP consumers out of poverty situations.

According to London (2008), one of the attributes that set apart the BoP approach to poverty alleviation from other market approaches to poverty alleviation is the principle of co-creation. London (*ibid.*) and Altman and Engberg (2016) assert that multi-national companies that want to conduct business at the BoP have to be socially embedded into the fabric of the BoP by partnering with local BoP entrepreneurs. Co-creation increases the productivity and incomes of the BoP populace as consumers, co-producers and clients thereby empowering their entry into the formal economy not only as consumers with access to better quality goods and services but also as business partners (DIBDI, 2010; Rangan *et al.*, 2011). Hence, the market approach to the BoP advocates a free market-based approach to catering to the needs of low-income consumers where companies develop solutions specifically with the BoP populace in mind.

Notwithstanding the good intentions of companies that try to do business at the BoP, conducting business at the BoP is not without its challenges. Scholars point out that many companies fail in BoP environments as most emerging economies where most of the BoP population resides suffer from widespread corruption, poor infrastructure, institutional voids; as well as other resource constraints such as a lack of financing and shortage of skilled labour (Govindarajan and Trimble, 2012; Simanis and Duke, 2014; Prashantham and Yip, 2017). These challenges need to be taken into consideration

when developing business strategies that will work in BoP environments. Many global multi-national companies have struggled to make a return on investment in these markets, as noted by Simanis (2012), Prahalad (2012), and Govindarajan and Trimble (2012). BoP scholars are increasingly focussed on finding formulations that can lead to business success at the BoP (Simanis & Duke, 2014; Christensen *et al.*, 2017; Devang *et al.*, 2017).

Scholars contend that one of the reasons businesses fail to make profits at the BoP is because they fail to craft appropriate business strategies for these environments (Simanis, 2012). The BoP, it has been noted, is not a monolith market of 4 billion people who all just want cheap necessities (Prahalad, 2012; Govindarajan and Kopalle, 2012). Just like their higher-income compatriots, the population at the BoP is varied in its needs, wants and aspirations (Alcock, 2015). Rangan *et al.* (2011) have thus further divided the BoP into three market segments as per below:

- low-income segment – about 1.5 billion people with incomes of between US\$3 – US\$8 per day;
- subsistence segment – about 2 billion people with incomes of between US\$1 – US\$3 per day; and
- extreme poverty – about 1 billion people whose incomes are below US\$1 per day.

The low-income and subsistence segments far outnumber the extremely poor market segment. According to the World Resources Institute (2007), it is for the low-income and subsistence segments that market-based approaches are particularly useful. Through private sector engagement in BoP environments, the BoP households might find their course out of poverty. Rangan *et al.* (2011) propose that the needs of the low-income and subsistence segments can be effectively addressed by treating these segments as consumers and co-producers in a free market environment. The communities will benefit from acquiring better goods and services and becoming more affluent. Business can also provide people at the BoP with employment opportunities, and a way to make extra incomes as earning an extra income is a primary need in these segments. An example is of farming communities where agricultural enterprises offer training and quality seeds to subsistence farmers who then benefit by reaping a more abundant and better-quality harvest that they can then sell back to the agricultural organisation at higher prices than they previously could.

Another example can be found in Wizzit, a South African company founded in 2004. Wizzit was one of the pioneers of cell phone banking and its target market was the unbanked low-income consumers in South African townships, mining, and farming communities. The company provided a solution for the consumers at the BoP to access safe and affordable banking services which they did not previously have access to. The company also employed local unemployed youths from the community known as 'Wizzkids'. The 'Wizzkids' moved around their communities, signing up people for new accounts. They were incentivised through a percentage of each signing as well as any further future transactional value on each account. While still currently based in Johannesburg, Wizzit has expanded to offer a variety of low-income solutions to other BoP environments in 13 countries across Africa, Eastern Europe, Central and North America (World Resources Institute, 2007; Wizzit, 2017).

For the extremely poor 1 billion who survive on less than US\$1 per day, it is suggested that this is the segment that requires a benevolent approach in the form of non-governmental organisations (NGOs) and governmental interventions (DIBDI, 2010).

2.6.1.1 Criticisms of the market approach to the BoP

Karnani (2009) expresses dismay at what he calls the libertarian movement that makes use of free-market mechanisms to reduce poverty as this inadvertently harms the poor. The author argues that the BoP approach does not pay enough attention to legal, regulatory, and social mechanisms to protect the poor. He notes that this approach understates the vulnerability of low-income consumers who are uniquely vulnerable due to a lack of education, information, and other deprivations. These deprivations lead them not to act in their best interest by, for example, spending their money on harmful products such as tobacco and alcohol instead of quality food even when it is available and affordable. Hall *et al.* (2012), in their study of tourism entrepreneurship in the Brazilian BoP, found that weak regulatory institutions led to unanticipated negative outcomes such as increased crime in low-income domains. Karnani (2009), therefore, argues that governments in low-income domains should instead create opportunities for steady employment as the best way out of poverty instead of letting the free-market mechanism reign. The World Resources Institute (2007) also highlights other concerns with the market approach to poverty alleviation such as the exploitation of low-income workers and the notion that it is morally wrong to profit from the poor.

These concerns are justifiable as any further harm to the struggling poor would be unconscionable. However, as Prahalad (2010) argues, the BoP is already served by an informal sector that is largely inefficient and uncompetitive, leading to higher prices at the BoP. Other authors also argue that focussing on high growth SME creation at the BoP is the only sustainable way to create significant job creation for the BoP populace. Private sector business profitability is requisite to attracting additional investment that can reach the full extent of the BoP need (Govindarajan and Trimble, 2012; Wanasika, 2013). Therefore, while benevolence is admirable, there is not enough charity or aid that can support over four billion people sustainably (London, 2008). Furthermore, governments in emerging and developing economies cannot always meet even the basic needs of the BoP from national treasuries or public funding (World Resources Institute, 2007).

2.6.2 EVOLUTION OF BoP THEORY

BoP literature falls within the purview of inclusive development and innovating in resource-constrained environments as the emphasis is on developing cost-effective products targeted at the cost-conscious consumers that mainly reside in emerging and developing countries. Emerging markets are seen as the new frontline for innovation research due to their perceived vast and untapped consumer base as well as the saturation of developed economy markets (Agarwal *et al.*, 2017; Pisoni *et al.*, 2018). The rising importance of innovation at the BoP is reflected in the current growth of academic articles about innovation in combination with emerging markets (Brem and Wolfram, 2014; Heeks *et al.*, 2014). An increase in scholarly interest usually highlights a corresponding policy emphasis.

First-generation BoP studies were mostly concerned with origins and definitions, delineation of, and understanding the needs of the BoP market segment, as well as product conceptualisation (Prahalad and Hart, 2002; Hart and Christensen, 2002; London, 2008). Second generation studies focussed more on the BoP ecosystem and its particular constraints, market entry strategies, as well as innovation processes (London and Hart, 2004; London, 2008; Yu and Hang, 2011; Simanis, 2012; Prahalad, 2012; Govindarajan and Trimble, 2012; Simanis and Duke, 2014; Prashantham and Yip, 2017). With the continued rise of emerging economies, innovating in the resource-constrained environments that are typical in emerging and developing countries has become a topical issue in academic literature (Zeschky *et al.*, 2014; Soni and Krishnan,

2014; Brem and Wolfram, 2014; Agnihotri, 2015; Agarwal *et al.*, 2017; Pisoni *et al.*, 2018).

2.7 THEORY OF DISRUPTIVE INNOVATION

The theory of disruptive innovations, according to its progenitor Christensen (1993), has its roots in Schumpeterian economics. Economist Joseph Schumpeter (1942), likened markets and market competition to a force of creative destruction where new entrepreneurs, through their innovative incursions into established industries cause the creative destruction of those industry structures and results in the equitable redistribution of wealth (Schumpeter, 1942; Habtay, 2012; Grant, 2018). In this sense, creative destruction is neither good nor bad. It just is; and it is inevitable, unrelenting and inescapable (Gobble, 2015).

Spencer, Kirchhoff and White (2008) have noted the preoccupation by researchers and business analysts on prescriptive concerns for industry incumbents regarding how they can avoid the decline associated with the creative destruction phenomenon. The authors argue that to ensure the vitality of the free-market economy and maintain wealth redistribution, the tendency of new technology-based companies to dominate innovation must continue. Afuah (2015) also notes the same gap in disruptive innovation literature in particular. He highlights that most scholarly research thus far has focused on disruptive innovations for its impact on incumbents.

On the innovation continuum, the converse of a disruptive innovation is a sustaining innovation. Sustaining innovations are incremental innovations that produce performance improvements along the dimensions valued by an organisation's current customer target market (Christensen, 1997). Sustaining innovations can be radical, revolutionary and breakthrough; or they can be progressive innovations that increase the perceived value of their current products, differentiate from the competition, and increase competitive advantage (Christensen *et al.*, 2015). However, sustaining innovations always target the mainstream or high-end markets that are the current existing companies' target market. On the other hand, disruptive innovations target neglected niche markets or low-end markets at inception. They typically produce products that are inferior along the performance dimensions valued by the mainstream market.

The disruptive innovation framework maintains that entrants do well with disruptive innovations, while incumbents are susceptible to disruptive innovations. The converse is

also true; incumbents tend to do better with sustaining innovations while entrant businesses struggle to compete against existing companies on sustaining innovations (Christensen, 1997; Danneels, 2004; Paap and Katz, 2004; Govindarajan and Kopalle, 2006; Habtay, 2012; Markides, 2013a). Disruptive innovations follow an atypical trajectory from the fringe, low-end markets that are the least profitable market segment for incumbents, into the mainstream markets. This atypical trajectory causes industry incumbents to initially overlook potentially disruptive entrants as a threat to their businesses. This process can be seen in Figure 2.2 below.

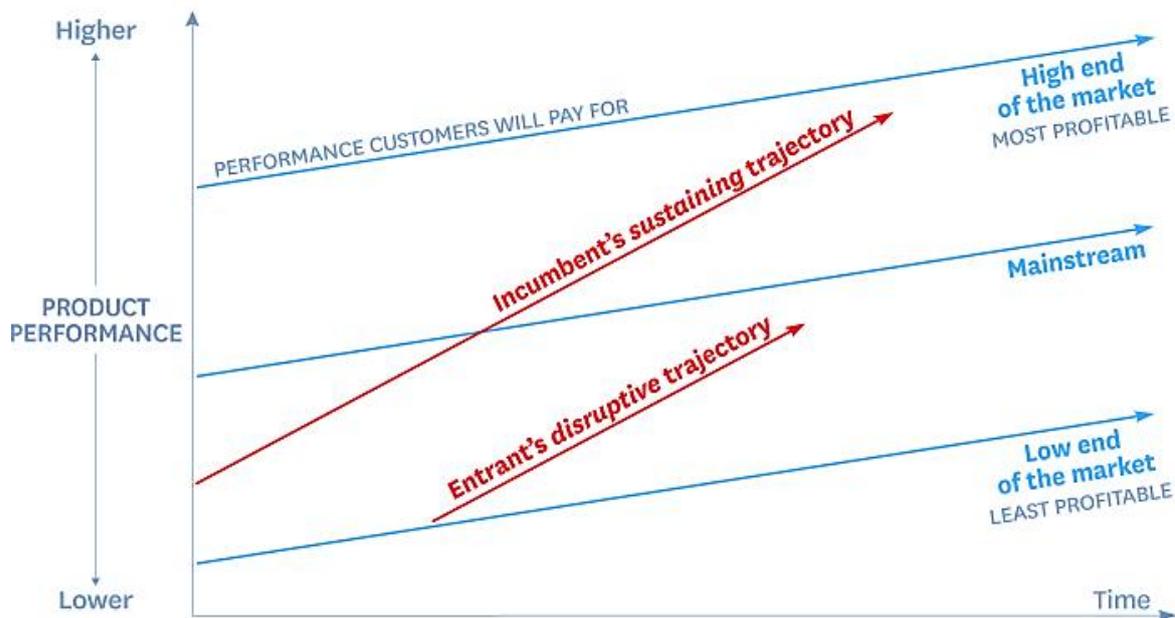


Figure 2.2: The Disruptive Innovation Model

(Source: Christensen *et al.* 2015)

The disruptive innovation model highlights how incumbents tend to focus on improving their products and services to satisfy their most demanding customers with sustaining innovations that yield the highest profit margins. The cycle of continual improvement leads them to eventually exceed the performance requirements of some customer segments and ignore the needs of others, usually the lower end and least profitable customer segments (Li; 2013; Christensen *et al.*, 2015). On the other hand, new entrants spot an opportunity to gain a foothold into the same market by introducing products that cater to the overlooked and over-served low-end markets. They introduce simpler and more affordable 'good-enough' products that appeal to cost-sensitive consumers (Hang *et al.*, 2011; Christensen *et al.*, 2015). Once an entrant establishes itself in the foothold market, it begins to improve its product/service in pursuit of higher

profit margins until it eventually intersects with the quality and performance demanded by the mainstream market.

Christensen (1993) in his seminal work conceptualised the theory of disruptive innovations in his study of the rigid disk drive industry between the years 1956 – 1990. He found that during the research period, of the 138 incumbents in the market, 103 subsequently failed. The failures were seemingly caused by the introduction by entrants of new product architectures in new and fringe markets. The incumbents in the market continually made improvements to their core products; in this instance, the speed and capacity of hard drives, to satisfy their most demanding customers. This eventually caused them to overshoot the performance requirements of many of their customers as they constantly tried to improve products to cater to their most demanding customers such as the mainframe computer makers where the highest profit margins were realised (Christensen and Raynor, 2003; Christensen *et al.*, 2015).

The theory of disruptive innovation, therefore, generalises that small new entrant businesses are best suited to introduce disruptive innovations to markets (Christensen and Raynor, 2003). This is due to the flexibility and agility of smaller entrepreneurial companies, as well as the specific skills and attitudes typical of the founding teams of entrant companies. They are locally embedded within communities leading to a better understanding of customer aspirations, wants, and unmet needs (Prahalad and Mashelkar, 2010; Markides, 2013a; Altman and Engberg, 2016). Furthermore, they are not burdened by ingrained, high-cost operational structures or prior dominant logic (Habtay and Holmèn, 2014). Scholars such as Hart and Christensen (2002), Yu and Hang (2011), Markides (2013b), Li (2013), and Christensen *et al.*, (2017) believe that disruptive innovations are the ideal innovation type for BoP environments due to their emphasis on products and services that will initially appeal to price-sensitive or fringe markets as well as targeting non-consumption within markets.

Disruptive innovations typically leverage technologies to introduce good-enough products for price-sensitive consumers as well as satisfy unmet needs. This has proven to be a successful innovating model as illustrated by now globally competitive disruptive entrants from emerging economies such as Luyuan electric bikes, Haier and Galanz in China, the Tata Nano car and Suzlon wind turbines in India (Yu and Hang, 2011), Media-Tek in Taiwan (Zhou *et al.*, 2013), M-Pesa mobile money platform in East Africa, Nollywood and Tolaram in Nigeria (Ojomo, 2016), as well as M-Kopa solar products in Ghana (Adegbile and Sarpong, 2018). While the examples cited above may not always

be fully the outcome of the disruptive innovation process, innovation authors often cite them as good examples of such because at the heart of disruptive innovations are products/services that have a low-end or unserved market focus which then improve over time until they intersect with the demands of the mainstream market.

Disruption theory is, therefore, a way to think about the creation of new-markets and innovation-driven growth (Christensen and Raynor, 2003). It emphasises creating new markets from non-consuming occasions and expanding low-end market capacity. According to Christensen *et al.* (2015), the most significant competitive threat that China poses to Western incumbents is not its cheap labour market but the massive untapped and unknowable non-consumption within its population that is waiting to be disrupted. In South Africa, at least 75% of the total populace are categorised as low-income consumers residing at the BoP (DIBDI, 2010), representing a significant non-consuming market waiting to be disrupted with low-end and new-market disruptive concepts. Scholars such as Li (2013) and Yu and Hang (2010) note the fact that the majority of the populations in emerging economies reside at the BoP means that they cannot afford high margin products designed for developed markets. The lower incomes inherent in emerging markets have consequently made them ideal breeding grounds for the development of disruptive innovations and other low-cost innovations.

2.7.1 CONCEPTUAL ISSUES IN DISRUPTIVE INNOVATION LITERATURE

Authors such as Assink, (2006), Nagy, Schuessler & Dubinsky (2016), Pandit *et al.* (2017) define disruptive innovations as innovations with radical functionality and technical standards that redefine marketplace expectations. This definition calls to mind cutting edge technologies that change the dynamics of a marketplace. Innovations with radical functionality and technical standards are what most people assume a disruptive innovation to be. This is quite different from the conceptual definition of a disruptive innovation as per Christensen (1997). A disruptive innovation starts as an inferior product that targets a low-end or fringe market at its inception. Radical innovations, on the other hand, are based on substantially new technologies relative to what is currently on the market and are almost always developed for the mainstream and high-end market segments (Markides, 2008; Govindarajan, Kopalle, & Danneels, 2011). Therefore, not all radical or breakthrough; new to the world innovations are disruptive and not all disruptive innovations are necessarily radical or breakthrough. Disruptive innovations and radical innovations are separate and distinct types of innovations

(Govindarajan *et al.*, 2011). The difference is in regard to market focus. Disruptive innovations always target or appeal to a low-end or previously un-served market at inception. Improvements over time in the disruptive innovation will eventually enable the innovation to also appeal to the mainstream market when its performance attributes finally intersect with those valued by the mainstream market (Christensen *et al.*, 2015).

Most disruptive innovations, for example, online travel booking sites like Expedia and TravelStart leverage existing technologies such as the internet, bundled in a unique way with a platform business model to make a product more straightforward, cheaper or more convenient to use. At inception, online booking sites initially appealed to the price-sensitive low-end market that valued the price reductions from these services. The mainstream market still preferred to arrange their travel with full service, in-person travel agencies. Online booking sites have since improved with regards to accessibility, ease-of-use, and convenience, whilst retaining their cost-effectiveness advantage to almost render traditional travel agencies obsolete. This is particularly true in the leisure travel market. Therefore, disruptive innovations involve scaling up a niche market into a mass-market (Markides, 2006), whereas radical innovations are typically created with the mass market and high-end markets in mind.

Scholars such as Govindarajan and Kopalle (2006), Druehl and Schmidt (2008) and Chen *et al.* (2017) have argued that if a disruptive innovation can begin in a low-end niche market and improve to take significant market share in the mainstream market, then an innovation can also encroach from a high-end market to gain significant market share in the mainstream market. Govindarajan and Kopalle (2006) give an example of the cellular phone versus the landline. When the first mobile phones were introduced, they had poor reception quality (main performance criteria), but they offered a new standard that phones did not previously compete against (mobile telephony). Because of the technology involved, they were costly and only the high-end market could afford them. As they became cheaper, they were then adopted *en masse* by the mainstream market. However, the concept of high-end encroachment still seems to be an argument for radical, breakthrough innovations or pure competition (Denning, 2016). Existing businesses would conceivably like to cater to markets that yield the highest profit margins. For that reason, any innovation that is initially adopted by the high-end market where the highest margins can be achieved would inherently be a sustaining innovation and cannot, at the same time, be disruptive.

Scholars such as Danneels (2004) and Nagy *et al.* (2016) point out that definitions of disruptive innovations are quite vague. Weeks (2015), believes that the definition of a disruptive innovation is too broad. The author argues that if the definition were more streamlined, then it would go a long way to dispel some of the confusion surrounding the theory. As argued by Kumaraswamy, Garud & Ansari (2018), in academic literature the meaning of the term disruptive seems to vary across different perspectives. Scholars may define it from a relational perspective in terms of how businesses relate to each other in the operating environment; that is, entrants versus incumbents. Disruption is also defined from a temporal perspective which refers to the evolution of a disruptive product or service over time and the path it takes from the fringe markets into mainstream markets. Other scholars use a framing perspective to define disruptive innovations. This refers to the different ways a technology or innovation is understood by different stakeholders in the operating environment; that is, whether an innovation is disruptive or sustaining.

The preceding discrepancies highlight some of the major contentions surrounding the theory of disruptive innovations. Gobble (2015) and Christensen *et al.* (2015) note how the words disruption and disruptive are so easily misconstrued and misapplied as to almost render the theory useless. Indeed, when one searches for literature on disruptive innovations, you are just as likely to find articles that address disruptive innovations as innovations with initially substandard performance encroaching from low-end and fringe markets as promulgated by Christensen (1997), as you are to find articles that address radical, revolutionary and breakthrough innovations but anointed as disruptive (Hopp, Antons, Kaminski & Salge (2018b). Christensen, McDonald, Altman & Palmer (2018) highlight how despite the widespread use of the term disruptive, by practitioners and scholars both, there is still a lack of clear conceptual meaning regarding what constitutes a disruptive innovation. A literature review on the state of disruptive innovation theory by Yu and Hang (2010) highlights the conflicting nature of disruptive innovation literature and the authors contend that this confusion poses a threat to disruptive innovation scholarship.

2.7.2 EVOLUTION OF DISRUPTION THEORY

The theory of disruptive innovations has undergone revisions and refinements over the years. In first-generation disruption studies (Christensen, 1993; 1997; Bower and Christensen, 1995; Adner, 2002; Adner and Zemsky, 2005), the authors only refer to

disruptive technologies. The focus of the initial study by Christensen (1993) was on the disk-drive industry and other high-technology industries. It highlighted how new but inferior disk-drive technologies eventually beat out seemingly superior disk-drive technologies that were already in the market. Over the years, however, the theory of disruption has been refined by Christensen (2006) and other scholars and has evolved to encompass not only technologies but also products, services and business models (Govindarajan and Trimble, 2002; Govindarajan and Kopalle, 2006; Markides, 2008; Hang *et al.*, 2011; Christensen *et al.*, 2015; Christensen, Bartman & van Bever, 2016a).

Examples of disruptive innovations include: Ikea and Amazon – disruptive business model innovations; Nintendo Wii and the Sony Walkman – disruptive product innovations; online travel booking portals and online stockbrokers – disruptive service innovations; and Intel microprocessors and voice over internet protocol (VoIP) – disruptive technology innovations (Christensen and Raynor, 2003). Thus, disruption theory has evolved from a technology and product focus to a market (customer) and process (business model) focus.

2.7.3 CRITICISMS OF THE DISRUPTIVE INNOVATION FRAMEWORK

Forbes (2011; 2013), named Clayton Christensen one of the most influential business theorists of the last 50 years as he was ranked first, for the years 2011 and 2013 in the Thinkers 50 rankings, considered one of the world's most prestigious rankings of management theorists. Christensen's theory has resonated with both scholars and practitioners. Notwithstanding, not all are convinced of the relevance and applicability of disruption theory and these views will be discussed next.

One of the most cited concerns with disruption theory has nothing to do with the formulation, applicability, or generalisability of the theory. It hinges on the word itself; disruption. According to Gobble (2016), the confusion arises from the use of the word disruption in the English vocabulary versus Christensen's use of it. In the English language, a disruption denotes a disturbance, interruption or impediment. Many people have thus taken a disruptive innovation as referring to any innovation that shakes up an industry, which very often turns out to be a radical innovation rather than a disruptive innovation. As a result, many people confuse disruptive innovations with radical or breakthrough innovations. As Christensen *et al.* (2015) define it, innovation is only disruptive in terms of the trajectory it takes from the fringe to the mainstream market and the competitive response, or lack thereof, it elicits from incumbents in the target market.

Another criticism of disruption theory relates to the abuse of the term disruption. There is a lack of discipline in the use of the word disruption as it relates to the theory of disruptive innovations (Christensen *et al.*, 2018). Yu and Hang (2010) and Christensen *et al.* (2018) have noted how there is an overuse or overloading of the term 'disruptive' that often conflicts with the concept itself, to such an extent that it is almost always misunderstood and misapplied. Nowadays, any technology-based innovation or any company successful in the technological arena is randomly labelled as disruptive. Hopp, Antons, Kaminski & Salge (2018a) note that the term disruption comes up as the magical solution to any business or start-up problem, the national economy, or any political conundrum. According to Markides (2013b) and Gobble (2016), when anything and everything new and innovative is deemed disruptive, it makes it difficult to respond effectively to the competitive environment because different kinds of innovations have different competitive effects on the market. Christensen *et al.* (2015) highlight that as a result of this, disruption theory may become a victim of its own success as mislabelling any and every type of innovation as disruptive, undermines the usefulness of the theory.

Danneels (2004), Markides (2006), Yu and Hang (2009) and Weeks (2015), question the predictive power of the disruptive innovation framework. They note that the framework does not help to make predictions of which potentially disruptive companies will succeed and under what circumstances. The disruptive innovation framework also cannot make predictions of the technological performance levels that the market will demand in the future. They contend that these issues render the theory impractical to start-ups and business executives both. Govindarajan and Kopalle (2006b) however believe that the framework may not help predict exactly which technologies will be successful. However, it is still useful in making predictions about the type of companies that are likely to develop disruptive innovations. Bienenstock (2016) concurs as he believes that disruption theory is invaluable to practitioners as it shows the power of a disruptive innovation to infiltrate a low-end or new market with an inferior product and still succeed over time.

Droege and Brown-Johnson (2010) also contend that the disruptive innovation framework uses market demographics that are too broad to be of practical value to practitioners. It segments the market into only three market segments: high-end, mainstream and low-end. Thus, well-established market criterion such as psychographics and demographics; in other words, consumer purchasing behaviour, is mostly ignored.

Additionally, the theory of disruptive innovations has come under scrutiny from scholars who criticise Christensen's (1993) chosen methodology in his seminal study of the disk drive industry. Danneels (2004) and Lepore (2014) have criticised Christensen's (1993) use of case studies and a case study of only one industry as well for his original theory formulation. They argue that the retrospective analysis of cases is subject to bias as it allows for cherry-picking of only the cases and evidence that align with the theory. In response, Christensen *et al.* (2015) assert that the use of a case study of the disk drive industry in the seminal work was necessary because disruption occurs much faster in high-technology industries making them easier to assess in these highly evolutionary industries.

King and Baartatogtokh (2015) also highlight that the theory of disruptive innovation, while widely accepted, has never been thoroughly empirically tested for validity and generalisability in academic literature. Weeks (2015), concurs and points out that most of Christensen's work has rarely been subjected to peer review. Most of Christensen's work has been published in books and the Harvard Business Review. The former are not academically peer-reviewed while the latter is editorially reviewed.

King and Baartatogtokh (2015) argue that disruption theory does not accurately describe the realities of the business environment. They surveyed 77 disruptive innovations given as examples in Christensen's work (Christensen, 1997; Christensen and Raynor, 2003) and concluded that only 9% of the innovations they assessed could completely meet the classic pattern of disruption propounded by Christensen. Lepore (2014) also highlights that some examples that Christensen (1997) and Christensen and Raynor (2003) give as companies that failed due to incursions by disruptive entrants into their markets, such as US Steel and Bucyrus, did not fail because of disruption. The author contends that these companies failed due to other market forces that were at work such as industry recession, oil price fluctuations and labour action. To this, Christensen *et al.* (2015) have responded by stating that disruptive innovation is not an event but a process which happens over, sometimes, a very long time. They argue that just because disruption does not occur quickly, it does not mean it is not occurring.

Despite these criticisms, the theory of disruptive innovations is still deemed relevant by scholars and practitioners in the fields of business management and innovation. Even as these concerns are noted, scholars still contend that the theory of disruption offers significant insights and is a powerful tool in technology and innovation management (Yu and Hang, 2009; Gobble, 2015; Weeks, 2015; Si, Zahra, Wu & Jeng, 2020). Lately, the

disruptive innovation framework has been attracting scholarly attention with regards to its applicability to innovating in BoP markets in developing and emerging economies. This is unsurprising as at the heart of disruption theory, are low-cost products initially targeted at low-end and new-markets. BoP markets in emerging economies are primarily composed of low-end consumers and a large number of non-consumers whose markets are still to be discovered.

2.8 INNOVATING IN RESOURCE-CONSTRAINED ENVIRONMENTS

A literature review on new product development in emerging markets by Brem and Wolfram (2014) highlights an increasing shift in innovation research to emerging markets as witnessed by the sharp increase in scholarly articles about innovation in combination with emerging markets. According to Agnihotri (2015), the preconditions for low-cost or constraint-based innovations in an economy are low per capita income, low customer sophistication, poor infrastructure, a lack of resources and an emerging middle class. There has been an assumption in innovation literature that local organisations at the BoP rely on low-cost imitation of Western products/innovations for competitive advantage (Li, 2012) and innovations trickle down from developed countries to developing countries (Govindarajan and Ramamurti, 2011). However, current scholarship on innovating in resource-constrained environments challenges these assumptions with the rise of frugal innovations in emerging and developing economies that are conceptualised specifically with the BoP population in mind. In some instances, these innovations end up trickling-up and being adopted in developed economies as reverse innovations (Govindarajan and Ramamurti, *ibid*; Hart and Christensen, 2002; Prahalad, 2012).

Most BoP scholars advocate a business logic that differs from the traditional developed economy models for successful innovations at the BoP (Prahalad, 2010; Brem and Wolfram, 2014). While most developed economy models emphasise high margins per unit sold, BoP markets call for low margins and emphasise volume sales as the BoP consumers cannot afford high priced items (Hart and Christensen, 2002; Prahalad, 2012; Govindarajan and Trimble, 2012; Wanasika, 2013). However, Simanis and Duke (2014) disagree with the prevailing logic. They cite examples of companies like Unilever, Proctor and Gamble and SC Johnson that used the low margin, high volume pricing model and failed to make a return on investments in various BoP environments in Africa and Asia. The failed products such as water purification sachets, cleaning products and

personal hygiene products ended up being relegated to corporate social investment initiatives instead of being the profitable business units they were initially projected to become. Simanis (2012) asserts that there is a fatal flaw in the low margin, high volume proposition because empirical evidence shows that a market penetration rate of at least 30% into BoP markets is required to cover operational costs and make a profit from low margins. This kind of market penetration rate is usually unfeasible for many large companies, and for SMEs with resource constraints, it is almost unattainable.

Therefore, rather than focussing on the low-cost innovating paradigm, the dimensions of interest should rather be cost-effectiveness and ease of use in new product development (Wimschneider *et al.*, 2020). Focussing on cost-effectiveness rather than simply cheap products enables the development of value-based products for the BoP. Cost-effectiveness may be facilitated by cost advantages brought about by lower labour costs, localised sourcing, cost-effective raw material utilisation, scale efficiencies (Zeschky *et al.*, 2014), leveraging of technologies and business models (Taneja *et al.*, 2016; Shaughnessy, 2016), and focussing on product features and relevant marketing activities (Wimschneider *et al.*, 2020). Faced with significant resource constraints, companies in emerging markets must mitigate this by developing capabilities in the form of unique organisational processes to create valuable product solutions (Brem and Wolfram, 2014).

Cost structures in low-income markets may be higher due to increased operating expenses from higher costs of distribution in areas with poor infrastructure and higher costs of customer acquisition and retention, as frequently, potential customers have to be educated about the product and trained on how to use it (Simanis and Duke, 2014). Products for the BoP should, therefore, be developed in such a way that they are affordable for the target market. Still, innovative ways must be found to ensure a reasonable margin on each sale for the company. Solutions suggested for increasing margins include product bundling or miniaturisation, leveraging lower costs of labour and raw materials, localised product manufacturing and business model reconfigurations (Yu and Hang, 2011; Simanis, 2012; Zeschky *et al.*, 2014; Devang *et al.*, 2017).

According to Agarwal *et al.* (2017), the growth of literature on resource-constrained innovations has increased significantly, and this has led to terminology confusion and fragmented literature; with no delineation among terms (Brem and Wolfram, 2014). Current research is trying to address this by streamlining and categorising terminology (Brem and Wolfram, 2014; Zeschky *et al.*, 2014; Agarwal *et al.*, 2017; Pisoni *et al.*,

2018). Resource-constrained innovation terms currently in use include: glocalisation and reverse innovations (Govindarajan and Ramamurti, 2011; Corsi and Di Minin, 2014); frugal engineering (Soni and Krishnan, 2014); frugal innovations (Rao, 2013); disruptive innovations (Hart and Christensen, 2002); BoP innovations (Prahalad and Hart, 2002; Prahalad, 2010); catalytic innovations (Christensen, Baumann, Ruggles & Sadler, 2006); grassroots/jugaad/bricolage and Gandhian innovations (Prahalad and Mashelkar, 2010; Cunha *et al.*, 2014).

Scholars note that in the past, innovations in BoP environments tended to be merely imitative of Western concepts (Li, 2012, Devang *et al.*, 2017). That is, they copied Western innovations and changed aspects of the product to make them affordable to the BoP, also known as 'glocalisation' (Govindarajan and Trimble, 2012; Corsi and Di Minin, 2014). These imitation products were not always successful in BoP markets as they did not address specific BoP needs or wants and ended up only being used at the middle and top segments of the economic pyramid of emerging economies (Govindarajan and Trimble, 2012, Prahalad, 2012; Prashantham and Yip, 2017). New types of innovations specifically geared for BoP environments have now been suggested in the academic literature under the umbrella of frugal or low-cost innovations. These include:

- Frugal engineering (Soni and Krishnan, 2014; Vadakkepat, Garg, Loh & Tham, 2015) - these are innovations that entail re-engineering of products to remove non-essential features thereby making them cheaper for BoP consumers. The process of frugal engineering aims to use resources economically. They are typically based on existing technologies, but novel technologies are sometimes utilised as well.
- Cost innovations (Zeschky *et al.*, 2014) - these innovations offer similar functionality to Western products at a lower cost. Lower prices are enabled by lower factor costs in the manufacturing process.
- Bricolage and jugaad innovations (Cunha *et al.*, 2014; Ernst, Kahle, Dubiel, Prabhu & Subramaniam, 2015; Agnihotri, 2015) - bricolage and jugaad innovations create low-cost products with value to low-income consumers through an improvisational use of materials at hand. They utilise existing resources in new and creative ways to develop cost-effective solutions.
- Gandhian and indigenous innovations (Brem and Wolfram, 2014; von Zedtwitz, Corsi and Frega, 2015; Prahalad and Mashelkar, 2010) - innovations informed by

the application of indigenous know-how to create innovations that suit local conditions.

- Disruptive innovations (Hart and Christensen, 2002; Li, 2013; Christensen *et al.*, 2017) - innovations that are typically enabled by an existing or new technology to create 'good enough' value solutions that improve over time but are initially targeted at the low-income consumer market. Disruptive innovations involve both process and product innovation.

This study is focussed on disruptive innovations as an ideal strategy and innovation outcome for new entrepreneurs to employ for successfully and competitively innovating in BoP environments. Cost innovations can gain market share through price competitiveness, but they are usually dependent on lower factor costs, such as cheaper labour and raw materials, which can be eroded over time. Furthermore, competing on price alone is risky because it is a source of advantage that can be easily imitated by competitors leading to the commodification of goods sold. Bricolage brings to mind a chaotic effectuation type process of doing business which is typical in subsistence entrepreneurs. While these types of micro-entrepreneurs may help their own families out of poverty, they usually never become fully competitive and do not grow the economy or create employment. They are typically not based on a structured approach to innovation and are not scalable (Karnani, 2009; Alvarez and Barney, 2014; Agnihotri, 2015).

Frugal engineering involves technological re-engineering that may require higher investments in research and development. Technological re-engineering calls for increased financial resources that start-ups in emerging economy environments do not usually have access to. This may be why most examples of frugal engineering cited in literature, such as the Tata Nano car, GE's Logiq Book portable ultrasound machine and the ChotuKool mini-refrigerator by Boyce and Godrej, were introduced by large, diversified corporations operating in BoP environments (Rao, 2013; Agnihotri, 2015; Weyrauch and Herstatt, 2016). Breakthrough or radical technologies are also often very costly to bring to market. Ciutiene and Thattakath (2014) point out that the costs of developing breakthrough and revolutionary innovations are often high because they usually require sustained long-term research and development efforts.

Disruptive innovations, in comparison, focus on innovation rather than invention (Govindarajan and Kopalle, 2006b). They are 'just-good-enough' value solutions that are initially targeted at low-end markets at inception. Buoyed by an inimitable business model and enabling, usually pre-existing technology they improve over time, increasing

their market share in an industry and thereby making them more competitive over time (Christensen and Raynor, 2003). The disruptive innovation framework emphasises an inherent advantage for new entrants. Furthermore, scholars such as Adegbile and Sarpong (2018) posit that disruptive innovations are likely to produce maximum social welfare at the BoP as they tend to be affordable and still deliver on the performance requirements of BoP consumers.

BoP markets have unique competitive environments and socio-cultural contexts (Wanasika, 2013). The market approach to the BoP emphasises value solutions in the form of products and new business models that are geared to the BoP environment. Successful innovating at the BoP can only be achieved by an intimate knowledge of BoP environments and consumers and what they consider as value (World Resources Institute, 2007; Prahalad, 2010). Therefore, local SMEs that are steeped in the daily lives of the BoP and are familiar with what their communities consider as value are more likely to come up with strategies that are likely to be successful at the BoP (Wanasika, 2013; Altman and Engberg, 2016; Christensen *et al.*, 2017).

While the literature on the market approach to innovating at the BoP began with Prahalad and Hart (2002), Agarwal *et al.* (2017) theorise that all constraint-based innovation literature and scholarship is a progression of Christensen's (1993) disruptive innovation framework being applied to emerging market environments by Hart and Christensen (2002). Scholarship on resource-constrained innovations is, therefore, at the nexus of disruptive innovation theory and BoP theory. The progression of the literature is shown in Figure 2.3 on the following page.

An emerging trend in literature is the recognition of the inherently disruptive potential of resource-constrained and frugal innovations that can effect bottom-up disruptions of products conceptualised in developed economies (Rao, 2013). These disruptions would occur in both emerging and developed markets as products conceptualised in emerging economy conditions take market share from developed nation products (Govindarajan and Ramamurti, 2011; Pisoni *et al.*, 2018).

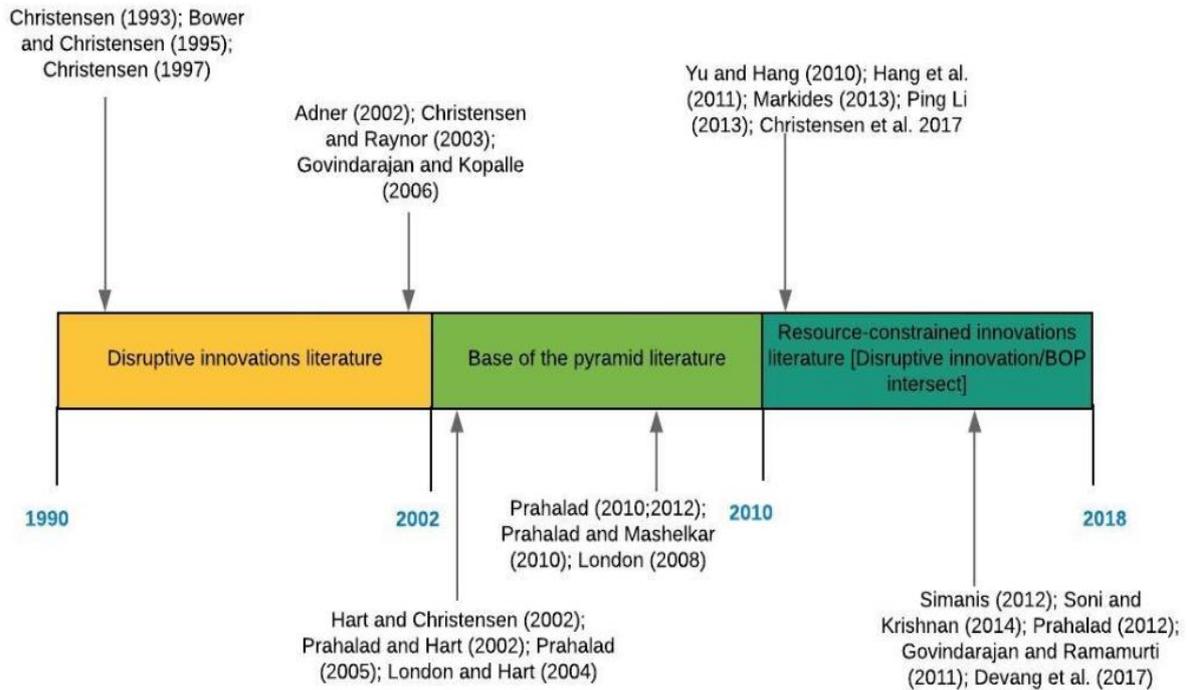


Figure 2.3: Evolution of resource-constrained innovations literature

Source: Author construct

The following section delves deeper into the disruptive innovation framework as a competitive strategy and assesses the perceived advantages it bestows on entrant companies in general.

2.9 DISRUPTION AS A COMPETITIVE STRATEGY

According to Sen (2015), disruption is both a strategic process and the strategic outcome of an innovation process. Raynor (2011a) argues that due to the predictive and explanatory power of the disruptive innovation framework, it can be used to assess which types of businesses have the best chance of survival and to shape strategy for competitive advantage. Disruption as a strategy leverages low market visibility of entrant businesses (Carayannopoulos, 2009), and perceived market uncommonality and dissimilarity with incumbents to minimise the competitive response of incumbents towards the entry of smaller, resource-constrained entrants (Chen, 1996; Markman and Waldron, 2014).

There is a growing awareness of the disruptive innovation framework as a tool for competitive strategy (Wan *et al.*, 2015; Sen, 2015). The process of disruptive innovation has been attributed as the strategy that led to Japan's impressive economic

improvement after World War II (Hart and Christensen, 2002; Markides, 2013b). Now globally dominant and ubiquitous Japanese companies like Nippon Steel, Toyota, Sony, and Canon started from the fringes to global dominance (Hart and Christensen, 2002; Li, 2013; Markides, 2013b). A similar disruption of Japanese car manufacturers like Nissan and Toyota is said to be currently occurring as they face bottom-up competition from South Korean car manufacturers such as Hyundai and Kia (Li, 2013). According to Hang *et al.* (2010) and Wan *et al.* (2015), disruption is the ideal competitive strategy to follow at the BoP.

Disruptive innovations gain a foothold in an existing market by initially targeting the incumbents' worst customers. This can be at the lower end of the current market by providing low-cost products (low-end disruption). Alternatively, entrants can establish a completely new-market which introduces a unique value proposition by introducing an aspect of performance along which products did not previously compete (new-market disruption) (Christensen and Raynor, 2003; Danneels, 2004). A model of a new-market and low-end disruption is shown in Figure 2.4 below.

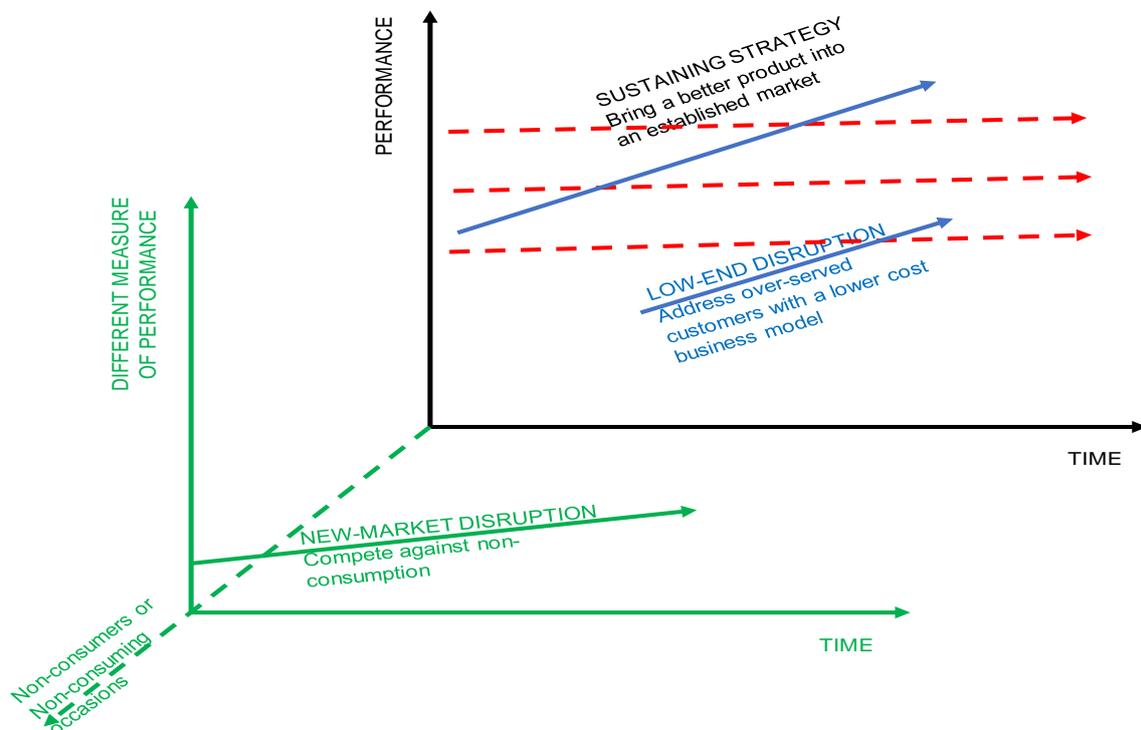


Figure 2.4: New-market and Low-end disruptive innovations (Adapted from: Christensen and Raynor 2003.)

Low-end disruption is the most common type of disruptive innovation. It makes competitive sense for an entrant business to establish a foothold by picking out a market share among the customer segment that is neglected by incumbents. With a low-end disruptive innovation, the source of disruption is a low-cost business model which does not involve much technological innovation (Christensen and Raynor, 2003; Li, 2013). New-market disruption is much less common as it involves creating new value and competing not against another product in the market, but against non-consumption (Christensen *et al.*, 2015). Christensen and Overdorf (2000) contend that a new-market disruptive innovation does not need to be exceptionally good; it just has to be better-than-the-nothing before it. They cite the example of the Sony Walkman, which on its inception had terrible audio quality in comparison to any desktop radio. But because it enabled the listener to listen to music on the move, it became a success by introducing a new parameter of competition (mobile music) along which products did not previously compete.

Entrants have been shown to fare much better than incumbents at introducing both low-end and new-market disruptions (Habtay and Holmèn, 2014). This is not merely because of the skills and behaviours inherent in start-up founding teams, but it is also enabled by the motivations that influence existing companies in the market. Christensen (1993; 1997) and Govindarajan and Kopalle (2006) found that a strong mainstream customer focus often causes incumbents to overlook emerging market segments and become susceptible to disruptive entrants. Incumbents often become so focussed on their current target markets and ignore emerging markets to their detriment. Paap and Katz (2004) highlight that the factors that might have led an organisation to success in a previous era, such as, leadership, vision, strategic focus, and corporate culture can become its greatest weakness as technologies and market conditions change in a new era. Habtay and Holmèn (2014) in their study of entrants and incumbents in various industries in South Africa also concluded that, in the long run, an incumbent's mainstream market orientation is positively related to the emergence of a disruptive niche market. Furthermore, smaller entrants have the advantage of lean cost structures, being unencumbered by legacy costs and prior dominant logic, they can find a foothold and make a profit from fringe, lower-margin, and overlooked market segments (Christensen and Raynor, 2003).

According to Thurston and Singh (2010), from the incumbents' point of view, disruptive innovations are a cost accounting and organisational resource allocation problem. Basic

cost accounting instructs executives to divest their least profitable business units or market segments. Wessel (2017) concurs and points out that disruptive innovations are by definition, lower quality and lower-margin products. It is therefore unlikely that a successful business would take resources from its currently profitable products to invest in lower-margin fringe markets that fail to utilise hard-won technical competencies fully.

Scholars also note that due to resource dependency, incumbent businesses find it hard to respond effectively to disruptive threats, even when they recognise the dangers in time. The organisation's existing customers and its investors control the allocation of the businesses' financial and internal resources as they provide the resources needed for survival (Christensen and Bower, 1996; Nagle and Golden, 2009; Sandstrom *et al.*, 2014). This makes it difficult for incumbents to allocate resources to peripheral markets with uncertain futures at the expense of currently profitable products that contribute more visibly to the bottom line and shareholder value.

Markides (2013a) observes that of the genuinely disruptive innovations introduced to markets, only a few have been successfully developed by existing companies in a market. Most are the creation of local entrepreneurs embedded in the daily lives of the local populace or social entrepreneurs. Notwithstanding these observations, it should be noted that BoP markets are largely informal and seemingly invisible making it more critical to know the market well. Unfortunately, in certain instances, local entrepreneurs are blinded by social prejudices to market opportunities that are available in their home markets (Alcock. 2015).

The new school of thought in disruption theory emphasises the business model as the lynchpin in a successful disruption. While an enabling technology can drive a disruptive innovation (Christensen and Raynor, 2003; Sen, 2015), it is the corresponding business model to back up the technology that leads to market success (Phillips, 2009; Li, 2013; Christensen *et al.*, 2016a). Markides (2008) notes that a disruptive business model innovation has specific unique characteristics and grows in a certain way that makes it difficult for large, established companies to recreate or develop. Smaller organisations are usually more flexible and agile and therefore, better suited to creating disruptive business models (Yu and Hang, 2009). Furthermore, as Markides (2013b) points out, a mere cost advantage is unsustainable, it must be backed by a unique business model because business models are difficult to imitate. Therefore, while potential disruptive entrants usually start from a fringe market with 'just-good-enough' products at lower prices, to be genuinely disruptive, they have to improve the innovation to meet

mainstream market standards while retaining their original cost advantage and also back it up with a business model that is difficult to replicate. Unless all these components are aligned, the potential disruptor may simply be relegated to a niche fringe market or competing on price against larger and better-resourced incumbents.

Studies on entrepreneurial start-ups are increasingly concerned with business model configuration as a key success driver (Garcia-Guiterrez and Martinez-Borreguero, 2016; Devang *et al.*, 2017). Denning (2012) and Christensen *et al.* (2015), contend that the entrants that eventually graduate to become disruptors usually pay attention to getting the business model right and not just the product. This is echoed by Zhou *et al.* (2013) who consider the business model to be the linking mechanism for new technologies and new markets in BoP markets. Technology is therefore usually not disruptive in and of itself. The combination of an enabling technology and a supporting business model will lead to disruption.

Momaya and Gupta (2013) contend that imitation is a viable option when innovating at the BoP so long as the imitation is disruptive along other parameters, such as the business model. Notwithstanding this finding by Momaya and Gupta (*ibid.*), Devang *et al.* (2017), in their study of start-up business model innovations in Asia, found that innovations in emerging markets are evolving. The new generation of start-ups in Asia are more sophisticated and are shirking imitation and prefer to compete on total business model reconfiguration rather than just depending on imitation and low-cost modelling. The following section delves deeper into how disruption theory presupposes an inbuilt advantage for entrants.

2.9.1 THE DYNAMICS OF ENTREPRENEURIAL MARKET ENTRY

Christensen *et al.* (2015) assert that when entering a market, entrepreneurs are faced with a strategic choice, that is, whether to take a sustaining path or a disruptive path. In his seminal work on the disk drive industry, Christensen (1993) found that during the period 1956 to 1992, only 6% of sustaining innovation entrants flourished compared to 37% of disruptive entrants. As noted previously, this is likely because market leaders often lack the motivation to defend their least profitable customer segments (Thurston and Singh, 2010). This gives new companies entering a market on a disruptive trajectory the advantage of time. Time to grow and perfect their business processes before larger incumbents become interested in the market segment they are operating. Therefore, rather than going into a competitive battle with significantly better resourced existing

businesses for market share, it is better to discover or carve out new-market space (Kim and Mauborgne, 2004; Denning, 2016).

The theory of disruption predicts that when an entrant tries to compete directly with incumbents, by offering better or similar products and services, incumbents will immediately recognise the threat and take steps to defend their market space (Raynor, 2011b; Christensen *et al.*, 2015). Incumbents have compelling motivations to defend their existing mainstream and high-end customer segments and they usually succeed because of superior resources and well-honed processes (Christensen and Raynor, 2003; Yu and Hang, 2010; Markman and Waldron, 2014).

Markman and Waldron (2014) found that micro-entrants in an industry dominated by large incumbents succeed when they either solidify the incumbents' position by offering complementary products or when they target small niche markets that are insignificant to incumbents. The paradox is that small entrants, that seem highly vulnerable due to their lack of resources, seem to be better able to survive market entry. Their lack of resources, experience, and perceived lack of legitimacy confers the advantage of low competitive visibility (Carayannopoulos, 2009; Markman and Waldron, 2014). A high degree of similarity with incumbent offerings or business models was found to result in high competitive visibility in the market and elicit a corresponding competitive response from incumbents (Christensen and Raynor, 2003).

Would-be disruptors tend to focus on low-end or new niche markets at the outset. Disruption theory, therefore, offers advantages from the perspectives of market focus and competitive response. If an entrant focusses on creating solutions for low-income consumers, the barriers to entry into the market are significantly lowered. Firstly, low-income consumers are happy with a reliable solution at an affordable price. When the solution gives them access to something they did not have before because there were no suitable options on the market beforehand, then the solution is automatically better than the nothing before it. Secondly, as predicted by disruption theory, an entrant that initially targets the lower end of a market is likely to get minimal competitive resistance from existing companies in the market. Consequently, entrepreneurs should search for opportunities that are disruptive to incumbents in the target market (Davenport, Leibold & Voelpel, 2007; Carayannopoulos, 2009; Raynor, 2011b).

Disruption theory does not, however, suggest how to succeed in the foothold market and move up to the mainstream market. Succeeding in a foothold market and moving to the mainstream market requires further entrepreneurial capabilities such as market sensing

abilities and identifying what functionality or product features potential customers will value in an innovation in the future (Christensen and Raynor, 2003; Thurston and Singh, 2010; Schilling, 2017). While scholars agree that there is an unfathomable potential for new entrants introducing disruptive innovations, the challenge has always been how to tap into this potential successfully. As Gobble (2015) points out, creating a truly disruptive innovation is a gamble that is like trying to create a viral video. There are attributes that are necessary to have a shot at either one. However, for a disruptive innovation, the result may depend on the alchemy of the market and the management team. The majority of both potential viral videos and disruptive innovations will not make it even if they have all the essential requirements.

As a guideline, disruption theory advises that entrants should gain a foothold in a low-end market or create a new market and from there improve the technology, product, or service until it appeals to the mainstream market and becomes disruptive. The challenge to address with a low-end disruption is never actually making it out of that low-end market and thus being relegated to price-based competition against other low-cost businesses in the foothold market. The ability to move upmarket depends on the intangible skills of the individual entrepreneur or founding team. With a new-market disruption strategy, it is difficult for an entrant to know beforehand that an identified new market will continue to grow and be viable in the future. As Nagle and Golden (2009) point out, markets that do not exist cannot be analysed or assessed for future growth capabilities. Therefore, future market size cannot be measured in advance. There is always a chance that the identified market will only ever grow into a small niche at best.

2.10 CHAPTER CONCLUSION

This chapter presented a thematic integrated review of existing literature on the theories and concepts of disruptive innovations, the market approach to poverty alleviation at the BoP and innovating in resource-constrained environments. Emphasis was paid to disruptive innovations as an innovation outcome and innovation process for small companies to pursue for competitive advantage in BoP environments. The challenges of doing business in BoP environments were presented. The linkages of academic inquiry on disruptive innovations and innovating at the BoP as they pertain to success or failure of technology-based entrant companies were explored. The next chapter presents a conceptual framework that identifies various organisation-specific and contextual factors

and concepts that influence disruptive innovation capability in BoP environments that were gleaned from the literature review.

3 CHAPTER 3: CONCEPTUAL FRAMEWORK

3.1 CHAPTER SUMMARY

The previous chapter presented an extensive review of the existing literature on disruptive innovations in BoP environments. This chapter proposes a new conceptual framework, also known as an analytical framework (Ngulube, Mathipa & Gumbo, 2015), based on the theoretical constructs of the national systems of innovation, resource-based perspective, the market-based approach to poverty alleviation at the BoP, and the disruptive innovation framework as a competitive strategy for entrants in BoP environments. This chapter identifies and discusses the drivers (enablers) for developing successful disruptive innovations and innovating at the BoP, as suggested in academic literature. Furthermore, the organisation-specific and contextual factors that may enable the development of commercially viable disruptive innovations and disruptive innovation capability in BoP environments will be discussed. Finally, a conceptual paradigm will be presented that highlights the proposed relationships among the postulated concepts and determinants of successful disruptive innovation capability in BoP environments.

3.2 INTRODUCTION

Christensen *et al.* (2018) posit that success with a disruptive strategy is not achieved through random chance but requires effortful strategic enactment. It is driven by factors such as enabling technologies, the strategic decisions taken by incumbents and entrants, and the characteristics of the ecosystems in which they operate. This supports the contention of this study that disruptive innovation capability should be investigated through both an internal and external perspective. A conceptual framework presents the relationship between proposed concepts and variables in a study and their impact on the phenomenon under investigation (Ngulube *et al.*, 2015). In order to explore the factors that influence disruptive innovation capability in South African NTBCs, this study will assess concepts relating to the contextual environment in which the businesses operate in, such as the entrepreneurial ecosystem, as well as concepts that are internal to the organisation, such as the new entrant's strategic orientation.

3.3 CONTEXTUAL FACTORS

Contextual factors are the characteristics of the operating environment in which NTBCs operate in that influence the strategies they choose to employ for competitiveness, how these strategies perform and in the long run, their prospects of survival. For the purposes of this study on disruptive innovation capability, contextual factors include enablers of disruption suggested in literature and the entrepreneurial ecosystem.

3.3.1 ENABLERS OF DISRUPTIVE INNOVATION

Paap and Katz (2004) define an innovation driver as the performance attribute whose influence is the primary factor that potential customers consider when selecting a product or service. For example, the speed of processing in a personal computer (PC) or sustainable consumerism factors in the green economy. Hang *et al.* (2011) and Nogami and Veloso (2017) have identified the following as specific drivers (enablers) that influence the pace and fate of disruptive innovations over time:

- a.) Lifestyle changes and consumer behaviour – for example, increased access to technology, or lack thereof, the rapidly urbanising emerging economies and lower disposable incomes
- b.) Legislation (governmental and regulatory) – for example, new environmental laws and regulations
- c.) Social and demographic changes – for example, the anticipated population explosion and emerging middle class in Africa
- d.) The continued growth of developing and emerging economies – these economies will require products and services that correspond to their specific environments
- e.) Availability of a large enough foothold market – it can be argued that BoP environments already represent a natural foothold market with their large numbers of low-income consumers that represent low-end market and new-market disruption potential.

Any changes in the business or consumer environment will create new dominant drivers (Paap and Katz, 2004). As Taneja *et al.* (2016) note, entrepreneurs should have the capability to take advantage of the opportunities presenting in their operating environment for growth, long-term sustainability and competitive advantage. Christensen and Raynor (2003) and Skarzynski and Rufat–Latre (2011) suggest that disruptive innovation opportunities are based on market pattern recognition rather than on data-

driven market analyses. The ability to successfully develop products and services for a low-end market segment requires a clear understanding of customer needs and the changing economics of customer use (Kachaner, Lindgardt and Michael, 2011). This leads to the following proposition:

P_{1a}: Social and demographic changes; as well as consumer behaviour in BoP environments influence the ability of NTBCs to develop a disruptive innovation capability.

3.3.1.1 Enabling technologies

Enabling technologies as drivers of disruptive innovations deserve separate and specific mention. Technology advances drive innovations. Most documented cases of disruptive innovations have been as a result of enabling technologies (Markides, 2008; Christensen and Raynor, 2003; Eggers *et al.*, 2012). Markides (2008) notes that ICT allows for better reach to customers and allows new entrants to scale up their businesses and business models quickly without a corresponding increase in costs.

However, a technology orientation by itself, which is defined as an organisation that shows a commitment to research and development, including acquisition and application of new technologies, and operates on the philosophy that consumers prefer technologically superior solutions (Zhou, Yim & Tse, 2005), does not necessarily result in disruptive innovation capability. In a study of disruptive innovation capability of various strategic business units (SBUs) of Fortune 200 companies by Govindarajan and Kopalle (2006a) the researchers concluded that possessing a technology orientation was associated with the successful introduction of radical innovations but had no effect on disruptive innovation capability. Zhou *et al.* (2005) also found that possessing or controlling cutting edge technologies had no significant impact on the capability to develop market-based innovations such as disruptive innovations. Instead, other orientations such as entrepreneurial orientation may be more useful. This suggests that disruptive innovations are not dependent on entrants' ability to create cutting-edge technologies themselves in order to succeed.

Notwithstanding, scholars highlight that disruptive innovations require an enabling technology for successful implementation as the enabling technology allows the combination of a disruptive idea or strategy with a technology that can propel the innovation forward (Yu and Hang, 2011; Hang *et al.*, 2011; Eggers *et al.*, 2012; Sen, 2015; Shaughnessy, 2016). The speed with which the disruptive innovation diffuses and

is adopted in the foothold, and eventually into the mainstream markets, has been found to be dependent on how quickly the enabling technology improves over time (Christensen *et al.*, 2015). For example, the speed with which mobile banking is adopted in BoP markets will largely depend on internet access in remote areas as well as smartphone penetration rates.

Understanding the evolution of technological developments is therefore crucial for would-be disruptive innovators as they need to be able to leverage any technological opportunities arising for growth and sustainability (Taneja *et al.*, 2016; Schilling, 2017). Due to the many resource constraints in BoP environments, Prahalad and Mashelkar (2010) recommend that entrepreneurs in these environments need to adapt and synthesise existing technologies in new ways, thereby creating disruptive business models. This suggests the following:

P_{1b}: The availability and progression of enabling technologies facilitate the disruptive innovation capability of NTBCs in BoP environments.

3.3.2 ENTREPRENEURIAL ECOSYSTEM

The entrepreneurial ecosystem in which SMEs conduct business has been found to have an impact on how they create and exploit entrepreneurial opportunities (Lamotte and Colovic, 2015; Buckley and Davis, 2016; Prashantham and Yip, 2017; Acs *et al.*, 2017). Clusters of innovative businesses emerge under certain geographical conditions that dictate their success or failure (Ligouri, Bendickson, Solomon & McDowell, 2019). The entrepreneurial ecosystem has been defined by Spender *et al.* (2017) and Autio and Levie (2017) as a dynamic and institutionally embedded collection of various public and private actors that interact to create and sustain the success of new entrepreneurial businesses. They include academic institutions, venture capitalists, public administrators, financial institutions, policymakers, incubators, suppliers, customers, and other intermediaries. Entrepreneurial ecosystems literature falls under the purview of the national systems of innovation (NSI) framework which highlights how national and geographic institutions and actors affect the organisations that operate therein (Acs *et al.*, 2017).

SMEs with greater access to funding through venture capitalists, financial institutions and other forms of investment and financing have been found to perform better in the long term (Omri *et al.*, 2015; Spender *et al.*, 2017). Bukula (2015) points out that although South Africa has a very sophisticated financial services industry, problems of

access to finance, funding, and investment for SMEs in South Africa are still persistent and this hampers the growth of the sector in general.

Governmental agencies, policymakers, and public administrators play a crucial role in fostering a sustainable environment for small business development. Governments affect small business development in the form of macro- and micro-economic interventions (Buckley and Davis, 2016). Macroeconomic policies that can affect SME development and sustainability include legislation, regulations, contract enforcement policies, wage policies and interest rate policies, among others. Microeconomic interventions can be in the form of direct public sector support such as incubators, incentives and grants, as well as training and technical assistance. According to Chen *et al.* (2017), the Chinese governments' emphasis on independent technological innovation and entrepreneurship has promoted the emergence of disruptive innovations in the Chinese SME sector.

According to Coovadia (2015) and Potgieter (2015), the regulatory environment can be an inhibitor to start-up growth whereby regulations and laws pertaining to business, tax, labour and contract enforcement are sometimes so burdensome as to discourage entrepreneurship. On the other hand, if institutional frameworks that are supposed to enact and enforce laws that enable business development are weak or absent, then this will also hamper entrepreneurial growth. Absent institutional structures are often the reality in emerging and developing countries (Simanis and Duke, 2014). These institutional voids lead to market imperfections caused by lack of transparency in judicial systems, bureaucratic red tape, corruption, dysfunctional competition, inadequate informational flows and weak contract enforcement (Lamotte and Colovic, 2015; Prashantham and Yip, 2017; Ge *et al.*, 2019). A study by Parry and Kawakami (2017) that compared the creation, adoption and diffusion of disruptive innovations between the United States of America and Japan concluded that the encroachment speed of disruptive innovations depends at least in part on the legal and regulatory environment of a country. In a study assessing the factors that influence India's lead market status in cost-innovations, Tiwari and Herstatt (2012) concluded that India would maintain its lead market status in part because of the regulatory environment in that country which allows such innovations to flourish.

Scholars also note that knowledge and skills transfer is vital in the entrepreneurial ecosystem to facilitate successful innovations (Spender *et al.*, 2017). The Western Cape Province leads in South Africa in terms of technology start-ups (59% share). This,

according to Bouwer (2015), could be because Stellenbosch University and University of Cape Town have a good dialogue with technology entrepreneurs in Cape Town thereby enabling the transfer of skills, knowledge and, research and development. Innovation frameworks such as the NSI (Lundvall, 2007; Acs *et al.*, 2017) and the Triple-Helix (Ranga and Etzkowitz, 2013) highlight the importance of knowledge spill-overs and transfers between universities, the scientific community, and economic agents for innovation capability.

Compared to other economies in sub-Saharan Africa, South Africa is generally lauded as having a more conducive entrepreneurial ecosystem, with better quality institutions (Oluwatobi, Efobi, Olurinola & Alege, 2015; Akinyemi and Adejumo, 2017). However, a study of start-ups across three emerging economies; China, India and South Africa by Prashantham and Yip (2017) found that South Africa had a weaker entrepreneurial ecosystem compared to India and China. Bukula (2015) contends that even though the South African ecosystem is relatively advanced and comprehensive, it falls short of being nurturing to SME development because it is highly fragmented with no clear thought leadership. This fragmentation has led to a collaborative gap that weakens the entire system. This leads to the following proposition:

P₂: A robust entrepreneurial ecosystem in terms of enabling policies, funding, supporting institutions and knowledge transfers facilitates disruptive innovation capability of NTBCs in BoP environments.

3.4 ORGANISATION-SPECIFIC FACTORS

Organisation-specific factors are elements that are internal to the organisation and influence the choice of strategies it employs for competitiveness, how they are implemented and ultimately, how the business performs. These internal factors include the organisation's strategic posture in terms of orientations towards emerging markets, learning propensity, innovativeness, ability to tolerate market risks, as well as the human capital controlled by the organisation in terms of the experience of the founder or founder team, and their levels of education.

3.4.1 STRATEGIC POSTURE

According to the resource-based perspective, organisations gain competitive advantage by strategically employing resources that are unique to the organisation for efficiency

and effectiveness. These internal resources include the physical, human and organisational capital held by the organisation (Barney, 1991). These unique internal resources influence an organisation's strategic posture or orientation. Strategic orientation reflects the organisation's internal assets, strengths, and weaknesses. Strategic orientation also shows the organisation's attitude regarding how to conduct business, given its resources and capabilities, to enable competitive advantage (Zhou *et al.*, 2005).

Varying strategic postures can be found in literature, including market or marketing orientation, entrepreneurial orientation, service orientation, customer orientation, competitor orientation and learning orientation. Orientations are not mutually exclusive as a company often engages in multiple sets of behaviours at the same time (Gatignon and Xuereb, 1997).

When entering a new-market, entrants are faced with a strategic choice between either taking a disruptive or sustaining path to market (Christensen *et al.*, 2015; Hang *et al.*, 2015). The notion that entrepreneurs have the power of choice between competing options echoes Lumpkin and Dess' (1996) concept of entrepreneurial orientation. Entrepreneurial orientation theorises that entry into new markets can be successfully undertaken by active and effortful enactment on the part of the entrepreneur, given the various choices and options available to them. Christensen *et al.* (2018) point out that an innovation is not innately disruptive. It is up to the entrepreneur to situate the innovation in a strategically disruptive way. The types of strategic orientations that are presumed to support a potential disruptive entrant, and are examined in this study, include entrepreneurial orientation, market orientation, and learning orientation.

3.4.1.1 Entrepreneurial orientation

According to Wanasika (2013), an entrepreneurial mindset is essential when operating at the BoP as the unique environmental conditions call for new ways of doing things. Different entrepreneurial orientation markers such as innovativeness, risk-taking behaviours and proactiveness need to be assessed for their impact on the probability that an NTBC will develop disruptive capability.

Innovativeness

In the business environment, innovation includes any new approach to conducting business along its entire value chain (Grant, 2008). Innovativeness includes new technologies, products, processes, and business models (Ligthelm, 2010; Taneja *et al.*,

2016). Current scholarship on disruptive innovations deemphasises the role of technological innovativeness in enabling disruptive capability and emphasises the importance of business model innovativeness (Markides, 2008; Phillips, 2009; Li, 2013; Habtay and Holmén, 2014; Christensen *et al.*, 2016a). In a study of the entrepreneurial processes of successful high-value entrepreneurs in Asia, Devang *et al.* (2017) found that the new generation of high-value entrants such as OYO, BGI and Viki typically leverage new technologies such as advanced genomics, mobile internet, and cloud computing to reconfigure their business models instead of relying on lower factor costs as has been typical of earlier emerging economy entrepreneurs. This leads to the following proposition:

P_{3a}: Innovativeness, especially along the business model dimensions, can facilitate the disruptive innovation capability of NTBCs in BoP environments.

Risk-taking

According to Lumpkin and Dess (1996), venturing into the unknown in terms of investing in new markets and new technologies is risk-taking behaviour in entrepreneurs. Investing in new markets and technologies is at the crux of a disruptive strategy as disruptive innovators often have to create markets where none existed before or take a chance in low margin, low-end markets whose profitability is not certain at the outset (Christensen and Raynor, 2003). Sandberg (2002) also notes that disruptive innovations are inherently risky in terms of their technological feasibility and commercialisation.

Yu and Hang (2011), Govindarajan *et al.* (2011), Habtay and Holmén (2014), and Christensen *et al.* (2015) contend that the purposeful creation of a disruptive innovation is risky because it is a process that occurs over sometimes a very long time. Furthermore, doing business in emerging and developing markets, as compared to developed economies, is intrinsically riskier due to the often-cited challenges of institutional voids, systemic corruption, poor infrastructure, uncertain and unknown potential market size and profitability, as well as changing and ambiguous customer preferences (Prahalad, 2012; Wanasika, 2013; Christensen *et al.*, 2017). The foregoing implies that organisations that pursue a disruptive strategy at the BoP require a higher tolerance for risk and ambiguity. This leads to the following proposition:

P_{3b}: A higher tolerance for risk in the start-up founding team encourages the disruptive innovation capability of NTBCs in BoP markets.

Proactiveness

Proactive entrepreneurs have been shown to perform better in the early stages of an industry's development and in dynamic environments characterised by rapid change and uncertainty. Proactiveness is defined as taking initiative as shown by anticipating and pursuing new opportunities as well as participating in emerging markets (Lumpkin and Dess, 1996; 2001). Sandberg (2002) and Skarzynski and Rufat-Latre (2011) using various case studies of successful disruptive innovators found that a critical capability for would-be disrupters is the ability to proactively anticipate and act on market discontinuities and unmet customer needs.

Being proactive encompasses product or technology innovativeness, as well as market proactiveness. Market proactiveness ensures diffusion and adoption of innovations through building market awareness and educating prospective customers (Sandberg, 2002). To extend this argument, Simanis (2012) also posits that in BOP environments, customers often have to be educated on the availability and applicability of the innovation and how to use it thus making market proactiveness essential to disruptive innovators in BOP markets.

Innovation proactiveness can also be accomplished by seeking to learn customer needs extensively and focusing on the jobs they are trying to get done (Christensen *et al.*, 2016b; Leavy, 2017). Following the jobs-to-be-done assessment, innovators can then adopt the notion of lean start-ups that advocates launching products and making changes as customers react to product features. This type of failure and rapid reconfiguration is actively embraced and considered crucial to obtain validated learning in the start-up environment (Blank, 2013; Bajwa, Wang, Nguyen-Duc & Abrahamsson, 2016). This leads to the following proposition:

P_{3c}: Market and innovation proactiveness promote the development of a disruptive innovation capability in NTBCs operating in BOP environments.

3.4.1.2 Emerging market orientation

Market-oriented organisations focus on customer needs as well as what competitors are doing in the market and use this knowledge to craft strategy and innovations (Zhou *et al.*, 2005). An organisation can have a mainstream market orientation, which refers to a focus on its current customers and developing solutions to suit their current and anticipated needs, or an emerging customer orientation which is a search for new and fringe sectors of the customer environment (Govindarajan *et al.*, 2011). A study based

on data from 128 SBUs of 19 Fortune 200 companies in the United States of America by Govindarajan and Kopalle (2006), as well as a study based on data from five different industries in South Africa by Habtay and Holmén (2014) both concluded that an emerging market orientation facilitates disruptive innovation potential. In contrast, a mainstream customer orientation was found to be detrimental to disruptive innovation potential.

Sandberg (2002) and Skarzynski and Rufat-Latre (2011), using various case studies of successful disruptive innovators found that a critical capability for would-be disruptors is the ability to anticipate and act on market discontinuities and unmet customer needs. The ability to sense and shape threats and opportunities, and seize opportunities presenting in the market is a dynamic capability that leads to competitive advantage (Teece, 2018).

Scholars agree that successful disruptors always enter the market by developing solutions for the low-end and fringe markets first while reserving entry into established markets for later (Raynor, 2011b; Afuah, 2015; Hang *et al.*, 2015; Christensen *et al.*, 2015). Prahalad and Mashelkar (2010) note that local entrepreneurs in India acknowledge that focusing on the rich and middle-class market segments significantly limits their potential market. Li (2013) concurs and points out that successful disruptors in BoP markets always target the BoP first by customising products and services for affordability before trying to cater to the middle or top of the pyramid. Therefore:

P₄: An emerging market orientation encourages the development of a disruptive innovation capability in NTBCs operating in BoP environments.

3.4.1.3 Learning orientation

As Urban (2010) notes, the 21st century is increasingly shifting towards economies primarily driven by technology and knowledge. Bremmer (2017) highlights that China and India have performed better on the global economic stage compared to their BRICS counterparts because of their focus on knowledge and innovative sectors. Scholars note that innovation capability and organisational learning are closely related concepts (Calantone, Cavusgil & Zhao, 2002; Kropp, Lindsay & Shoham, 2006). Successful innovation involves the transformation of knowledge into commercially viable products, services, processes, or business models. According to Wolff *et al.* (2015), learning is the propensity to acquire, create, and use knowledge to sense and seize opportunities presenting in the business operating environment.

Scholars contend that a learning capability is a higher-order dynamic capability (Winter, 2003) which allows an organisation to sense and seize opportunities (Kropp *et al.*, 2006), thereby enabling organisational renewal through change and adaptation (Wolff *et al.*, 2015). A study by Pandit *et al.* (2017) on how dynamic capabilities influence disruptive innovation capability in the Indian auto sector concluded that a learning orientation had a positive effect on the development of a disruptive innovation capability.

In innovation systems literature, entrepreneurs gain knowledge by learning through their own efforts, and through spill-overs from other actors and institutions in their environment (Carlsson, 2007). Viotti (2002) posits that in emerging and developing country contexts, innovation and learning are synonymous. Learning is the ability to absorb innovations from elsewhere and make improvements on them to suit one's own purposes and environment. This implies that knowledge integration and assimilation is a source of competitive advantage. Frugal innovations are enabled by adapting Western technologies, innovations, and know-how to suit BoP environments (Prahalad and Mashelkar, 2010; Cunha *et al.*, 2014). In order to overcome resource constraints, it is essential for entrepreneurs operating in BoP environments to assimilate technologies from elsewhere and learn quickly by testing products/services and business models. This suggests the following proposition:

P₅: A learning orientation promotes the development of a disruptive innovation capability in NTBCs operating in BoP environments.

3.4.1.4 Human capital

The intellectual base for a start-up's initial strategies in the formative stages of the business can be attributed to the mindset of the founder or founding team. Prior knowledge and experience shape these formative strategies (Christensen and Raynor, 2003; Saemundsson and Candi, 2014). Therefore, the strategic orientation of the new venture reflects the founder's capabilities and mindset (van Praag, 2003). Sargut and Gunther-McGrath (2011) posit that a disruptive innovation capability is influenced by the mindset, cumulative experience and collective capital of the entrepreneurial team in terms of past affiliations, relationships, and financial capital as these affect organisational strategy.

Human capital has been defined as the knowledge, skills, capabilities, and expertise, whether innate or expressed, of an organisation's employees that have productive value in the operating environment (Duneas, 2010; Alvarez and Barney, 2014). New

businesses with higher levels of human capital are more likely to yield positive innovation outcomes (Kato, Okamuro & Honjo, 2015; Spender *et al.*, 2017); to survive longer and get higher loan capital amounts from commercial banks (Bates, 1990; van Praag, 2003); to be more profitable and employ more people (Bosma, van Praag, Thurik & de Wit, 2004; Alvarez and Barney, 2014); and to get higher venture capital injections (Duneas, 2010).

Level of education of the founder has often been used as a proxy for measuring human capital in a new business (Bates, 1990; Bosma *et al.*, 2004; Kato *et al.*, 2015). Human capital has been found to be even more important in the so-called 'knowledge industries' such as ICT related fields (Bosma *et al.*, 2004). In this same vein, Duneas (2010) notes that technology entrepreneurship is a very complex process that calls for the interaction of financial capital, intellectual capital, and the human resource element to transform innovations into economic value. This, therefore, leads to the below proposition:

P₆: NTBC founders or founding teams with higher levels of human capital in terms of levels of education and prior experience are more likely to develop a disruptive innovation capability in BoP environments.

3.5 CONCEPTUAL PARADIGM

The preceding sections presented how the enablers of disruptive innovation, taken together with internal and external environmental factors affect the disruptive capability of entrants innovating in resource-constrained environments. A proposed new framework provides for an analysis of how organisation-specific and contextual influences affect disruptive innovation capability in BoP environments. This would account for the differences in disruptive innovation commercialisation capabilities seen across emerging economies even though they all have the catalytic features of large BoP consumers and varying degrees of resource constraints. Existing disruptive innovation scholarship does not offer definitive conclusions in the areas of how contextual influences such as specific country features, entrepreneurial environments, and individual entrepreneur attributes affect disruptive innovation capability of new entrants in resource-constrained settings. It is, therefore, proposed that clusters of internal and external factors interact with each other to influence the disruptive innovation capability of NTBCs in BoP environments, as asserted in Dzimba and van der Poll (2019) (see Appendix K). The new proposed framework considers the drivers of disruptive innovation capability found in literature and the other internal and external

factors presented in the conceptual framework. The relationships among the concepts are shown diagrammatically in Figure 3.1 below.

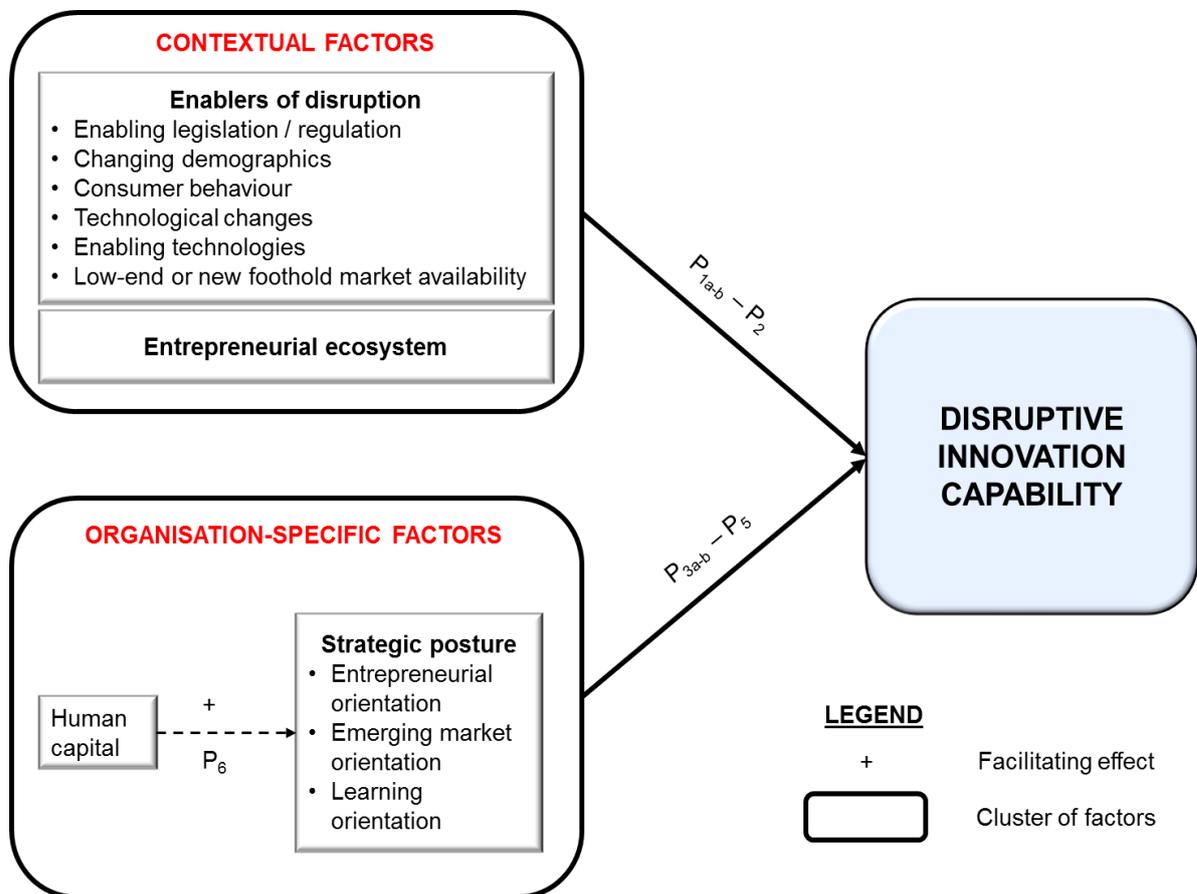


Figure 3.1: Conceptual framework of determinants of disruptive innovation capability in BoP environments

The proposed framework shows how contextual factors such as enablers of disruption; including, enabling technologies and legislation, changing consumer lifestyles and technologies, availability of a potential foothold market, and other contextual factors such as the entrepreneurial ecosystem interact with organisation-specific factors such as the strategic posture and human capital of the NTBC to influence disruptive innovation capability of NTBCs in BoP environments. The interaction of these factors leads to the successful development of disruptive innovation capability.

3.6 CHAPTER CONCLUSION

This chapter identified the drivers of disruptive innovation capability as well as other factors in the internal and external business operating environment that potentially

influence the disruptive innovation capability of NTBCs operating in BoP environments. Based on these, a preliminary conceptual framework was developed that incorporates organisation-specific and contextual factors and how they interact to influence the disruptive capability of NTBCs operating in BoP environments. The chapter following presents the methodology that was employed to determine and explore the concepts and relationships identified in the conceptual framework and in so doing, develop a theory of disruptive innovation capability in BoP environments.

4 CHAPTER 4: METHODOLOGY

4.1 CHAPTER SUMMARY

The previous chapter presented a conceptual framework highlighting the proposed concepts and relationships that influence disruptive innovation capability in South African new technology-based companies (NTBCs) as gleaned from an extensive review of the literature. In this chapter, the qualitative grounded theory research methodology that was applied to develop a theory and framework of disruptive innovation capability in BoP environments is explained. The chapter begins by presenting the rationale for using a qualitative methodology and a grounded theory approach. Next, the research philosophy governing the study is described. The chapter also discusses the research setting and study population to situate the study fully. After this, an overview of the entire research process is given in terms of methodological choices taken, and the data collection and analysis techniques employed to facilitate the development of a theory of disruptive innovation capability in BoP environments. The chapter closes with a discussion of ethical issues and measures taken to ensure the quality of the research process and output.

4.2 INTRODUCTION

According to Bryant (2017), research is a systematic process comprised of various stages which include enquiring, gathering of data and using specific methods to analyse what has been collected. In seeking to generate new knowledge, data should be collected and interpreted in a systematic manner (Saunders, Lewis & Thornhill, 2019). The research process is often presented as being linear step-by-step process (Davis, 2014), in reality, it is more often iterative and recursive (Bryant, 2017). There are many ways of seeking and generating knowledge, and these are influenced by the researcher's worldview, views on reality and what they consider as valid knowledge (Babbie, 2016). These concepts allude to the methodology of research which Saunders *et al.*, (2019) define as the principles of how research should be undertaken, and Corbin and Strauss (2015) describe as a way of thinking about and studying social reality.

This study sought to understand the research problem concerning why South African NTBCs seemingly fall behind their counterparts in other base-of-the-pyramid (BoP) environments in developing commercially viable disruptive innovations. The study,

therefore, sought to explore the organisation-specific and contextual factors that enable disruptive innovation capability in the South African BoP environment to develop a substantive theory of how NTBCs organise for the disruptive innovation process given their operating context. The following research questions needed to be answered;

- i. What factors influence the disruptive innovation capability of NTBCs in the South African BoP environment?
- ii. How do NTBCs operating in South Africa's BoP environment evaluate competing market entry opportunities?
- iii. What are the characteristics of NTBCs that are likely to develop a disruptive innovation capability in South Africa's BoP environment?
- iv.
 - a. What challenges do South African NTBCs face in developing and commercialising viable disruptive innovations for BoP markets and;
 - b. How can these challenges be resolved?

The section following presents the rationale for choosing a qualitative methodology and the grounded theory approach, and also gives an overview of the philosophical paradigm within which the researcher was working.

4.3 RATIONALE FOR QUALITATIVE RESEARCH DESIGN

Qualitative methodologies emphasise discovery and interpretation of meanings of study participants' experiences and perceptions in a particular context (Armstrong, 2010; Bloomberg and Volpe, 2019). This is in contrast with quantitative methodologies with their emphasis on examining relationships between variables, and numerical measurement and analyses (Saunders *et al.*, 2019). Quantitative methods aim to test hypothesis and generalise results to a larger population (du Plooy-Cilliers and Cronje, 2014) which is not always possible or the intention with a qualitative study. Qualitative methods, therefore, suit studies where the aim is to develop new hypotheses rather than to test existing ones (Vogt, Gardner and Haeffele, 2012).

A qualitative research approach was chosen for its ability to address the specific research questions in this study, which are mainly exploratory in nature. The study sought to understand the perceptions and experiences of NTBCs operating in South Africa's low-income environment with regards to how they organise for the disruptive innovation process and the contextual conditions that support successful disruptive innovation processes. The goal was to understand and explore the subject matter and

come up with a contextualised substantive theory on the phenomenon, and not necessarily to measure innovation outputs or business performance. Thus, qualitative methods were chosen for their ability to facilitate exploration and discovery of in-depth data regarding the strategic posture of NTBCs in South Africa's BoP environment and the context in which they operate.

4.4 RATIONALE FOR GROUNDED THEORY APPROACH

Within the qualitative research framework, the grounded theory method was chosen as the most suitable to the requirements of the research problem. Barney Glaser and Anselm Strauss developed the grounded theory method in the late 1960s in reaction to the perceived extreme positivism that had pervaded social research (Suddaby, 2006; Clarke, 2019). Glaser and Strauss (1967) proposed grounded theory as a practical research method that offers a systematic and interpretive data collection and analysis process that could be used to develop theories of processes in their social setting (Suddaby, 2006). Grounded theory is a qualitative research process whereby the researcher generates a substantive explanation, i.e., theory, of a process, action or interaction shaped by the views of research participants (Creswell, 2018). The principle of the grounded theory approach is that the generation of new theories is more important than merely verifying existing ones as this is how new knowledge evolves (Bryant, 2017). The objective of conducting grounded theory studies is, therefore, to develop new theory based on the data collected or to extend or modify existing theory (Bloomberg and Volpe, 2019).

Corbin and Strauss (2015) define grounded theory as a methodology that constructs theory from a systematic and qualitative analysis of data. It is called a grounded theory because the theory emerges from the data collected and thus, it is grounded in the reality and context of the data (Corbin and Strauss, 1990; Strydom and Bezuidenhout, 2014). According to Bryant (2017), a grounded theory is the theory that has resulted from the use of the grounded theory method, as well as the research methodology itself. The main aim of the grounded theory method is to move beyond a mere description of a phenomenon and have the researcher develop a theory of what is going on based on what the data reveals (Urquhart, 2013; Bloomberg and Volpe, 2019). The grounded theory method is most useful when the research is regarding a curious phenomenon that has no clear explanation, or when existing literature may have frameworks or models available to explain the phenomenon, but they were developed and tested on

populations other than those of interest. In such an instance, new theory can then be discovered from data collected in a specific contextual setting (Corbin and Strauss, 1990). The ability of a grounded theory methodology to systematically generate theory from data was particularly useful to this study which needed to contextualise disruptive innovation capability in the South African BoP environment. Consequently, participants in this grounded theory study were specifically chosen to shed light on the problem being researched as they all had experience with the phenomenon. Insights from the data collected from them could then help explain practice and develop a theory that is grounded in the data collected (Creswell, 2018).

Bryant (2017) highlights that theories in a grounded theory study do not necessarily claim the status of grand or overarching theory, but are initially offered as substantive theories which can also be termed models, frameworks or conceptual schemas. For this study, the theory developed is an understanding that the researcher has developed that will be articulated in the form of a framework that explains the disruptive innovation capability of NTBCs in South Africa's BoP environment. The framework was developed through an interpretation of the data collected and arranging of the concepts found into a logical explanatory scheme (Corbin and Strauss, 2015). The framework that emerged is presented in the Discussion and Interpretation chapter of this thesis.

The grounded theory method, therefore, suited the requirements of this exploratory study that also needed to develop a substantive theory regarding how NTBCs operating in the South Africa BoP environment organise for disruptive innovation capability given their unique constraints in the operating environment.

4.5 RESEARCH PHILOSOPHY

In the research context, a paradigm, also known as a research philosophy, tradition or worldview can be defined as a particular way of conducting research that is accepted and shared by a community of scholars (du Plooy-Cilliers, 2018). One's research philosophy influences such things as what the nature of reality is, what is considered as valid knowledge and what topics are considered as worthy of pursuit in a particular field of research (Saunders *et al.*, 2019). According to Babbie (2016), the research paradigm provides a framework for what we see and how we understand and make sense of it. In this sense, the researchers' worldview influences and informs ones chosen methodology and methods (Corbin and Strauss, 2015).

Some of the dominant research paradigms which researchers ascribe to include:

- Positivism - considered as the philosophical stance of the natural sciences (du Plooy-Cilliers, 2014).
- Interpretivism and Constructivism - considered as the philosophical stances of the social sciences (du Plooy-Cilliers, 2014).
- Realism and Pragmatism – these paradigms share philosophical aspects of both positivism and interpretivism and are therefore considered to be more inter- and trans-disciplinary philosophical stances (Lipscomb, 2011; Morgan, 2014; Saunders *et al.*, 2019).

There are, therefore, varied perspectives from which a research problem can be analysed, and there is no one correct way to address a research problem. Scholars note that the paradigm wars involving debates about the right or wrong way of conducting research and the incommensurability and incompatibility of the different paradigms are seemingly on hold, with researchers becoming more accepting of new and emerging paradigms (Bryman, 2008; Lipscomb, 2011; Molina-Azorin *et al.*, 2012; Given, 2017).

One such emergent paradigm is pragmatism. While pragmatism as a philosophy is not new, with its beginnings from Charles Peirce in 1903 and John Dewey in 1905, it has recently found a renewed ascendancy (Bryant, 2017; Cohen, Manion & Morrison, 2018). The ontological stance of pragmatism recognises that an independent reality exists, regardless of human belief or cognisance of it (Dewey, 1905), although there will be multiple interpretations of that reality, which could be subjective or objective and sometimes scientific or humanistic (du Plooy-Cilliers, 2018; Cohen *et al.*, 2018). The axiology of the pragmatist worldview is the belief that the utility of science is not to find the truth or reality but to find practical solutions to humanity's problems (Powell, 2001; Morgan, 2014). The focus of any study in the pragmatist tradition becomes the outcomes of the research - the actions and consequences of inquiry, rather than the antecedent conditions as in positivism (Creswell, 2018).

The epistemology of pragmatist research evaluates research by whether the researcher has in practice found out what they wanted to know at the outset (Cohen *et al.*, 2018). It is a tradition that emphasises a practical approach to research and problem-solving. The utility of a research methodology is seen to lie in its ability to solve a problem or facilitate human discovery (Powell, 2001; Campbell, 2011). Morgan (2014) notes that the pragmatist approach shifts the concerns of a study from metaphysical issues to issues of problem-solving in the research context, such as questioning the impact of research

design choices on the eventual research output. This, as Morgan (*ibid.*) and Saunders *et al.* (2019) point out, also makes pragmatism a useful philosophical tradition for any researcher, whether the researcher is employing quantitative methods, qualitative methods or mixed methods. In the pragmatist tradition, the value of any form of knowledge is in its usefulness and applicability, and that is why this worldview has found currency in practice-led fields such as the medicine, business, and organisational management fields (Locke, 2011; Bryant, 2017).

Since the inception of the grounded theory method by Glaser and Strauss (1967), grounded theory as a methodology has evolved through several significant elaborations. Barney Glaser has remained true to the original conceptual formulation, and he is regarded as being positivist/objectivist in his approach to the methodology (Clarke, 2019). Anselm Strauss, together with his student Juliet Corbin (1990; 2015) introduced a pragmatist/interactionist stance to the methodology. Kathy Charmaz has proposed a more constructivist/interpretivist approach to grounded theory (Charmaz, 2006). This study follows the pragmatist approach to grounded theory as propounded by Anselm Strauss (Corbin and Strauss, 2015). This is congruent with this researcher's own worldview, which is pragmatist in nature, with the belief that research should contribute practical solutions to problems that can inform future practice. This study, therefore, follows a 'Straussian' approach to grounded theory which is governed by a pragmatist viewpoint to knowledge generation.

4.5.1 THEORY GENERATION

Theory is developed for this study through a process of abductive reasoning. Abductive reasoning, also known as inference to the best explanation, is a common mode of reasoning in the pragmatism tradition (Lipscomb, 2012; Bryant, 2017). Abductive reasoning combines both deductive and inductive reasoning by moving from theory to data and from data back to theory (Saunders *et al.*, 2019). Abductive reasoning is also a common form of theorising in the grounded theory approach. It involves moving from the data to abstract theory and testing the emerging theory with new data in the constant comparative process of assigning meaning (Charmaz, 2014; Reichertz, 2019). Abductive reasoning involves considering all possible explanations for the data gathered and then pursuing the most logical explanation (Bryant, 2017). Thus, the data corpus might present various interpretations of what is going on, but abductive reasoning defers to the most logical and plausible explanation (Corbin and Strauss, 2015).

This study began with the observation that South African NTBCs seemingly lag behind their emerging economy counterparts in commercialising disruptive innovations. A review of the literature was undertaken, which inductively informed the propositions that make up the preliminary conceptual framework of the study. Data was then collected from the study participants in the form of in-depth interviews that inductively informed an emerging provisional theory. The emergent theory was then deductively tested through further interviews and data collection, and so on, in the manner of constant comparison to develop an understanding and theory (theoretical framework) of the disruptive innovation process in BoP environments.

4.6 THE RESEARCH SETTING

The research setting for the study was The Innovation Hub Management Company. The Innovation Hub Management Company (TIHMC, also referred to as the Innovation Hub) is a subsidiary of the Gauteng Growth and Development Agency under the Department of Economic Development of the Gauteng provincial government. It is an incubator that has created and fostered innovative enterprises and start-ups for more than 15 years. The chief aim of TIHMC is to promote the economic development of Gauteng Province through promoting innovation and entrepreneurship. This aim is realised through, among other things:

- Fostering entrepreneurship and incubating new innovative companies
- Provision of attractive working spaces for emerging knowledge companies
- Enhancing synergy among industry, government, academic, and research institutions

Source: The Innovation Hub (2018)

TIHMC offers several start-up incubation programmes in the smart, bio-economy, and green economy industries. The incubated start-ups are assisted in terms of advisory services, skills and enterprise development, market access, infrastructure and networking and funding opportunities. The stated core business of TIHMC is fostering the accelerated growth of technology start-ups for them to become sustainable businesses. The company's focus is on innovative entrepreneurs that address the local social, economic and environmental challenges faced by the province of Gauteng. TIHMC has various incubation programmes currently running. These include Maxum, Climate Innovation Centre, BioPark, eKasiLabs and mLab Southern Africa.

This study focused on the eKasiLabs and BioPark programmes of TIHMC. The eKasiLabs incubation programme offers business development support to innovative start-ups in various low-income township areas in TIHMC priority sectors such as smart industries and the creative economy. Townships currently included in the programme include Soweto, Garankuwa, Alexandra, Tembisa, Mohlakeng, Sebokeng, Mamelodi, Kathorus, Mapobane and Kagiso. Therefore, the eKasiLabs programme suited the requirements of this study due to its emphasis on technology entrepreneurship in low-income environments. The BioPark programme focuses on start-ups in the health, agriculture and industrial biotechnology sectors. The BioPark programme had not been included in the study initially, but as the study progressed, it became evident that many of the start-ups showing disruptive potential at the Innovation Hub were in this programme. Incubatees in the BioPark programme use technology to offer novel value-addition to both low-end and new-markets. Through purposive and theoretical sampling, some entrepreneurs in this programme were consequently selected into the study.

The Innovation Hub presented an ideal population in which to place the study. Clayton Christensen, the progenitor of the term disruptive innovations, defends his choice of using a case-study of the disk drive industry in his seminal work by noting that disruptions can take a long time, often years to fully manifest. However, in ICT environments, these time frames are usually much shorter due to the ever-evolving nature of new technologies (Christensen *et al.*, 2015). Christensen and Raynor (2003), also highlight that an enabling technology usually propels most successful disruptions. Also, Spencer and Kirchhoff (2006) point out that NTBCs are the most common introducers of disruptive innovations. This is due to the shift from an industrial economy of the past to the current digital economy which is technology-driven, and that presents immense opportunities for entrepreneurs trying to introduce disruptive innovations (Markides, 2013b).

4.6.1 THE STUDY POPULATION

A specific study population was identified as being familiar with the phenomenon of disruptive innovation capability in BoP environments. Individuals were selected to participate in the study based on their involvement in a technology-based start-up, through their participation as a founder, in an advisory role or an ecosystem support role. In-depth interviews were conducted with three groups of participants, namely: start-up founders, business mentors, and industry experts involved with the eKasiLabs and

BioPark incubation programmes. The industry experts included some of the executive management of the Innovation Hub. They were identified through their long-term involvement in the incubation of new businesses and their familiarity with the start-up innovation process.

4.7 SAMPLE SELECTION

Consistent with a grounded theory methodology, this study used theoretical sampling that initially employs purposive and judgemental, non-probability sampling to select the study participants (Strydom and Bezuidenhout, 2014; Birks and Mills, 2015). Sampling initially proceeded on a judgemental basis where study participants, such as the industry experts, were selected based on their perceived knowledge of the phenomenon and their ability to provide rich information that meets the analytical needs of the study (Birks and Mills, 2019). Their responses were then used to generate the initial concepts on the phenomenon that provided the basis for subsequent data gathering (Corbin and Strauss, 2015). New cases were then added to the sample based on their theoretical relevance to the emerging and evolving theory; hence the term theoretical sampling (Cohen *et al.*, 2018). According to Charmaz (2014), in grounded theory data collection, the initial purposive sampling gets you started; and the theoretical sampling guides where to go thereafter.

A total sample size of 20 interviewees comprised of multiple comparative groups in the form of 11 start-up founders, six business mentors and three identified industry experts proved sufficient for the development of the theory. The criteria for selection were as follows:

- Start-up founders - had to be current incubatees of the Innovation Hub in either the eKasiLabs or BioPark incubation programme with a business that has been operational for at least three years.
- Business mentors - had to be involved in mentorship at the Innovation Hub in the eKasiLabs or BioPark programme for at least a year.
- Identified experts - chosen based on their academic output and long-term involvement in small business incubation and the start-up ecosystem in South Africa.

The non-probability sampling methods used were the most suitable choice for this type of study because purposive or judgemental sampling ensures that only participants or cases that fit with the parameters of the study are selected for inclusion (Pascoe, 2014). This saves time and effort and ensures that only relevant data are collected. Additionally, theoretical sampling is considered a major strength of the grounded theory approach as it allows data collection to match the data required to ensure a final theory that fits the problem being investigated (Bezuidenhout and Cronje, 2014).

In utilising non-probability sampling methods, it should also be borne in mind that they can never be representative of a population as not all potential participants who meet the population parameters for the study have an equal chance of being selected for inclusion into the study (Pascoe, 2014). Therefore, study results cannot be generalised beyond the scope of the research setting to a larger population (Babbie, 2016). However, generalisability to a larger population was not the goal of this study.

4.8 OVERVIEW OF THE RESEARCH PROCESS

Saunders *et al.* (2019) utilise the concept of an onion to depict issues underlying the choice of methods and procedures available to a researcher. The methodological choices of this study are represented in the adapted research onion presented in Figure 4.1 on the following page.

The research onion highlights how the researcher's worldview, as the outer layer of the onion, encompasses and thus, influences all other concerns of the research project. There needs to be methodological alignment from the research paradigm down to the techniques used for data collection and analysis. The pragmatist paradigm that governs this study has already been discussed earlier in this chapter. A pragmatist standpoint influenced all other methodological choices of the study. Given the exploratory nature of the research, and the need to develop an explanatory theory regarding disruptive innovation capability in South Africa's BoP environment, a qualitative research design and grounded theory approach were deemed to suit the requirements of the study.

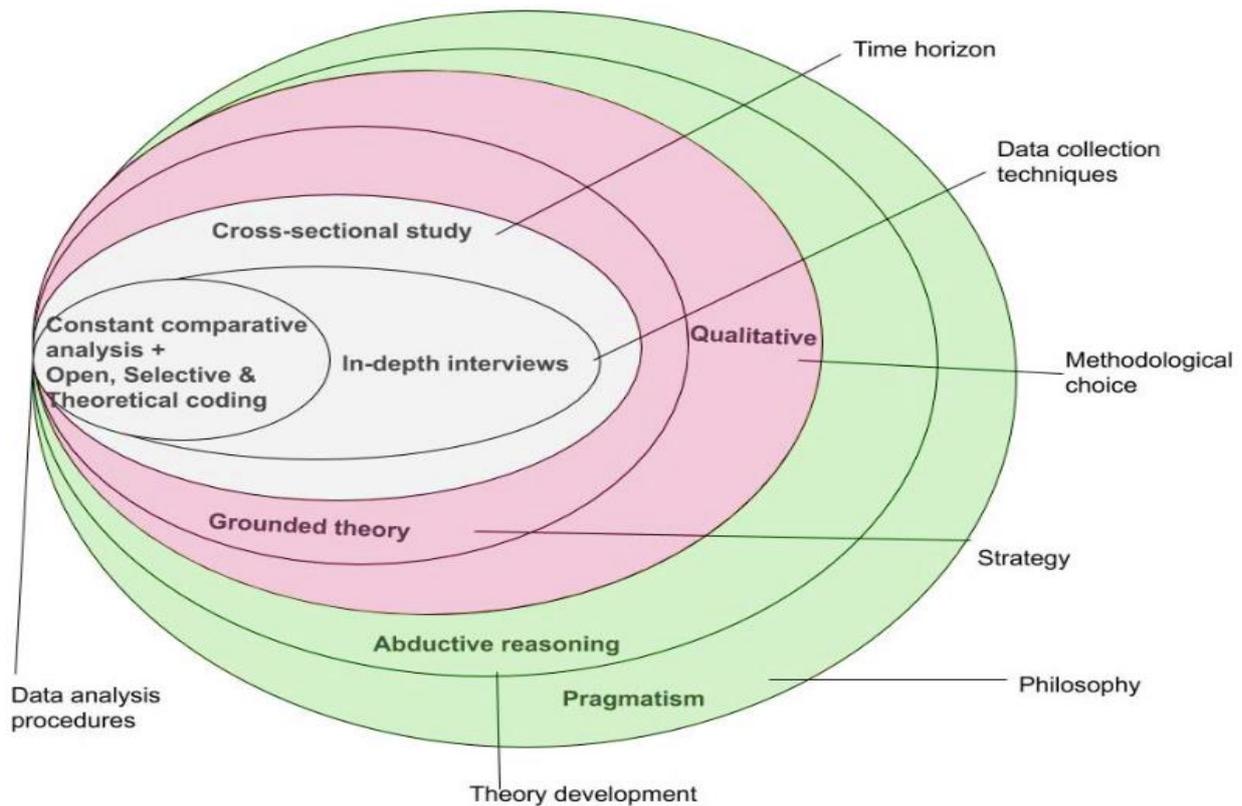


Figure 4.1: Overview of the research process

Adapted from Saunders *et al.* (2019)

Exploratory research questions are best investigated through in-depth interviews with a purposively selected sample of participants that are judged to be able to give rich and thick descriptions of the phenomenon under investigation (Bloomberg and Volpe, 2019). Congruent with a grounded theory methodology, data collection and analysis were intertwined using the constant comparative method where concepts obtained from the analysis of earlier interviews informed the next stage of data collection until theoretical saturation was reached. The following sections will delve deeper into the components of the research design not yet articulated thus far.

4.9 THE RESEARCH DESIGN

Cohen *et al.*, (2018) define the research design as the plan and foundation for approaching, operationalising, and investigating the research problem. The research design involves explicitly setting out the approach, theories, and methodologies that will be employed; the types of data collected from the study population, data analysis procedures, interpretation, and reporting of findings, as well as the degree of trust that can be placed in the quality of the research process. In essence, a good research

design enables the researcher to answer the research questions truthfully. To facilitate an understanding of the research problem, this study used a grounded theory strategy as articulated by Corbin and Strauss (1990; 2015) as illustrated in Figure 4.2 below.

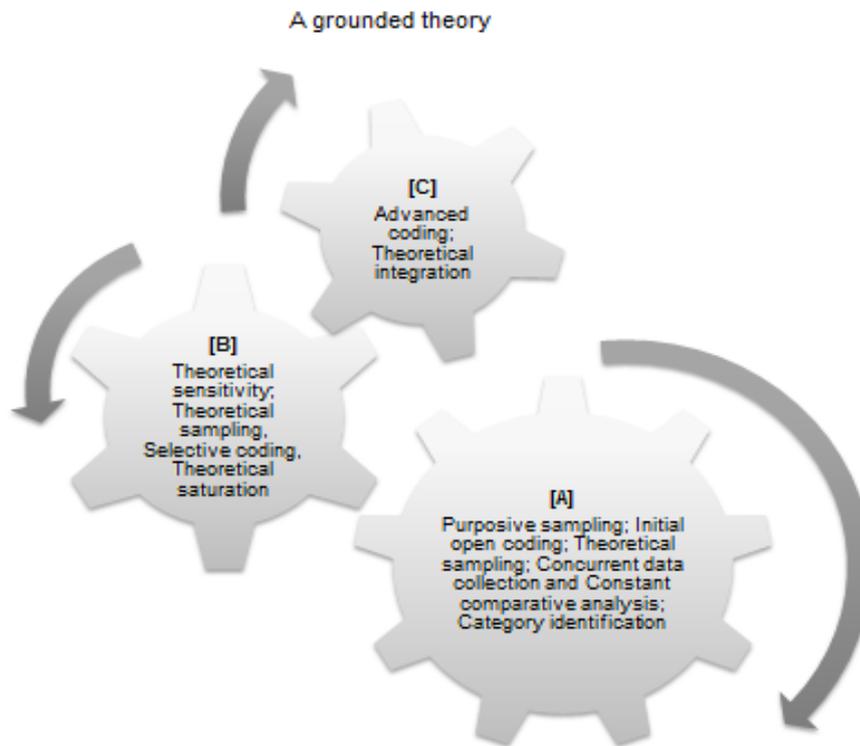


Figure 4.2: Research design overview

Source: Adapted from Birks and Mills (2015)

The grounded theory method is a multistage process whose end goal is to build theory (Okta, 2012). According to Birks and Mills (2015), the systematic procedures of the grounded theory approach work together like the gears on a piece of machinery to enable the researcher to generate and refine data collected in the field into a substantive theory. Cog [A] constitutes the backbone and initial stages of a grounded theory methodology. It begins with purposive and theoretical sampling of study participants, followed by several iterations of open coding, concurrent data collection and analysis, constant comparison, and category identification. The smaller cogs [B] and [C] comprise of the techniques that take the study to higher levels of analysis and abstraction moving beyond mere qualitative description to an explanatory theory of the phenomenon under investigation. These techniques include theoretical sensitivity, selecting a core category, achieving theoretical saturation, and theoretical integration. Employing these methods

refines the data analysis process and increases the comprehensiveness of the final theory developed.

Original formulations of grounded theory specified that a literature review should not be conducted before data is collected and analysed to avoid contaminating emerging theory with preconceived notions (Barney and Glaser, 1967; Corbin and Strauss, 1990). However, this study followed a modified Straussian approach to the grounded theory method (Corbin and Strauss, 1990; 2015) in that a literature review was conducted before data collection in the field to satisfy the requirements of the degree programme. A conceptual framework was developed from an extensive review of the literature and presented in chapter three of the study. However, the literature reviewed and conceptual framework developed were non-committal to allow theory to emerge solely from the data collected (Urquhart, 2013). The propositions developed in the conceptual framework are based on innovation systems literature, disruptive innovations literature and BoP literature. Nonetheless, the propositions developed were not used to test the theories reviewed but solely to increase the theoretical sensitivity of the researcher and as an initial guide in the data collection process. Care was taken to ensure that any new concepts were allowed to emerge from the data collected and thus, theoretically guide the study.

4.10 UNIT OF ANALYSIS

According to Mouton (2013), the unit of analysis refers to the object, phenomenon, entity or event that is under investigation. Creswell (2018) also refers to non-human entities such as programmes, events, activities or processes as units of analysis. Babbie (2016) notes the difference between the unit of analysis as defined above and the unit of observation. The unit of observation is the object from which data are collected to indirectly give us information about the phenomenon under study. This study sought data from various research participants, as the units of observation, in the form of entrepreneurs, industry experts, and business mentors to indirectly obtain data on the actual unit of analysis, which is the entrepreneurial processes of NTBCs operating in South Africa's BoP environment. The grounded theory approach is particularly suited to the development of process theories that account for how things happen in a social setting (Locke, 2011). Corbin and Strauss (1990) note that in the grounded theory approach, it is usually not the individuals in the study who are the units of analysis. It is

the concepts that make up the phenomenon that is under study that are the units of analysis.

4.11 DATA COLLECTION METHODS

Data collection methods are the means by which data are gathered from the study population. Data was collected using in-depth, semi-structured interviews which Saunders *et al.* (2019) define as a purposeful discussion between two or more people. According to Strydom and Bezuidenhout (2014), the best way to obtain data on the views, opinions, and beliefs of persons towards a particular phenomenon is through systematic interviewing of a small sample of the population. Myers (2013) contends that interviews are one of the most important data collection techniques in qualitative studies and are used in almost all types of qualitative research. This is because interviews can be used to obtain exploratory and descriptive data by getting in-depth information and generating thick descriptions as reported by study participants (Hesse-Biber and Leavy, 2017; Bloomberg and Volpe, 2019). The interview questions were structured in such a way as to facilitate the collection of mainly contextual and perceptual data on the operating environment of technology-based start-ups in South Africa's BoP environment and the organisation-specific factors that influence disruptive innovation capability.

4.11.1 DATA COLLECTION PROCEDURES

Twenty face-to-face interview sessions with purposively selected start-up founders, business mentors and industry experts were conducted over three months from October to December 2019. The interview process was as follows:

- e-mails with the study details were sent to potential study participants. In some instances, follow-up phone calls to the participants were necessary to facilitate their participation;
- willing participants responded with a proposed date and time convenient to them for a face-to-face interview, and in two instances, for a Skype™ interview;
- per ethical practice, all interviewees were requested to read and sign a consent form to indicate that they were aware of what the study was about, and they voluntarily agreed to participate (see Appendix A);
- all interviews were recorded using an audio recording device to ensure the accuracy of data collected;

- transcription of interviews was done by the researcher and took place as soon as possible after each interview, typically on the same day as the interview while the events of the interview were still fresh in the interviewer's memory. Transcription by the researcher had several advantages in that it ensured the accuracy of notetaking and allowed the researcher to keep track of any non-verbal expressions made by interviewees during the interview. These non-verbal cues were noted in the nascent data analysis. Transcription also allowed the researcher to familiarise herself with any emerging themes that could start the initial open coding process;
- a field note journal was kept during the interviewing process to take note of any participant behaviour that the audio recording device could not capture and any interesting impressions that the researcher got that needed to be noted. The field note journal also served as a memo-writing tool.

4.11.2 INTERVIEW PROTOCOL

A series of open-ended questions, with some probes, was developed based on the study's four research questions. A research question/interview question congruency matrix was developed (Castillo-Montoya, 2016) to ensure that the interview questions are anchored in the study aim and research questions. The resulting semi-structured interview protocol that was developed can be found as Appendix B. The format uses pre-formulated questions as a guide. However, there is no strict adherence to them, allowing for flexibility during the data collection process as new questions and meaningful insights are easily accommodated into the interview as they arise (Myers, 2013). It also allows for sensitivity to any emergent themes that may come up during the interview (Myers, 2013; Bloomberg and Volpe, 2019). The interview sessions lasted between 25 minutes and 1 hour and 30 minutes in duration. There was no need to conduct pilot interviews. Following the grounded theory approach, responses from each interview informed the following interview(s) in a self-correcting and analytical process as sampling proceeds on a theoretical basis (Charmaz, 2011; Castillo-Montoya, 2016).

Advantages and disadvantages of in-depth face-to-face interviewing

Opdenakker (2006) notes that face-to-face interviews are synchronous in time and place as the interviewer and interviewee(s) are both present at the same place at the time of interviewing. This offers advantages such as:

- It allows the researcher to take note of and take advantage of social cues such as voice intonation and body language that the interviewee(s) may exhibit. Richer information can, therefore, be added to the interviewees' verbal answers (*ibid.*).
- Alshenqeeti (2014) notes that this synchronicity ensures that more accurate data is collected as interview questions can be rephrased for understanding, and unclear responses can be probed further.
- There is no time delay between the posing of questions and receiving a response. This saves time in terms of data collection as well as enables the interviewer and interviewee(s) to react to what the other says or does (Opdenakker, 2006; Cant and van Heerden, 2013).
- Synchronicity also allows the interviewer to create rapport with the interviewee(s) and create a good interview ambience. This may enable the interviewee(s) to open up more and provide details that might not have come to light otherwise (Opdenakker, 2006).

The main **disadvantages** associated with face-to-face interviewing are linked to its synchronicity of time and place, and self-reporting bias.

- There is a chance of subconscious bias creeping in during the interviewing process (Alshenqeeti, 2014) where the visibility of the interviewer leads to negative interviewer effects (Opdenakker, 2006). The interviewee may inadvertently react to interactions with the interviewer and answer questions in the way they think the interviewer wants to hear. Opdenakker (*ibid.*) notes that an awareness of this effect on the part of the interviewer goes a long way in mitigating its effects.
- Face-to-face interviews are affected by the nature of self-reporting. Interviewees tend to reveal information from their personal perceptions and opinions of events. These perceptions and opinions are subjective, being influenced by time lapses, faulty memory, and incomplete knowledge. The views interviewees hold might even be “a considerable distance from reality” (Alshenqeeti, 2014: 43) where the information an interviewee presents is not what actually occurred.

4.12 GAINING ACCESS

The ability to collect the requisite data is an important aspect of the research process. Myers (2013) and Saunders *et al.* (2019) highlight that the ability to gain both physical and cognitive access to the data required to answer research questions directly impacts the feasibility and quality of the research study. The management of an organisation typically grants physical access to a specified research site. However, this is not the only access that a researcher should be concerned with, as they also need to consider cognitive access. Cognitive access means gaining unobstructed access to the correct participants or data to obtain a truthful representation of the social reality and phenomenon under study (Saunders *et al.*, 2019).

Various strategies, as suggested by Saunders *et al.* (2019), were employed to gain physical and cognitive access to the research site. The researcher approached The Innovation Hub Management Company directly to negotiate access to the research participants by establishing credibility, providing a clear account of the purpose of the research, and using suitable language. After physical access to the research site had been granted, the researcher made use of existing contacts and developed new ones; thereby developing access on an incremental basis, to gain access to specific study participants.

4.13 DATA ANALYSIS PROCEDURES

Qualitative data is associated with large amounts of textual data that needs to be sorted and analysed. According to Mouton (2013:108), all qualitative analysis procedures inherently involve “breaking up” textual data into manageable and identifiable themes, patterns, trends and relationships. Corbin and Strauss (2015) also note that any qualitative data analysis involves thinking about the data and designating concepts to the data that stand-in for the meaning intended by the participants. It is the process of analysis that gives the collected data significance.

In order to develop a framework/theory of disruptive innovation capability in BoP environments, this study employed grounded theory analysis procedures proposed by Corbin and Strauss (1990; 2015) as a guideline. Strauss and Corbin’s so-called revised approach to grounded theory analysis is much more systematic and prescriptive than the original model proposed by Glaser and Strauss in 1967 (Cohen *et al.*, 2018). While the revised model has been criticised as introducing rigidities into a methodology that is

supposed to be free-flowing and open to allow theory to emerge from data (Glaser, 2011), Corbin and Strauss (1990; 2015) sought to provide strategies to students and new researchers struggling with the complexities of the methodology by providing a systematic framework for grounded theory analysis (Kearney, 2007). Bryant and Charmaz (2007) note, however, that Corbin and Strauss' approach should be seen as a guideline and is not meant to be followed to the letter regardless of the research context. Kelle (2019) also notes that beginner researchers are likely to benefit more from the revised approach to grounded theory as its systematic procedures help novices to avoid drowning in the data. The typical stages in the data collection and analysis process as proposed by Corbin and Strauss (1990; 2015) are shown in Figure 4.3 below.

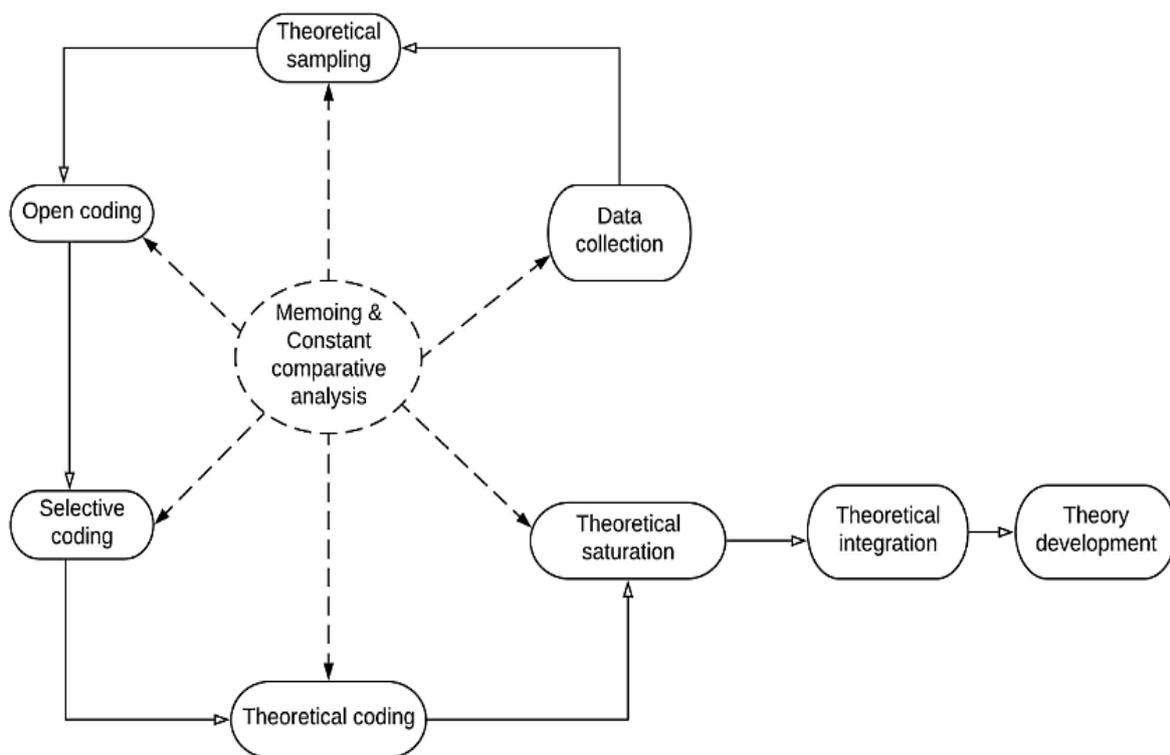


Figure 4.3: Data analysis process

Source: Author construct

Various methodologists have often lamented how many studies that purport to be grounded theory studies are often just qualitative descriptive studies with one or two elements of the grounded theory method added in (Suddaby, 2006; Hood, 2007; Oktay, 2012; Urquhart, 2013; Birks and Mills, 2015; Bryant, 2017). The following subsection clarifies how some of the essential elements of the grounded theory method, as presented in Figure 4.3, were applied to this study.

4.13.1 THEORETICAL SAMPLING

Theoretical sampling is the process of allowing emerging research concepts to guide data collection (Corbin and Strauss, 2015). Previously collected and analysed data guide the researcher in where to collect the next relevant pieces of theoretical data. New data are collected solely based on their perceived theoretical importance (Hood, 2007; Birks and Mills, 2015). Therefore, a grounded theory sample evolves as the study progresses because it cannot be pre-determined in advance for representativeness. This was proven in the current study by the fact that the researcher initially only intended to interview start-up founders in the eKasiLabs programme at the Innovation Hub. However, upon entering the research site, it became clear that the study also needed to include start-up founders in the BioPark programme given their innovativeness in harnessing technologies to bring novel products to market. Furthermore, some concepts that later evolved into sub-categories, such as the concept of “indigenous knowledge”, were not on the researcher’s radar beforehand and only came to light in the research field. This led to seeking out business mentors and industry experts that could shed light on this concept and the reformulation of some interview questions further bearing out the evolving nature of theoretical sampling in the grounded theory approach.

4.13.2 CODING

In qualitative research, a code is a word or short phrase that attaches a conceptual meaning to raw data (Urquhart, 2013; Saldaña, 2016). When codes are linked together into relationships, they can achieve a higher level of abstraction in the form of concepts, categories and themes (Urquhart, 2013; Corbin and Strauss, 2015). Hence, the coding process in grounded theory studies is the foundational stage of all data analysis. According to Saldaña (2016), coding represents a transitional stage between data collection and more intensive data analysis. All the data for this study went through three cycles of coding comprised of initial or open coding, selective coding, and theoretical coding, as shown in Figure 4.4 following.

Saldaña (2016) proposes several coding methods. First cycle coding methods are more direct and apply to the initial fracturing and sorting of the raw data, while second cycle methods typically require higher-level analytical skills (*ibid.*). The appropriate coding methods for this study were chosen based on their alignment to the grounded theory methodology, as well as alignment to the research questions. The first coding cycle of initial or open coding simultaneously applied thematic coding (Saldaña, 2016; Gibbs,

2018), process coding (Charmaz, 2014; Corbin and Strauss, 2015) and in-vivo or substantive coding (Oktay, 2012; Charmaz, 2014) on the data corpus.

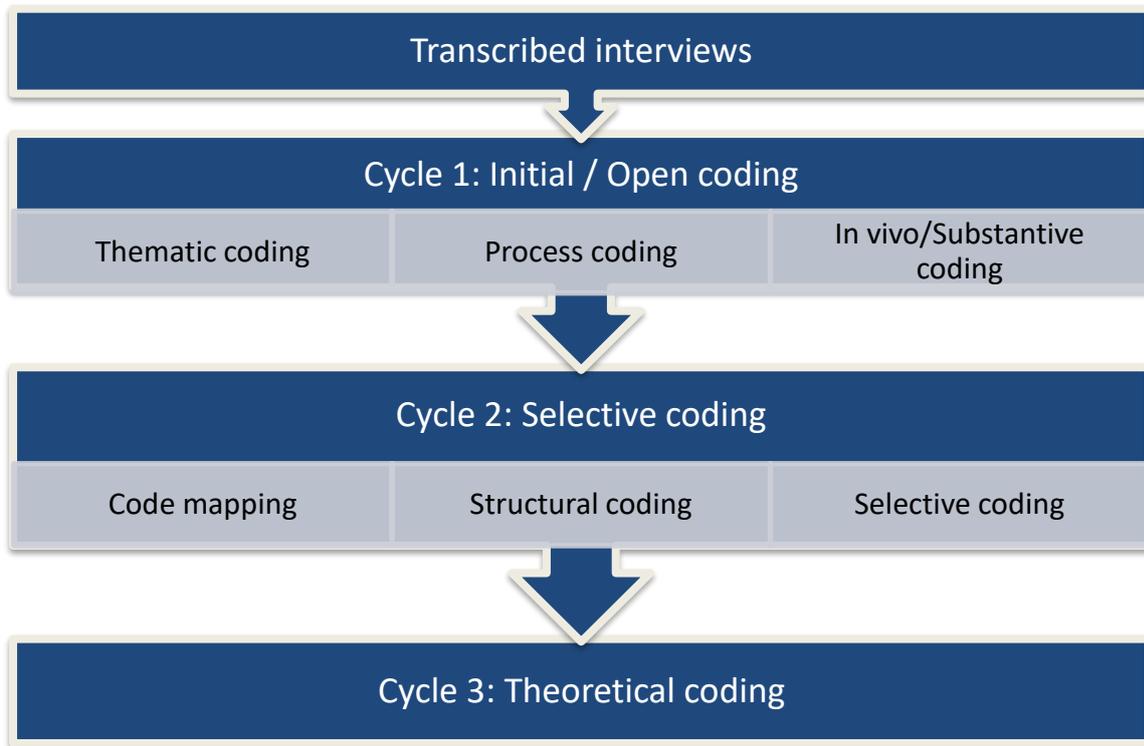


Figure 4.4: The coding process

Source: Author construct

Thematic coding, also known as theming the data, is the use of a phrase or sentence that identifies what the data is about or its meaning (Saldaña, 2016). Passages of text are linked together by a common analytic idea. Thematic codes or categories may be gleaned from the literature, research or interview question topics, or other previous knowledge held by the researcher (Gibbs, 2018). Process coding, also known as action coding, gerunds words to highlight actions taken by participants (Charmaz, 2014). Action and interaction are important processes in the grounded theory approach and may point to more abstract theoretical concepts (Corbin and Strauss, 2015). In-vivo coding applies the terms used by the participants themselves to code the data (Charmaz, 2014). The codes are therefore based solely on the data rather than on previous literature (Oktay, 2012).

After the initial coding process, 144 codes were extracted from the data corpus. The codes were cleaned up to merge similar codes and delete redundant codes to remain with a total of 112 codes. The second cycle of coding facilitated the categorisation of codes and was enabled by code mapping, focused coding and structural coding. Code mapping involves organising and categorising the full set of codes into conceptual

categories (Saldaña, 2016). Structural coding makes use of a conceptual phrase that relates to a specific research or interview question as a way of categorising data for further analysis (*ibid.*). Codes are, therefore, categorised based on conceptual similarity and their frequency of occurrence (Charmaz, 2014). These processes enabled the codes to be abstracted to a more conceptual selective coding process. In the grounded theory approach, selective coding involves identifying a core category that is central to the theory and presents as an overarching explanatory concept. All other concepts and categories are linked and related to the core category (Corbin and Strauss, 2015). Urquhart (2013) defines selective coding as the process of abstracting codes into categories that are pertinent to the research problem at hand. Through code mapping, structural coding and a selective coding process, a total of nine categories and one core category emerged.

The final stage of theory generation in the grounded theory approach involves theoretical coding. This stage consists of relating the abstracted categories from the selective coding process to each other as a means of building theory (Charmaz, 2014; Urquhart, 2019). Theoretical coding enables the researcher to pull all the research threads together in the process of integrating theory that links all the categories and sub-categories around the core category to construct a logical and plausible theoretical framework explaining the phenomenon under study (Corbin and Strauss, 2015). The use of memos enhanced theoretical integration. Integrative memos pull together the different research threads and ideas into a cohesive whole (*ibid.*). Theoretical coding also involved relating the emergent theory to existing knowledge in the areas of innovation systems, disruptive innovations and innovating in resource-constrained environments. Doing this enhances the explanatory power of the developing grounded theory (Birks, Hoare & Mills, 2019).

4.13.3 MEMO-WRITING

Memos are written records of a researcher's thinking during the research process (Birks and Mills, 2015). Memos record the researcher's ideas, thoughts, questions, insights, observations, conjectures, etc. (Oktay, 2012; Cohen *et al.*, 2018). Birks and Mills (2015) view memos as intellectual assets for a grounded theory researcher as those written down notes can address operational and theoretical matters that will, in time, transform into the grounded theory findings. The sorting of memos also aids in theoretical integration (Corbin and Strauss, 2015). There was continuous and extensive memo-

writing during the data collection and analysis stages. The memos were recorded in a field note journal and ATLAS.ti software. They included analytic, commentary, and theoretical memos. Saldaña (2016) likens memoing as a place for the researcher to dump their brain during the grounded theory research process as memoing allows the researcher to think about the data, participants, and phenomenon under investigation. It also aids in researcher reflexivity. The memos were later sorted through to facilitate the construction of the final theoretical construct of disruptive innovation capability in South Africa.

4.13.4 CONSTANT COMPARISON

The grounded theory method makes use of inductive and abductive reasoning to compare any new data collected in the field against other data for similarities and differences (Oktay, 2012; Reichertz, 2019). This is known as the constant comparison technique, as data collection and data analysis are intertwined and iterative (Hesse-Biber and Leavy, 2017). Incidents are compared to other incidents, incidents to codes, codes to categories and so forth until the theory is fully integrated (Corbin and Strauss, 2015; Birks and Mills, 2015). Therefore, as an incident or code is discovered, it is considered provisional until it has been compared to other incidents etc. and earns its way into the theory (Corbin and Strauss, 1990). Categories and theories must be modified until all data is accounted for, including all discrepant cases, and there is a perfect fit (Cohen *et al.*, 2018). Doing constant comparisons guards against researcher bias and helps to achieve greater precision and consistency in the final theory (Corbin and Strauss, 2015). Constant comparison was utilised throughout the entire data analysis process as new data in the form of findings from interview transcripts was compared to existing data until all codes, emerging categories and theory were fleshed out and refined.

4.13.5 THEORETICAL SATURATION

Data collection in the grounded theory method continues until a point of saturation is reached (Glaser and Strauss, 1967). That is to say, no new concepts are emerging from additional data collection (Oktay, 2012), and further data collection and analysis adds little in terms of conceptual value to the already collected data, even though some variations may still be found (Corbin and Strauss, 2015). Suddaby (2006) notes the signs of saturation as the repetition of information and confirmation of existing

conceptual categories. While it may be impossible in practice to reach saturation on all categories, Corbin and Strauss (2015) note that the core category should at least be saturated. Theoretical saturation for the study was deemed to have been reached at around the 16th interviewee when data collected supported the emerging theory satisfactorily. However, four additional interviews were conducted to satisfy the researcher that data collection had not been prematurely concluded. The last four interviews (three start-up founders and one industry expert) did not yield any new concepts or variations on the provisionally developed theory, nor did they yield any new theoretical insights (Charmaz, 2014). At this stage, the theory was considered ready to be integrated and presented.

The data analysis phase was enhanced by using ATLAS.ti software. Using a software programme was useful in storing, sorting, retrieving, and assigning researcher generated codes to the large amounts of textual data in the form of transcribed interviews and memos produced throughout the research process. It should be noted; however, that the use of software did not in any way replace the researcher's insights as the software was merely used as a means of mechanically organising the large amount of textual data generated and not as an analysis tool.

4.14 ETHICAL CONSIDERATIONS

Dictionary definitions of the word ethics bring to mind issues of morality and doing the right thing. Mouton (2013) defines ethics in research as what is wrong, and what is right in the conduct of research. Louw (2014) further notes that a researcher with integrity commits to act in a trustworthy and respectful way towards all research stakeholders, even when confronted with difficulties. These stakeholders include the research participants, the research community, the academic institution one is affiliated with, policymakers, mass media, and the public at large.

In order to uphold the highest ethical principles while this study was being conducted, the following issues were dealt with during the research process from the perspectives of gaining access, collecting the data and publishing of results:

- There was truthful and full disclosure of information regarding the nature of the study to the study participants beforehand so that they could give informed consent (Appendix A).

- Confidentiality was maintained before, during and after the study. Participants were given the option to participate anonymously. In transcribed interviews, participants were given codes and not referred to by their real names.
- Written permission was sought to research the study site from TIHMC executive management before data in any form was collected (Appendix C).
- Findings were reported completely and honestly. Respondents were given an option to fact check the results of the study and their contribution in it through member checking.
- In reporting the results, the researcher committed to not falsifying information, distorting results, misusing information, or plagiarism.
- Ethical clearance from the University of South Africa (UNISA) Ethics Committee was applied for and granted (Appendix D). The researcher abided by the ethical tenets of UNISA – School of Business Leadership (SBL) before, during and after the field research.
- The researcher ensured that no harm came to the study participants or organisations involved from taking part in the study or through reporting of the study findings.

4.15 RESEARCH QUALITY

The consumers of the final product of research, such as the academic community, policymakers and the public at large need to be able to have confidence in the truthfulness of researchers and findings of research products (Koonin, 2014). In quantitative research, this refers to the validity and reliability of research findings as it relates to the measurability of results. However, qualitative research uses different criteria to evaluate the quality of research products. The criterion used is called trustworthiness, which evaluates textual and contextual evidence as opposed to numerical evidence, as is the case in quantitative studies (*ibid.*).

Trustworthiness in qualitative research is a process whereby the researcher convinces the audience that they have “gotten it right” (Hesse-Biber and Leavy, 2017: 326), and “can the findings be trusted?” (Korstjens and Moser, 2018: 120). Nevertheless, scholars highlight that there are no set standards to determine the quality of the research product in qualitative research (Armstrong, 2010) as the qualitative research field is multifaceted and populated by a multitude of viewpoints due to a multiplicity of paradigmatic perspectives (Anderson, 2017). As a result, achieving trustworthiness is not an easily

attainable outcome (Hesse-Biber and Leavy, 2017) as the values for quality are always evolving and are context-bound (Tracy, 2010; Welch and Piekkari, 2017). There are, however, several characteristics that are considered as general indicators of quality in qualitative research designs. For this study, the criterion of trustworthiness in qualitative research will be assessed in the following sub-sections under its sub-categories of credibility, transferability, dependability, confirmability, and authenticity.

4.15.1 CREDIBILITY

Shenton (2004) defines credibility as an attempt to show that an accurate picture of the phenomenon under study is being presented in the research product. Credibility is the equivalent of internal validity in quantitative research (Kortsjens and Moser, 2018) and it is an indicator of how accurately a researcher has interpreted the data to represent the participants' original views (Koonin, 2014). Triangulation is one of the ways that scholars suggest to ensure the credibility of findings (Lincoln and Guba, 1988; Shenton, 2004; Tracy, 2010; Armstrong, 2010). Triangulation involves using more than one research method, data collection technique, research site or data source in gathering data (Myers, 2013) and then looking for convergence in the research findings (Hesse-Biber and Leavy, 2017). This study used various data sources in the form of start-up founders, business mentors, and industry experts to investigate the research questions and increase range and breadth of perceptions so as to increase the credibility of findings. Armstrong (2010) notes that good qualitative studies are time-consuming as the researcher needs to become thoroughly acquainted with the study site, its inhabitants, and its context. Without a full immersive understanding of the research site and its population, the results of the study may be inferred out of context. Prolonged engagement with the research site is often suggested as a hallmark of good qualitative studies (Anderson, 2017). For this study, the researcher engaged with the site and its population even before the actual data collection process began. Information that was already in the public domain was obtained through perusing newspaper articles, organisational websites, social media accounts and past interviews on the internet. Prolonged engagement was also achieved by undertaking preliminary visits to the research site to familiarise with its context and inhabitants.

Furthermore, the researcher was invited to and was involved in many activities at the Innovation Hub from October 2018 to October 2019 whilst processing institutional ethical clearance requirements. These activities included attending conferences, such as the

International Association of Science Parks and Areas of Innovation (IASP) - Africa Region Workshop and the Tshwane Leadership Summit; workshops, such as various CoachLab and Innov8 sessions; and awards ceremonies, such as the Gauteng Accelerator Programme (GAP) awards. Attendance of these functions assisted with engagement with the research site and setting as it enabled interaction with many entrepreneurs, programme managers, executive committee members and other stakeholders at the Innovation Hub. Prolonged engagement also allowed the researcher to build trust with the participants and to test for misinformation during the actual data collection stage (Anderson, 2017).

Credibility of the findings was also enhanced through the use of thick descriptions, which Tracy (2010) defines as the use of concrete detail and in-depth explanations of implied knowledge. Shenton (2004) notes that without these in-depth details and explanations, it becomes difficult for a reader to assess the accuracy of findings. This study includes verbatim quotes from the participants and a full description of the research site to provide concrete detail and explications of findings. Allowing the voices of the participants to be heard in the research findings (Welch and Piekkari, 2017) was also accomplished by using in-vivo codes during the coding process. Furthermore, the core category, which was the overarching explanatory concept for the final theoretical construct of the study (Corbin and Strauss, 2015) was generated from a term used by some of the participants themselves.

Member checks were employed (Welch and Piekkari, 2017) to verify data and interpretation accuracy by asking willing participants to review the findings and their role in the study. Three participants, who agreed to conduct member checks agreed with the conclusions and interpretations of the researcher and in some cases, gave additional insights. Peer scrutiny of the research product through conferences and colloquia and reference to previous research findings to assess consistency with current findings were other measures employed to improve the credibility of the study findings (Shenton, 2004).

4.15.2 TRANSFERABILITY

Transferability refers to the extent to which the research findings can be applied to a similar situation, or how the research audience can draw inferences from the research findings to their, or a similar situation (Lincoln and Guba, 1988; Koonin, 2014). To enable transferability, the research must provide thick descriptions in the narrative about the fieldwork, research site and research context for the readers to be able to draw

inferences from the study findings to another setting (Shenton, 2004). As noted earlier, in-depth descriptions of the research site, participants and research methods employed were provided elsewhere in this work to enhance the transferability of findings.

Transferability can also be achieved through the purposeful sampling of multiple voices (Johnson and Rasulova, 2016). This was accomplished by interviewing multiple data sources in the form of start-up founders, business mentors, and industry experts to uncover multiple perspectives on the phenomenon and ensure concept saturation. Tracy (2010) refers to the transferability criterion as resonance and contends that research findings that resonate will influence or move readers to action and thus have transferable findings. Findings may influence readers through their theoretical contribution, heuristic value, or policy action applicability (Lincoln and Guba, 1988; Tracy, 2010). Hood (2007) and Corbin and Strauss (2015) note that as the concepts in a grounded theory become more abstract, the theory developed becomes more widely applicable to a variety of settings not just to cases that are similar to the ones a researcher has studied. Therefore, it may be conceivable that the theoretical construct developed in this study will resonate with readers and transfer to other areas of knowledge.

4.15.3 DEPENDABILITY

According to Koonin (2014), the dependability criterion refers to how data collection methods, data analysis and the theory developed from the data collected are integrated so that another researcher may be able to replicate the research process in the future if need be. This criterion is challenging for qualitative researchers to meet as all qualitative research is context-bound and results obtained by one study may not be replicable, even when the same methodological procedures are employed in another study (Shenton, 2004).

In order to meet the dependability criterion, Tracy (2010) suggests achieving meaningful coherence in the study. Meaningful coherence involves using methods and procedures that fit the research goals and connecting the literature, research questions, findings, and interpretations into a meaningful whole. Armstrong (2010) suggests that achieving transparency and rigour in the research process goes a long way towards achieving dependability. Transparency can be accomplished by providing an audit trail with detailed descriptions of how the fieldwork was conducted, how the researcher interacted with the participants and other minute details of what was done in the field, including

how and why the researcher proceeded as they did (Korstjens and Moser, 2018). A field note journal was kept throughout the data collection process to record occurrences and choices made while in the field. Additionally, transparency of research processes was greatly enhanced by extensive memo-writing during the data collection and analysis phases.

4.15.4 CONFIRMABILITY

According to Korstjens and Moser (2018), the confirmability criterion includes aspects of neutrality and consistency in the research process. It refers to how well findings are supported by the data collected in the field. In qualitative studies, a researcher cannot be an objective observer. It is not only unachievable; it is also not the aim of qualitative inquiry (Lincoln and Guba, 1988). The researcher is fully immersed in the research context, as a subjective observer and as the research instrument (Hesse-Biber and Leavy, 2017). As a result, to eliminate biased results, others who scrutinise the research process must reach similar conclusions as the researcher did (Koonin, 2014). This study used a grounded theory methodology and measures were taken through the open, selective, and theoretical coding processes to ensure that the study findings were grounded in the data. The analytical techniques of data collection and analysis in the grounded theory approach, as proposed by Corbin and Strauss (2015) were applied methodically. Where they were not applied as suggested, such as in conducting a literature review before data collection, these deviations to the process were noted and justification provided for such variations. Taking these steps ensured that findings were emerging from the data and not from the researcher's own biases and predispositions. Confirmability can also be achieved by exercising reflexivity (Welch and Piekkari, 2017). This is when a researcher acknowledges that their social biography, such as their beliefs, attitudes, and inclinations influence the choices they make in the research process and this can have an impact on the research findings (Hesse-Biber and Leavy, 2017). In qualitative research, the researcher is a vital component of the research process as a subjective generator of data (Bryant, 2017; Hesse-Biber and Leavy, 2017). It is, therefore, essential for a qualitative researcher to be self-aware and reflect on how their social biography affects data collection, analysis and interpretation of data (Korstjens and Moser, 2018). The researcher kept reflexive notes in the form of memos on her subjective responses to the research site and individual interviewees,

observations on participant responses, and assumptions and views held prior to data collection.

4.15.5 AUTHENTICITY

According to Johnson and Rasulova (2016), the authenticity criterion for assessing qualitative research quality was introduced in response to calls for research to be more transformative and emancipatory. In essence, research must have some sort of positive impact on the population being studied, whether in the form of recommending improved practice or policy, spurring participants into action or in allowing the individuals or groups to appreciate the viewpoints of others. To accomplish authenticity, the researcher must fully and truthfully portray the meanings and experiences of the phenomenon as they are lived and perceived by the entirety of the research participants (Whittemore, Chase & Mandle, 2001; Johnson and Rasulova, 2016).

The authenticity criterion is made up of five sub-components as suggested by Seale (1999) and Johnson and Rasulova (2016). They include:

- Fairness – the researcher must demonstrate that all viewpoints and realities are represented. This was accomplished by using multiple voices in the investigation by interviewing identified experts, business mentors, and start-up founders. A full range of views and perspectives was thus obtained, and elite bias was avoided.
- Ontological authenticity – the researcher must ensure that research participants show an improved understanding of the phenomenon after participating in the study. Disruption strategy and the processes of low-cost innovating were discussed with the study participants during the interviewing process. It is conceivable that they left the discussions with an improved understanding of the phenomenon and how they can apply it to their own business or strategic processes.
- Educative authenticity – the research process must help the participants to appreciate the viewpoints and situations of others in more informed ways, even though they might not necessarily agree with them. The processes of theoretical sampling and constant comparison enabled the researcher and interviewees to engage with each other's viewpoints and perspectives, and those of previous participants as the questions asked evolved because they were influenced by concepts gleaned from previous interviews, thereby plausibly allowing for educative authenticity.

- Catalytic authenticity – the research process or research findings must spur the participants to action given the new insights they would have gained. This study produced a framework of disruptive innovation capability in low-income environments that may assist NTBCs catering to South Africa's BoP market in developing their innovation strategies and assist policymakers in crafting ecosystem support strategies thus possibly achieving catalytic authenticity.
- Tactical authenticity – the research participants must feel empowered to act following participation in the research process. The study findings are available to participants at any time through the researcher as well as open access through the UNISA academic repository. By ensuring the accessibility of findings, participants may be empowered to act on them.

4.16 CHAPTER CONCLUSION

The chapter presented the techniques and procedures that were followed to provide answers to the stated research questions. Pragmatism was noted as being the philosophy underpinning this study. The grounded theory approach was identified as the research strategy that was employed for data collection, analysis, and interpretation. The Innovation Hub Management Company, as an incubator of NTBCs, was chosen as a suitable research site for the study. Participants were purposefully selected to facilitate an in-depth exploration of the organisation-specific and contextual factors influencing the disruptive innovation capability of NTBCs operating in the South African BoP environment. Data collection was through in-depth interviews, and the data collected was analysed through cycles of open, selective, and theoretical coding. Finally, factors that may affect the quality of the final research product were discussed under the criteria of trustworthiness. The next chapter presents the findings of the 20 in-depth interviews conducted with the research participants.

5 CHAPTER 5: FINDINGS

5.1 CHAPTER SUMMARY

The preceding chapter presented the methods and techniques employed to collect data from the 20 in-depth interviews conducted and how, using a grounded theory strategy, the collected data were analysed to answer the research questions. This chapter presents the findings from the data collection process. The chapter is organised as follows; an introductory section reiterates the study aim and discusses how the findings will be presented. The next section explains how the coding process evolved and the analytic process of linking codes to concepts and concepts to categories. Following this, brief biographical profiles of the participants are presented to contextualise the findings further. The findings are then presented, and the chapter is then concluded.

5.2 INTRODUCTION

This study sought to explore the perceptions and opinions of participants in the South African new technology-based company (NTBC) incubation space on the organisation-specific and contextual factors that enable disruptive innovation capability in low-income environments. Several key findings emerged from the 20 in-depth interviews conducted with the research participants. The findings are presented according to the study's research questions in a narrative format with illustrative quotations from the research participants that capture the diversity of perceptions and opinions on the phenomenon. The number of participants that raised a concept is noted by enumerating them or by using percentages which follows the format proposed by Bloomberg and Volpe (2019) on reporting qualitative findings. This use of numbers and percentages is merely to enhance clarity in the narrative and does not infer any statistical weighting or import. Tables and graphs are also used to support the diagrammatic representation of findings where applicable. To facilitate the emergence of research findings, the following section illustrates the analytical process of how codes were abstracted to concepts and then into categories using a grounded theory approach.

5.3 CODE AND CATEGORY DEVELOPMENT

The transcribed interviews went through three cycles of coding and constant comparative analysis until theoretical saturation was reached (Corbin and Strauss, 2015;

Bryant, 2017). The first interview was with two start-up founders running two separate companies. This turned out to be fortuitous as the conversation was lively and yielded very rich data. As a result, 73 codes were extracted from the first interview alone. Only an additional 71 codes were extracted from all further interviews conducted to give a total of 144 codes. Table 5.1 below shows the number of codes extracted per interview transcribed.

Table 5.1: Codes extracted per transcript

Participant number	Transcript number	New codes allocated	Cumulative codes
1 & 2	1	73	73
3	2	14	87
4	3	15	102
5	4	5	107
6	5	5	112
7	6	4	116
8	7	1	117
9	8	9	126
10	9	3	129
11	10	0	129
12	11	6	135
13	12	5	140
14	13	2	142
15	14	1	143
16	15	1	144
17 & 18	16	0	144
19	17	0	144
20	18	0	144

Thematic codes (Gibbs, 2018), process codes and in-vivo codes (Charmaz, 2014) were extracted from the interview transcripts. Through additional coding cycles, the original codes were abstracted to a higher conceptual level by organising and categorising them into higher-level concepts and themes/categories (Corbin and Strauss, 2015). Theoretical saturation was deemed to have been reached when no new concepts were emerging from additional data collection, and the data already collected gave an adequate explanation of what was going on with regards to the phenomenon being studied. Therefore, further data collection was yielding very little in terms of conceptual value (Corbin and Strauss, 2015; Cohen *et al.*, 2018). An example of the analytic process of abstracting codes to concepts and categories from the original data used in this study is shown in Table 5.2 following.

Table 5.2: Process of category development from raw data

Raw interview data	Codes	Concepts	Categories
<p>*The company was founded following my PhD work...at the Bone Research Laboratory...And it is during my PhD work, we, the team discovered a new way to make bone...So I became a technology entrepreneur, I decided to become one and started the company</p> <p>*The first point is being plugged into the community, know what the community wants...don't just do a product for the sake of yourself that does not meet what the community or the market requires</p>	<p><i>Prior founder knowledge benefits</i></p> <p><i>Extensive prior founder knowledge</i></p> <p><i>Market knowledge</i></p>	Initial knowledge base	Overcoming internal limitations
<p>*I think I was born innovative...it's not something that I was able to culture or cultivate...it's written in the DNA somewhere</p> <p>*I don't think even money is enough of a driver for it. Like you need to have a real solution that you are vested in, that you're passionate about, that you want to solve. If you are just doing it for money, you're going to get exhausted.</p>	<p><i>Innovativeness of entrepreneur</i></p> <p><i>Passion and drive</i></p>	Harnessing competencies and capabilities	
<p>*The process is something that we're working on continuously and improving...</p> <p>*...the learning capability then helps you to understand whether the environment that you're operating in does it require you to beat your competitor down or work with your competitor.</p>	<p><i>"Continuous improvement"</i></p> <p><i>"Learning capabilities"</i> <i>Strategic options</i></p>	Strategising in foothold market	
<p>* You have this big push now by the government to push innovations. So as long as we can prove a market...it's actually a good thing...</p> <p>*Another issue that has greatly hampered the innovativeness of small enterprises in South Africa is the Public Finance Management Act which hinders innovation procurement by the public sector.</p>	<p><i>Political will</i></p> <p><i>Regulations: stifling innovation</i></p>	Macroeconomic and regulatory context	Overcoming external constraints
<p>*...we are saying no to [VC funding] because we are at the point that we want to get in some more data first, we want to get more clients. We want to drive the valuation up then we'll talk to you.</p> <p>*...some don't even have a computer, you know, some don't even know that there are opportunities out there.</p>	<p><i>Negotiating funding</i></p> <p><i>Accessing support</i></p>	Ecosystem support	
<p>*And you have to educate them about your specific product and how it's going to actually make their one rand move to 2 rands</p> <p>*I think the one that would stand out is market access. The greater market doesn't really want to accept you until you have a well-oiled machine. But then who's willing to get their hands dirty and [be a lead user]</p>	<p><i>Consumer education</i></p> <p><i>Understanding operating environment</i></p>	Responding to context	

* Codes in quotation marks indicate in-vivo codes

Table 5.2 illustrates some examples of how raw data in the form of verbatim quotes from participants in the interview transcripts were coded. The codes were then organised into higher-order concepts, which are groups of codes that embody the same idea (Oktay, 2012). The concepts were further organised and grouped into higher-order conceptual categories. In grounded theory studies, categories are linked together to offer a theoretical explanation of the phenomenon under investigation (Corbin and Strauss, 2015). Therefore, groups of codes form concepts and groups of concepts form categories. Linking categories enables theoretical integration.

5.4 BIOGRAPHICAL PROFILES OF PARTICIPANTS

Interviews were conducted with 20 participants that were composed of three separate groups of participants, namely: 11 start-up founders or entrepreneurs, six business mentors, and three industry experts. Figure 5.1 below shows the breakdown of participants by group.

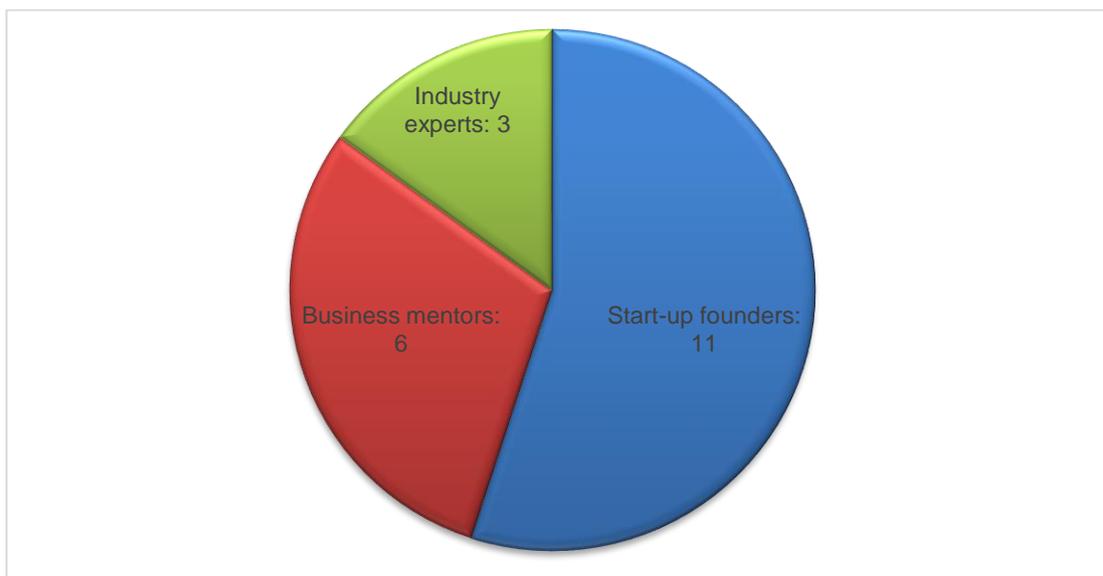


Figure 5.1: Number of participants by group

Most of the participants were male with an 80% representation, as shown in Figure 5.2 following.

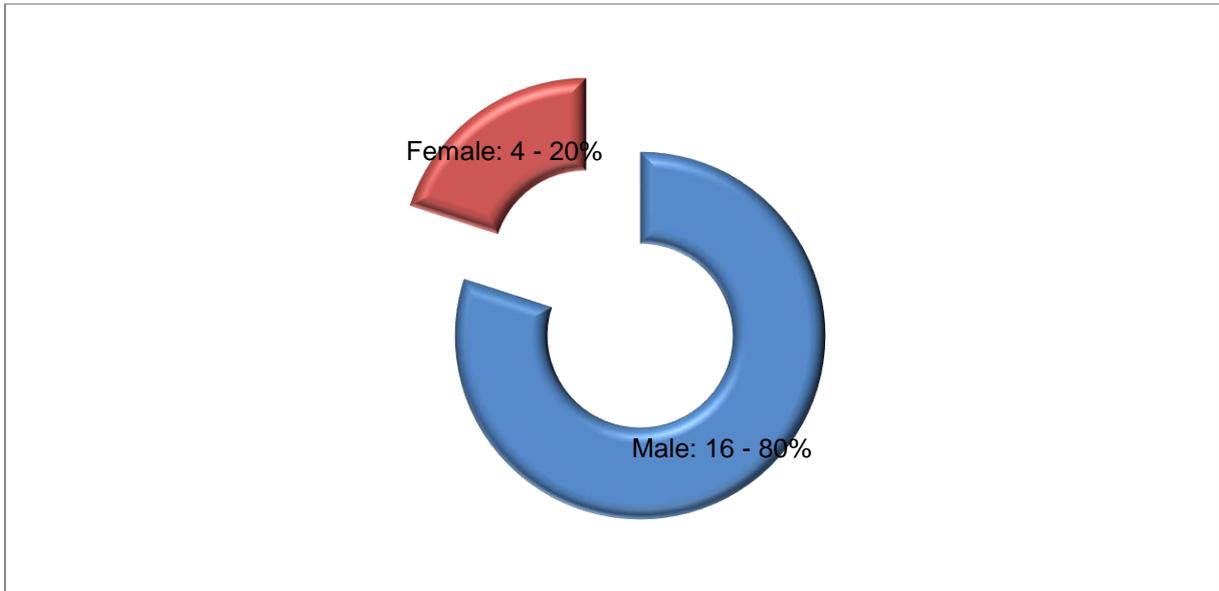


Figure 5.2: Participants by gender

The participants' highest level of qualification ranged from Matric certificate to PhD, as shown on Figure 5.3 below.

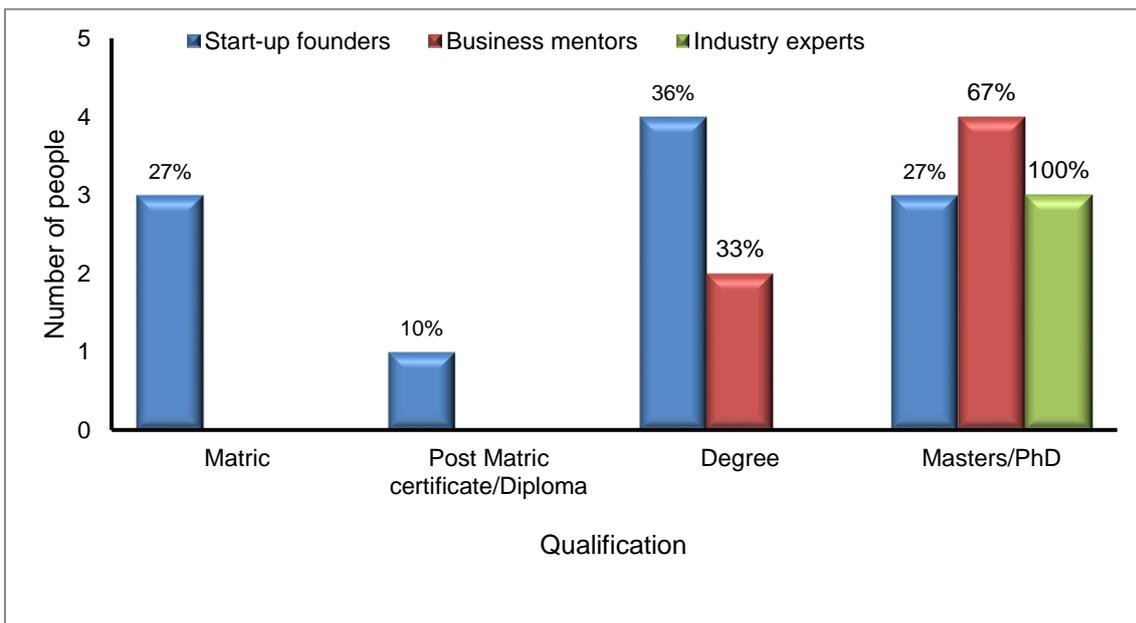


Figure 5.3: Highest formal qualification by participant group

Half the participants had a Master's or PhD qualification, with all the industry experts holding at least a Master's degree. Some of the entrepreneurs had a Matric (27%) or a Post Matric certificate or diploma (10%), with the largest proportion of entrepreneurs having an undergraduate degree qualification (36%). A larger proportion of the business mentors had a Master's or PhD qualification at 67% with the rest (33%) having an undergraduate degree qualification.

The entrepreneurs that participated in the study were from a variety of industry sectors. Even though they were all using novel or off-the-shelf technologies in developing, producing or selling their products, the end products were targeted at different industry sectors, as shown in Figure 5.4 below. The participating entrepreneurs were operating in five different industry sectors, namely, healthcare, manufacturing, business services, engineering, and agriculture.

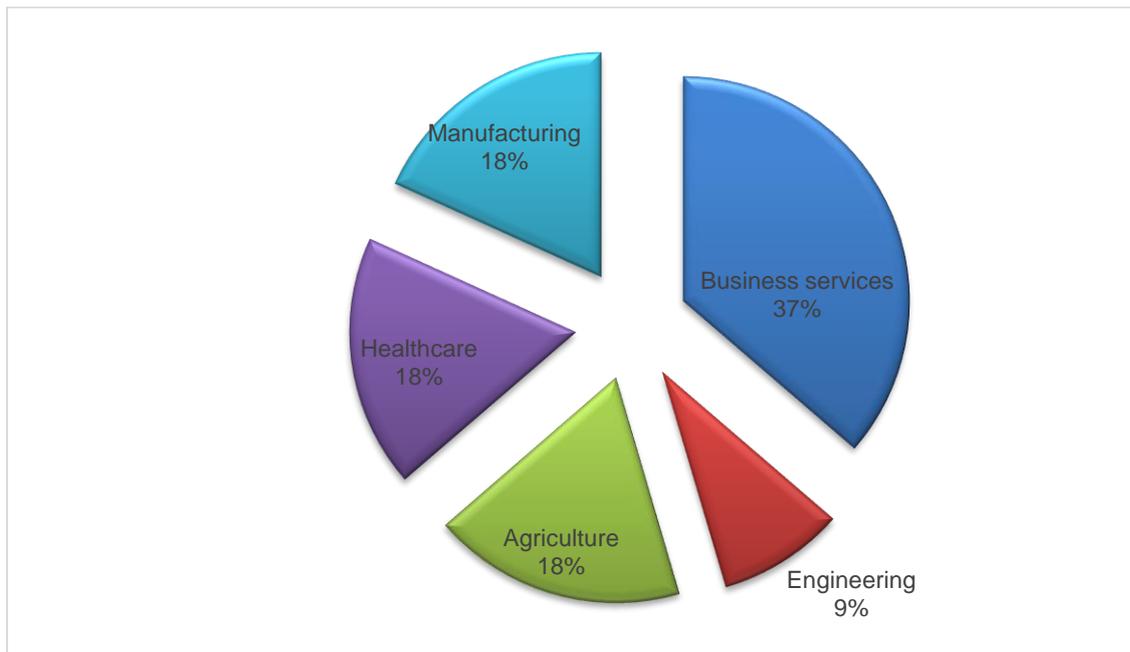


Figure 5.4: Participating start-ups by industry sector

The following sections will present the findings from the data collected. The findings are organised according to the research questions of the study. Presentation of findings makes use of extensive verbatim quotes from the study participants. Participant names were coded for confidentiality. These codes appear after each quote to indicate the participant who was quoted. The codes can be understood as follows:

- I1P1SF – Interview 1; Participant 1; Start-up founder
- I3P4BM – Interview 3; Participant 4; Business mentor
- I12P13IE – Interview 12; Participant 13; Industry expert

It should be noted that while responses were sought from three distinct groups of participants, the objective of this was to facilitate a range of views and a holistic look at the phenomenon under study. Therefore, the purpose of soliciting responses from different participant groups was not necessarily to seek convergence or divergence of perceptions, although where responses from the individual participant groups were

extremely divergent, this was noted in the narrative and addressed in the discussion section of this thesis.

5.5 FINDINGS FOR RESEARCH QUESTION 1

What factors influence the disruptive innovation capability of NTBCs in the South African BoP environment?

The objective with this research question was to explore the enablers of disruptive innovation capability in South Africa's BoP environment as well as the factors that influence the adoption of disruptive innovations in the consumer market. A full data summary sheet of the findings for research question 1 is shown as Appendix E.

Participants were asked whether they perceived any specific features in the South African environment as being enablers of disruptive innovation capability. Participants acknowledged various factors in the South African environment that favour the development of disruptive innovations. 17 out of 20 participants identified socio-economic drivers in the South African operating environment as being enablers of disruptive innovations. The socio-economic drivers that were mentioned include issues that target the pain points of consumers such as the need for cheap or lower-cost products, improved accessibility to products, healthcare, safety and security, social and environmental concerns, changing consumer lifestyles and incorporating indigenous knowledge into new product development to contextualise innovations.

Need for cheaper or lower cost products

The need for lower-cost products was expressed by participants as follows:

So to me the South African economy and the rest of the African economy is there for the taking if you come up with something that is useful to people at the correct price point. You have to price it as low as possible, as simply as possible, because the consumer market at the low end is not fussy. It's about functionality... People will go for the cheapest stuff. **(I13P14SF)**

I think in general a weaker economy forces people to tighten their budgets and look for lower-cost alternatives which may encourage disruptive innovations because that higher cost of living forces people's lifestyles to also change. **(I18P20IE)**

Improved accessibility to products

Improved accessibility to products and services that were not available before because of scarcity or affordability was also mentioned as a driver of disruptive capability. A business mentor, **I6P7BM** commented that: “So I think there are certain margins where there is lack of access to facilities, infrastructure and everything and entrepreneurs can offer innovative solutions there.”

Healthcare

Providing a basic social need such as better healthcare outcomes was also noted as a driver of disruptive innovation capability. One entrepreneur with a successful health sciences innovation noted that:

...[I]t is during my PhD work, we, the team discovered a new way to make bone...At that time, they were using autogenous bone grafts to repair serious bone defects. And there were serious disadvantages. Firstly, it's very painful because they have to harvest bone from the hip of the patient. And it's a very brutal procedure...So we had a technology that potentially would disrupt the way surgeons repair defects. **(I11P12SF)**

Safety and security

Recognising environment-specific consumer pain points can lead to useful innovations that may become disruptive. In South Africa safety and security, especially for women, is currently a big concern. An entrepreneur recognised this, and she stated the following regarding her innovation:

[We developed] a mobile panic button for women. It's a device the size of a R5 coin. You press it in case of an emergency and it alerts five people from your contacts...[an] added feature is that you can choose whether you send your location or not. So basically, it works independent of the phone...So what we're doing is we're taking a security perspective...we're ensuring that we go with a preventative approach, instead of a responsive, because currently the solutions that are out there are all responsive **(I1P2SF)**.

Social and environmental concerns

Social and environmental concerns also emerged as drivers of disruptive capability as noted by an industry expert and entrepreneur below:

...one of the water-saving solutions that we piloted at a school in Sebokeng they are now rolling it out also as part of every new school that they're constructing. So that has been an enabling factor, the focus on going green. **(I10P11IE)**

The market is still catching up a little bit. But there is a movement to greener solutions to find, you know, more environmentally friendly, more sustainable sources of protein in less expensive components on any kind of pet food or even animal food...we are [also] a waste management company, and that is what in large part we're trying to tackle is all this food that has been thrown away on landfill, where it rots, releases greenhouse gases, and obviously, all the money that went into producing that food is then lost as well...So it is absolutely a social and environmental impact that is driving the foundation of this company. **(I8P9SF)**

Changing consumer lifestyles and trends

With reference to how changing consumer lifestyles and trends fuelled their innovations, an entrepreneur mentioned that:

...we kind of plugged into the urban agricultural change that was happening in Joburg at that time and it's definitely still kind of going on...there's the effect of current factors like unemployment and all those things and they've been key factors in certain stakeholders trying to revive that [agricultural] value chain...**(I14P15SF)**

Leveraging indigenous knowledge

Harnessing indigenous knowledge was seen as a potential enabler of disruptive innovations by participants. The concept of indigenous knowledge was raised mainly by business mentors and industry experts while only one start-up founder raised this issue. Some participant quotes were as follows:

And that, of course, leads us to a very fundamental principle for South Africa. We have indigenous knowledge that's been there for thousands of years. And some of us are arrogant to think that that knowledge is not important... in fact, at least ten big ideas have been commercialised to a very, very big extent. Hoodia for example is indigenous knowledge which became a very big a product, I was

working with scelenium at one stage...sutherlandia, all these indigenous knowledge things. So I think what needs to happen now is that universities are now starting to lift the level of the technological capability of these things. Now, they're synthesising active ingredients and looking for other actives. So, it's becoming high science... **(I11P12SF)**

And how many of herbal products are being used by the traditional healers and what is the missing link to take them to the market? It is combining that science and technology with the already complex indigenous knowledge technologies. But, we have missed that point. **(I12P13IE)**

Demographic make-up

Fifteen of the twenty (15 of 20) participants mentioned the demographic make-up of South Africa as being an enabler of disruptive innovations. There is a large proportion of low-income consumers, as well as consumers that previously could not access certain goods and services in the market that can potentially be disrupted by new innovative products and services. As participant **I16P17SF** put it: "I became so much interested in it about 20 years ago because I could see the gap in the township. We didn't have a ceramic designing company there." Another participant also noted that:

The way the structure of the economy is, is such that the big companies are focused on the middle class. There's been this wave of spaza shops, for example, that are run by Pakistanis, they came in with a very different model [that focuses on the low-end market] **(I13P14SF)**.

New markets

In terms of identifying new markets as enablers of disruptive innovations, other participants had this to say:

Yes, most of the time I think its market opportunities, the missing gaps, you know, areas that aren't properly serviced or not serviced well. You get a lot of that where...I'll give you a certain example where people will say that you know, there isn't a service, there isn't an app for entrepreneurs to access maybe other entrepreneurs in the townships... So that's gaps and obviously opportunities. **(I6P7BM)**

...[T]he broader aim was that we realised that the digital space in South Africa is a fairly new phenomenon. So we wanted to be the main players or the leaders when it comes to solutions for businesses, entrepreneurs and personalities **(I17P19SF)**.

Enabling technology

Eleven of the twenty (11 of 20) participants mentioned access to enabling technologies as being a driver of disruptive capability. As industry expert **I18P20IE** put it, "...the move to a more digital economy may also encourage disruptive innovations built around them." Another industry expert also said:

So what we also try to do is...give them as much technical support as we can, especially within incubation, because that's one of the offerings is for them to get technical support around their solution...their offering. So that's part of the support that we do provide them to make sure that they do have the best possible technology as part of their solution to obviously help make it more attractive. **(I10P11IE)**

Operating/Economic environment

Five of the twenty (5 of 20) participants mentioned that the specifics of operating in low-income or developing economy environments, while being a challenging environment, can also be an enabler of disruptive capability. One entrepreneur stated it clearly when he said:

...South Africa and emerging markets, in general...they are difficult to operate in. But as difficult and, you know, as numerous as the challenges are [such as] electricity, distances between production centres and markets, that has necessitated that we look very carefully and make sure that we can actually design our production system for emerging markets. And that has also contributed, you know, to our reducing our capital requirement by about 90% compared to our [international] competitors. And it's because we've had to build it for an emerging market, if we, let's say, for instance, started this in the Netherlands or in France, where we have ample access to electricity and capital...we could have easily upscaled our production very quickly, with very expensive equipment, which maybe would have had a detrimental impact on the cost of production. Whereas now we can actually say that our cost of production

is highly competitive in the market because of those challenges actually.
(I8P9SF)

5.5.1 ADOPTION OF DISRUPTIVE INNOVATIONS

Another aspect that this research question looked at is the adoption of potentially disruptive innovations in the market. Various factors that refer to the adoption of potentially disruptive innovations by the consumer market emerged in the findings. Adoption influences how innovations developed by NTBCs become potentially disruptive. The majority of the participants (18 of 20) mentioned factors that impact adoption of disruptive innovations in the market including the need for consumer education, lack of trust in products and aspirational consumers. Just over half of the participants (11 of 20) specifically mentioned issues around consumer education being a major challenge with regards to the adoption of disruptive innovations. Entrepreneur **I8P9SF** mentioned that, “Consumer acceptance is still also a challenge...as [the product] is still relatively unknown.” Similarly entrepreneur **I17P19SF** stated that “[Consumer education] is a very big part of it. So once you start educating everyone, now they really see the sense in it and the need for it.” While another entrepreneur poignantly stated:

[Market penetration] was very difficult. Any disruption requires a lot of education of the consumer...So we had to educate [the end users] and we had to show them evidence that we had done sufficient research to prove the safety and efficacy with the technology so they could inject the first growth factor into a patient. **(I11P12SF)**

A business mentor also noted how consumer education is challenging for entrepreneurs offering novel innovations into the market. He said:

I find that many [entrepreneurs] get a bit fatigued by that, that they have to work so hard to create confidence in the product and there's no PR (public relations) machinery that they can kind of rely on to create confidence in the product.
(I5P6BM)

Consumer education is also linked to consumers' perceptions of innovations developed by local entrepreneurs. Some of the participants (8 of 20) specifically mentioned that there is seemingly a lack of trust by consumers in purchasing or using innovations developed by local entrepreneurs. For example, entrepreneur **I1P1SF** noted that: “...[P]eople are concerned and you can't really blame them because we have been dealt

a shady hand by some South African made products.” While entrepreneur **I14P15SF** also mentioned that: “[Another challenge was] regarding trust, trust of the customers to trust that you can actually provide the service promised.” An industry expert, **I12P13IE** noted the pervasiveness of this problem when he stated that “[E]ven within our communities also we have got this feeling that if it's something that has not been bought from Makro, then it's not good enough.”

A few of the participants (5 of 20) also expressed the view that innovations by local entrepreneurs were regarded suspiciously by the market and perceived as risky to use with the fear that they might cause some sort of harm to the consumers. One entrepreneur expressed it as follows:

...from my experience with [my technology] people are wary and slow to adapt into something that actually shares, not exactly their personal information, but their whereabouts. Well, there are those who will freely actually disclose that, and there are those who are conscious, I don't want to say paranoid, about their location (laughs). (**I2P1SF**)

Another issue that affected the adoption of innovations by local entrepreneurs as noted by some of the participants (8 of 20) was how aspirational South African consumers seem to be with concerns around how one looks and the well-known labels and brands they own or buy. This was cited as an issue that affects the adoption of locally produced innovations and products. A business mentor had the following to say about the consuming public:

I guess many feel that they're going to have to choose the cheaper product because that's all they can afford... But it doesn't necessarily take away that when [they] can afford and have a little bit more money [they are] still going to go back to the brand that comes with a certain lifestyle and show it [off] to others. It's like, just showing your product that nobody knows [about] it's not going to do anything for someones shine (laughs). (**I5P6BM**)

Regarding consumer mindsets around locally produced products, an entrepreneur had this to say:

I've seen I16P17SF's product while taking a walk, maybe in Maponya Mall. Seeing the very same products there that I16P17SF makes and really looking at the responses that people give MrPriceHome, and I mean, I know a person that makes such things from dust into a cup. It's sad because I think here we are

fighting a mental battle with our people...The minute someone knows that I16P17SF made this product they will scrutinise the product...That's the most unfortunate part. **(I16P18SF)**

Some of the participants (6 of 20) also highlighted that entrepreneurs would need to fully understand the aforementioned consumer mindsets to succeed in the South African operating environment. One of the business mentors had this to say from the consumers' perspective:

I'm black, I'm a consumer, but I will not buy a product just because it's made by a black person. I'll buy it because it's good, addresses my needs, and it's affordable. So those things need to come into play. **(I7P8BM)**

While another mentor mentioned how one entrepreneur he had worked with had tackled this challenge. He said:

I think, with aggressive marketing from the entrepreneurs [one can succeed] because I have worked with "entrepreneur X"... She has maybe tried to break into that space of changing people's minds. A lot of young black women are now believing in her product because of the extensive marketing...So that one is an exception. **(I4P5BM)**

5.6 FINDINGS FOR RESEARCH QUESTION 2

How do NTBCs operating in South Africa's BoP environment evaluate competing market entry opportunities?

The objective was to determine how entrepreneurs evaluate market opportunities in terms of which market segments they focus on when developing innovations, the reasons for choosing those specific markets, and the level of competition faced in those markets. A full data summary sheet of the findings for research question 2 is shown as Appendix F.

Target market

With regards to market entry focus, it was found that only one entrepreneur of those that participated had a new-market segment focus, while some of the entrepreneurs had a solely low-end market segment focus (3 of 11 entrepreneurs). Five out of eleven (46%) of the participating entrepreneurs had an exclusively mainstream market segment focus,

while two of the entrepreneurs targeted both the mainstream and low-end market segments by developing innovations that could be configured differently according to market specifications and needs. This is illustrated in Figure 5.5 below.

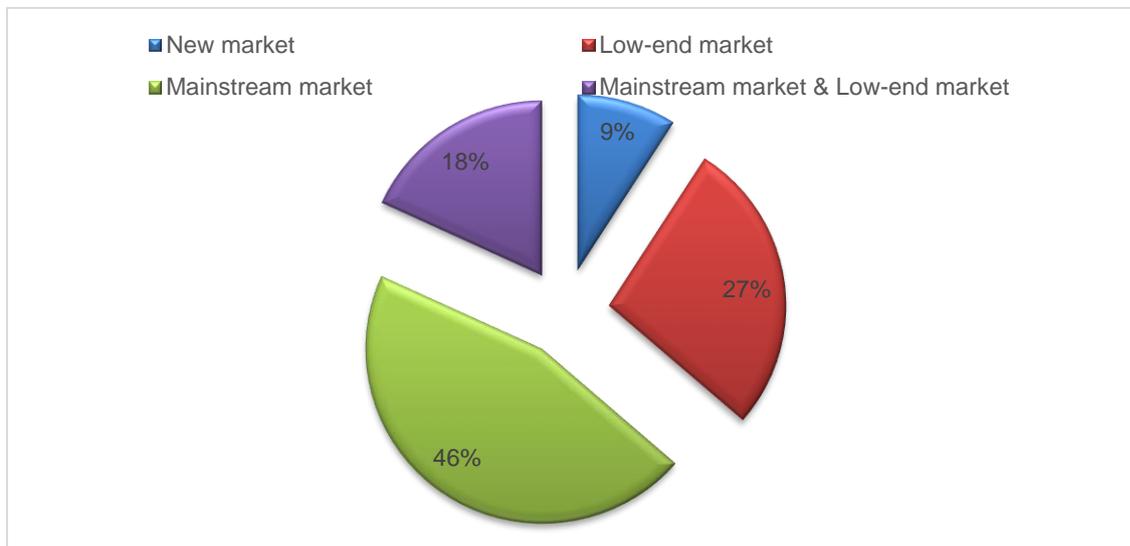


Figure 5.5: Participating entrepreneurs by market segment focus

Entrepreneurs were then asked to elaborate on why they typically chose the markets they catered to, and business mentors and industry experts were asked to elaborate on why they thought the entrepreneurs they mentored typically chose the markets they catered to. Reasons given for catering to low-end or wholly new markets were varied. Just over half of the participants (11 of 20) recognised that there were market **opportunities** in low-end or new markets. An entrepreneur expressed how he found his market opportunity thus: "...[I]n 2016 I saw an opportunity within the informal market, being the spaza shop market...[I] wanted to bring mobile web-enabled platforms and technologies to the informal market because no one else was doing that." (I15P16SF) A business mentor stated that:

...I come across people who make beauty products or creams and specifically service the lower-income market because they feel that sometimes the high-end industry, going to Checkers, going to Dischem and all of these becomes a bit far removed from affordability. So they may want to develop products that are more affordable, more accessible. I speak quite a lot to [some] who, not out of fear, don't necessarily want to go outside of the township or their community because they want to service the community. (I5P6BM)

Nine of the twenty (9 of 20) participants, mostly start-up founders, indicated that identifying a **social** or **societal need** that needs solving may lead to developing solutions for low-end or new markets. This was explained in the following ways:

[Initially]...it was purely an academic project, but there is a huge drive now [towards] social entrepreneurship. It is getting bigger because the wealth divide is now too much. So people like Bill Gates are putting money to help...everyone is trying to help the poor that are part of the world economy... So initially, it was an academic project to develop something for Africa, but then there was potential for it to become commercial. **(I13P14SF)**

I think identifying a pressing market need also goes hand-in-hand with satisfying a social need in many instances. So we have found that in a lot of cases entrepreneurs that have identified a social need that they can cater to also become commercially successful because a pressing social consumer need can be translated into a marketable product... [I]nnovation must address real challenges to succeed. **(I18P20IE)**

Necessity on the part of the entrepreneurs was also identified as a reason the entrepreneurs enter low-end markets. It becomes a case of necessity because the entrepreneurs may not have enough resources to enter mainstream markets and also because those are the markets they are familiar with and have an understanding of. Half the of participants mentioned necessity as a reason for choosing low-end markets. Two business mentors expressed this as follows:

I think most of them (entrepreneurs), they really want to [move into mainstream markets]. But there are so many hurdles to go through to get there. That is the challenge...most of the people then find it comfortable to put their products in the low-income market space. **(I4P5BM)**

[The entrepreneurs] are from those environments...townships and so forth. Normally a lot of them are young. You can understand that if you're younger, you maybe don't have that much money. So, yes a lot of them that go to the Innovation Hub are mostly from the black population and because the Innovation Hub's facilities are in the townships and not in the city centres or upmarket areas their clientele also is [from there]. **(I6P7BM)**

Two entrepreneurs also mentioned that they found that operating in low-end markets was beneficial to their businesses as it provided a **good testing ground** for their

products with consumers that are willing to help and try out the products. One of the entrepreneurs stated that:

...the good side of it, is that in Tembisa you can literally test like anything...especially with what I1P2SF is doing with [her product] the people are all willing to help, they are understanding. And it's unlike taking the same thing and taking it to Lynwood...they'll be like, what are you gonna do with my information, are you compliant with the POPI (Protection of Personal Information) Act? (laughs)
So in Tembisa it's community-driven. **(I1P1SF)**

With regards to concentrating innovation capability in the mainstream market, several reasons were given. Chief among these was the fact that young South African entrepreneurs are seemingly very **aspirational**. This was cited by seven of the 20 respondents. A business mentor, **I7P8BM** noted that: "I think every business is quite ambitious in that sense in that they hope to cater for much wider need." An entrepreneur boldly stated that: "I am not in the business of [simply] putting food on the table. I am here to build great things, solutions. That's what I'm here for, that's what I do (laughs). **(I1P1SF)**

A few of the participants (4 of 20) cited the perceived **inadequate market** size in low-end markets to enable scale-up due to the low disposable incomes in those markets. An entrepreneur expressed it thus:

Look, remember, income determines needs and wants. Looking at our current economic climate, it may seem like there is no opportunity or interest from that (low-income) market... I'm not sure if my partners think that there is enough money there. **(I2P3SF)**

A few of the participants (4 of 20) also felt that low-end and new-market segments were **riskier to operate** in, in terms of getting goods to market efficiently, or riskier in terms of the operating environment in general. This was communicated as follows:

...the channel to these markets is a problem and [especially] if they are in rural areas...For example, you can be a vendor in a particular village...So you need a channel where you can have much exposure not just to one village, but to bigger village[s]. **(I7P8BM)**

And there's also a challenge that comes where some folks when...we say that we would like to use [their] components and we will give the business back to [them] at the end of the day, we have to be creative and say that we are based at the

Innovation Hub in Pretoria...[T]here's been an incident in the past where people were worried about giving us even R 5 000 worth of components to start off when we said we are based in Tembisa... **(I1P1SF)**

The participants were also asked how competitive they found the operating environment to be. Three of the entrepreneurs seemed to have found good foothold niches because they indicated that competitive pressure in their environments is low and indirect. An entrepreneur perceived his situation as follows:

We have a lot of indirect competition, you know, from the current incumbents...and that's what we're trying to disrupt. In terms of direct competition from other producers...we've not encountered any kind of direct competition from them. And there are quite a few much smaller producers...[i]t's mostly hobby farmers if I can call them that... **(I8P9SF)**

Forty per cent (8 of 20) of the participants indicated that the entrepreneurs themselves or the entrepreneurs they mentor face high competitive pressure in their market segments, particularly from dominant incumbents in those market spaces. This was articulated as follows:

The market penetration is low, you know because also the market is overcrowded. There are so many choices when you walk into Clicks or Pick n Pay. There are so many face washes; you don't know which one to choose. **(I9P10BM)**

...I deal with, there are four sectors. We have the food and beverage industry...[and] there is a lot of competition from the bigger companies, Coca-Cola and all that stuff. So [entrepreneurs] who are manufacturing their soft drinks...have to go through a lot to compete with those [large corporations]. The other sector that I deal with is pharmaceuticals or indigenous natural medicine. So there are also big players in that space; Parceval and Afriplex. So the competition is stiff as well. So for you to go through to their level, you really need to have invested a lot, not only in terms of money but even in terms of your emotions to go through that. **(I4P5BM)**

Just under half of the participants (9 of 20) indicated that even though the competition was high in their operating environment, it was also fragmented and diffuse as noted by an industry expert:

It's a very competitive space. I think most businesses, including large established businesses, are starting to realise the potential of targeting the low-income market with appropriate goods. The good thing is that the competition is still highly fragmented in that market space which is a dynamic that allows for good [market] entry. **(I18P20IE)**

5.7 FINDINGS FOR RESEARCH QUESTION 3

What are the characteristics of NTBCs that are likely to develop a disruptive innovation capability in South Africa's BoP environment?

The objective of this research question was to identify the characteristics of NTBCs that are likely to develop a disruptive innovation capability in terms of their strategic posture, competences, and capabilities. A full data summary sheet for the findings for research question three is shown as Appendix G.

In terms of start-up founder characteristics and attributes that are likely to foster a disruptive innovation capability in the South African operating environment, the majority of participants (16 of 20) felt that entrepreneurs needed to develop **strong learning capabilities**. A common thread from the entrepreneurs was that they were passionate about getting information and new knowledge within their spaces and in improving their entrepreneurial and managerial skills. This was expressed as follows:

So the more problems I faced, the more I could research and look for who offers that service. So I knew that I needed business development. So we approached the eKasiLabs. I knew that we needed to find financial support, so we approached SAICA (South African Institute of Chartered Accountants)...So I think we were fortunate because we were coming from higher institutions of learning... we were ferocious readers because you just want all the information. Each time you encounter a problem, you want to go and research about the problem. So, learning capacity is very important for, especially when you say innovation. **(I14P15SF)**

I'm certainly here to learn. Like that's all I want. Yeah, so it's all about that at the end of the day. People need to put themselves in spaces where they learn...I find entertainment in studying things about investments and so on, it entertains me, I

enjoy it. So I say to them [my code developers] find obsession and enjoy seeing what other developers out there are doing. **(I1P1SF)**

An industry expert also noted the importance of learning capabilities as follows:

So I think for an entrepreneur in the low-income space, like any entrepreneur, a very important attribute to have is to learn fast. You have to be able to learn from your mistakes, learn from what the market is trying to tell you and pivot accordingly. **(I18P20IE)**

In line with developing a learning capability, the **ability to multi-skill** was cited by a few of the participants (4 of 20) as enabling innovation capability of entrepreneurs in emerging market operating environments where key skills to run a successful business may be in short supply or expensive to obtain for a small start-up. One entrepreneur gave the following insight into his situation:

I think because we're dealing with such a new industry, there is no real industry experience...there are platforms which I've been able to access for training to upskill, you know. The skill space that I have on the entomology side that is something that I definitely lacked but luckily, again, they were people and other resources that I could use. **(I8P9SF)**

Several participants (13 of 20) also mentioned that **innovativeness** on the part of the entrepreneur is an important attribute that enables disruptive innovation capability in low-income environments. Two of the participants said:

Obviously, you need to be more innovative because you need to come up with something that is out of the blues for you to have a competitive edge in terms of [the market]. I can give an example of a commodity like Moringa; everyone is doing it [right now]. But for you to get that market, you have to come up with an innovation in that space that will supersede the other people. Everyone is selling the powder or capsules. So we have to think [outside] the box... **(I4P5BM)**

I would say that you have to be innovative based on actually [who your target market is]. Take Tembisa for instance; there are some components which go into our devices which are very expensive. So we've had to find innovative ways to get the same results and also reduce the cost because you want the mother who is getting a child support grant to be able to afford that so they can have it for their daughter. **(I1P2SF)**

To succeed in unpredictable, low-income environments, 12 of the 20 participants mentioned that entrepreneurs need to have a strong **passion and drive** for what they do, as well as **resilience**. As an industry expert **I10P11IE** put it, “[Entrepreneurs need to] have the right type of motivation to really do the work. Really, you have to really be driven to access all these opportunities.” Likewise, other entrepreneurs spoke passionately about their motivations:

...to my mind right now it's hunger and failure. Not hunger in the poverty perspective. You need to be obsessed... I don't think the word ambitious even cuts it...I don't think even money is enough of a driver for it. Like, you need to have a real solution that you are vested in, that you're passionate about, that you want to solve. If you are just doing it for money, you're going to get exhausted. **(I1P1SF)**

[The innovation] was 100% based on a passion to know more about biology. So I was born with a curiosity for biology, how things work. And that is the driver...So it's a very selfish, self-centred motive which gave me a lot of satisfaction and pleasure. Only afterwards when you see the medical value of [it], then you realise that this can be useful...So I think this is driven through love. So the love of the subject and the love of innovation keep you in the laboratory trying to discover...And, eventually, you discover better ways to disrupt the technologies that will disrupt the way things are done presently. **(I11P12SF)**

Some of the participants (6 of 20) identified strong **market knowledge** and being immersed in your target market to understand what the market needs are as an enabler of disruptive innovation capability in low-income environments. This was conveyed in the quote below:

[To succeed in the low-income market space] what I would say is it should be somebody who understands their community, and that is something beyond just having grown up there because it doesn't necessarily mean you understand your community. Obviously you have some understanding but understanding how things move, having maybe studied how other products get some traction, understand how the community is composed so that if you don't have access to some of the PR machinery I told you about...maybe this other way you understand that if this group in society starts to use my product that's also going to make other people have an interest. And I think that means you understand how the tapestry works. **(I5P6BM)**

Another entrepreneurial attribute that was mentioned by a few of the participants (4 of 20) as enabling disruptive innovation capability was a high **tolerance for risk**. This came through when, for example, a participant mentioned that:

Because for you to be innovative, you must be risk-taking. But who is helping you to de-risk that path? Because before you think of a new product, you think if this product flops all my mortgage bonds, whatever...I'm going to go under administration. **(I12P13IE)**

Participants were also asked whether they believed that being **proactive** led to disruptive innovation capability. None of the participants believed this to be the case.

Another aspect that this research question dealt with was regarding whether prior founder knowledge in terms of the **highest level of education attained** or **prior industry experience** had any bearing on developing a disruptive innovation capability in low-income environments. An overwhelming majority of the participants (18 of 20) believed that founder experience was beneficial to developing a disruptive innovation capability in low-income environments. This was articulated as follows:

I think even in terms of my investigation and the work I've done in the innovation space, I do find that the most successful [entrepreneurs] are probably the better-educated ones. I think if you can back your idea with proper evidence and so forth, you get better support, and also you'll be able to morph your idea better...because remember that also education gives you more exposure, more information about how to market, or information about market penetration strategies or pricing information, all that information which if you haven't had much formal education will be even harder [to obtain]... [E]specially your high-end innovations where technology is built into something... So, for me, I think there is a direct correlation to your education and how much easier it is for you to innovate or it increases your chances and probabilities of achieving success. **(I6P7BM)**

[W]hen you build a product; there are other challenges as to how do I get this to communicate and give me the desired result? So knowing where to look for whatever answer that you need and how to actually read the documentation that comes with the product comes in very handy. It saves you time, it saves you money, because if you don't know how to do it, you then have to outsource it to someone who knows how to do it. It costs you money and time. So having the relevant experience has actually saved us in that regard...[And] when you go and

raise funds or approach investors and all that...there are questions that they're going to ask you about your product, or whatever it is that you're doing as a business... So experience comes in a lot. It helps a lot. **(I1P2SF)**

Another entrepreneur also highlighted how he feels that not having that prior industry-specific educational background has made running his business more difficult. He said, "I'm self-developed...so you can imagine when you start teaching yourself something that you don't really know, like how difficult it is and not knowing the challenges of what you are [getting] into." **(I16P18SF)**

Conversely, even though participants mostly agreed that higher levels of education led to better innovation outcomes, five of the 20 participants indicated that having a high level of education may be a negative attribute in some instances. This was expressed as follows:

I actually think [educational degrees] can to some extent be a hindrance because these degrees often come with worldviews and ways of approaching what you know...and that knowledge may not apply or may not be possible to use within that setup because the dynamics are quite different. So I don't think it is necessarily an asset, it can also actually be an obstacle. **(I5P6BM)**

Participants were also asked whether the make-up of the start-up founding team had any bearing on innovative success. A majority of participants (14 of 20) expressed that good **skills complementarity** were important for successful innovation capability. As one industry expert put it: "...ultimately, I think, by and large, it just comes down to individuals within this specific team...there's no way that you can separate the success of any product or service from the people behind it..." **(I10P11IE)**

An entrepreneur conveyed it as follows:

I could have easily said that this thing I'm going to do it myself, and I would have needed money for it because I don't have an electronics background, which [my partner] has. So how do I remove that risk? We come together. Then we realised that at some point, we're going to want to add an artificial intelligence feature. And there was a guy who was sitting right here, who was coding like nobody's business...[t]hat's our other partner...Because at some stages, you don't need money, you just need people that are qualified [so] go partner with someone. **(I1P1SF)**

5.8 FINDINGS FOR RESEARCH QUESTION 4

What challenges do South African NTBCs face in developing and commercialising viable disruptive innovations for BoP markets, and how can these challenges be resolved?

The objective of this research question was to explore the challenges that South African NTBCs face in developing and commercialising viable disruptive innovations, as experienced by the research participants, and also to note the solutions suggested by participants. A large number of challenges were identified as hindering disruptive innovation capability in South Africa. Given the large number of individual factors cited by the participants, these have been further categorised into micro-level challenges, meso-level challenges, and macro-level challenges for ease of presentation. Micro-level challenges arise from the private actions of entrepreneurs and their abilities to launch, sustain, and grow new business (Kim, Wennberg & Croidieu, 2016), as well as consumer demand. Meso-level challenges are intermediate, institutional level factors which underlie the coordination of resources and stakeholders, and socio-technical norms such as the entrepreneurial ecosystem and the culture towards entrepreneurship and innovation in society (Zhang, 2016; Kim *et al.*, 2016). The macro-level encompasses broader structural concerns such as the national economy, laws and regulations, tax systems, and political systems (Zhang, 2016). A data summary sheet for the findings to research question four can be found as Appendix H.

5.8.1 MICRO-LEVEL CHALLENGES

Consumer mindsets

Eighty per cent (16 of 20) of the participants cited challenges around **consumer mindsets** with regards to their perceptions of local innovations as being among the issues that most hinder development and commercialisation of potentially disruptive innovations in the South African operating context. Just over half of the participants (11 of 20) remarked that consumers seem to lack trust in locally produced innovations or products, and that leads to low adoption rates for these products. As one business mentor put it: “But I think [the consumers] are still very sceptical. So I think that's a challenge for many entrepreneurs, how do you convince the market that this [product] is actually quality?” (I5P6BM)

Another consumer concern was highlighted as the **perceived risk of adopting** these new innovations by the consumers. An entrepreneur cited his experiences around this issue with his innovation:

...I think there's a bit of a concern from the [labour] union side. Which we know what the concern is really about. Because they're not looking at the safety perspective of [the innovation], they're looking at the fact that I'm gonna have something that tells where I am at all times... because I didn't understand [the reluctance to adopt] at first, but then I got a bit of insight from the inside...[So this] got a bit of a push back. **(I1P1SF)**

Another challenge that was identified by close to half of the participants (8 of 20) was **aspirational consumer mindsets** whereby consumers seemed to prefer imported or name brand products at the expense of innovations and products that are produced by small local entrepreneurs. This was expressed in the following excerpt from an industry expert:

...[I]n most cases adoption is a challenge...Because you have to convince the market that what is coming from your start-ups or from your small guys is good. And at times [consumers] are so much engrossed in this consumerism that we are label conscious that if I'm wearing something that is not Polo, it cannot be good ...So the adoption is a big challenge and I don't know how we can promote the adoption of our innovations. **(I12P13IE)**

Concerns around low adoption rates also meant that entrepreneurs had to spend a lot of effort in **educating the consumers** regarding the use and utility of their innovations. Just over half of participants (11 of 20) cited issues around consumer education as being a challenge. This was expressed as follows:

Consumer acceptance is still also a challenge. [The product] is still relatively unknown...There is still a lot of consumer education that we need to do. So for this niche market, the drive that we're trying to do is to get in at the consumer end and do a bit of education there and the response has been good, slow obviously than we would like but I mean that's I think, that's just business. **(I8P9SF)**

If you want to compete with Colgate, you have to work hard on that. It's been established for years and years and years. Nobody's wondering, what is Colgate? Even if now some research even shows that that type of toothpaste might not be

the best for your teeth, you're going to work very hard to make people choose your product...Yeah, so I think that creates an unfairness in that when you want to market your [product], you don't get anything for free in terms of people believing in your product. **(I5P6BM)**

Contextualisation of innovations

Several of the participants (12 of 20) also cited challenges regarding contextualisation of innovations by entrepreneurs to the South African operating context. One of the participants said:

Perhaps there is a problem of poor contextualisation of technologies and innovations. Innovation should be contextualised to what works in Africa and in our own operating environment. Do not just try to copy or compete with Silicon Valley without appreciating our own specific environment, the people here, and their pain points. **(I18P20IE)**

In keeping with the notion of poorly contextualising innovations, some of the participants (6 of 20) mentioned that innovations can be better contextualised by **looking to indigenous knowledge**. This view was articulated as follows:

And what we've seen as a trend, is like going back to your roots, you know, using some of the indigenous concepts that you grew up with...we need then the mindsets, the mind shift change, to say, can we try the African angle to say this is what your granny used to do and maybe build on it. **(I9P10BM)**

...when you talk of indigenous knowledge, it is not just African knowledge but each community wherever it is, it has got a set of its own indigenous knowledge. The reason why you see Silicon Valley being successful is because they are leveraging on their indigenous knowledge, the knowledge that resides with the people that are in that environment. Similarly, if we were to do the same in Africa, where we leverage on the knowledge that we have, and that resides within the communities, because remember, the communities face daily problems, and they have got the solutions. **(I12P13IE)**

The challenge of poor contextualisation also came through as a **misalignment between what the market needs and products** the entrepreneurs develop which resulted in entrepreneurs having low contextual market awareness and targeting the wrong

markets. Close to half of the participants (8 of 20) alluded to this problem and this was expressed as follows:

...to our surprise, everybody is targeting the high-end [market segment], because they want to use a cocktail of eight ingredients which are super expensive. And therefore...you find that a jar of a [cosmetic] cream is like R200 to produce it. Therefore, you need to charge R499 [at the retail shop]. Who's going to pay for that? So we need to educate [the entrepreneurs] about, you know, look at the population of South Africa; what are their needs; what can they afford? So as a result, not all of them become successful because they've totally missed the point. All of them are high-end focussed, that's the benchmark... [Develop] a mass market product...those are the products that move... **(I9P10BM)**

...there is a lot of targeting of the wrong market. Because most of our start-ups think that getting into Dischem, Pick n Pay, Makro etc. is the ultimate thing... And the issue of entrepreneurs, not producing what is required by the market boils down to the misalignment of understanding of what resides within the market, what the market needs and what the entrepreneurs produce... **(I12P13IE)**

5.8.2 MESO-LEVEL CHALLENGES

Ecosystem challenges

The embedded socio-technical institutions in which entrepreneurial action plays out can present challenges to entrepreneurs in that instead of enabling entrepreneurial action, they hamper entrepreneurial action (Acs *et al.*, 2017). Participants found the South African entrepreneurial ecosystem to be less than nurturing to innovativeness because all the participants in this study (20 of 20) cited various challenges in the ecosystem that negatively impacted disruptive innovation capability. A major ecosystem challenge that was cited by 16 of the participants was the **lack of capabilities within the ecosystem** which resulted in a poorly performing system overall. The lack of capability was mainly expressed as a lack competencies and capabilities in some of the ecosystem role players as noted in the following excerpts:

...[In] South Africa...[we need] to train the people that are going to be dealing with the entrepreneurs as well. Because in South Africa you have for example, everyone who is anyone asking for a business plan. And if we go back and look

how the business plan originated in the US at the time of Roosevelt we'll see that it is irrelevant to this time. The people that actually came up with it are no longer using it. Yet we copied it from them and we're insisting on it...[a]nd it's frustrating for me. I am here saying that I need money for XYZ. You are saying to me that you will spend R10 000 to pay someone to do a business plan for me. Then you will review that business plan for six months. You might say yes, you might say no. I came asking for R3 000! I came to you saying that I need these components. This is what I need. They sell it at Communica. It costs X amount. That's all, that's all I need! **(I1P1SF)**

The challenge is, when you are talking about innovation we also need to innovate around the various systems. How do we fund our start-ups? Are we going to try to adopt the Barclays Bank template and score them for funding? And this is where you find that we are a bit lazy, particularly in the government sector where we just rely on templates that are coming from the corporate world. We need to understand what are the challenges that are being faced by these start-ups or these innovators. You'd be very surprised to find that some of our funding within the various government instruments will stipulate that they will not fund overheads like a stipend for the person who is running the business. So how do you expect that person to survive? So that's the challenge...There is a need for massive education among the government workers or those that are in the policy or promotion of the innovation arena. **(I12P13IE)**

Fifteen of the participants cited **poor access to technology** as a challenge in the operating environment. Either the required technologies are simply non-existent or if they are available then they are very expensive to procure. Two entrepreneurs detailed their struggles as follows:

So the initial machine that we used was actually homemade. It was made by a group of people there [in Germany] to do the demonstration on a bench-scale, very small unit but expensive to make. [The Germans] have a lot of them. Here in South Africa we have very few such machines. So it means if you don't have an instrument that can demonstrate your technology that usually is the death of your innovation, you can't go forward... To get that machine is very expensive. I got a quotation for R 7 million simply because, you know, it's an innovation. **(I13P14SF)**

Access to technology, I think is the biggest thing, you know. We're essentially building all our own technical and production systems. It would have been great if we could just you know, pick something off-the-shelf in order to produce this.

(I8P9SF)

An industry expert also cited the poor access to technology as a shortcoming where the entrepreneurial ecosystem needs to be strengthened. He said:

So [access to technology] is one of our shortcomings. And one of the primary technologies now is around the internet of things (IoT). Now, most of the hardware is for example, still imported. And we're not doing enough local manufacturing of these things. So you become dependent upon international suppliers ultimately...[S]o in terms of our incubation currently, this is one of the other things we are focussing on now is to provide a more comprehensive technical offering to the entrepreneurs, and IoT is one of those spaces. So we're now in the process of developing what we call a Smart Industry Centre...so that we start to develop these capabilities locally, make these technologies locally available...So, it's one of the offerings that we are starting to strengthen within the ecosystem. **(I10P11IE)**

Lack of adequate support within the ecosystem was also seen as a challenge by just over half (11 of 20) of the participants. The support mentioned was not only from government, but also from other ecosystem actors such as private enterprises, municipalities, universities, etc. All the 11 participants who mentioned ecosystem support challenges acknowledged that there are various support mechanisms available to entrepreneurs within the ecosystem, but the problem was that these support mechanisms seemed to fall short of being adequate to foster the success of small innovative enterprises. This was expressed as follows:

Look, there's an effort put by a few companies to develop smaller businesses because I think also because of the tax incentives that the government is now starting to give to businesses that are developing others. But it's not happening at the scale that we all require. It's not as fast as it should be. So it's a drop in an ocean. **(I2P3SF)**

The company is, you know, incubated there but in all honesty I haven't had that much input from the Innovation Hub and I think it's been a bit of a disappointment... I mean, you know, to be fair to the Innovation Hub, they did help

us out with a little bit of funding which was obviously beneficial. But I feel like if the interaction was a bit more structured because it felt to me like a lot was left up to the entrepreneur... If there was some sort of skill sharing platform or access to engineers, you know, who could help in the design and manufacturing process, you know, that would have been a massive, massive benefit to us. And I personally feel that that's something that's been a bit lacking in my experience of the ecosystem. **(I8P9SF)**

Ecosystem fragmentation

The reasons why the ecosystem was not adequately supportive to small innovative enterprises was cited as a **highly fragmented ecosystem** as cited by 15 of the 20 participants and an inability to properly contextualise ecosystem support to South Africa's unique operating environment was cited specifically by seven of the participants. A fragmented ecosystem was blamed for duplication of efforts among ecosystem role players leading to inefficient ecosystem support for entrepreneurs. This was expressed by participants as follows:

And also in terms of creating an ecosystem, I just think that we're doing things in our little pockets...we need to coordinate this SMME development ecosystem, so that people know where to go and for what, that's a big one...Because you find CSIR (Council for Scientific and Industrial Research), Innovation Hub and somebody else are assisting the same enterprise for the last seven years, which is not on. So the others would suffer...so there needs to be coordination... [W]e need to create an ecosystem where parties know what is happening in the SMME development space at any given point. **(I9P10BM)**

[W]hat I find is often a challenge is that sometimes people innovate in isolation. You know, you have the innovators and then you have the people who need innovations...I'm talking here more your companies,...your municipalities and government. They need some of those innovations but you know the process of partnering the two isn't really there. So I do think that we need to bridge that gap a lot more. You know, so a lot of [innovators] would come up with issues in the townships like water leakages and other things and how they could help. But you'll never find a municipality using that innovation. For them to get a municipality to use that innovation they will have to go through leaps and bounds

and, you know, get political connections [and navigate] government corruption.
(I6P7BM)

Poor contextualisation of ecosystem structures was noted by one industry expert as follows:

And it's a pity that everyone always talks of Silicon Valley. Here we talk about making a Silicon Valley in Gauteng. We are not even manufacturing silicon chips. So why should we call it Silicon Valley? We have got our own resources and we've got our own people. The solutions are there but we don't know how to tap into them, all solutions lie in the local environment...we've developed this mentality of subordinating the local solutions. **(I12P13IE)**

Funding

Another major meso-level challenge that was cited by 16 of the 20 participants was the availability of funding, which turned out to be a multi-faceted problem in the South African operating environment. Generally, access to funding was perceived as a challenge hampering the growth and sustainability of innovators. 14 of the 20 participants indicated that funding was not adequately available to innovators and when it was available there were inefficiencies around its disbursement that negatively impacted entrepreneurial activities. A business mentor commented that: "So I'd say the biggest challenge is around funding. I mean, you need to spend money to make money. So in the absence having money, how are you going to make money?" **(I9P10BM)**, while another said: "I think funding is the biggest [challenge]...at the end of the day the thing that businesses want is not support, they want money." **(I3P4BM)**

An industry expert elaborated further on this by noting that technological innovations require financial investments that may not be easily accessible in the South African operating environment:

I think the discouragement of low-cost innovators comes from the point of technological enhancement in the sense that even if they've got excellent products, scaling up is a challenge. Scaling up is a challenge in the sense that they do not have enough capital to invest in what is required to scale up.
(I12P13IE)

Further to this, the entrepreneurs themselves expressed concerns around the **funding horizons** for getting funds even if they are available. This came out strongly in some of

the entrepreneurs' statements who said: "Small business is not funded; if it's not a government grant that will take you five years to get... it doesn't happen when you need it." (I2P3SF) Another entrepreneur cited his experiences with obtaining funding thus:

I remember we applied for funding in January and eventually got the funding, I think, the deposit was made into our account in November. So in between there what was the company doing? The company could have failed. So you see, there is that disconnect. Really there is that need to create and to help small businesses, but the actions fall short... [I]n China, I hear they take 30 days from applying to getting the money into your account or getting a rejection. And then you know that within 30 days, okay, then that helps you if you are rejected, then you can try other means, but the results come fast. They should not just keep you waiting and you don't know what is happening. (I13P14SF)

Some of the participants (6 of 20) also noted that even where funding was available, it was not **equitably or efficiently distributed** to all entrepreneurs. This disconnect was expressed as follows:

And then in that [funding] space you see a lot of chance takers. So you've got 'grant-entrepreneurs'...they know how to apply for funding, [while other entrepreneurs] don't even have a computer, you know, and others don't even know that they are opportunities out there. (I9P10BM)

Of course, government has made funds available for start-ups because of this drive towards small business sustainability and entrepreneurship but the only issue is the administering of these funds and the inefficiencies around that. So a lot more efforts have to go into properly administering and disbursing public sector funds earmarked for small businesses in order to have the anticipated impact. (I18P20IE)

A few of the participants (3 of 20) also specifically mentioned that innovators with novel concepts might find it harder to access funding in general due to a **risk-averse funding culture** in the South African environment. This is highlighted in the quote below:

I think people want to fund things they know. Whether you're a VC (venture capitalist) or you're even giving someone a loan, you kind of want to fund a business that you understand...but if it's like, okay, maybe this [innovation] here might treat, you know, blood sugar, right? But before we get there, we actually need R 10 million so that we can prove whether or not...so the risk is obviously high. (I3P4BM)

Some of the participants (6 of 20) were of the opinion that funding was not a problematic issue in the South African operating environment as it was sufficiently available and perhaps the only issue is that **entrepreneurs need training on how to access it**:

I would say there are enough channels for [innovators] to access funding...[W]hen you're in the programme, yes, there's competitive funding available, which is approved by our start-up support programme, where you can then as a start-up, compete with other start-ups in incubation for that funding. So we do have that vehicle available...Again within the innovation space, the Small Enterprise Funding Agency (SEFA) has recently introduced an Innovation Fund. It is a national fund and that will also help innovators, small businesses and start-ups...So there's enough money within the system I think. And then there's your other agencies...whether it's through your IDC (Industrial Development Corporation), your DTI (Department of Trade and Industry), TIA or whoever else. I think like I said, I think there's enough money... **(I10P11IE)**

Market access

A meso-level concern that was mentioned by the majority of participants (15 of 20) as a challenge for would-be innovators in developing and commercialising their innovations in the South African environment was **poor access to markets**. The participants felt that innovators were locked out of markets for various reasons such as using the wrong routes to market, lack of access to distribution channels, the high costs of marketing and other value chain activities required to penetrate markets, powerful incumbent business and other business lobby groups or forums that may block market entry with unfair market practices and anti-competitive behaviour, lack of market awareness, sceptical consumer perceptions around products, and the threat of substitute products and services already on the market.

A business mentor raised the need for **alternative routes to market for small entrants** as mainstream market distribution channels are very competitive. She said:

...with all [the entrepreneurs] there's an interest to get listed at Clicks, at Pick n Pay, at Dischem, at Woolworths and you're like, guys, maybe that's not your route to market. Can you perhaps check if you can't do direct marketing because that [mainstream retail] space is occupied already? **(I9P10BM)**

This was echoed by other participants who raised the concern of lack of access to distribution channels as a contributory factor to market access challenges. This is highlighted in the following quote:

So it's competitive in that way because there are others who can position their products without having to do much while you come in with a new product and you have to do wonders...I think there's a discord in the sense that when you target a lower-income market, the infrastructure of how to get your product distributed, how to get it into different shops, how to get it available, it's very much on you...I find that many get a bit fatigued by that. **(I5P6BM)**

The **high cost of marketing and other value-chain activities** required to penetrate markets has meant that innovative entrepreneurs face challenges in accessing markets. This was articulated as follows:

...it looks incredibly difficult to form part of the supply chain for you know, your pet food and animal feed manufacturers. And, you know, in order to be able to enter that market, you need massive economies of scale...to make sure that the structure and production process that we have aligns with the costing that's expected from these companies. **(I8P9SF)**

...marketing is not cheap; hey, you need to spend a lot of money. I worked for Johnson & Johnson years ago when I started in this industry, and we spent millions just in marketing. So for a product launch, it needs to be out there... [S]o the investment was more in sales and marketing, but as a small guy, you don't have a budget for that. So that is where the gap is I think... [small entrants] need support in that sense to access markets [because] sales and marketing is key. **(I9P10BM)**

Another barrier to accessing markets was perceived as being caused by dominant incumbents and other business lobby groups or forums that block entry through the nature of market competition or **unfair business practices and anti-competitive behaviour**. An industry expert, **I12P13IE**, stated that: "So big business can stifle you because if you compete with it directly, it will." Other participants expressed how large incumbents used anti-competitive behaviours to stifle any potential competition. This can be seen in the following quotes:

Unfortunately in South Africa, it seems to be an even bigger problem because I think the World Bank even raised that it's sort of a cartel. Once a company is in

the market, it prevents other companies from coming into that space. The laws are very relaxed on this anti-competitive behaviour...if you go to a supermarket you find just a few brands represented...You cannot have one company dominating the whole country...But here, one company supplies everything and so they're making so much money that they prevent others coming in. So it's a very difficult problem. I don't know really, through legislation government should come in and prevent such monopolies. **(I13P14SF)**

[The challenges] I'm aware of [are] actually market access and the monopolisation of markets. I'll give you an example, I was delivering a function at the Coca-Cola Dome, and I was exposed to a small business that is manufacturing a very good beverage product at a very low price compared to what you can buy a Coke for. And I wanted to have these small businesses who happen to be black catering for low-income to come and supply and I was told that the Dome has pouring rights, Coca-Cola has pouring rights. That means you cannot serve any other drink except Coke. So things like that exist, and things like that can be impediments to market... **(I7P8BM)**

A lack of adequate market awareness and sceptical consumer perceptions around innovators' products was also seen to hamper access to markets. As one entrepreneur put it:

So [those were the major issues for us]...the customers knowing about our product and also the pricing of our product. Also, other factors were regarding trust; trust of the customers to trust that you can actually provide the service and I mean, bigger businesses didn't really want to [work with us]...they don't really want to do business with someone that doesn't have an industry track record and things like that...[you] struggle trying to get customers. So we were basically looking for service supplier development programmes that will actually give us the necessary support and also give us enough muscle to then be able to provide to bigger businesses. **(I14P15SF)**

Social norms

Social norms were also seen as potentially hindering disruptive innovative capability of NTBCs in South Africa's operating environment by several of the participants (13 of 20). For example, participants contended that there are certain behavioural traits that are inherent in South African consumers due to the unique socio-demographic history of

South Africa that influence how consumers perceive and adopt innovations developed by local entrepreneurs, how entrepreneurs consider which markets to cater to, and even how ecosystem stakeholders' inclinations end up harming entrepreneurial activities. For this study, these socio-demographic traits have been defined as **mindset biases** as they describe certain prejudices and inclinations that South African consumers present in their purchasing behaviours.

Consumer mindset biases were described by participants in the following quotes:

Yeah, that's really a challenge to most of the people who bring in these new innovations... because I don't want to say it's a South African mindset, I don't know, because we have got products where for example you walk into a supermarket, and you want a cold drink, the first thing that you look for is where is the Coke fridge. So those are the things that are killing our people. And it's in all the commodities, it's everywhere. **(I4P5BM)**

And even within our communities also we have got this feeling that if it's something that has not been bought from Makro, then it's not good enough. So it's an issue of mindset that needs to be worked on which then brings in that issue... **(I12P13IE)**

These mindset biases were not unique to consumers only as other participants also expressed the view that entrepreneurs were also guilty of certain prejudices that made them focus on certain market segments when developing products at the expense of other more suitable market segments:

There is a misconception in the start-up space that having your product in Western defined spaces is what qualifies as success. I think this is because most start-ups are chasing margins and hope to make big profits from the outset. I think we have seen that this approach doesn't always work... **(I18P20IE)**

Yeah, so I mean, we train them, and we try to change their mindsets, but our entrepreneurs are just not there yet. They just do not understand the South African market, or the SADC (Southern African Development Community) market or the African market. We don't have money...Not everybody needs to be at Clicks because there's that obsession that you know I want to be listed next to Oh So Heavenly (Clicks in-house brand). **(I9P1BM)**

The mindset biases were also evident in the perceived stances taken by some ecosystem role players, as noted in the following quote:

So the adoption [of local innovations] could be improved. It's not the best. Considering that government should be the major buyer, it must lead by example. And then others will follow... we need to trust our own things. It's painful that people from overseas come in and they realise the beauty of our innovations and take them whilst we are right there saying fill in this form, fill in that form.
(I12P13IE)

Another social norm that was observed to have an impact on the innovative capability of NTBCs in South Africa was the **culture towards entrepreneurship and innovation** within communities as cited by eight of the participants. Entrepreneur **I13P14SF** described his experience as follows: "No one wants to even consider starting a business. People thought I was crazy when I told them that I was starting a business." Other participants likewise alluded to the following:

...if you tell your parents that I'm going to innovate something, I'm going to start my own business, already your family's worried. Like why do you want to start something and not do the safe thing? And then your friends might even also be like, but you don't even have money? So you are very discouraged to start with.
(I5P6BM)

5.8.3 MACRO-LEVEL CHALLENGES

Environmental constraints

Participants identified several challenges in the macroeconomic and regulatory environment. All the participants (20 of 20) mentioned environmental constraints in the macroeconomic environment such as the weak economy, the country's tax regime, governmental capabilities and the national educational capacity as factors that impact disruptive innovation capability of NTBCs in South Africa.

With regards to the **impact of a weak economy**, an entrepreneur observed that:

...remember, income determines needs and wants and looking at our current economic climate it may seem like there is no opportunity or interest from the market. But [consumers] want the services that we are offering, but they have been limited by the economic conditions in the country. So it is not an isolated issue.
(I2P3SF)

The **tax policies** were seen as demanding and onerous. As entrepreneur **I2P3SF** put it: “Our tax policies need to be reviewed. Businesses are being destroyed by tax; it’s too high.” Another entrepreneur, **I13P14SF** mentioned that: “SARS (South African Revenue Authority) for example, it’s a lot of taxes that you have to know, register them and know them. Sometimes some of them I still miss them.”

The **capability of the government** to adequately create an enabling environment for innovation capability was seen as lacking. This can be seen in the views expressed below:

And when government says you know we are pushing SMME development for job creation...I'm like, guys, are you really listening to what you're saying, who's going to fund this? ... [There is also] the fact that on the government side, it's not properly thought through in my opinion, as to how do you develop an enterprise. **(I9P10BM)**

Interestingly, [the government] talks a lot that we need to focus on small enterprise development, but what does it take to develop an enterprise?...So we talk a lot, but we don't implement, or we don't even know how to implement... [Small enterprise development] I think would require more from the policy perspective. And again, I'll keep on getting back to the capabilities and competencies of some of the office-bearers...So we need to be serious about it. If we really think that start-ups can drive the economy, we should come with appropriate mechanisms for start-up support. **(I12P13IE)**

One entrepreneur felt that the government was dealing with a lot of challenges, and presumably, that is why it is failing to adequately assist entrepreneurs. For that reason, the entrepreneurs had to make things work by themselves. She states:

Also this mentality that the government should do this or that...the government has a lot of things that it has to deal with that it needs concentrate on...we as entrepreneurs, we should be driven, we are the change-makers, we are the ones who are coming with this that's actually going to do 1,2,3,4. **(I1P2SF)**

The **national educational system** was also perceived as a shortcoming that hindered innovative capability in South Africa. An industry expert **I12P13IE** mentioned that: “...the environment is not geared for grooming entrepreneurs. The way we teach our students is not the way we should be teaching our entrepreneurs.” Another participant echoed the same views:

...we have to have the approach of let's solve our problems ourselves and let's develop our own technologies because the whole academic system is still very much about getting educated to get a job. And we need to realign because we have a lot of people who are unemployed. We should start moving now towards innovation and entrepreneurship at schools so that everyone is doing it...even the staff development. **(I6P7BM)**

Another environmental constraint expressed by entrepreneurs was the challenge they faced starting and running a business without any prior knowledge of how to go about. This stemmed again from shortcomings in the national educational system, particularly **entrepreneurship education**:

So, it has been a very steep learning curve for us to adapt to the market, especially if you are inexperienced...I think it's a tragedy that our education system does not incorporate entrepreneurship into the curriculum. So you're literally trained to look for a job...I had to learn a lot of things within the first maybe two years with the Innovation Hub....I think we lack that business acumen simply because we have not incorporated it into our learning system. If we can incorporate it into the learning system, it becomes a breeze because you know what to expect...because now we have learned how to run a business. So to me, that's the biggest challenge. I knew nothing about business. **(I13P14SF)**

Regulations and compliance

With regards to the macroeconomic challenges facing would-be innovators, the regulatory environment was mentioned by a majority of the participants (16 of 20) as a constraint to innovation capability in the South African context. Regulations were seen as stifling, poorly contextualised and onerous with regards to getting the requisite regulatory certifications. Furthermore, there was an information gap with regards to knowledge of relevant regulations by entrepreneurs.

Regulations and compliance issues were seen to **stifle innovativeness** and entrepreneurship as recounted by two of the participants:

...[this innovation] we were supposed to register it; [both] the technology and the fibre. We applied for registration with the Department of Agriculture, Forestry and Fisheries in 2017. They said it takes 12 months, so by 2018, we should have got it. This is end of 2019, and it's still not registered. And Dischem told us, look guys if you're not registered then we can't take your product...If you look at successful

economies, they are successful because of small businesses. Most employment comes from small businesses. But in South Africa, the regulations actually support big businesses and make it impossible for small businesses. **(I13P14SF)**

...thus far, our clients have mainly been government based. It's then the PFMA (Public Finance Management Act) rules, right? So that's one of the things we're struggling with...As the legislation stands currently it does not accommodate for...it doesn't make provision for innovations and procurement of innovations. **I10P11IE**

Regulations were also perceived to be **poorly contextualised** for the South African environment as expressed below:

We were doing smart metres and all that. And the challenge that we had was with regulations and legislature. We were being tested on an international standard while we were servicing the South African market. Those international standards required so many things that were inapplicable to what we were doing. And as a result, it hindered our certification processes and hindered our go-to market...because we didn't have that certification. **(I1P2SF)**

The process of acquiring certifications was also seen as so **cumbersome** to the extent that the country was losing out on the innovative capability of local entrepreneurs:

And as it stands now, people find it much easier to register some of their technologies outside of our borders. You go to Europe you can register your product so easily than what you have to go through here in South Africa. So those are some of the things that really hinder somebody when it comes to fast commercialisation of innovations and technologies in that space. **(I4P5BM)**

There was also a perceived **cognitive and physical barrier to information around regulations** and compliance issues as it seemed that entrepreneurs were not always aware of what the regulatory requirements were for developing and bringing their innovations to market. This was articulated in the following quotes:

When I listen to some of the people that I engage as a mentor with, I know that many struggle and I don't always know if it's because some information that government or institutions tell us is available [is there], just look on our website. But even to look at the website, and I use the internet a lot, there's a lot of information that I can't find because I don't understand where's the report, as opposed to the updates, as opposed to something else...And so I'm just thinking that that's a threshold...of getting into the stream of knowledge. **(I5P6BM)**

However, it should be noted that regulations did not only present as challenges for innovators. In other circumstances, the South African regulatory regime was actually seen as **enabling** as recounted in the experiences of one entrepreneur who said:

In terms of the product itself, the regulations aren't as strict in South Africa as they are abroad, which has been an advantage for us...[I]n South Africa, you need to adhere to a few criteria to protect consumer safety and if you meet those criteria, then you can sell, so you don't have to be approved. You just have to meet safety standards...so that has been a pretty big advantage actually. **(I8P9SF)**

Regulations were also seen as **protecting consumers and as enhancing competitive advantage** in that they differentiate a good product from others on the market. For example, entrepreneur **I1P1SF** said: "I somewhat appreciate [the regulations in place] because it ensures that we deliver things that are good for the market." Another entrepreneur expressed it thus:

[T]he regulations for a lot of people can be barriers to entry, but for us, it has been a kind of a stamp of approval to say that we have a waste management licence...So that means that regulatory bodies have looked at this and said, okay, this is fine, you can do it and go ahead with it, which means that we can take that to, you know, people who might have been hesitant before... **(I8P9SF)**

Political context

Half of the participants interviewed (10 of 20) cited **political structural issues** such as an **unequal society** and **corruption in governance** structures as hampering innovative capability of NTBCs in South Africa. This was expressed as follows:

I think I'll be honest, Esnah. I think if you're black and you're trying to innovate...I think it's just about impossible...Whereas I think with our white counterparts, there's a lot more money available [to fund their innovations] because maybe their networks, you know, maybe your dad knows a big CEO somewhere that can help you access some corporate funding etc...and also think of the "Silicon Valley" that we have in Stellenbosch which has put aside quite a lot of money for their innovations, so they have a lot more support. **(I6P7BM)**

For example, I16P17SF spoke about [help from] DTI. I think, for me to go to DTI I would have to know someone that's well recognised for me to receive any help.

Even if I have the final product, but for me to get to those guys to actually come and help, it's going to take me forever... **(I16P18SF)**

Information gap

Poor access to information at various points in the innovating or entrepreneurship process was cited as a challenge by 16 of the 20 participants. This lack of access to relevant information or information gap was identified as a challenge across all the specified levels of the micro-, meso-, and macro-environments. Poor access to information was an insidious multi-faceted challenge that seemed to permeate most of the other challenges experienced by entrepreneurs. Many of the challenges cited by the participants pointed to, in some shape or form, poor accessibility to information. For example, participants highlighted problems with weak knowledge transfers from experienced persons to entrepreneurs who are starting out, whether from academia or business mentors; poor cognitive access to regulatory and compliance information whereby entrepreneurs do not know how to find or decode complicated regulatory and compliance information; scant information on potential funding options; lack of information on support mechanisms in the operating environment, and poor access to market information.

The challenge of **weak knowledge transfers** was expressed as follows:

So there is also another element now that knowledge is not being really transferred as fast as it should be...But the problem is there's no appetite for study in this country. Eish, it's a problem. You have business people that are relying on experience alone, and experience alone does not really make you innovative. It just makes you a well-oiled machine. **(12P3SF)**

We have an innovation chasm where ideas developed from universities are unable to make it through to markets for commercialisation... [and] access to academia for knowledge transfer remains a challenge, however, because of that innovation chasm I mentioned earlier which needs to be addressed. **(I18P20IE)**

Participants also noted that while information regarding regulations and compliance issues may be obtainable, it was **not always cognitively accessible** in the sense that entrepreneurs often didn't know how to interpret the legalese used to write the documents. This was highlighted by an industry expert as follows:

But the challenge also is, is everybody privy to these regulations? Is there accessibility to these regulations or it's only for those that might be a class above. So information around that must be available publicly, but you also need the entrepreneur to understand them... [W]ho is writing that information [on funding requirements]? What knowledge does he or she have in communication? You may find that it's a lawyer or an investment analyst. We need somebody who knows communication [to] scale down the information to the level that is required... [W]e are pushing people who have got the real solutions out. So how do we ensure that we've written our documents in a way that is [accessible] to everybody? **(I12P13IE)**

Information regarding available funding instruments was seen as unclear. This was perceived to be particularly true for entrepreneurs operating in low-income markets, as noted by a business mentor who said:

But I think in a particular way when you are targeting a low-income market, you struggle maybe more because like, I find that again, back to the question of how do you access the information, and unless you are maybe connected to institutions like this; chances are that you wouldn't really know about where to access funding unless you happen to buy the right newspaper and open it up on the right page with that one announcement. It's not easy to find out...chances are that you will find out a week too late. Then you can't apply. So I guess there are opportunities out there...[but] it's difficult to get the information...I think the access is a problem. **(I5P6BM)**

An entrepreneur highlighted his struggles with accessing information in general and accessing relevant support mechanisms as follows:

But then, I mean, for me, to be able to run my company to the fullest, I need to be well informed. You know, I think we're lacking a whole lot of information as location hustlers (township entrepreneurs)...we don't really know where to go, as in which doors to knock, which people to talk to in order to get the proper assistance. For argument's sake, I've been here (at Soweto Empowerment Zone premises) for the past seven years and only this year I [found out] about the Innovation Hub...I didn't even know the purpose of the Innovation Hub. That's why I'm saying that there is too little information out there, hence why we are struggling in our businesses. We don't know where to start or where to go...There

is the NYDA (National Youth Development Agency). It's supposed to be for the youth...but what I've picked up is that they don't really help the youth because the youth doesn't know what the purpose of the NYDA is. We don't have any idea of what's happening out there, which institutions to go through. **(I16P18SF)**

Information on markets was also seen as a challenge for innovators as noted in the comment from an entrepreneur below:

I think you need to understand the market...You'll be in a far better position if you actually know the market in and out because you have to put up a product that must sell and you can only do that if you have information on the market. **(I2P3SF)**

The information gap was seen as a major challenge to innovativeness as entrepreneurs often had to navigate the lack of information together with other missing linkages in the operating environment for success. One entrepreneur summed it up as follows:

Until you clear all those red tapes, you can't really access the market. And you're also in yourself resource-limited, you literally don't have money... You don't have five years to wait for the certification body to give you that piece of paper. Then the word hustling comes in. You have to keep the business going despite the fact that you're kind of locked out of the market. So you have to come in with no money and very little information and try to get past regulations and policies and all those things...and you don't have experience... So it's about you going to the shop and taking the milk, taking the sugar you know, and making muffins... **(I14P15SF)**

5.8.4 SUGGESTED SOLUTIONS

During the interviews, the participants were asked to suggest solutions to some of the challenges they had identified. Several solutions were proposed, and these are presented in the following sections.

Solutions to micro-level challenges

Some of the solutions suggested for the micro-level challenges include means to **overcome internal organisational limitations** by employing various strategic options and innovative business models. All of the participants (20 of 20) suggested various

ways of overcoming internal organisational limitations resulting from lack of experience of the founder(s), lack of resources or inability to identify the right markets to cater to.

Participants observed that **collaborating** and **creating networks** with more skilled individuals or partners allows entrepreneurs to overcome the skills gap within their organisations as it enables skills transfer. For example, an entrepreneur recounted how interaction with another entrepreneur led to a positive business outcome:

[Entrepreneur X] came to me one day, we were sitting chatting and suddenly, just through the interaction between two entrepreneurs we created a new formula which would never have happened if she hadn't visited me.... In my 20s I was naïve, now I'm much more mature, I think, hopefully. So enthusiasm sometimes blinds you to the extent you think you can bootstrap a project and push it through to a market in 10 years flat and you're going to be a multi-billionaire...young entrepreneurs need maybe grey hairs (older and more experienced persons) on their board to guide them and to caution them... **(I11P12SF)**

The findings show that entrepreneurs employ **entrepreneurial bricolage** (Yu, Li, Su, Tao, Nguyen & Xia, 2019) to drive their businesses forward in a volatile operating environment. Bricolage involves making do with the resources at hand to create opportunities, particularly in the face of resource constraints. Some of the entrepreneurs stated that they do what needs to be done, what others call hustling, which sometimes involves taking shortcuts to market. This was expressed as follows:

...the funny thing is when people ask, what stage of your start-up are you in I always say I'm at the do whatever it takes stage...So at some point, people just need to get up and go and see what's out there...[Issues around regulations are] not going to change overnight...go to these places where you get standards [and get them] or do it the guerrilla way. Deploy and pay the fine and hopefully make enough money to pay the fine and get the standard...Pay the fine and then apply to have the licence because if you've got zero [product on the market] and no one is listening to you, then you have to do something as wrong as it may be...Sometimes the long route does not pay. **(I1P1SF)**

To overcome organisational limitations, entrepreneurs also need to be able to **create the right value chains** to push their goods to market. This was highlighted by a participant who said: "...not everybody is good at selling, right? So when you look at Somalis, they're really good at that, right? So why not just use them and be able to plug

in your products into those channels?" **(I3P4BM)**. Another participant also recounted the success achieved by another entrepreneur at the Innovation Hub by creating the right value chains for her business:

[One entrepreneur here, X], her entrepreneurship was very strong on the networking talent that she's got, fantastic networking talent. A lot of entrepreneurs get stuck in the lab, they create a product, and it stays on the shelf. Now, this lady doesn't have a formal degree in biochemistry. But through networking, she was able to tap into competencies in marketing, making of labels, artwork, design of new formulations, design of new enclosures, bottles, and then very much thinking about logistics, how do I move this thing?...And she started small here. It's now a multi-million rand business, very, very successful... **(I11P12SF)**

Participants articulated that on top of creating the right networks, **finding mentorship**, and **fostering peer-support** also helped in overcoming some internal organisational limitations. This was conveyed as follows:

...we sort of left this space to go to work at Tshimologong in Braamfontein. Solely because I believe in the power of networks. So I was like, you know what, let's just go and meet other people...which paid off very well. We were there for four months....There's an electronic space where [my partner] was working and she was meeting new people. We found a better way of going about what we were doing. Instead of just being here by ourselves thinking that we are going on the right path. We met people, we met the Siemens Digital Mine and so on. It was worth it, but it was tough as can be. **(I1P1SF)**

So I mean, not knowing where to get support [was a challenge]. This was actually even before we came across the Innovation Hub for mentorship...So I mean maybe not having enough support with regards to the pricing models, and business models, and procurement and ways around procurement so that you can actually have a service that's better and affordable to customers...deeply understanding those factors made us change our pricing...Because right now what I would say was a solution for me was knocking on doors. So the more problems I faced, the more I could research and look for who offers that service. **(I14P15SF)**

The majority of the participants (16 of 20) suggested various strategies or **strategic options** that entrepreneurs operating in the South African environment can employ for disruptive capability. These included options like lowering costs, innovativeness,

flexibility, differentiation, continuous improvement of products and processes, providing good enough functionality and competitive cooperation (co-opetition), which refers to cooperation between business competitors (Ansari *et al.*, 2016).

Finding ways of **lowering costs** was seen as crucial to competing successfully in low-income environments. One industry expert (**I12P13IE**) stated that he advises entrepreneurs to find ways to lower costs. He said: "...in [the] cosmetics sector, I often encourage entrepreneurs to unite and buy raw materials in bulk in order to reduce their costs." Entrepreneurs were also aware of the need to lower costs in low-income environments as articulated in the following quotes:

So when you start to sell a product, you wouldn't think that selling to smallholder farmers who actually are resource-limited, is actually tough. It's tough because their income is hand to mouth. So now you're coming in, and you're taking a bit from whatever they were saving, and so you have to seriously provide value...So now you have to kind of struggle with your inputs, bringing the cost of production low so that they can afford your product. So finding a balance, that is where I think the innovativeness should come through to actually make you survive the market. Because if you can't make it cheap enough for them to buy, you won't be able to compete with guys that are commercially producing the same product you're producing. (**I14P15SF**)

Another key strategy that was suggested was being innovative. **Innovativeness** in low-income environments could be in the actual products that are offered or in the business model and monetisation strategies employed in catering to the market. This was expressed in the following quotes from the participants:

...[Y]ou cannot survive in any business if you're not innovative. That is the truth. So, you need to also look into other things, like maybe going the solar route, and not stick to electricity powered installations, things like that and maybe see if you cannot penetrate the recycled product industry as well. And then you can also win on the price factor. So yes, some little bit of innovation is required. (**I2P3SF**)

...whatever you do, you must know that people have very low disposable incomes. So unlike the [higher-income segment] where, you know, people will just try things and spend money because they've got higher disposable income, there [in the lower-income segment] it's either your [product] or a taxi ride or a meal that you've got to compete with. So the margin from a financial side if you're going to be

relying on them paying, you know, you have to look for other ways of making the revenues other than [relying on] the people that are actually using your innovations to pay you directly. [You have to find] other indirect ways of getting to your payment. **(I6P7BM)**

Flexibility was seen as strategically important when operating in low-income environments based on what the market needs. An entrepreneur described his experiences below:

You have to be open. Because the thing is, the market is different from what anyone would imagine before you enter the market. So the attitude really is that you have to be flexible, to open up your mind. You have something that you're pushing, but as you learn you need to be able to pivot, you know, that helps you to adapt to the situation. They say you make plans, but when the plan is implemented, you find out that the plan is wrong. But because you're now implementing it, you have that opportunity to change the plan and adapt to the situation. **(I13P14SF)**

Being able to **differentiate your product** in a crowded market was seen as strategically beneficial:

...the market is overcrowded... So I think if [the entrepreneur] were to say my point of difference is Marula and then you do a Marula story so that people can buy into the, you know, the whole African Marula story...So those are the things that they could do...using good ingredients with very rich, African stories and history... Don't be everywhere, just focus. **(I9P10BM)**

Additionally, **continuously improving** around the product and processes was also seen to lead to positive innovation outcomes as described below:

And it was essentially a garage operation at that point, just experimenting with trying to find solutions for food waste, which is a very big problem, both locally and globally. The company at that stage went through, I think, it was two or three very quick pivots as I tried different technologies. It took quite a while for me to get this product right... **(I8P9SF)**

Cooperating with competitors (co-opetition) was also mentioned as a strategy that entrepreneurs with resource constraints can follow to improve innovative capability. One industry expert suggested that:

Learning capabilities are important [to entrepreneurs] because they will then help in terms of understanding whether to be aggressive in terms of penetrating the market. And what does it mean to be aggressive? Because remember aggressive can be in two ways, you can have cooperative aggression where you unite, and then...you take the market by storm as a unit with combined resources or beat your competitor and be ahead of the pack. [So] the learning capability then helps you to understand whether the environment that you're operating in, does it require you to beat your competitor down or to work with your competitor.

(I12P13IE)

Operating in resource-constrained environments may require entrepreneurs to **offer 'just-good-enough' functionality** at the lowest price because low-end market segment consumers do not have high disposable incomes. An entrepreneur, **I13P14SF** noted that: "You have to price [the product] as low as possible, as simply as possible, because the consumer market at the low end is not fussy. It's about functionality...People will go for the cheapest stuff."

Solutions to meso-level challenges

Various solutions were also proposed for overcoming some of the identified meso-level challenges. These included the ability to innovate according to context, solutions to market access challenges, alternative funding options to overcome access to funding challenges, and having in-depth market knowledge.

Several participants (13 of 20) suggested that **innovating according to the context** of the South African operating environment was a way of improving the disruptive innovation capabilities of entrepreneurs. An entrepreneur showed how he tried to contextualise his innovation to the operating environment in the excerpt below:

...[T]he problem in Africa is of low-incomes. And a lot of development happens in richer countries, and they develop solutions for their markets, which we can't afford. So in the instance of preventing malaria transmission, you typically use a mosquito repellent. Okay, so they've discovered nice mosquito repellents, they have synthesised very effective ones, but they are very expensive to be used by a normal person in the village. So for us, it was always the objective; low-cost, but effective intervention to solve the problem of malaria. So that's what drove

us...the need to contextualise innovations to the South African environment.
(I13P14SF)

Participants also suggested **harnessing local indigenous knowledge** to contextualise innovations for the operating environment. This was expressed as follows:

...If we could train our scientists, our engineers, both in whatever they are doing in the formal [systems] but also understanding how do you go home and sit with your grandparent, who has been weaving baskets, making those curves without Computer Aided Drawing (CAD) and all that. That then helps us to bridge the skills gap. Look at some of the innovative countries, look at India, look at China, how immersed are they with their local knowledge bases? That is what we need. South Africa and Africa we have got very few that are immersed with their local knowledge systems. **(I12P13IE)**

Twelve of the participants suggested solutions to tackle market access challenges for NTBCs in South Africa. Some of the solutions were around **creating alternative channels to market** for local innovators instead of focussing on the regular channels that are overcrowded. This was articulated as follows:

It's Facebook, other social media; it's word of mouth, local churches, you know, taxi ranks, pamphlets...so that is how they are doing it at the moment. And I think yeah, the strategy is right, but they're still not making enough money... That is why then direct marketing or direct selling tend to do well because remember there, it's [about] relationships. **(I9P10BM)**

[We need to] start our own retail spaces. I can tell you that it's very difficult to get into this retail market space. I did a pilot project with Builders Warehouse; it's not easy. That's when I sat down and said to myself that the only way to penetrate this market is for us to have our own retail spaces in our own communities. Why should we join others? **(I16P17SF)**

Other participants advocated for the **creation of specific technology platforms** that will assist innovators with better access to markets:

So the primary aim of the OpenIX programme is to focus on demand-led innovation... that is the primary aim in terms of market access, enabling market access. So we link up with clients who say that, okay, I've got this specific problem, whether it's a government or a private sector client who says we've got a specific problem and we look for a solution for it...we give the innovator, the

entrepreneur, the SMME a better chance after they have demonstrated their solution in a real environment... **(I10P11IE)**

While others suggested that **legislation** needs to be enacted that promotes equitable market access for all businesses. One entrepreneur said:

I don't know really, through legislation government should come in and prevent such monopolies. I think that is one of the reasons why employment isn't being generated [in the country]... But you need to have a systematic approach; I think that legislation must make sure that access to the market is democratic and more products are given priority to be sold in order to prevent big companies building a wall, and then you only have those big companies operating. **(I13P14SF)**

Seven participants recommended solutions to address the funding challenges experienced by entrepreneurs. It was suggested that not all entrepreneurs benefit from financial support but rather that they should be given **alternative forms of empowerment through useful linkages and information**. This can be seen in the following quotes:

Let's take this pen, for example. I want to build a pen... [T]he incubators should just partner with these people. [Then tell the entrepreneur to] go meet with company ABC, we already have an agreement with them...Meet with company ABC they will help you build these rubber parts. You need this plastic, meet with company XYZ they will help you with this plastic...Nurture the entrepreneur and get them to prototype as quickly as possible. Then only can we can talk about funding because once they are at prototype, they must go and find someone who will use it. Don't give us money... just give us [the linkages] we need... **(I1P2SF)**

...if people can come and say...we can see that you are short of machines, go and talk to that office and see if they will assist you and if they can't, then go talk to that other office. I'm saying we don't know where to go. When I'm stuck with my machines there when they break down, I have to crack my head. It's either I have to fix them myself, or I go out and get someone to fix them. But if I have to go out to get someone to fix the machines, it's time lost. But the assistance that we need as small business is equipment and materials, not cash... **(I16P17SF)**

Furthermore, **bootstrapping and organically growing a business** through its client base were seen as viable ways of self-funding a business. One entrepreneur's approach was: "[I've had no external] investment...I've always believed that I can get clients and

through the clients, I can run the business.” (I17P19SF) Another also indicated the value of bootstrapping:

My take on that [is that] people need to understand that before I can invest in your idea, I want to know what have you done with your money, what have you invested in this venture? So bootstrapping comes before external funding...then you know, it teaches you how to manage money, so that you can actually get the product. It helps you with cost efficiency... (I1P2SF)

Having **in-depth market knowledge** was also suggested by some of the participants (5 of 20) as a solution for the poor market acceptance and penetration of locally produced innovations. On this point, an industry expert stated:

So you need to be plugged into the community and understand what the challenges are. When you understand the challenges, you can come up with the solutions that talk to the people. Otherwise, if you've got a solution that does not talk to the people, they will not take it. And that also goes to the success of the business in terms of management. Management for me, it has got a cultural component. You can do all the business management degrees that you want, administrative degrees that you want, but if you are not immersed into the local culture within which that business is being conducted, you are going to find your business as an outcast, it will not bring in customers as it should... (I12P13IE)

Solutions to macro-level challenges

Six of the participants suggested solutions that address constraints in the operating environment. One entrepreneur recommended that the government should offer **tax incentives** to smaller entrepreneurs: “Businesses are being destroyed by tax, it’s too high. They have to be serious about tax incentives.” (I2P3SF)

Another entrepreneur suggested that entrepreneurs need to be **innovative around their business processes** to overcome challenges in the operating environment. He said:

But then what I've really learned is that in order for upcoming entrepreneurs to make it we're not really supposed to be depending on government...we need to come up with maybe plans on how to improve, like our working systems. Because I think most of us are using systems which are already there. But if you are an entrepreneur or a hustler, you always come up with new ideas of doing things. (I16P18SF)

In order to overcome challenges of poor availability of technology and other resources, one entrepreneur suggested that **government fully leverage multi-lateral agreements with other nations that foster research and human capital development**. He pointed out that:

We don't have that infrastructure. So it's very important to me, what I saw as very important, that the government actually expands this connection with the Europeans and the Americans and all that because we get to leverage on their infrastructure for free. I mean, Germany is willing...for me my first visa I paid money, and they said you know what, you are going for research, so we are refunding all your visa money. Then when I applied for a visa, again, this time instead of giving you a visa for two months, we'll give you for the whole year. So it's open, I think government, the South African government has done well, I think other African governments can leverage on the Europeans because they are waiting with open hands and that will help technology innovations. **(I13P14SF)**

Regarding the **skills shortage** in technology entrepreneurship, 5 of the 20 participants suggested solutions including:

[I would suggest] a coaching system...for example, if you talk of skills, universities have different departments that cover all the skills that you require to run a business and we have equipment...If we can have an individual from each department that's necessary, group them and match them into a business and they dedicate [themselves], not just to tick a CE (community engagement) box but to see that business from one place to another. For a vested interest of course, because in the long run...sometimes people think what is in it for me?...So it's a negotiation. **(I7P8BM)**

What I would recommend is that the curriculum must include business management courses early on maybe from grade 12 or in high school, even right through university they must have those. I think they have some component of that, they call them service courses, it's one small course just for you to appreciate... it has to be a very strong component. **(I13P14SF)**

Regarding governmental policies and legislation that promote small enterprise growth some of the participants (5 of 20) recommended various solutions that included **recrafting legislation to protect and promote small business and properly**

consulting small business owners before developing legislation and regulations that impact them. This was expressed as follows:

If you look at successful economies, they are successful because of small businesses. Most employment comes from small businesses. But in South Africa, the regulations actually support big businesses and make it impossible for small businesses. That needs to change...you need that component of small businesses to come in and thrive because small businesses employ way more people than big businesses...So it's an unfortunate thing. I don't know why it hasn't been raised loudly...The regulations are very restrictive, especially for small businesses...
(I13P14SF)

5.9 CHAPTER CONCLUSION

This chapter presented the findings from the 20 in-depth interviews conducted during the data collection phase of the study. The chapter began by outlining the coding process that was the basis of the findings uncovered, as well as the analytic process of linking codes to concepts, and concepts to categories. Following this, basic biographical profiles of the participants were presented in the form of visual graphs to contextualise the findings fully. The findings were presented according to the research questions. Congruent with a qualitative methodology, findings were presented with the support of verbatim quotes from the study participants to accurately represent their opinions, views, perceptions and experiences with the phenomenon under study. The major findings were that the South African socio-demographic situation that is composed of a large number of low-income consumers presents an ideal environment for developing and commercialising disruptive innovations. However, market demand for local NTBCs' products is weak. NTBCs typically favour entry into mainstream markets, rather than the low-end and fringe markets. As a result, NTBCs face high competitive pressures in the mainstream markets. NTBCs that are likely to develop a disruptive innovation capability typically have high founder knowledge, as well as innovativeness, a learning and emerging market orientation. These attributes are required to navigate the myriad challenges in the entrepreneurial ecosystem and the macro-environment. The next chapter presents a discussion and synthesis of these findings, and a framework for disruptive innovation capability at the BoP is developed from this.

6 CHAPTER 6: INTERPRETATION AND DISCUSSION

6.1 CHAPTER SUMMARY

The previous chapter presented the findings gleaned from 20 in-depth interviews conducted with the study participants on their perceptions and experiences with the phenomenon of disruptive innovation capability in the South African low-income environment. This chapter discusses the findings uncovered and presented in chapter five of this work and interprets their meaning and significance. In so doing, the findings will be synthesised into a coherent whole and a framework of disruptive innovation capability in BoP environments is developed from this.

6.2 INTRODUCTION

The study aimed to explore, through a theoretical purposive sample of 20 participants in the South African new technology-based company (NTBC) incubation space, the organisation-specific and contextual factors that enable disruptive innovation capability in low-income environments. A substantive framework for how NTBCs organise for the disruptive innovation process and the conditions that support successful disruptive innovation development in BoP environments is developed from a synthesis of the findings.

Even though three different groups of respondents were interviewed, the findings are discussed and synthesised as a whole. Interviewing different groups of respondents was done to facilitate a range of views, as this was a largely exploratory study, and to avoid elite bias (Seale, 1999; Natow, 2020). No single groups' responses were deemed to be more important or carry more weight than any other group of interviewees. The findings are organised and discussed according to the analytic categories below, which are directly linked to the research questions of the study:

- i. Contextual factors that influence the disruptive innovation capability of NTBCs in South Africa's BoP environment. (*Research question 1*)
- ii. NTBCs choice of market segment to cater to, reasons for choice of market and competitiveness of the chosen market segment. (*Research question 2*)
- iii. Characteristics of NTBCs likely to develop a disruptive innovation capability in the South African operating environment. (*Research question 3*)

- iv. Challenges and solutions to NTBCs developing and commercialising viable disruptive innovations for the South African BoP (*Research question 4*).

6.3 ANALYTIC CATEGORY 1

Contextual factors that influence the disruptive innovation capability of NTBCs in South Africa's BoP environment.

The first objective of the study was to explore the factors that influence the disruptive innovation capability of NTBCs in South Africa. The research findings provided rich and varied responses around factors in South Africa's operating environment that encourage the development of disruptive innovations, in particular, the fact that the demographic make-up of South Africa is primarily composed of low-income consumers with low disposable incomes. This, in turn, promotes product and service innovations that are cost-effective and provide good value for money. This finding echoes the literature on disruptive innovations in emerging economies such as Yu and Hang (2011), Li (2013) and Christensen *et al.* (2017) that have also found that the low-income environments prevalent in emerging and developing economies encourage the successful development of disruptive concepts. This is because disruptive innovations are products and services that are initially targeted at price-sensitive market segments as well as targeting non-consumption within markets. Therefore, this demographic make-up presents an ideal foothold market for would-be disruptors.

The results further suggest that the South African operating environment also exhibits several other enablers of disruptive innovation capability, including lifestyle trends and consumer behaviours. These lead to the need for improved access to healthcare, quality food, social and environmental concerns, and safety and security concerns. This is witnessed by how different entrepreneurs who participated in this study leveraged various consumer trends and concerns including safety and security, healthcare, urban agriculture, and environmental sustainability to power their innovations. These enablers of disruptive innovations mentioned above are corroborated by Hang *et al.* (2011) and Nogami and Veloso (2017) in their studies of disruptive innovations in the BoP environments of China, India, and Brazil. Thus, the research findings support proposition 1_a of the conceptual framework (chapter 3) where we presumed that social and demographic changes, as well as consumer behaviour in South Africa's largely BoP environment, influence the ability of NTBCs to develop a disruptive innovation capability. This finding implies that developing a disruptive innovation in BoP environments is about

identifying and targeting consumer pain points. The focus should not be on the technology driving the innovation, but on the market need that will be fulfilled.

Enabling technologies, such as ICTs, drive disruptive innovation capability by allowing small entrants better reach to customers and facilitating a cost-effective scaling up of business models (Christensen and Raynor, 2003; Markides, 2008; Eggers *et al.*, 2012). The findings of this study point to poor access to enabling technologies in the South African operating environment by NTBCs. Participants suggested that there is a deficit in current technologies such as IoT and other technical systems to support production systems. A shortage of enabling technologies appears to be one reason why South Africa may be falling behind emerging economy counterparts such as India and China in developing disruptive concepts (Prashantham and Yip, 2017). Entrepreneurs typically need to leverage existing technologies to bring innovative products or business models to market (Christensen *et al.*, 2015) as they often cannot develop these technologies themselves due to resource constraints (Taneja *et al.*, 2016). This finding supports proposition 1_b of the conceptual framework where we surmised that the availability and progression of enabling technologies facilitate the disruptive innovation capability of NTBCs in BoP environments.

Leveraging indigenous knowledge to fuel disruptive innovation capability was another factor that came out of the findings of the study. Indigenous knowledge is context-specific, locally embedded knowledge, that is accumulated over time and is specific to a culture, people or local community (Jauhiainen and Hooli, 2017). It includes traditional ways of food preparation, preservation, and nutrition; indigenous oils and creams for cosmetic use; traditional herbal medicine and pharmacology; and traditional ecological knowledge among others (Shava, 2020) which can find commercial use when bundled into appropriate innovations or products. There is a paucity of literature around the use of indigenous knowledge as an enabler of disruptive innovations in emerging and developing economies.

It is worth noting that incorporating indigenous knowledge as an enabler of disruptive innovations was mainly mentioned by the business mentors and industry experts, but hardly mentioned by any of the start-up founders. This may indicate poor contextualisation of business concepts by entrepreneurs in the South African environment. Indigenous knowledge is largely trivialised; as Shava and Togo (2020) note, indigenous knowledge in many economic spheres is mostly unrecognised and underrated. Mwantimwa (2008) cites the main reason for this as the colonial legacy of

demonising indigenous knowledge and casting it as primitive and irrelevant. However, Jauhiainen and Hooli (2017) found that indigenous knowledge bundled with external technologies contextualised innovations to suit local contexts in Namibia while encouraging the development of inclusive innovations.

The findings from this study highlighted that contextualisation of innovations to the local consumers may be weak, which is why many innovations may fail to become commercially viable. The use of local knowledge contextualised to local consumers' needs and wants is a source of potentially disruptive innovations that entrepreneurs are seemingly ignoring leading to the lower success rates of disruptiveness witnessed in the South African operating environment. The undervaluing of indigenous knowledge leads to products that are misaligned with the reality of consumers' environment. Potential innovators then lose out to larger incumbent business as their products fail to resonate with consumers and thus are unable to gain market share. This has the knock-on effect of eroding potential capital to fund more innovations, thus hindering the innovation capability of the start-ups.

Prahalad and Mashelkar (2010), Markides (2013a) and Altman and Engberg (2016) have suggested that local entrepreneurs are most likely to introduce disruptive innovations as they are immersed in the daily lives of the consumers, leading to a better understanding of consumer aspirations, needs and wants. However, findings from this study indicate that entrepreneurs are not fully leveraging local and indigenous knowledge to bring market-relevant innovations to consumers in South Africa. For example, in other emerging markets such as India, Rao (2013) and Yadav and Goyal (2015) point to the success of innovations built from local customs and knowledge, such as the MittiCool clay fridge, that fulfil the need for a low-cost solution to a local problem. This implies that innovation success is context specific. The norms, cultures and lived experiences of the local populace need to be taken into account in developing useful innovations that find market success. Simply imitating innovations from elsewhere without due regard to the consumer context will not work.

This study found that adoption rates for potentially disruptive innovations introduced by new and small ventures are low. Adoption is a significant challenge for innovators who struggle to become sustainable, to the extent that the poor demand for products produced by small local enterprises is a perpetual policy concern in South Africa (Ndabeni, 2014). In addition to the potential misalignment with consumer needs, scholars also note that low-income environments are challenging to operate in

(Prashantham and Yip, 2017). Furthermore, due to the low disposable incomes of the majority of the populace, the consumers are often wary of experimenting with new products and services which they may not trust. As participants in the current study pointed out, adoption of innovations may be low because of a lack of trust in locally produced products. Limited trust with regards to new products is not peculiar to South Africa as Prahalad (2012) also highlighted the challenges of adoption of new products in low-income environments. Potential customers, therefore, often must be educated on the benefits of the innovations or trained on how to use them, which leads to increased costs of customer acquisition and retention (Simanis 2012).

The increased costs of customer acquisition and retention in the South African environment are a challenge for start-ups that often do not have the financial resources to invest in market adoption initiatives and branding efforts (O'Dwyer, Gilmore & Carson, 2009; Odoom, Narteh & Rand, 2017). In the absence of financial resources to deploy large scale marketing activities, start-ups need to employ innovative marketing practices to attract customers. Innovators need to consider how consumers will use innovations and make it easy for them to understand how products should be used, for example through the use of visual representations on the packaging to improve comprehensibility, direct marketing that enhances social interaction, social networks and opinion leadership to enhance consumer learning and adoption (Hasan, Lowe & Petrovici, 2019), as well as robust refund policies and visible after-sales support to improve trust in products (Foster and Heeks, 2013).

Although the operating environment might present challenges to adoption, it is also possible that, as suggested earlier, NTBCs in South Africa are failing to contextualise their innovations to the local low-income market segment adequately. As Prahalad (2012) points out, the low-income market segment is not merely interested in cheap necessities; they have varied needs, wants and aspirations that must be considered in developing innovations aimed at these markets. This is further borne out by the findings of this study, where participants indicated that South African consumers are "label-conscious" and aspirational and often seemingly prefer international brands to locally produced goods/services. These ingrained mindset biases indicate that innovation adoption is not only driven by practical reasons but also has an emotional component such as the enjoyment and pleasure derived from the use of the product or service (Hasan, Lowe & Petrovici, 2020). This suggests that in order to develop successful disruptive innovations in the South African operating environment, a holistic approach is

required. Innovations need to be useful and fulfil the practical job that needs to be done, they should be affordable given the low disposable incomes in the operating environment, and they should also satisfy other higher-order motivations such as belonging, esteem and even self-actualisation. Innovation success is about creating a product or service that is not only functional but also satisfies social and emotional requirements (Christensen *et al.*, 2016b).

6.4 ANALYTIC CATEGORY 2

NTBCs choice of market segment to cater to, reasons for choice of market, and competitiveness of the chosen market segment.

The expressed choice of mainstream market focus by most of the entrepreneurs in this study is another possible reason why South African entrepreneurs seem to lag in developing successful disruptive innovations. Prior empirical studies on disruptive innovations (Govindarajan and Kopalle, 2006; Habyay and Holmèn, 2014) have concluded that having an emerging market orientation facilitates disruptive innovation potential whereas a mainstream market orientation hampers disruptive innovation capability. This is because disruptive innovations always emerge from fringe niche and low-end markets that are overlooked by incumbents (Christensen *et al.*, 2015). The implication is that in environments where entrants typically focus on catering to mainstream markets, the possibility of potentially disruptive innovations emerging will be lower.

A possible reason why the entrepreneurs in this study typically favour the mainstream market could be because market intelligence is commoditised and expensive to procure and hence start-ups have limited access to it (Togo, 2019: personal interview). Venter and van Rensburg (2014) note that organisations typically spend significant resources on marketing intelligence to understand customer needs and the nature of markets. The expense limits the market intelligence smaller enterprises have access to and forces them to rely on information based on what they see in their daily lives which is the narrative of dominant incumbents that focus on the mainstream market. By also focusing on the mainstream market, the start-ups are forced into competitive battles, which they are unlikely to win, against better-resourced incumbents (Markman and Waldron, 2014; Christensen *et al.*, 2015).

The poor access to relevant market information would also explain the market needs misalignment that results in entrepreneurs developing products that do not resonate with the low-income market segment. Some of the participants in this study indicated that they did not think that there was an adequate market size for any potential innovations in low-end markets as they would not be able to make suitable margins on their products. This is a surprising finding considering that the majority of South African consumers (75%) are classified as low-income (DIBDI, 2010).

The targeting of mainstream markets may also explain the highly competitive markets reported by start-ups. Competition was reported from dominant incumbents or high, but fragmented, competition from a large number of smaller businesses operating in the same market space. The theory of disruptive innovations predicts that competition would be high in mainstream markets, as that is where higher profit margins are realised (Li, 2013; Christensen *et al.*, 2015). Furthermore, incumbents are entrenched in mainstream market segments and react defensively to any encroachment by would-be disruptors (Raynor, 2011b).

The stiff competition in mainstream markets explains why the dominant reason for entering low-income markets, by entrepreneurs who chose to do so, was market opportunity and foothold market availability. This is supported by Markman and Waldron (2014) who found that small entrants survive market entry better when they target small niche and low-end markets that are insignificant to incumbents. In other words, small entrants need to identify a market position that is disruptive to existing businesses in an industry so that they do not compete directly with existing incumbents. This further stresses that carving out a disruptive position in relation to existing incumbents in the target market offers advantages of low competitive visibility (Carayannopoulos, 2009).

Some of the participating entrepreneurs simply ended up in low-end markets, not out of any strategic intent but out of necessity. Not having sufficient capital and human resources to be able to penetrate the mainstream market was cited as a reason why entrepreneurs ended up choosing to target low-end and fringe markets. This suggests another reason why there is a low rate of successful disruptive innovations in the South African operating environment. Necessity entrepreneurs tend to focus on their own subsistence needs and are typically less scalable and are less likely to become fully competitive or create employment (Alvarez and Barney, 2014; Agnihotri, 2015). Developing a successful disruptive innovation does not typically happen by accident. It is often the result of strategic choice and intent by the entrepreneur to focus on a low-end

or fringe new market at the outset and then strategically grow their resource base and capabilities till they can successfully challenge mainstream market incumbents (Raynor, 2011a; Christensen *et al.*, 2015). Therefore, entrepreneurs need to make a strategically informed decision to target low-end and fringe markets to enhance the corresponding necessary disruptive innovation capacity. These findings support proposition P₄ of the conceptual framework which suggests that developing a disruptive innovation capability requires active intent by the entrepreneur to cultivate an emerging customer orientation which enables entrepreneurs to anticipate and act on the market needs of fringe and low-end customers (Govindarajan *et al.*, 2011; Habtay and Holmèn, 2014).

6.5 ANALYTIC CATEGORY 3

Characteristics of NTBCs that are likely to develop a disruptive innovation capability in the South African operating environment.

The perception of the overwhelming majority of participants in this study was that founders with higher levels of formal education and prior industry experience were more likely to develop successful disruptive innovations and find commercial success. Participants expressed that having higher levels of education gave an entrepreneur more exposure to how the market and business environments work, how to leverage technologies and provide better access to information sources. Additionally, participants felt that higher levels of education bestowed a sense of legitimacy on the start-up, and funders were more likely to take a chance on the enterprise. van Praag (2003), Kato *et al.* (2015) and Spender *et al.* (2017) observe that founders with higher levels of education - that is, founders with at least a university education – are more likely to yield positive innovation outcomes, survive longer and obtain more funding from lenders. This was found to be particularly true for technology entrepreneurs (Duneas, 2010).

Observational evidence from this study also corroborated the participants' views. Without inferring any causal relationship or statistical correlation, as this was a qualitative study, the findings from the NTBCs sampled for this study seem to show that founders with higher levels of education and/or prior industry experience have more successful innovations and have found better commercial success. The most successful innovations and businesses in the study sample were academic spinoffs and those run by founders with university degrees and industry experience. This finding confirms proposition P₆ of this study which assumed that the founders' human capital in terms of

their level of education and prior experience enables disruptive innovation capability in BoP environments.

The observation that high levels of education enable disruptive innovation capability suggests that in volatile operating environments, such as South Africa, while it is certainly possible to become a successful technology entrepreneur without higher tertiary education and prior industry experience, having these characteristics may assist an entrepreneur in better negotiating the challenges that may be present in the operating environment. As one entrepreneur expressed it: “I’m self-developed....so you can imagine when you start teaching yourself something that you don’t really know, like how difficult it is, and not knowing the challenges of what you are [getting] into.” **(I16P18SF)**

Furthermore, founder team complementarity in terms of how skills, abilities and experience supplemented each other within the start-up founding team was found to lead to positive disruptive innovation outcomes (Sargut and Gunther-McGrath, 2011). This may speak to the need for knowledge resources in early-stage enterprises. Knowledge is an expensive resource to obtain for any organisation (Teece, 2017), for start-ups already burdened by a shortage of resources, agglomerating the relevant resources becomes a make-or-break exercise. Therefore, in the absence of financial resources to recruit the required talent for the organisation, the next best thing would be to ensure that the start-up founding team has the relevant critical skills and capabilities between or among them in the form of education and experience. Founder team complementarity, therefore, saves money and may give the start-up the competitive advantage required for long-term survival (Garcia-Cabrera, Garcia-Soto & Nieves, 2020).

The above notwithstanding, some of the participants expressed the view that having a higher education might detract from innovation success in low-income environments. The suggestion is that having a higher education removes would-be innovators from the reality of the lived experiences of the low-income consumer and makes it challenging to develop contextualised innovations that speak to their needs and wants. Literature suggests that multinational companies often fail to develop successful innovations at the BoP, not because there is no market need, but because the innovations developed fail to address the latent or unexpressed market need of the consumers (Brem and Wolfram, 2014). This implies that having the right skills and abilities to develop an innovative product means very little if there is no clear understanding of the market being catered to.

Concerning the specific capabilities that entrepreneurs need to develop a disruptive innovation capability in BoP environments, most of the participants felt that would-be disruptors required strong learning capabilities. In volatile operating environments and uncertain markets such as those that characterise many emerging and developing countries (Govindarajan and Trimble, 2012; Prashantham and Yip, 2017), entrepreneurs would need to be nimble, continually pivoting and changing their approach as the market environment also changes. Since most product or innovation ideas never survive initial contact with the market or consumer (Ries, 2011; Bajwa *et al.*, 2016), entrepreneurs need to continually adapt their innovations based on feedback from consumers until the final product that meets consumers' needs is produced. Such agility in developing products requires interface capabilities (Reinhardt, Gurtner & Griffin, 2018) which allow companies to match business solutions with market needs. For this to happen, entrepreneurs need to have a strong learning orientation and be fast and agile in reformulating innovations according to market needs. In other words, entrepreneurs need to fail-fast and reconfigure products and innovations quickly according to market requirements (Blank, 2013). Participants in this study demonstrated an appetite for failing-fast as shown by their need to formulate and test products in the market and then pivot when necessary. The failing fast approach is encouraged by the business incubator hosting the entrepreneurs (TIHMC), which may push the entrepreneurs to develop the relevant learning capabilities. However, this may not always be the case with other entrepreneurs that are found outside such incubation environments.

Learning-by-doing, which also featured in the responses from participants, is a concept that features strongly in NSI literature (Viotti, 2002; Lundvall, 2009; Spender *et al.*, 2017). Learning-by-doing emphasises the interaction of the entrepreneur with the market and other actors and institutions within the innovation system (Chaminade, Lundvall & Haneef, 2018). Small enterprises, in particular, are seen to gain competitive advantage through experiential learning since they have fewer resources for more formal R&D activities (Thomä, 2017). However, in developing countries, entrepreneurs do not usually produce new to the world innovations, they often assimilate, master, and improve technologies and innovations produced in developed nations (Viotti, 2002). In such an environment, learning and innovation become synonymous processes (Heeks *et al.*, 2014). Learning-by-doing also ties in with the aspect of leveraging indigenous knowledge to drive disruptive innovations. Indigenous knowledge has an element of innate doing-using-interacting (Jauhiainen and Hooli, 2017). The possession of indigenous or local knowledge can be used by entrepreneurs to modify and adapt

technologies and innovations from developed nations to suit local conditions and markets.

Developing a learning orientation may assist entrepreneurs in volatile or ambiguous operating environments to negotiate the uncertainty and other constraints in the market and this is likely the reason why learning capabilities are essential for would-be disruptors (Wolff *et al.*, 2015). For example, participants in this study indicated that it is not always clear to the entrepreneurs where to get relevant or up-to-date information on funding options, regulations that might apply to their specific innovations or market information. In this instance, it then falls on the entrepreneur to somehow find a way to source this information and apply it to their circumstances. Additionally, entrepreneurs must develop active learning capabilities to reconfigure already existing technologies and innovations (Chaminade *et al.*, 2018) to suit the South African consumer and operating environment. Entrepreneurs that are better at this are consequently often more successful in the market. This finding is congruent with proposition P₅ of the conceptual framework, which posited that having a learning orientation would promote the disruptive innovation capability of NTBCs operating in South Africa's BoP.

Entrepreneurial orientation encompasses the entrepreneur's strategy-making processes to achieve superior performance (Zhou *et al.*, 2005; Brettel, Chomik & Flatten, 2015). Entrepreneurial orientation includes sub-dimensions such as innovativeness (Taneja *et al.*, 2016), risk-taking (Ahunov and Yusupov, 2017) and proactiveness (Krauss, 2013; Brettel *et al.*, 2015). Innovativeness was a critical capability that was highlighted by study participants as leading to disruptive innovation capability in BoP environments. Low-income consumers have low disposable incomes; innovators, therefore, need to innovate around their product offerings to make them as cost-effective as possible while still offering acceptable quality and functionality. This may involve innovating around their business models and how they extract value from the market (Christensen *et al.*, 2017). Entrepreneurs in the study highlighted instances where they had to innovate around their products and processes by substituting certain technologies in their products to make them cost-effective to a more price-sensitive market or re-evaluating their pricing strategies and how they extracted value from the consumers when it became clear that their target market could not afford their products. This frugal approach leads to disruptive innovation capability in BoP environments. These findings are affirmed by Chen *et al.*, (2017) in China, and Pandit *et al.*, (2017) in India, who found that innovativeness of the entrepreneur led to an increased likelihood of developing a

disruptive innovation capability. By harnessing new and existing technologies to reconfigure business models, emerging economy entrepreneurs can develop a disruptive innovation capability (Devang *et al.*, 2017). This finding is in line with proposition P_{3a} of the study that presumed that innovativeness, particularly along the business model dimension, is likely to lead to a disruptive innovation capability in BoP environments.

Several of the participants indicated that a strong passion and drive to see their innovations and products succeed was required to develop a disruptive innovative capability in the South African operating environment. Entrepreneurial passion is defined as an intense positive emotion that is accompanied by an internal drive to engage with work of high personal value (Cardon, Wincent, Singh & Drnovsek, 2009). Yitshaki and Kropp (2016) found that in high-tech entrepreneurs, passion was characterised by feeling a strong challenge to ensure that one's work is meaningful and to leave a mark in the world. In social entrepreneurs, passion was characterised by enthusiasm and the desire to make a mark in people's livelihoods. Additionally, Luu and Nguyen (2020), found that passion motivates entrepreneurs to take risks and experiment with new products, leading to a positive effect on innovation strategy outcomes.

The implication is that, given the perceived challenges in the operating environment, entrepreneurs need to be passionate about the success of their innovations to maintain the momentum required to overcome challenges. This goes beyond financial rewards and requires a higher conceptual driving force, such as the desire to make a meaningful impact on society. Most of the participating entrepreneurs in this study had innovations that were anchored in addressing a societal need such as healthcare, safety and security, and sustainable waste management. Fulfilling a societal need, which is a driver that is higher than oneself, or merely making money may thus provide the motivation that allows entrepreneurs in BoP environments to exhibit continued tenacity in the face of a challenging operating environment.

Besides innovativeness discussed earlier, this study sought to explore whether any other sub-dimensions of entrepreneurial orientation are likely to influence the disruptive innovation capability of South African start-ups. Very few of the study's participants felt that entrepreneurs in the South African BoP needed to exhibit risk-taking behaviours in order to develop a disruptive innovation capability. This finding is contrary to the existing literature on disruptive innovations which suggests that entrepreneurs purposefully pursuing market opportunities in low-end and fringe markets need a higher tolerance for

risk as these markets are uncertain and ambiguous (Wanasika, 2013; Christensen *et al.*, 2017). Additionally, the process of developing a successful disruptive innovation can sometimes take a long time, making it riskier (Govindarajan *et al.*, 2011; Haby and Holmèn, 2014). The reason for this finding might be because these entrepreneurs are already steeped in and operating in these ambiguous environments and thus do not perceive any additional risk in catering to BoP markets. Furthermore, innovating is inherently risky (Sandberg, 2002). Therefore, technology entrepreneurs who are already familiar with taking controlled and calculated risks (Brettel *et al.*, 2015) are not perturbed by the perceived additional risk in catering to fringe and low-end markets.

Additionally, studies show that opportunity entrepreneurs, that is, entrepreneurs who enter self-employment by choice, have a higher tolerance for risk compared to necessity entrepreneurs, who enter self-employment due to lack of employment opportunities (Block, Sandner & Spiegel, 2015; Ahunov and Yusupov, 2017). It may be that the sample of participating entrepreneurs in this study was mostly composed of opportunity entrepreneurs who would be more tolerant of the risks inherent in BoP markets. Therefore, the findings of this study do not validate the presupposition that higher tolerance for risk in the start-up founding team is necessary to develop a disruptive innovation capability in BoP environments and proposition P_{3b} of the conceptual framework is not supported.

Proactive entrepreneurs take initiative by anticipating and acting on consumers' latent needs and future problems (Brettel *et al.*, 2015), as well as participating in emerging markets (Lumpkin and Dess, 2001). Proposition 3_d of the conceptual framework presumed that proactiveness promotes the development of a disruptive innovation capability in BoP environments. This assumption was, however, not borne out by the study findings as none of the participants felt that being proactive led to the development of disruptive innovations in the South African environment. This finding is contrary to prior literature on disruptive innovations which found that a critical capability for would-be disruptors is the capacity to proactively anticipate and act on market discontinuities and unexpressed customer needs (Sandberg, 2002; Skarzynski and Rufat-Latre, 2011). The reason for this finding could be in line with the earlier finding that entrepreneurs in this study exhibited a low emerging market orientation. This means that the entrepreneurs tend to prefer to cater to mainstream markets as opposed to low-end and fringe markets. Kraus (2013) found that SMEs in the service industry displayed low proactiveness because enterprises in services tend to listen to what their customers explicitly express

and then react to that. Therefore, if entrepreneurs have a high mainstream market orientation, they pay particular attention to the needs of the mainstream market and would display low proactiveness with regards to low-end and fringe markets. Additionally, Kraus (*ibid.*) stresses the importance of having information and being knowledgeable of current and future customer needs and wants to be able to act on them. Participants in this study highlighted various difficulties with obtaining market information. This information gap likely affects their ability to be proactive since they have limited information on the potential target market to base their decisions on.

6.6 ANALYTIC CATEGORY 4

Challenges and solutions to NTBCs developing viable disruptive innovations for the South African BoP.

Participants identified numerous challenges that impact disruptive innovation capability in the South African operating environment and suggested some solutions to deal with the problems. The challenges and solutions will be discussed and synthesised together in the following section.

Given the findings from research question one that adoption and demand are weak for products developed by local innovators, it is not surprising that one of the significant challenges facing would-be disruptors as cited by the majority of participants was consumer perceptions to locally developed products and services which led to poor adoption of products. During the 46 years of apartheid rule in South Africa, the government's industrial strategies favoured the creation of large enterprises that catered to mainstream markets, leaving small scale producers to cater to low-income markets with inferior goods (Bolton, 2006; Ndabeni, 2014). The legacy of this might be a reason for the persisting views among the low-income consumers in South Africa that small local producers provide substandard goods. Thus, local innovations are looked upon with suspicion by the consumers.

The previously unequal dispensation may also be the reason why some of the participants felt that local consumers were "label-conscious" and aspirational, preferring international brands or branded local goods. Given that the economy and nation are now democratic, previously disadvantaged consumers might feel that they can now exercise their economic right to purchase some of the things and brands that were considered to be out of reach before (Ndabeni, 2014). South Africa remains one of the most unequal

economies in the world (World Bank, 2019). Scholars note that inequality in a society impacts product perceptions and consumption patterns with lower-income consumers engaging in conspicuous consumption by copying the buying patterns of the higher social classes (Wimschneider *et al.*, 2020). This calls for a reframing of the narrative to assure consumers that products developed by local innovators can be as good as any other aspirational brand, if not better because they are developed specifically for the South African context.

Additionally, the low-income market has been found to be unpredictable as sometimes an obvious need such as improved healthcare, nutrition or sanitisation may not translate to a viable market once the goods become available (World Resources Institute, 2007; Simanis and Duke, 2014). This may be the result of the poor informational flows that typify emerging market operating environments whereby the consumer need is difficult to recognise, sometimes even by the consumers themselves, as it is not well articulated which leads to ambiguous market environments (Angeli and Jaiswal, 2016; Ge *et al.*, 2019). Producing goods and services that suit market needs is dependent on accurate market knowledge. However, market information reports are expensive to obtain (Ge *et al.*, 2019). In South Africa, there is a paucity of market research documents and academic market reports, particularly regarding market information pertaining to the often-invisible BoP segment (Alcock, 2015; Togo, 2019: personal interview). When innovators are not fully cognisant of which needs and wants are driving consumers, it makes it difficult for them to create products and services that are relevant to the market. Knowledge of market dynamics and comprehensive market information is essential to offset the risks inherent in catering to ambiguous markets.

The lack of market information and thus an intimate knowledge of the market also affect how entrepreneurs contextualise products and services to suit the market. The study participants identified poor contextualisation of products as another challenge facing would-be disruptors. Participants felt that entrepreneurs tended to imitate products and innovations from developed nations and mostly pushed those concepts onto the market. While Devang *et al.* (2017) found that successful technology entrepreneurs in Asia do often imitate Western products initially; they also reconfigure their business models and leverage technologies such as mobile internet and cloud computing to contextualise their products to the local operating environment. When technologies are pushed on to the market (technology-push or market-push), it means that entrepreneurs start by developing the innovation and then trying to find a market for it afterwards (Maier,

Hofmann & Brem, 2016). The market may reject these products if they do not speak directly to their needs. Whereas market-pull innovations start by identifying an expressed or latent market need and then developing a solution that addresses that need (*ibid.*). This is echoed by Govindarajan and Kopalle (2006a) who found that technology companies that are technology-push oriented were more likely to produce radical innovations and less likely to develop disruptive innovations.

These findings once again stress the importance of requisite market information to enable entrepreneurs to develop innovations that address market needs as it has been found that technology-push start-ups often changed their orientation to a market-pull orientation once they obtained new market information (Lubik, Lim, Platts & Minshall, 2013). The implication is that adequate knowledge and information flows are requisite to enhance the chances of developing a disruptive innovation capability. Entrepreneurs require knowledge and guidance from business mentors, business forums or wider networks, in identifying consumer needs. Consumer needs in low-income environments go beyond the provision of cheap necessities (Prahalad, 2012). It also involves taking into account consumers' aspirational needs while keeping in mind functionality and cultural norms when designing products (Hasan *et al.*, 2020).

Various strategic options can be employed by the entrepreneurs to enhance their chances of developing a disruptive innovation capability that resonates with consumers at the BoP. Finding ways of lowering costs is essential to developing a disruptive innovation capability in low-income environments. For example, one of the entrepreneurs in this study found ways to substitute specific hardware in her security devices and replace it with more cost-effective options to deliver a product with the same functionality but at a lower price to more price-sensitive consumers. Christensen *et al.* (2015) also suggest that costs can be lowered by innovating around the business model with regards to how value is extracted from the consumers. Additionally, entrepreneurs need to be flexible and adaptable to identify emerging and latent market needs and adapt their innovations accordingly. For example, Christensen *et al.* (2017:35) advised would-be disruptors in low-income environments to learn to "spot the struggling moment" in consumers' lives. The struggling moment represents latent consumer needs. Spotting the struggling moment can be accomplished through four strategies, which include identifying emotional markers such as anger, frustration and anxiety. In the South African context, this can be seen by issues which typically drive protest actions and

demonstrations, for example, concerns over housing, safety and security and poor service delivery.

Secondly, entrepreneurs should be alert to workarounds that consumers resort to in their daily lives to overcome a lack and resource-constraints. Many South Africans trust in indigenous and traditional medicine due to their affordability, accessibility and cultural identity. Enhancing and processing the raw materials into capsules would make them more user-friendly, convenient to carry around, safe and consistent. This would represent an innovation to the market. Thirdly, innovators can learn from law-bending behaviours exhibited by consumers and then reconfigure their innovations according to consumer needs. In South Africa, illegal electricity connections are rampant. This kind of law-bending is a pointer that shows that innovative and affordable forms of electricity supply, such as, provision of pay-as-you-go or rent-to-own solar products would be a worthwhile innovation. Finally, entrepreneurs can also identify and leverage slack resources. In a country like South Africa with a high unemployment rate, human resources can be considered to be slack resources. Therefore, innovators can create business models that utilise peer-to-peer sales mechanisms and offer a commission to salespeople to bring their innovations to market. This route to market also involves personal selling which may improve adoption of innovations (Oladipo, 2019).

All of the participants identified challenges in the ecosystem as hampering disruptive innovation capability in South Africa. Challenges in the ecosystem were many and varied and included lack of funding, low skills of ecosystem role players, ecosystem fragmentation, poor access to technology, inadequate support and poor access to information.

The majority of the study participants cited challenges around funding as a deterrent to innovation capability of South African NTBCs. Lack of access to sources of financing is regularly cited as a significant obstacle to innovativeness in start-ups (Mehrez, 2019). Prior studies have found access to funding to be a substantial challenge to entrepreneurial growth in the South African context (Gwija, Eresia-Eke & Iwu, 2014; Iwu, 2017). Moreover, technology-based start-ups typically require significant amounts of financial capital to sustain their growth (Bellavitis, Filatotchev, Kamuriwo & Vanacker, 2017). Most entrepreneurs in South Africa end up bootstrapping their ventures, using personal funds and money borrowed from friends and family (Gwija *et al.*, 2014). Bootstrapping results in lower rates of innovativeness in South Africa compared to other emerging economies because the majority of entrepreneurs in South Africa typically

come from previously disadvantaged backgrounds and thus have fewer resources in terms of property, savings, investments and access to capital (Ndabeni, 2014). In the absence of adequate financing, entrepreneurs cannot explore innovative solutions, and they cannot scale their businesses.

However, in the South African context, the problem of access to financing by entrepreneurs is more complicated than merely an absence of funding options. For example, some of the participants observed that the government was making an effort to provide various forms of grant funding to entrepreneurs to promote mass entrepreneurship. The challenge was that there were inefficiencies in getting these funds to the intended recipients. In one participating entrepreneur's case, approved funds took 11 months to be disbursed to him. There was also a challenge with funds not being equitably distributed to deserving entrepreneurs. Participants remarked that the process of applying for these funds is often too complicated for some entrepreneurs. In contrast, there are some entrepreneurs, so-called "grantpreneurs", that are so skilled at navigating the grant funding application process that they make a living off this. Therefore, some participants felt that there were ample funding instruments in the ecosystem, but entrepreneurs may not know how to access them.

Entrepreneurs need training on how to apply for the various funding options. Iwu (2017) suggests that the funding application processes in South Africa need to be simplified to accommodate the reality of the South African context which is that entrepreneurs may have low levels of education, business skills and no collateral. Funding in the form of government grants should be streamlined to remove inefficiencies and improve its effectiveness if the funds allocated by the government are to have the anticipated outcome. These inefficiencies speak of a disjointed institutional framework. Disjointed institutional frameworks are not unique to South Africa but have been cited as an obstacle to business growth in many emerging economies (Manimala and Wasdani, 2015).

The problem with incompetence around the administration and disbursement of government funds also echoes another of this study's findings where the majority of the participants indicated that the ecosystem was comprised of key actors who did not have the skills or competencies to create an enabling environment for innovators to succeed. Education systems in emerging economies are known to be underdeveloped and inconsistent, with public schools often being of poor quality (Manimala and Wasdani, 2015). Ndabeni (2014), also notes that institutions that are supposed to support SMEs in

South Africa lack business skills due to low levels of education and technical capacity. Furthermore, many qualified and experienced professionals have left the public sector for the private sector, leaving a knowledge gap (Tonkin, 2010).

Public sector employees who are supposed to assist SMEs, such as investment portfolio managers, need training on the realities facing start-ups and how they operate with the understanding that start-ups are fragile and need fast turnaround times in terms of financing. Performance of public sector employees involved in the start-up ecosystem needs to be measured on key indicators such as commercialisation success rates of supported enterprises and other metrics like the number of companies given funding or number of applications processed.

While most entrepreneurs in emerging economies are generally dependant on government funding (Armanios, Eesley, Li & Eisenhardt, 2019), it is essential to find alternative and innovative funding options that are contextualised to the South African environment. South African innovators are typically resource-constrained and have no collateral (Ndabeni, 2014). An industry expert in this study observed that financing options in the operating environment are poorly contextualised as you can find funding instruments that do not provide a stipend for the entrepreneur running the business. Therefore, the entrepreneur is forced into formal work somewhere else to meet their financial needs, thus devoting themselves to their start-up on a part-time basis only. Some innovative funding options that have been suggested to work in Africa for technology start-ups include crowdfunding and accelerators (Neubert, 2019); business angels/angel investors (Manimala and Wasdani, 2015); and community-based savings and credit unions targeting entrepreneurs with no collateral (Ndabeni, 2014).

Even though resource-constrained innovators need financial resources to grow their businesses, other forms of support which are not necessarily monetary can enable them to thrive. Alternative direct support to entrepreneurs can be in the form of access to suppliers of raw materials, access to technical expertise, and access to business networks for information and knowledge sharing. Ge *et al.*, (2019) found that in the face of the information asymmetries and institutional voids prevalent in emerging economies, entrepreneurs need to cultivate informal network ties, political ties, as well as utilise family ties for improved business performance.

However, the problem of weak institutions within the ecosystem continued to emerge as participants also cited challenges regarding ecosystem support, poor access to technology, lack of capabilities of ecosystem role players and ecosystem fragmentation.

Innovators require assistance, not just from government, but also from other ecosystem agents such as private enterprises for knowledge transfer, mentorship, financing and as buyers of their innovations; municipalities as providers of infrastructure and consumers of innovations; universities and incubators for knowledge transfers, training and technical assistance, etc. Weak institutions are a common feature in emerging economies as they are often still developing and evolving (Manimala and Wasdani, 2015). This leads to institutional voids that result in bureaucratic red tape, corruption and dysfunctional competition (Lamotte and Colovic, 2015; Prashantam and Yip, 2017). These are familiar in the South African environment

Most of the ecosystem challenges cited by the participants are attributable to a fragmented ecosystem. For example, one participant observed how difficult it was to link up entrepreneurial innovations with municipalities even when these innovations would cost-effectively solve a problem faced by the municipality. Another commented on how various funding institutions might be supporting the same entrepreneur over several years without any one of them being aware of the duplication in efforts. This breakdown in informational flows relates to how the various ecosystem role players and institutions conduct their functions in silos without any connection or regard to other actors that may have purposes related to their own. Bukula (2015) highlights that the South African ecosystem is reasonably advanced and comprehensive, but it is highly fragmented with no clear strategic vision.

Furthermore, according to Manzini (2015), the South African NSI framework emphasises institutions without due regard to the systems linkages and learning processes. Ecosystem integration among actors such as academia, governmental organisations, corporations and private investors is requisite as a fragmented ecosystem makes it difficult for entrepreneurs to obtain the resources they need for sustainability. Fragmented ecosystems create disjointed networks, separate rules and practices entrepreneurs need to follow, parallel processes and imperfect informational flows (Scheidgen, 2020). To ensure ecosystem integration in the South African context, an independent body to oversee and coordinate ecosystem actors is necessary, particularly in the government-funded support sector where most of the fragmentation and duplication of efforts seems to occur.

Given the finding of a fragmented ecosystem, it is unsurprising that a challenge cited by the majority of the participants is poor access to information in the operating environment. Poor institutional quality has been found to influence informational flows

and magnify informational asymmetry (Barasa, Knobon, Vermeulen, Kimuyu & Kinyanjui, 2017). This finding is also not unique to the South African environment as Simanis and Duke (2014), Devang *et al.*, (2017) and Ge *et al.*, (2019) have noted inefficient informational flows as one of the challenges faced by entrepreneurs navigating institutional voids that characterise emerging market operating environments.

New and small ventures cannot compete using economies of scale and have to rely on the development of innovative products and processes for their competitive advantage. This ability is reliant on obtaining accurate market and customer information (O'Dwyer *et al.*, 2009). Therefore, in the absence of the requisite information, entrepreneurs would struggle to innovate as the availability of information shapes the opportunities that entrepreneurs perceive (Porter, 1990). Manzini (2015) asserts that the strength of an innovation system is dependent on the quality of information flows among its actors. Creating formal and informal knowledge networks may assist NTBCs to overcome knowledge and information gaps as these would undertake market research and collate compliance and regulatory information for the collective and disseminate it to its members.

The South African operating environment was also perceived to be dominated by large diversified incumbent corporations who acted in a monopoly-like fashion and blocked access to markets for small enterprises through anti-competitive behaviours. In South Africa, large companies dominate value chains, and efforts by the government through policy initiatives to encourage large companies to purchase and form linkages with emerging small enterprises from previously disadvantaged groups have had a minimal impact (Rogerson, 2013). Sokol and van der Veer (2017) suggest that small entrants in emerging economies may need special regulatory protection in markets dominated by large incumbents or state-owned enterprises to avoid monopoly-like situations. The government needs to step in to address anti-competitive behaviour by large dominant corporations. The Competition Act of 1998 was promulgated for precisely such purposes. The Act seeks to prevent anti-competitive behaviour by dominant companies, and ensure that new and small ventures have an equitable chance of participation in the economy, among other directives (South African Government, 1998). However, as highlighted by Rogerson (2013), the South African government often struggles to implement its policy initiatives, a situation which is made more difficult in a country where policy directives are often misused to benefit a few.

The South African government is the single largest procurer of goods and services in the country (Rogerson, 2013; Bolton, 2016). However, participants in the study felt that the government only paid lip service to providing market access opportunities to SMEs as it failed to implement its policies around procurement. Furthermore, regulations such as the Public Finance Management Act of 1999 (PFMA) were seen to actively stifle procurement of innovations developed by small local enterprises. The directives of PFMA seek to promote uniformity in bid and procurement procedures and, standardisation and transparency of supply chain management issues (Ambe and Badenhorst-Weiss, 2012). The PFMA does not make any express provision for the procurement of innovative goods and services. Its directives make it easier to address the purchase of off-the-shelf goods that are already available on the market but not innovative products that may not currently be on the market or in existence. Due to lack of skills and capabilities of public sector procurement personnel to interpret the provisions of the Act, they are unable to drive innovation procurement in the country (Bolton, 2016). Continued training of procurement personnel on how to procure innovations within the confines of the Act is suggested to open up the public sector market to small entrepreneurs with innovative concepts.

The broader macro-environment also presented obstacles for entrepreneurs trying to develop disruptive innovations in South Africa's BoP context. All of the participants cited challenges with environmental constraints in the operating system such as national educational capacity and skills shortage, the country's tax regime, regulatory and compliance issues, and structural political concerns such as perceived systemic corruption.

Participants felt that the country's educational system did not adequately prepare most for a career in entrepreneurship. As a result, many of them struggled to get their bearings once they had started their businesses. An inadequate educational background may partly explain the continued low new business sustainability rates in South Africa, as cited in the Global Entrepreneurship Monitor South Africa 2019/2020 report (Bowmaker-Falconer & Herrington, 2020). Tertiary level entrepreneurship education has been found to enhance start-up intentions and improve new venture performance (Nabi, Linan, Fayolle, Krueger & Walmsley, 2017), with low levels of business acumen hampering innovativeness (Gundry, Ofstein & Kickul, 2014). Furthermore, a lack of entrepreneurial marketing education often leads to business failure (Amjad, Rani & Sa'atar, 2020). For a country that is focused on economic growth through mass

entrepreneurship (South Africa. NPC, 2012), more emphasis needs to be put on vocational entrepreneurship training. This is particularly so in institutions of higher education where participants noted that they received elementary entrepreneurship education in so-called “service courses” that did not adequately prepare them for the realities of entrepreneurship in the field. As observed by Nabi *et al.* (2017), the course content of entrepreneurship courses makes a difference to intended outcomes. Educational institutions offering such courses, therefore, need to reexamine their instructive approaches to entrepreneurship education and assess them for impact. Courses provided need to be in-depth and address the specific operating context of South Africa, and Africa as a whole.

The country’s tax regime was perceived to be burdensome and onerous, especially on small ventures that may not have the internal competencies to keep abreast of tax compliance obligations. The South African Revenue Services (SARS) needs to be serious about addressing tax issues that affect small business as tax compliance costs have been found to hamper small business viability in South Africa (Smulders and Naidoo, 2011; Schutte, Labuschagne, Georgescu & Pop, 2019). South African tax law is complex, and there is no free software available that SMEs can utilise for record-keeping and compliance with tax issues (Smulders and Naidoo, 2011). Entrepreneurs have to subscribe for premium services offered by other enterprises. However, entrepreneurs felt that it should be the responsibility of SARS to develop and provide such software for free to enhance their tax collection efforts. Participants also felt that the government needed to be serious about tax incentives for the SME sector and introduce minimum thresholds below which qualifying SMEs need not pay tax or file a tax return. Additionally, the government needs to simplify tax law to reduce the administrative burden on resource-constrained start-ups and small businesses. Furthermore, it is proposed that comprehensive tax education should be introduced into the entrepreneurship education curriculum proposed in the previous paragraph so that SMEs do not have to depend on external expertise to file tax returns.

Issues around regulations, certifications and product registrations were seen as obstacles to innovation capability of NTBCs in South Africa. Inefficiencies around the process of registering innovations were perceived as stifling to innovative capabilities of NTBCs. An entrepreneur in this study applied for registration of a new product with the Department of Agriculture, Forestry and Fisheries in 2017 on the understanding that the process takes 12 months to complete. However, at the time of data collection for this

study (end of 2019), his product had still not been registered. Issues regarding regulations, product certification and registration impact on a country's ease of doing business. An inefficient and inconsistent regulatory environment leads to taxing bureaucracy and makes it challenging to do business. This, in turn, discourages entrepreneurship and reduces small business viability (Lamotte and Colovic, 2015; Prashantham and Yip, 2017). A participant remarked that the registration process was seen as so cumbersome that the country was losing out on the innovative capability of entrepreneurs since some of them ended up registering their innovations outside of South Africa in countries where the process was much more transparent and faster. A solution here again involves comprehensive training of public sector employees that are involved in administering regulatory, compliance and certification issues. There has to be an understanding on the part of officeholders on the impact of their work (or lack thereof) not only on small businesses, which are inherently more fragile due to resource constraints, and other corporates trying to conduct business in the country but on the economy as a whole.

Notwithstanding the above finding, the regulatory environment was seen by some participants as enabling their innovations. Regulations were rightly seen as protecting consumers and in some cases as less strict in South Africa than in some other countries, thereby allowing business founders to be more experimental and innovative. This finding is echoed by Tiwari and Herstatt (2012), who found that the regulatory environment in India was less strict than in, for example, most developed countries. As a result, it allowed low-cost experimental innovations to flourish. Guttentag (2015) and Hopp *et al.* (2018a) also note that disruptive innovations such as peer-to-peer accommodation and ride-sharing are often enabled by regulatory gaps around those concepts at their introduction which may accelerate their diffusion. The finding that regulations in South Africa enable innovativeness highlights the fact that South Africa has the requisite infrastructure to foster a productive innovation system; the challenge arises with regards to the effectiveness of implementation and integration of the individual components.

Weak institutions and weak governance, as well as ambiguous policies, have been found to create fertile grounds for corruption in emerging economies (Manimala and Wasdani, 2015). Participants felt that there was systemic corruption within the South African operating environment, and it was impossible to succeed in developing any kind of innovation if one is not politically connected to someone with influence. For example, it was observed that entrepreneurs could get innovations registered timeously only if

they were well connected. In fact, to receive any help at all from a government department required that one know someone who can facilitate things. Corruption increases the costs of innovating or inhibits innovation altogether as it hampers the implementation of governmental agenda (Oluwatobi *et al.*, 2015). Ge *et al.* (2019) note that the presence of institutional voids in emerging economies make corruption more likely to occur as entrepreneurs seek to form political ties with government officials to acquire resources such as information and execute transactions by creating personal contacts, informal agreements, gift-giving and exchanging favours. The government needs to be serious about sanctioning corrupt officials. There is a need for business optimisation and customer relationship management software to be implemented in government departments that deal with entrepreneurship and business facilitation.

Participants also noted that the government seemed to say all the right things when it comes to creating a conducive operating environment for new and small businesses. However, the reality experienced by entrepreneurs is very different. Weak institutional frameworks lead to inconsistent policy implementation (Manimali and Wasdani, 2015) as the government is unable to respond effectively with the necessary entrepreneurial support (Oluwatobi *et al.*, 2015). For example, Bailey (2018) notes that government touts the SME sector as the engine of economic growth in South Africa and has committed to the provision of various SME capital funds. Yet, it is the chief transgressor with regards to paying SME service providers late. Late payment of SMEs has multiple consequences for the SMEs, including, raised costs of financing working capital, reduced cash reserves, increased administrative costs, and in the worst-case scenario results in bankruptcy and business discontinuance. Furthermore, as Rogerson (2013) points out, government has increasingly been trying to compel the private sector to procure from SMEs, and yet it does not practise its own policies, especially when it comes to procurement of local innovations (Bolton, 2016). The government must exercise the political will to implement its policies to nurture innovation and entrepreneurship by sanctioning corrupt officials and late payment defaulters.

The preceding discussion on the operating context for South African NTBCs highlights that institutions that are supposed to support the growth of innovative small enterprises exist. However, due to inconsistent and unclear policies, lack of capabilities, inadequate governance and fragmented efforts by ecosystem players, the institutional environment falls short of providing a nurturing environment for the innovative capacity of NTBCs. This finding supports proposition P₂ of the study which proposed that a robust

entrepreneurial ecosystem in terms of enabling policies, funding, supporting institutions and knowledge transfers facilitates the disruptive innovation capability of NTBCs in BoP environments.

6.7 CORE CATEGORY OF THE STUDY

Congruent with a grounded theory methodology whose aim is to produce substantive theory on the process of disruptive innovation capability of NTBCs in South Africa's BoP environment, this section presents the core category derived from the study findings. The core category is a theoretical explanation that describes how the categories in the findings relate to each other and highlights their logical connections to facilitate the emergence of theory (Urquhart, 2013; Birks and Mills, 2019).

The core category of this study is: "NEGOTIATING THE MISSING LINKS". The word negotiating evokes the acts of overcoming, surmounting, and working things out. From the findings of this study, it appears that South African NTBCs are in a state of continually trying to overcome challenges in the operating environment to develop disruptive innovation capability. Challenges exist in the entrepreneurs' organisation-specific or internal environment where entrepreneurs lack skills, information, resources and/or the requisite strategic orientation to enable the development of successful disruptive innovations. Challenges also exist in the external environment where entrepreneurs face weak demand for their products, poor market access, competitive markets, a lack of funding, weak support mechanisms, a fragmented ecosystem, poor quality national educational system, an inconsistent regulatory and policy environment, and a largely weak institutional environment.

The national systems of innovation (NSI) framework is a systems-based conceptualisation of the environment within which enterprises carry out their business. This environment is composed of various institutions such as government, business, socio-cultural, political and educational institutions (Manimala and Wasdani, 2015). These institutions shape economic activity and behaviour (Oluwatobi *et al.* 2015). While the institutions play a part in how entrepreneurs behave and perform, the quality of the linkages within the system is also important. Quality of linkages is defined as the relationship between and among the institutions and the enterprise. Quality linkages improve the coordination and synergies among the components of the innovation system (Salovisa and Vali, 2011). Linkages, therefore, affect knowledge transfers, information flows and learning. As highlighted by Manzini (2015), the strength of a NSI

rests on the communication and linkages between its institutions, rather than on the strength of the institutions themselves. The South African NSI has been found to have reasonably well-developed institutions (Oluwatobi *et al.*, 2015; Bukula, 2015), but has poor quality linkages (Cai, 2011; Bukula, 2015; Manzini, 2015).

Poor quality linkages lead to ecosystem fragmentation, poor coordination, a lack of strategic vision and poor dispersion of resources in the entrepreneurial ecosystem (Salovisa and Vali, 2011). The findings of this study indicate that the South African NSI is characterised by weak system linkages that result in a poorly performing innovation system overall. Entrepreneurs struggle to get information on markets, regulatory and compliance issues, funding and other supports. On the other hand, institutional actors are poorly coordinated with weak informational flows among supporting institutions and the government. The process of developing and commercialising a disruptive innovation in South Africa's BoP context then becomes a process of negotiating the gaps or missing linkages in internal capabilities and gaps in the external institutional environment for innovation success and business growth.

Negotiating also implies working things out. NTBCs must constantly work things out for themselves given the missing linkages in the operating environment such as in their internal environment, the demand environment, the ecosystem environment and the macro-environment. These missing linkages present as capability gaps, resource gaps, information gaps, knowledge gaps, technology gaps, regulatory, and policy implementation gaps. Entrepreneurs then employ a form of entrepreneurial bricolage (Yu *et al.*, 2019) which involves combining the scant resources at hand to create opportunities. Hence, the enterprises' survival becomes an innovative exploit in itself as a lot of effort is expended in working out and overcoming the obstacles presenting in the operating environment. To borrow a term used by some of the entrepreneurs in the study; innovation success in South Africa is about "hustling". ***Therefore, an NTBCs ability to develop a successful disruptive innovation in South Africa's BoP context is dependent on the venture's ability to work things out and negotiate internal and external constraints.***

6.8 A FRAMEWORK FOR DISRUPTIVE INNOVATION CAPABILITY AT THE BOP

Figure 6.1 below represents the proposed framework for the process of organising for disruptive innovation capability in South Africa as gleaned from the study findings.

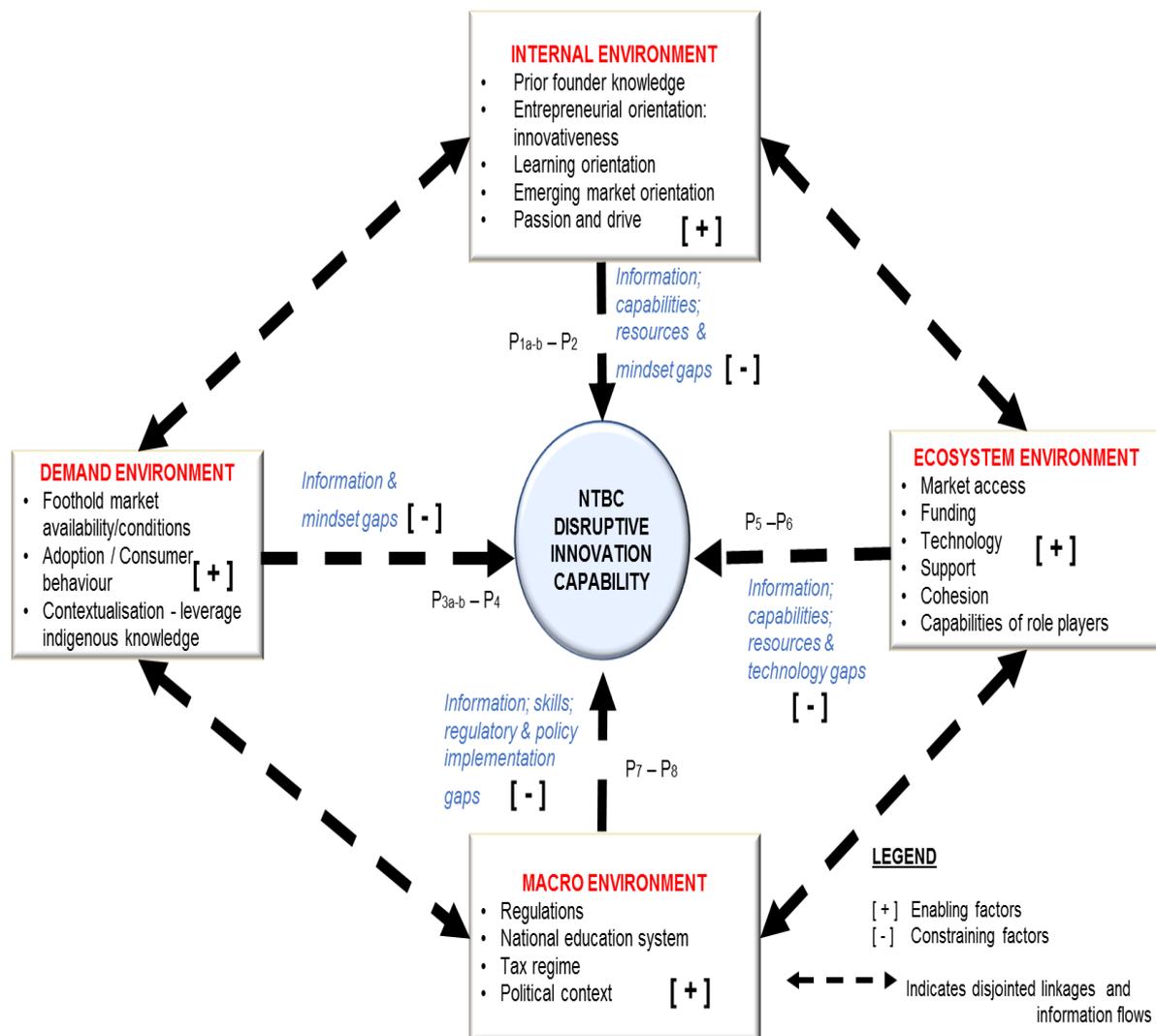


Figure 6.1: Framework for disruptive innovation capability in BoP environments

Four environments have been identified as influencing the disruptive innovation capability of NTBCs in South Africa's BoP environment. These include the ventures' internal, demand, ecosystem, and macro-environments. These environments have relationships and linkages amongst themselves that are reciprocal in nature and

influence how each of the other components behaves, and ultimately, how NTBCs perform in trying to develop disruptive innovations in this environment. Findings of this study show that there are poor quality relationships and linkages among the four identified environments, and this leads to an overall environment that does not support the successful development of disruptive innovations by NTBCs. The individual components of the framework are discussed in the following sections.

6.8.1 THE INTERNAL ENVIRONMENT

The internal environment is composed of elements within the enterprise that influence the company's performance. **Prior founder knowledge** represents the initial knowledge base and human capital of the venture in terms of capabilities and skills. Founders with higher prior knowledge and experience performed better in terms of innovation development and commercialisation. **Innovativeness** in terms of products and business models also enhances disruptive innovation capability as the BoP requires new ways of doing things that suit the particular environment, as well as new ways of extracting value from consumers with low disposable incomes. Developing a **learning orientation** is crucial for developing a disruptive innovation capability as learning-by-doing enhances innovativeness and continuous learning is requisite for navigating the missing linkages in the operating environment. Having an **emerging market orientation** that is responsive to the needs and wants of consumers in low-end and fringe market segments also enhances the chances of developing a disruptive innovation capability in South Africa's BoP environment. Given the volatile operating environment, entrepreneurs need to have a strong **passion and drive** to continue forging ahead in their innovations despite the contextual challenges.

The internal environment suffers from a lack of market information (**information gap**) which might prevent entrepreneurs from seeing the value in low-end or niche fringe markets. This results in entrepreneurs trying to force themselves into mainstream markets, to their detriment. A **capabilities gap** may hinder entrepreneurs from catering to low-end markets where entrepreneurs have to be innovative to extract value from the market and have strong marketing capabilities to attract consumers that are wary of products from local innovators resulting in weak market demand. Lack of financial and other **resources** may hinder innovators from adequately penetrating low-end and fringe markets for successful disruptive innovation success. Entrepreneurs may also have ingrained biases against low-end and fringe markets (**mindset gap**) that prevent them

from seeing the value in developing products and services aimed at these markets. The foregoing synthesis leads to the following propositions:

P_{1a}: High prior founder knowledge in terms of high levels of education and experience enable disruptive innovation capability of NTBCs in the South African BoP environment.

P_{1b}: Attributes and capabilities such as innovativeness, a learning orientation, emerging market orientation and strong passion and drive of the entrepreneurs encourage the development of a disruptive innovation capability in BoP environments.

P₂: Behavioural biases and a lack of information, capabilities and resources in the entrepreneurs' internal operating environment hinder the development of a disruptive innovation capability.

6.8.2 THE DEMAND ENVIRONMENT

The South African context provides an **ideal foothold market** environment for the development of disruptive innovations as it is largely comprised of low-income consumers. Entrepreneurs can focus on this market segment with innovations that cater to improved healthcare, affordable housing, nutrition, and safety and security at affordable prices while still taking cognisance of the contextual environment. However, the demand environment is characterised by **low market adoption** rates of innovations from local entrepreneurs. This may be the result of various factors such as lack of information by the consumers on available products, lack of trust in locally produced innovations and **poor contextualisation** of innovations by innovators to the local environment and consumers. Contextualisation of innovations may be improved through harnessing indigenous knowledge.

The demand environment suffers from **informational gaps** whereby the consumers are not aware of the availability of innovations developed by local entrepreneurs that may have relevance to their lives. This is a result of entrepreneurs not having the necessary financial resources for adequate market visibility and customer acquisition campaigns. Consumers also show negative biases (**mindset gap**) towards products by local innovators, in the form of lack of trust in products which results in low adoption rates. This is the result of the view that small local entrepreneurs produce inferior goods and the fact that large incumbents dominate the operating environment. The latter drown out

the narrative of the smaller entrants through better-resourced marketing activities. This leads to the following propositions:

P_{3a}: Foothold market availability in terms of social and demographic conditions; as well as consumer behaviour, enables the ability of NTBCs to develop disruptive innovation capability in the South African BoP environment.

P_{3b}: Improved contextualisation of innovations to the South African BoP consumers; for example, through leveraging indigenous knowledge, enables disruptive innovation capability in South African NTBCs.

P₄: Information and mindset gaps in the demand environment constrain the ability of NTBCs to develop disruptive innovation capability in the South African environment.

6.8.3 THE ECOSYSTEM ENVIRONMENT

Competitive pressure faced by would-be disruptors is high as they are more likely to enter mainstream markets that tend to be overtraded and dominated by large incumbents or many smaller competitors. NTBCs would be better served looking for market opportunities in low-end markets and fringe niche markets, but they may be prevented from doing so by a lack of market information. Additionally, market access is poor because of **information gaps** where entrepreneurs lack **market information**, **resources gaps** because entrepreneurs lack the resources for adequate market acquisition activities and **regulatory gaps** where current regulations and policies are not seen to support innovation commercialisation success.

Access to funding is limited due to the **information gaps** in the ecosystem whereby entrepreneurs do not always know how to access the various financing options within the ecosystem. Access to funding is also hampered by a **capabilities gap** on the part of some entrepreneurs who lack the know-how to apply for funding successfully. **Technology and related infrastructure** are not widely available in the ecosystem. This **technology gap** leads to low innovative capability, particularly for would-be disruptive innovators whose innovations are typically leveraged on existing technologies.

Supporting institutions in the **ecosystem are fragmented**, leading to poor dispersion of knowledge, information, and other resources. Furthermore, personnel in the entrepreneurial support infrastructure lack the capabilities and skills to create a nurturing

environment for small and new ventures. Therefore, ecosystem support is hampered by **information and capabilities gaps**. This leads to the following propositions:

P₅: A cohesive and robust entrepreneurial ecosystem in terms of access to markets, funding, technology, and other support mechanisms facilitates the disruptive innovation capability of NTBCs in BoP environments.

P₆: Technology, resource, and information gaps, as well as deficiencies in capabilities of ecosystem role players constrain the disruptive innovation capability of NTBCs in South Africa's BoP environment.

6.8.4 THE MACRO-ENVIRONMENT

Regulations were generally perceived as stifling to the innovative capability of small and new ventures. **Regulatory gaps** mean that current regulations do not adequately address the market dominance and anti-competitive behaviours of large incumbents. Policies that address this exist, such as the Competition Act of 1998, but there is poor implementation of them. Furthermore, regulations such as the PFMA are not geared for the procurement of innovations by the government. As the government is the largest procurer of goods and services in South Africa, this directly impacts market access for small and new innovators in the South African context. This results in **policy implementation gaps**.

The **national educational system** is not enabling to disruptive innovation capability in South Africa. This is because the educational system is currently lacking in entrepreneurial education, and this affects small business venture innovativeness and performance. The lack of entrepreneurial education introduces **skills and information gaps** in the entrepreneurial operating environment. The **tax regime** was seen as demanding and onerous. Due to **skills and information gaps**, small ventures must use their scarce resources to outsource to someone or employ someone with the requisite skills to tackle tax concerns.

The country's **political context**, which was seen as riddled by systemic corruption and poor implementation of enabling policies, is a hindrance to disruptive innovation capability of South African entrepreneurs. Corruption hinders the equitable distribution of resources and the **implementation gaps** where policies are not appropriately applied weaken the entire system of innovation in the country. The preceding synthesis leads to the following propositions:

P₇: A robust regulatory, political, and national educational system encourages the development of disruptive innovation capability in BoP environments.

P₈: Information, skills, regulatory and policy implementation gaps in the macro-operating environment constrain the disruptive innovation capability of NTBCS in South Africa.

Therefore, developing a successful disruptive innovation capability in South Africa's BoP is dependent on the NTBC successfully negotiating various missing linkages in their capabilities and skills, the consumer demand environment, the entrepreneurial ecosystem, and the macro-environment. Inability to negotiate the missing linkages leads to failure in innovativeness.

6.9 STUDY LIMITATIONS

According to Aguinis and Edwards (2014), the field of management research has made significant progress from a methodological standpoint, but there is still no such thing as a flawless study. The following limitations of this study highlight issues that may have an influence on the impact of this study's findings and thus, its conclusions.

- Time – due to time constraints, this study was a cross-sectional study of the organisation-specific and contextual factors influencing the disruptive innovation capability of NTBCs in BoP environments. The topic might have benefitted from a longitudinal study as trends over time could have revealed the full impact of organisation-specific and contextual features that influence disruptive innovation capability and how developing a disruptive capability influences business survival by comparing start-ups that succeed and those that fail in the long-term.
- Accessibility and budget – the choice of research site was made based on it being the best fit for investigating the problem in the area most accessible to the researcher. Other research sites in other provinces of South Africa could have been included in the study, but the Innovation Hub was selected as the single research site in part because of access and budgetary concerns.
- Self-reporting – the data for this study was collected from interviews where the researcher is forced to rely on the answers the respondents give as truth that cannot be independently verified. Some respondents might give untruthful or embellished answers. In an effort to partially overcome this challenge and find illustrative perceptions, the study triangulated data sources by interviewing three different groups of respondents. (Korb, 2011).

- Researcher as research instrument – the researcher personally conducted the interviews as well as analysed and interpreted the data. As a key instrument in the research process, the researcher could have biased the study with her own beliefs, background, history, and prior understandings (Hesse-Biber and Leavy, 2017). To counter this shortcoming, the study employed such measures as member checking and having an audit trail of the research process.
- Limited generalisability of findings – the use of purposive sampling techniques means that the study may have very limited generalisability beyond its specific research setting. The study’s findings may, however, be transferable to a different or similar setting (Lincoln and Guba, 1988), or be found to be generalisable to theories of disruptive innovations or innovating in resource-constrained environments (Corbin and Strauss, 2015).
- Participant sample – the study participants, were wholly chosen from an incubation environment. This means that the participating entrepreneurs may already have access to certain support mechanisms that some other entrepreneurs that are outside the incubation environment may not have access to. The implications drawn are consequently specific only to the experiences of the sample of participants in this study.

6.10 CHAPTER CONCLUSION

This chapter synthesised and theorised on the process NTBCs go through to develop successful disruptive innovations in the South African BoP context given their internal or organisation-specific constraints and the contextual or external environment constraints. The process of developing a disruptive innovation capability was shown as a negotiation of the missing linkages in the internal and external environment of the NTBC for innovation success. The limitations of the study, which include time, budgetary constraints, researcher bias, self-reporting, and characteristics of the participant sample, were also discussed. The next chapter concludes the study by presenting a summary and overview of the research, as well as giving some recommendations based on the study’s findings and analysis.

7 CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 CHAPTER SUMMARY

The preceding chapter discussed and synthesised the findings of this study. The core category derived from the findings was presented and explained. A framework for disruptive innovation capability, which shows the factors that affect disruptive innovation capability and how NTBCs in the South African context organise for disruptiveness, was developed. This chapter presents a summation of the entire thesis and the answers to the research questions. Some recommendations to start-up founders, ecosystem role players and policymakers are suggested.

7.2 INTRODUCTION

The purpose of this grounded theory study was to explore with a theoretical sample of participants in the South African NTBC incubation space their perceptions on the organisation-specific and contextual factors that enable disruptive innovation capability in low-income environments. In doing so, a substantive framework for how NTBCs organise for the disruptive innovation process and the conditions that support the successful development of disruptive innovations in BoP environments was developed.

This study began by questioning why South African NTBCs seemingly lag behind their emerging economy counterparts in developing successful disruptive innovations. This even though the South African environment has the catalytic factors of a sizeable low-income population and a relatively advanced entrepreneurial ecosystem. An extensive integrative literature review was conducted, which highlighted a gap in the existing literature that shows that the small new entrant's perspective is mostly ignored in the disruptive innovation literature. This, even though most of the value creation activity is by small entrants that enter markets with resource constraints but are still able to successfully challenge existing businesses in the market (Afuah, 2015). Furthermore, while scholars acknowledge the applicability of the disruptive innovation framework to innovating in the resource-constrained environments that characterise emerging economies, most of the studies thus far have been on analyses of the Chinese and Indian markets. This study was at the nexus of filling these gaps in the literature by exploring the organisation-specific and contextual factors that influence the disruptive innovation capability of small entrants in the South African environment. Based on the

literature reviewed, propositions and a conceptual framework were developed with suggested factors that influence disruptive innovation capability in South Africa. As the research investigated an area of research with very little information, a grounded theory methodology was deemed to suit the requirements of the study for its ability to explore the perceptions of the participants and develop substantive theory that is based on the data collected. The data was collected through 20 in-depth interviews with three groups of participants: namely, start-up founders, business mentors and industry experts. Interview data were transcribed and analysed through grounded theory analysis procedures that include coding, comparative analysis and core category abstraction to produce substantive theory.

The findings indicate that: (a) socio-economic conditions and demographic factors in South Africa support the development of disruptive innovations; however, adoption of these innovations is poor; (b) NTBCs in the South African context lack an emerging market orientation which is crucial for the development of disruptive innovation capability. They tend to focus on the mainstream market and as a result, face high competitive pressures; (c) the founder attributes that support the development of a disruptive innovation capability in South Africa include high prior founder knowledge, strong learning capabilities, innovativeness, and passion and drive; and (d) NTBCs face several challenges that hinder them from developing a disruptive innovation capability in the South African environment. These challenges are in the internal, demand, ecosystem and macro-environments. The following section presents the conclusions drawn from the findings. They are structured according to the analytical categories drawn from the research questions.

7.2.1 CONTEXTUAL FACTORS THAT INFLUENCE THE DISRUPTIVE INNOVATION CAPABILITY OF NTBCs IN SOUTH AFRICA'S BOP ENVIRONMENT

Findings show that the demographic make-up and socio-economic conditions prevalent in South Africa support the development of disruptive innovations. However, an analysis of consumer behaviour in the low-income segment indicates that adoption of products by local innovators is low. A conclusion that can be drawn from this finding is that alert entrepreneurs can leverage the market dynamics prevalent in South Africa to introduce cost-effective innovations that target the pain points of consumers. These pain points include access to better quality healthcare, nutrition, sanitation, safety and security, and environmental concerns. Although the socio-economic and demographic environment

encourages the successful development of disruptive innovations, consumer behaviour in the low-income market segment shows a weak demand for these products. It can be concluded that innovations by NTBCs need to be contextualised to the realities of South African low-income consumers. Entrepreneurs not only need to consider the practical purpose of their innovations but also be aware of consumers' aspirational motivations when purchasing products. Another conclusion related to this finding on consumer behaviour is that entrepreneurs need access to market information to develop disruptive innovations that are relevant to the market. A lack of information on consumer needs and wants leads to poor contextualisation of innovations.

7.2.2 NTBCs CHOICE OF MARKET SEGMENT TO CATER TO, REASONS FOR CHOICE OF MARKET, AND COMPETITIVENESS OF THE CHOSEN MARKET SEGMENT

Another significant finding indicates that NTBCs have a low emerging market orientation as they tend to develop innovations targeted at the mainstream market. As a result, they face high competitive pressures in the mainstream market from many other small competitors or dominant incumbents. A conclusion that can be drawn from this is that entrepreneurs need to have an emerging market orientation which enables them to focus on market opportunities that are in low-end or niche markets. By targeting a low-end or fringe niche market first, they can gain a foothold in a relatively less competitive market space. This will give NTBCs time to grow their products and processes before larger and better-resourced competitors start to get interested in the consumers they are catering to. It also gives them time to grow organically before entering the more competitive mainstream market segment. A related conclusion is that entrepreneurs who choose to enter low-end markets should do so with strategic intent and not merely out of necessity. Developing a successful disruptive innovation requires some strategic intent to develop cost-effective products and services that apply to a low-end market first before trying to enter mainstream markets. Also, to avoid competitive battles with better-resourced competitors, NTBCs need to identify market footholds that are disruptive to existing incumbent businesses.

7.2.3 CHARACTERISTICS OF NTBCs WHICH ARE LIKELY TO DEVELOP A DISRUPTIVE INNOVATION CAPABILITY IN THE SOUTH AFRICAN ENVIRONMENT

The third finding is that the founder attributes that support the development of a disruptive innovation capability in South Africa include high prior founder knowledge,

strong learning capabilities, innovativeness, and passion and drive. A conclusion that can be drawn from this is that high prior founder knowledge and experience is crucial for positive innovation outcomes and venture success. Prior founder knowledge substitutes for the lack of human capital resources in the formative stages of the start-up when resources are limited. Strong learning capabilities in the start-up founder or founding team are essential to facilitate learning-by-doing, which is necessary for innovation success in a dynamic market environment. Learning capabilities also enable entrepreneurs to successfully navigate the challenges and missing links in the operating environment. Being innovative is vital as entrepreneurs have to cater to consumers with low disposable incomes. Being innovative can be around the product or service or around the business model, which determines how value is extracted from the market with issues such as pricing of products being important. In challenging operating environments, it becomes critical to have a strong passion and drive to see innovations succeed. Passion and drive provide entrepreneurs with the determination to succeed in the face of obstacles. Therefore, high prior founder knowledge, innovativeness, strong learning capabilities, and passion and drive are necessary attributes for developing a disruptive innovation capability in the South African BoP context.

7.2.4 CHALLENGES TO NTBCs DEVELOPING DISRUPTIVE INNOVATIONS FOR THE SOUTH AFRICAN BOP

Several challenges were identified as hindering the disruptive innovation capability of NTBCs in South Africa. Entrepreneurs faced difficulties in their internal environment from a lack of resources and capabilities; in the demand environment from poor adoption of products and lack of market information; in the ecosystem environment from poor market access, limited funding, weak supporting mechanisms, and ecosystem fragmentation; and in the macro-environment from poor implementation of regulations, a sub-par educational system, and systemic corruption. This indicates that South Africa has weak institutional frameworks that do not provide adequate support for the sustainability of new and small innovative enterprises. In particular, the linkages among the institutions are of poor quality. These challenges were believed to lead to low innovation capability of NTBCs in South Africa. The conclusions that can be drawn from this are that a robust entrepreneurial ecosystem in terms of enabling policies, funding, supporting institutions and knowledge and information transfers facilitates the disruptive innovation capability of NTBCs. Additionally, to successfully innovate in the South African BoP context, NTBCs

have to learn to navigate the missing or poor-quality linkages in the operating environment.

7.3 RECOMMENDATIONS

Based on the research findings, analyses and conclusions, some recommendations are offered to start-up founders, ecosystem role players, policymakers, and for further research.

7.3.1 RECOMMENDATIONS FOR START-UP FOUNDERS

Start-up founders should consider the following:

- i. Emphasise collaboration, networking and fostering peer support. In a challenging environment characterised by weak institutional linkages, collaborating and networking will assist in overcoming the information, skills, capabilities, resources, and other support gaps. In essence, this creates a personal support ecosystem. This can be accomplished through:
 - a. Going to places where entrepreneurs and other professionals tend to congregate, such as co-working spaces and small business events. This allows for opportunities to share information and ideas and boost entrepreneurial skills.
 - b. Fostering collaboration with other start-ups which might otherwise be considered as competition. Such partnerships may assist in meeting market needs that may otherwise be out of reach due to resource constraints, particularly in circumstances where the size of the business venture matters. Collaboration also enables smaller enterprises to accomplish more than they would individually.
- ii. Accentuate an emerging market orientation to develop disruptive innovation capability. This requires a mindset that searches for opportunities in low-end and fringe, niche markets. With a view to finding successful footholds in these markets, the following strategic options should be considered:
 - a. Target consumer pain points with products that are not only cost-effective but also address consumers' aspirational needs.
 - b. Leverage technologies like mobile internet, social media, online selling to enhance business model innovations and improve market access capabilities.

- c. Harness local and indigenous knowledge to contextualise innovations to the target market.
- iii. Remain open-minded and keen to learn helps to navigate the challenges that are in the operating environment successfully. It also facilitates learning-by-doing, which is essential when catering to low-end and fringe markets whose needs and wants can be latent and ambiguous.

7.3.2 RECOMMENDATIONS FOR ENTREPRENEURIAL ECOSYSTEM ROLE PLAYERS

Ecosystem role players should address the challenges in the entrepreneurial environment that make it difficult for new and small innovative enterprises to succeed. Ecosystem actors should consider the following:

- i. Ecosystem fragmentation makes it difficult for entrepreneurs to efficiently obtain the resources they need for survival. To ensure a cohesive ecosystem in the South African context, particularly in the government-funded support sector where most the fragmentation and duplication of efforts occurs, the Small Enterprise Development Agency (SEDA) should play its mandated role more effectively. SEDA should provide a strategic vision for SME development and coordinate the entrepreneurial ecosystem. Up-to-date databases on ecosystem support role players in terms of funding and other supports should be kept and maintained by SEDA so that entrepreneurs and other ecosystem actors have easy access to this information. This will ensure better informational flows and avoid duplication of efforts.
- ii. Market information reports are costly to access for small enterprises. Ecosystem role players such as the Department of Trade, Industry and Competition or SEDA should consider sponsoring relevant research organisations in South Africa to conduct market research in the South African environment and then ensure access to these reports to entrepreneurs through accessible channels.
- iii. Regarding the lack of skills of ecosystem role players, training and measures that ensure accountability of personnel are recommended. Continuous training of public sector supply chain management personnel is vital to ensure their skills keep abreast of changes in the operating environment. In this instance, particularly with regards to the procurement of innovations by small enterprises. Furthermore, accountability of public sector employees that deal with start-ups and other small businesses in their formative, fragile years is crucial. To this end,

their work should be measured in terms of impacts such as commercialisation success rates of supported enterprises and the number of companies granted funding or the number of applications processed. This can be achieved through the use of business optimisation and customer relationship management software that can track such metrics.

- iv. Adoption of local innovations by the low-income market is weak. Organisations such as ProudlySA can do more to highlight the benefits of buying from local producers and innovators and promote particularly new and small ventures. Campaigns that encourage consumers to purchase locally produced goods such as “Local is Lekker”, targeted towards the low-income market can also be useful here. Currently, these campaigns exist, but they are mostly aimed at the middle class and more affluent market segments. Changing consumer perceptions and mindsets in the low-income market segment, where incomes are low, but they are still very aspirational, may be improved by running campaigns where local celebrities are seen to use and support local products and innovations.
- v. Ecosystem support agents such as incubators, venture capitalists and other funders should take note of the specific entrepreneurial attributes and capabilities from this study, such as, high prior founder knowledge, innovativeness, a learning orientation, an emerging market orientation, and passion and drive that are likely to lead to success with developing a disruptive innovation. Incubators, for example, can then choose founders that exhibit these traits if they want to promote small businesses that are likely to become disruptive.

7.3.3 RECOMMENDATIONS FOR POLICYMAKERS

Policymakers that influence the broader macro-environment should consider the following issues that impact small business innovative capability and sustainability:

- i. Emphasis should be placed on entrepreneurial education at all educational levels in the country. Entrepreneurship education should focus on training students, not only on general business management principles but also emphasise training on accessing and applying for various funding instruments and training on the national tax regime.
- ii. Implementation of policies and regulations that encourage small business sustainability should be emphasised. These regulations, such as the Competition Act and PFMA, are already in existence, and they just need proper

implementation as the government is perceived as being all talk and no action. In line with this, the government should also mitigate the effects of corruption by sanctioning corrupt public sector officials.

7.3.4 RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the limitations of the current study, the following recommendations are offered:

- i. A similar study to explore factors that influence disruptive innovation capability in a different context should be conducted and the findings compared. The population of the current study was very specific and taken wholly from an incubation environment. As a result, entrepreneurs in this study may have access to support mechanisms that other entrepreneurs outside this context may not have access to, which may have skewed the findings in some way.
- ii. This was an exploratory study of factors that influence disruptive innovation capability in the South African BoP environment. A further study to determine the causal reasons why some NTBCs might develop a disruptive innovation capability while others do not is recommended. This type of investigation should have a longitudinal and quantitative design.
- iii. A quantitative study in the form of a case-study applying the framework of disruptive innovation capability presented in Figure 6.1 is recommended to test the practical applicability of the framework. This would also add a dynamic component to the static framework potentially making it more applicable to different contexts.
- iv. It would be worthwhile to conduct a study on the role of indigenous knowledge on developing disruptive innovations in South Africa. Similar studies have been conducted in other African countries (Mwantimwa, 2008; Afolabi, 2013; Jauhiainen and Hooli, 2017) but to the best of this researcher's knowledge, a similar study has not yet been conducted in South Africa.
- v. There are no academic studies to date that offer quantitative comparisons of disruptive innovation performance of small entrant companies amongst the BRICS countries. A study to determine this may be worthwhile in fully understanding the context that enables disruptive innovation capability in entrant companies.

7.4 CONTRIBUTION TO THEORY

Given the research findings and implications, the current study contributes in the following manner to various literatures:

- i. The study adds to the body of literature on disruptive innovations. In particular, it highlights the organisation-specific and contextual factors that influence the development of disruptive innovations in differently configured emerging economy environments.
- ii. The findings add to and extend the literature on NSI, particularly as they emphasise the role of the quality of linkages in an innovation system and their importance to the performance of the entire system.
- iii. This study adds to the literature on dynamic capabilities and the resource-based perspective by showing the capabilities required for developing a disruptive innovation capability in emerging economies.
- iv. Taken together, national systems of innovation and resource-based view theories have produced a holistic understanding of disruptive innovation capability of NTBCs in an emerging market context. None of the previous studies reviewed for this work focussed on the interplay between organisation-specific factors as typified by resource-based view theories and contextual factors as typified by the national systems of innovation theory. These two theories taken together may illustrate how different operating environments may enable or constrain disruptive innovation capability of entrepreneurs. This integration of theories is important for assessing innovation capability of small entrant companies in any context.

7.5 CHAPTER CONCLUSION

This chapter presented the conclusions of this study on the organisation-specific and contextual factors that influence the disruptive innovation capability of NTBCs in South Africa. Based on the research findings and conclusions, recommendations were offered to start-up founders, ecosystem role players, policymakers, and further studies. The study's theoretical contribution was also highlighted.

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APPENDICES

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APPENDIX A: PARTICIPANT CONSENT FORM

Graduate School of Business Leadership, University of South Africa PO Box 392 Unisa 0003 South Africa
Cnr Smuts and First Avenue Midrand 1685 Tel: +27 11 652 0000 Fax: +27 11 652 0299
Email: sbl@unisa.ac.za Website: www.sblunisa.ac.za



Informed consent for participation in an academic research project

A FRAMEWORK FOR DISRUPTIVE INNOVATION CAPABILITY IN BASE-OF-THE-PYRAMID ENVIRONMENTS

Dear Participant

You are herewith invited to participate in an academic research study conducted by Esnah Dzimba, a student in the Doctor of Business Leadership programme at UNISA's Graduate School of Business Leadership (SBL).

The purpose of the study is to investigate the organisation-specific and contextual factors that influence disruptive innovation capability of South African new technology-based companies catering to the low-income consumer market.

All your answers will be treated as confidential, and you will not be identified in any of the research reports emanating from this research.

Your participation in this study is very important to us. You may however choose not to participate and you may also withdraw from the study at any time without any negative consequences.

Please answer the questions I will pose to you as completely and honestly as possible. This should not take more than an hour of your time.

The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.

Please contact my supervisor, John Andrew van der Poll at vdpolja@unisa.ac.za or telephone 0116520316, fax: 0116520299 if you have any questions or comments regarding the study. Please sign below to indicate your willingness to participate in the study.

Yours sincerely

Esnah Dzimba

I, _____, herewith give my consent to participate in the study. I have read the letter and understand my rights with regard to participating in the research.

Participant's signature

Date

APPENDIX B: INTERVIEW PROTOCOL

Interview Protocol based on Research Questions

Note: Research questions are in bold and the corresponding interview questions follow.

Research Question 1: What factors influence the disruptive innovation capability of new technology-based companies (NTBCs) in the South African BoP environment?

Broad area of inquiry: Contextual enablers of disruptive innovation in South Africa's BoP environment and factors that influence adoption of innovations

1.1 Are there any features in the South African environment in particular, such as perceived strength or weakness of the economy, changing consumer lifestyles, technological changes, etc. that are likely to encourage or discourage disruptive innovations?

**Probe: how so?*

1.2 In your experience how has been the adoption of cost innovations introduced by local start-ups into the low-income market segments in the past?

1.3 How do small businesses operating in low-income environments leverage technology to bring their products to market?

Research Question 2: How do NTBCs operating in South Africa's BoP environment evaluate competing market entry opportunities?

Broad area of inquiry: Entrepreneurial market entry decisions and competitiveness of markets

2.1 Do products/services NTBCs introduce typically favour an established mainstream market with an assured market size or is there an emphasis on exploring new offerings for new and emerging markets?

**Probe: why do you think this is the typical choice of market?*

2.2 What are the common reasons for entering low-income markets?

- market opportunities?
- social focus; to cater to a social need?
- intensity of competition in mainstream market?
- availability of funding/subsidies for catering to low-income segment?
- any other reason _____?

2.3 How far are the social consumer needs in low-income environments (e.g. need for affordable housing, healthcare, safety and security etc.) a determining factor in new product development for start-ups operating in these environments?

2.4 How competitive do you perceive the South African low-income market segment to be in general?

Research Question 3: What are the characteristics of NTBCs that are likely to develop a disruptive innovation capability in South Africa's BoP environment?

Broad area of inquiry: Strategic posture, capabilities and competences of NTBCs

3.1 What would you consider to be the common characteristics of start-ups that are likely to succeed with a disruptive strategy that is focused on the low-income market segment?

3.2 What kind of management attitude/personality would foster a disruptive innovation capability?

3.3 Do you think that start-ups catering to low-income consumer markets need to be more:

- innovative in their product/service offering?
- risk-taking?
- competitive aggressiveness?
- proactive?
- learning capabilities

3.4 In what ways could the background of the founder/founding team, in terms of professional skills and qualifications, influence disruptive innovation capability?

**Probe: ask for elaboration on why this would be so.*

Research Question 4: What challenges do South African NTBCs face in developing and commercialising viable disruptive innovations for BoP markets, and how can they be resolved?

Broad area of inquiry: Ecosystem factors, other challenges and solutions

4.1 Do you feel that the South African legal and regulatory environment is favourable to technology start-ups trying to commercialise low-cost innovations such as disruptive innovations?

4.2 In terms of the South African business operating environment in general, would you consider a disruptive strategy to be more, or less risky to follow in terms of bringing products to market, and why?

4.3 In your experience, do start-ups with disruptive concepts find it more, or less difficult to:

(a) obtain funding?

(b) obtain support from supporting institutions such as business mentorship programmes, incubators, academia for knowledge transfer, etc.?

4.4 What are the challenges that technology-based start-ups operating in low-income market segments face?

**Probes:*

(a) from a competitive point of view?

(b) consumer attitudes and preferences?

(c) technology access and availability?

(d) product development?

(e) any other _____?

4.5 What solutions can you suggest to these and any other challenges?

APPENDIX C: ORGANISATIONAL PERMISSION LETTER



16 November 2018

GRANTING OF INSTITUTIONAL PERMISSION FOR RESEARCH

Dear Esnah Dzimba

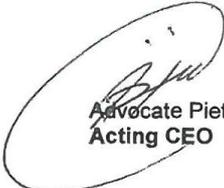
I, **Advocate Pieter Holl**, the Acting CEO of The Innovation Hub Management Company grant permission to collect data at this site for your research project titled: Exploring disruptive innovation capability in base-of-the-pyramid environments.

I grant this permission as the authorised person to do so in this company and I am aware of the following,

1. The study is conducted by a UNISA researcher and remains the property of UNISA
2. You can use the name of the company in your research project. However, publication into the public domain will be subject to a written approval from this company after the EXCO has gone through the material.
3. All data and information collected will be solely in the possession of the researcher
4. I will require feedback on the research.
5. The research may be published in the public domain under the supervision of the supervisor (see point 2 above regarding the use of the name of organization)

I wish you the best and success in this research.

Kind regards,



Advocate Pieter Holl
Acting CEO

The Innovation Hub Management Company (SOC) Ltd, Box 1, Mark Shuttleworth Street, The Innovation Hub 0087, Pretoria, South Africa
The Innovation Centre, 6 Mark Shuttleworth Street, The Innovation Hub 0087
Tel: +27 12 844 0000 Fax: +27 12 844 1107 www.theinnovationhub.com

Directors: Dr T Ratshitanga (Chairman), Mr M Muofhe, Mr R J Monyokolo, Dr L Marwala, Ms M Modise, Ms S S Lowitt, Mr X Mlonyeni
Adv Pieter Holl (Acting Chief Executive Officer), Ms M Thomani (Chief Financial Officer) Mr J Mulaudzi (Group Company Secretary)
Reg. No. 2000/012801/30 A GGDA Group Company



APPENDIX D: ETHICAL CLEARANCE CERTIFICATE

Graduate School of Business Leadership, University of South Africa, PO Box 392, Unisa, 0003, South Africa
Cnr Janadel and Alexandra Avenues, Midrand, 1685, Tel: +27 11 652 0000, Fax: +27 11 652 0299
E-mail: sbl@unisa.ac.za Website: www.unisa.ac.za/sbl

SCHOOL OF BUSINESS LEADERSHIP RESEARCH ETHICS REVIEW COMMITTEE (GSBL CRERC)

13 September 2019

Ref #: 2019_SBL_DBL_015_FA
Name of applicant: Ms E Dzimba
Student #: 79162894

Dear Ms Dzimba

Decision: Ethics Approval

Student: Ms E Dzimba, 79162894@mylife.unisa.ac.za, 081 533 8956

Supervisor: Prof JA Van der Poll, ydpolja@unisa.ac.za, 011 652 0316

Project Title: A framework for disruptive innovation capability in base-o- the Pyramid environments

Qualification: Doctorate in Business Leadership (DBL)

Expiry Date: August 2023

Thank you for applying for research ethics clearance, SBL Research Ethics Review Committee reviewed your application in compliance with the Unisa Policy on Research Ethics.

Outcome of the SBL Research Committee:

Approval is granted for the duration of the Project

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the SBL Research Ethics Review Committee on the 05/09/2019.

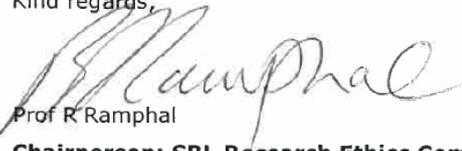
The proposed research may now commence with the proviso that:

- 1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
- 2) Any adverse circumstance arising in the undertaking of the research project that is

relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the SBL Research Ethics Review Committee.

- 3) An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.
- 4) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

Kind regards,



Prof R Ramphal

Chairperson: SBL Research Ethics Committee

011 – 652 0363 or ramphrr@unisa.ac.za



Prof RT Mpofu

Executive Dean (Acting): Graduate School of Business Leadership

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APPENDIX E: FINDINGS SUMMARY SHEET – RQ1

RQ1: What factors influence the disruptive innovation capability of new technology-based companies in the South African BoP environment?											
Broad area of inquiry: Enablers of disruptive innovation in the South Africa's BoP environment											
Pseudonym	<i>Enablers of Disruptive Innovation mentioned</i>										
	Socio-economic enablers - Targeting pain points						Demographic make-up		Technologies and operating environment		
	Accessibility	Consumer lifestyle changes (changing preferences, needs & wants)	Healthcare	Lower costs (cheaper products)	Safety & security	Social & environmental impact	Leveraging indigenous knowledge	Low-end market availability	New market availability	Enabling technologies	Enabling operating environment features
I1P1SF	X			X	X	X		X	X	X	X (+)
I1P2SF				X	X			X		X	
I2P3SF						X		X			
I3P4BM	X						X				
I4P5BM			X				X	X		X	X (-)
I5P6BM	X						X	X			
I6P7BM	X							X	X		
I7P8BM		X						X	X	X	
I8P9SF		X				X			X		X (+)
I9P10BM							X	X	X		X (+)
I10P11E						X				X	X (-)
I11P12SF			X				X			X	
I12P13IE		X					X			X	
I13P14SF			X	X		X		X	X		
I14P15SF		X							X		
I15P16SF	X			X				X		X	
I16P17SF								X			
I16P18SF										X	
I17P19SF									X	X	
I18P20E		X	X	X		X				X	
TOTAL (individual points)	5: 25%	5: 25%	4: 20%	5: 25%	2: 10%	6: 30%	6: 30%	11: 55%	8: 40%	11: 55%	5: 25%
TOTAL (GROUP OF FACTORS)	85%						70%		55%	25%	

APPENDIX E: FINDINGS SUMMARY SHEET – RQ1 CONTINUED...

Pseudonym	<i>Adoption factors mentioned</i>				
	Consumer education	Consumer perception: Perceived risk of new product by market	Adoption: Aspirational consumer mindset	Consumer perception: Lack of trust	Understanding limitations: Consumer behaviour
I1P1SF	X	X		X	X
I1P2SF	X	X			
I2P3SF			X		X
I3P4BM					X
I4P5BM			X		X
I5P6BM	X		X	X	
I6P7BM					
I7P8BM			X	X	X
I8P9SF	X			X	
I9P10BM			X		
I10P11IE					
I11P12SF	X	X			
I12P13IE	X		X	X	
I13P14SF					X
I14P15SF	X			X	
I15P16SF	X				
I16P17SF	X		X		
I16P18SF			X	X	
I17P19SF	X			X	
I18P20IE	X	X			
TOTAL (20)	11: 55%	4: 20%	8: 40%	8: 40%	6: 30%
TOTAL (GROUP OF FACTORS)	90%				

APPENDIX F: FINDINGS SUMMARY SHEET - RQ2

RQ2: How do NTBCs operating in South Africa's BoP environment evaluate competing market entry opportunities?

Broad area of inquiry: Entrepreneurial market entry strategies

Choice of market chosen for entry

Pseudonym	Low-end market	New market	Mainstream market	Mainstream & low-end
I1P1SF			X	
I1P2SF	X			
I2P3SF			X	
I3P4BM				
I4P5BM				
I5P6BM				
I6P7BM				
I7P8BM				
I8P9SF		X		
I9P10BM				
I10P11E				
I11P12SF				X
I12P13IE				
I13P14SF				X
I14P15SF	X			
I15P16SF	X			
I16P17SF			X	
I16P18SF			X	
I17P19SF			X	
I18P20IE				
TOTAL (20)	3: 27%	1: 9%	5: 46%	2: 18%

<i>Competition in market segment</i>			
Pseudonym	Low: indirect & fragmented	High: Dominant incumbents	High: but fragmented
I1P1SF			X
I1P2SF	X		
I2P3SF			X
I3P4BM			X
I4P5BM		X	
I5P6BM		X	
I6P7BM			X
I7P8BM		X	
I8P9SF	X		
I9P10BM		X	
I10P11E	*	*	*
I11P12SF		X	
I12P13IE		X	X
I13P14SF			X
I14P15SF			X
I15P16SF		X	
I16P17SF			X
I16P18SF			X
I17P19SF	X		
I18P20IE		X	
TOTAL (20)	3: 15%	8: 40%	9: 45%

APPENDIX F: FINDINGS SUMMARY SHEET - RQ2 CONTINUED...

Pseudonym	<i>Reasons for entering low-end/new markets</i>				<i>Reasons for not entering low-end/new markets</i>			
	Necessity:limited resources	Market opportunity & Foothold market availability	Social & lifestyle focus	Innovation process: Good testing ground for products	Aspirational entrepreneurs	Market needs misalignment	Perceived lack of adequate market size in low-end for scale-up	High risk operating environment in low-end
I1P1SF			X	X	X		X	X
I1P2SF			X	X				
I2P3SF		X	X		X		X	
I3P4BM	X							X
I4P5BM	X							
I5P6BM	X					X		
I6P7BM	X				X			X
I7P8BM		X			X		X	X
I8P9SF		X	X				X	
I9P10BM	X	X			X	X		
I10P11IE			X					
I11P12SF		X	X~					
I12P13IE	X	X				X		
I13P14SF		X	X					
I14P15SF	X	X	X					
I15P16SF	X							
I16P17SF	X	X			X			
I16P18SF		X			X			
I17P19SF		X						
I18P20IE	X		X					
TOTAL (20)	10: 50%	11: 55%	9: 45%	2: 10%	7: 35%	3: 15%	4: 20%	4: 20%

APPENDIX G: FINDINGS SUMMARY SHEET – RQ3

RQ3: What are the characteristics of NTBCs that are likely to develop a disruptive innovation capability in South Africa’s BoP environment?							
Broad area of inquiry: Strategic posture, capabilities and competences of NTBCs							
A.] Common characteristics of startup founders that are likely to succeed with a disruptive strategy							
<i>Start-up founder capabilities & attributes likely to foster a disruptive capability</i>							
Pseudonym	Innovativeness: of entrepreneur	Risk-taking: of entrepreneur	Proactiveness: of entrepreneur	Market knowledgeTarget market immersion	Learning capabilities & learning by doing	Multi-skilling	Passion & Motivation
I1P1SF		X			X	X	X
I1P2SF	X			X	X		X
I2P3SF	X	X		X	X		
I3P4BM	X				X		
I4P5BM	X						X
I5P6BM				X			
I6P7BM	X				X		
I7P8BM					X		
I8P9SF	X				X	X	X
I9P10BM		X					X
I10P11E	X			X			X
I11P12SF	X	X			X	X	X
I12P13IE	X			X	X		X
I13P14SF				X	X	X	X
I14P15SF	X				X		
I15P16SF	X				X		X
I16P17SF					X		
I16P18SF	X				X		X
I17P19SF					X		X
I18P20IE	X				X		
TOTAL (20)	13: 65%	4: 20%	0	6: 30%	16: 80%	4: 20%	12: 60%

APPENDIX G: FINDINGS SUMMARY SHEET – RQ3 CONTINUED...

<i>Founder/founder team background as enabler of DI</i>				
Pseudonym	Prior founder knowledge: Benefits	Founder team complemetarity	Prior founder knowledge: Cons	Highest level of qualification
I1P1SF	X	X		X [Udrgrd-incomplete]
I1P2SF	X	X		X [Udrgrd]
I2P3SF	X	X		X [Masters]
I3P4BM				n/a [PhD]
I4P5BM	X		X	n/a [Masters]
I5P6BM	X		X	n/a [Udrgrd]
I6P7BM	X	X		n/a [Masters]
I7P8BM	X	X	X	n/a [PhD]
I8P9SF	X	X	X	X [Udrgrd]
I9P10BM	X			n/a [Udrgrd]
I10P11IE		X		n/a [PhD]
I11P12SF	X	X		X [Phd]
I12P13IE	X	X	X	n/a [Phd]
I13P14SF	X	X		X [PhD]
I14P15SF	X	X		X [Udrgrd]
I15P16SF	X	X		X [Matric+High ind' exp]
I16P17SF	X	X		X [Matric]
I16P18SF	X	X		X [Matric]
I17P19SF	X			X [Udrgrd]
I18P20IE	X			n/a [PhD]
TOTAL (20)	18: 90%	14: 70%	5: 25%	

APPENDIX H: FINDINGS SUMMARY SHEET – RQ4

RQ4: What challenges do South African NTBCs face in developing and commercialising viable disruptive innovations for BoP markets, and how can they be resolved?						
Broad area of inquiry: Microeconomic, ecosystem, macroeconomic challenges and solutions						
A.] Challenges: Microeconomic context						
Pseudonym	Consumer perceptions			Contextualisation		
	Adoption: consumer mindset	Consumer education	Consumer perception: lack of trust / perceived risk of product	Innovating according to context	Innovating according to context: Indigenous knowledge	Poor contextualisation: Market needs misalignment
I1P1SF		X	X	X		X
I1P2SF		X	X	X		X
I2P3SF	X					
I3P4BM					X	X
I4P5BM	X					
I5P6BM	X	X	X	X	X	X
I6P7BM				X		
I7P8BM	X		X		X	
I8P9SF		X	X	X		
I9P10BM	X			X	X	X
I10P11IE						
I11P12SF		X	X	X	X	X
I12P13IE	X	X	X	X	X	X
I13P14SF				X		
I14P15SF		X	X			
I15P16SF		X				
I16P17SF	X	X				
I16P18SF	X		X			
I17P19SF		X	X			
I18P20IE		X	X			X
TOTAL (20)	8: 40%	11: 55%	11: 55%	9: 45%	6: 30%	8: 40%
TOTAL (GROUP OF FACTORS)			80%		60%	

APPENDIX H: FINDINGS SUMMARY SHEET – RQ4 CONTINUED...

B.) Challenges: Meso-economic level											
Pseudonym	Ecosystem challenges							Social norms		Market access barriers	
	Ecosystem: Support	Ecosystem: Technology	Ecosystem: Capabilities (low skills of role players)	Ecosystem: Fragmentation & inefficiencies	Ecosystem: Poor contextualisation	Funding	Lack of information: Information gap (MULTI-FACETED)	'Mindset' gap: Behavioural biases	Culture towards entrepreneurship & innovation	Market access	Barriers to entry: Existing businesses
I1P1SF		X	X	X	X		X				
I1P2SF		X	X	X	X	X	X	X [entre & consumer]			
I2P3SF	X		X	X		X	X				
I3P4BM	X		X	X	X	X	X	X [entre]	X	X	
I4P5BM	X	X	X	X		X	X			X	X
I5P6BM					X	X	X	X [entre + legacy]	X	X	
I6P7BM	X		X	X		X	X	X [regulators + envt]	X	X	
I7P8BM	X	X	X	X		X	X		X	X	
I8P9SF	X	X	X	X			X			X	
I9P10BM	X	X		X		X	X	X [entre]		X	
I10P11IE	X	X	X	X						X	
I11P12SF		X	X	X	X	X	X		X		X
I12P13IE	X	X	X	X	X	X	X	X [entre+ consumer+envt]	X	X	X
I13P14SF		X	X	X		X	X		X	X	X
I14P15SF	X		X	X		X	X			X	X
I15P16SF		X									
I16P17SF		X	X			X		X [consumer]		X	
I16P18SF	X	X	X	X		X	X	X [consumer]	X	X	
I17P19SF		X				X		X [entre]			
I18P20IE		X	X	X	X	X	X	X [entre]		X	X
TOTAL (20)	11: 55%	15: 75%	16: 80%	15: 75%	7: 35%	16: 80%	16: 80%	10: 50%	8: 40%	14: 70%	6: 30%
TOTAL (FOR GROUP OF FACTORS)	100%							65%		75%	

APPENDIX H: FINDINGS SUMMARY SHEET – RQ4 CONTINUED...

	Macroeconomic & regulatory context		
Pseudonym	Environmental constraints incl. (GVT concerns)	Regulatory issues	Political structures & political will
I1P1SF	X	X	X
I1P2SF	X	X	X
I2P3SF	X	X	
I3P4BM	X	X	
I4P5BM	X	X	
I5P6BM	X	X	X
I6P7BM	X		X
I7P8BM	X	X	X
I8P9SF	X	X	
I9P10BM	X	X	
I10P11IE	X	X	
I11P12SF	X	X	X
I12P13IE	X	X	X
I13P14SF	X	X	X
I14P15SF	X	X	
I15P16SF	X		
I16P17SF	X		
I16P18SF	X	X	X
I17P19SF	X		
I18P20IE	X	X	X
TOTAL (20)	20: 100%	16: 80%	10: 50%

APPENDIX H: FINDINGS SUMMARY SHEET – RQ4: SOLUTIONS

Solutions									
Pseudonym	Micro-level solutions		Meso-level solutions				Macro-level solutions		
	Understanding & overcoming limitations & constraints	Strategic options & strategies employed	Innovating according to context + IKS	Market knowledge	Market access solutions	Funding options	Environmental constraints: solutions	Skills shortage	Governmental policy: solutions
I1P1SF	X	X	X		X	X			
I1P2SF	X	X	X	X		X	X	X	
I2P3SF	X	X		X			X		X
I3P4BM	X	X	X			X			
I4P5BM	X	X							
I5P6BM	X		X	X	X				
I6P7BM	X	X	X		X				X
I7P8BM	X		X		X		X		
I8P9SF	X	X	X		X				
I9P10BM	X	X	X		X			X	
I10P11IE	X	X	X	X	X				
I11P12SF	X	X	X	X		X			X
I12P13IE	X	X	X		X	X		X	X
I13P14SF	X	X	X		X		X	X	X
I14P15SF	X	X			X				
I15P16SF	X	X							
I16P17SF	X	X			X	X	X		
I16P18SF	X	X					X	X	
I17P19SF	X								
I18P20IE	X		X		X	X			
TOTAL (20)	20: 100%	16: 80%	13: 65%	5: 25%	12: 60%	7: 35%	6: 30%	5: 25%	5: 25%

APPENDIX I: CERTIFICATE OF LANGUAGE EDITING

CERTIFICATE
OF LANGUAGE EDITING

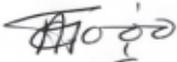
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AUTHOR:
Esnah Dzimba

DATE ISSUED: 29 OCTOBER 2020

The editorial team confirms that neither the research content nor the author's intentions were changed during editing.
The author was given an option to accept or reject the suggestions and changes.

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APPENDIX J: SIMILARITY INDEX REPORT (TURNITIN)

***NB:** A similarity index of 4 % from a single source refers to the conference paper published from this work. It was based on information gleaned from the literature review (Chapter 2) and conceptual framework (Chapter 3) of this thesis (see Appendix K).

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APPENDIX J: CONTINUED...



¹ A FRAMEWORK FOR DISRUPTIVE INNOVATION CAPABILITY IN BASE-OF-THE-PYRAMID ENVIRONMENTS

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APPENDIX K: RESEARCH OUTPUT

TOWARDS A FRAMEWORK FOR DISRUPTIVE INNOVATION CAPABILITY IN BASE-OF-THE-PYRAMID ENVIRONMENTS.

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ABSTRACT

Aim/Purpose	Literature suggests a disruptive innovation strategy holds distinct advantages for new entrants at the base-of-the-pyramid (BoP). Consequently, the aim is to develop a conceptual framework integrating the factors that facilitate disruptive innovation capability in BoP environments.
Background	The paper investigates the organisation-specific and contextual factors that influence disruptive innovation capability in small new businesses operating in resource constrained BoP environments, and on the strength of these, a framework is developed.
Methodology	The paper relies on an extensive integrative review of the literature on disruptive innovations, innovating in resource-constrained environments, resource-based theories and national systems of innovation literature to inductively develop a framework of disruptive capability in BoP environments.
Contribution	An integrated theoretical exploration is conducted of the factors likely to influence disruptive innovation capabilities of small businesses in resource-constrained BoP environments. On the strength of this, a conceptual framework that enhances our understanding of the interaction of various internal and external factors that influence the disruptive innovation capability of small businesses in BoP environments is developed.
Findings	The major findings of the paper are: <ul style="list-style-type: none">• Disruption strategy could be a tool for improved survival of small new businesses in BoP environments.• Current literature on disruptive innovations does not offer definitive conclusions in the areas of how contextual influences such as country specific features, entrepreneurial environments, and organisational attributes affect disruptive innovation capability of new entrants in resource-constrained environments.• Disruptive innovation capability of entrants at the BoP is enabled by the presence in the operating environment of essential drivers of disruptive capability and a conducive entrepreneurial ecosystem. Additionally, developing a disruptive capability requires purposeful strategising on the part of the entrepreneur.
Recommendations for Practitioners	From a practitioner perspective, we found that developing a disruptive innovation capability is a purposeful endeavour. The framework proposed allows entrepreneurs to assess and streamline their own resource bases to the business operating environment for disruptive capability.

Recommendation for Researchers	Our work extends the literature on the purposeful creation of disruptive innovations, in particular, under what contextual circumstances disruptive innovations are likely to emerge, and the entrepreneurial innovation processes in low-income domains. Scalability of the framework should be investigated.
Impact on Society	The proposed disruptive innovation framework could facilitate improved small business sustainability in a developing economy.
Future Research	An empirical study to enhance and validate the framework should follow, as well as investigating its scalability within new technology-based companies.
Keywords	Disruptive innovation, base/bottom of the Pyramid (BoP), emerging economies, constraint-based innovations, small business survival.

INTRODUCTION

For the majority of developing and emerging countries, increasing economic development and the welfare of citizens, as well as reducing income inequality and poverty are usually some of the most important policy goals. This is because in these economies the majority of citizens usually reside at the base-of-the-pyramid (BoP). The base-of-the-pyramid, also referred to as the bottom-of-the-pyramid in some text, is a term that was conceptualised by Prahalad & Hart (2002) in reference to the over 4 billion people who make up the global low-income consumer market. To accomplish the goals of poverty alleviation, inclusive development and social transformation, many governments have looked to mass entrepreneurship as a possible solution to lift the poor from the fringes into mainstream economic markets through the provision of quality and cost-effective goods and services, and the provision of employment opportunities (Alvarez & Barney, 2014; Prahalad & Mashelkar, 2010).

While entrepreneurship is lauded as an engine for economic growth in developing and emerging economies, scholars point out that not all entrepreneurship is created equal with regards to growth outcomes and poverty alleviation (Alvarez & Barney, 2014; Kanani, 2009). Policy emphasis is shifting towards fast-growing, innovative and technology-based entrepreneurs (Buckley & Davis, 2016), who develop, use, diffuse, or market new technologies as part of their product development, production or marketing strategies (Park, 2005). It is argued that these types of innovative entrepreneurial companies lead to better economic outcomes as opposed to subsistence entrepreneurship (Alvarez & Barney, 2014). Consequently, innovation capability and the sustainability of small and medium-sized enterprises (SMEs) are closely related concepts.

According to the Global Entrepreneurship Monitor (GEM Report, 2016), South African entrepreneurs are struggling to succeed beyond the 3 ½ year mark. The global average for new businesses succeeding beyond the 3 ½ year mark is at 7.6%. In contrast, only 2.1% of South African business start-ups succeed past this milestone. The data shows consistently low levels of entrepreneurial activity in South Africa compared to other emerging economies such as China, Brazil and India. Kumalo & van der Poll (2015) also found that small business failure rates in South Africa are as high as 63% in the first year of operation, with most failing to survive beyond the two-year milestone. These dismal figures, taken together with the fact the majority of South Africa's population are low-income consumers, and that developing and emerging economies suffer from many and varied resource constraints, raises questions regarding the ideal strategies small entrant businesses can employ for survival in these types of operating environments.

Literature suggests that the disruptive innovation framework offers an inherent advantage to young entrant companies operating in BoP environments (Hang, Chen & Subramian, 2010; Christensen, Ojomo & van Bever, 2017). The mid-income and high-income segments in developing countries are small, already well served and extremely competitive. A small entrant

trying to enter an established market is, therefore; better off targeting the low-income market first (Christensen et al., 2017). The resource constraints and high unemployment conditions prevailing in low-income environments favour the successful creation of disruptive innovations by alert entrepreneurs (Skarzynski & Rufat-Latre, 2011).

Disruption has been suggested as the reason for Japan's exceptional economic growth after World War II (Markides, 2013; Hart & Christensen, 2002). More recently, scholars have noted how Chinese and Indian companies by crafting strategies that target the vast low-income populations within their markets have eventually disrupted Western companies within their borders and on the global stage (Prahalad, 2010; Yu and Hang, 2011; Rao, 2013). South Africa, with its large population of low-income consumers and a relatively advanced entrepreneurial ecosystem, has the right catalytic ingredients to produce disruptive innovations. It is thus not clear why South Africa seemingly lags behind its emerging economy counterparts in producing commercially viable disruptive innovations. We found it worth exploring the company-specific and contextual factors that influence disruptive innovation capability in BoP environments, particularly from the South African perspective.

In the next section, we present a brief literature review of disruptive innovations and innovating in resource-constrained BoP environments, as well as the theoretical foundation of the study. This is followed by a conceptual framework with propositions gleaned from our extensive review of the literature. The paper concludes with a discussion of our findings and opportunities for application.

LITERATURE REVIEW

Disruptive innovation has been defined as a strategy whereby a smaller company with fewer resources is able to successfully challenge established incumbent business and eventually overthrow the status quo of an industry (Christensen, 1997). This occurs specifically, as existing businesses in an industry focus on improving their products or services to cater to their most demanding and profitable customers with sustaining innovations (Christensen, Raynor & McDonald, 2015). The main reason why disruptive innovations typically succeed is that they almost always start out as being financially unattractive to incumbents in a market (Ansari, Garud & Kumaraswamy, 2016). Incumbents in a market lack the financial motivation to compete with entrants in these financially unattractive low-end or fringe markets. This affords smaller entrants the advantages of low competitive visibility (Carayannopoulos, 2009; Markman & Waldron, 2014) and time, time to grow and perfect their business processes before larger and better-resourced incumbents become interested in the same markets they are operating in (Christensen et al., 2015).

According to the seminal work by Christensen (1997), 37% of disruptive entrants into the disk drive industry between 1956-1990 succeeded, compared with only 6% of entrants who entered the industry with sustaining innovations that had a similar value proposition to those offered by incumbents. A disruptive strategy has consequently been seen as a tool for improved entrant business survival and competitive advantage (Wan, Williamson & Yin, 2015). Disruptive entrants typically target markets that are different from those being served by incumbents and offer a different product/service proposition to those of incumbents (they target fringe markets or wholly new markets). The disruptive innovation framework has as a result been hailed as a powerful tool for crafting competitive strategy, improving new business survival rates, creating high growth businesses and expanding new markets (Christensen, McDonald, Altman & Palmer, 2018; Ahlstrom, 2010; Raynor, 2011).

In BoP environments, in addition to competitive pressure from existing businesses, small entrants have to contend with a myriad of resource constraints in the form of poor access to funding,

lagging technology, knowledge gaps and institutional voids (Simanis and Duke, 2014; Govindarajan and Trimble, 2012; Prashantham and Yip, 2017). Also, small entrants have low survival rates in general (Löfsten, 2016). It is, therefore, useful to investigate strategies that confer competitive and survival advantages to smaller entrants operating in BoP environments.

Low-income or BoP consumers make up the majority of the populace in emerging and developing countries. BoP is a term conceptualised by Prahalad & Hart (2002) in reference to the more than four billion people who constitute the global low-income consumer market. Li (2013) defines the BoP as the individuals who survive on less than US\$ 3000 in local purchasing power parity. Using this definition, at least 75% of South African consumers can be categorised as residing at the BoP (Danish International Business Development Institute, 2010), while 80% of China's population and 98% of India's population can be classified as BoP consumers (Li, 2013).

Owing to the unique resource constraints inherent in emerging and developing countries, such as masses of low-income consumers, skills and materials shortages, large income disparities, high unemployment levels and institutional and regulatory voids (Rao, 2013; Simanis and Duke, 2014; Adegbile and Sarpong, 2018), scholars suggest that these unique environments require specific innovation frameworks suited to these environments (Prahalad, 2012).

The term frugal innovation has become an umbrella term for innovative processes in resource-constrained environments. Different kinds of resource-constrained innovations have been suggested in the literature to cater to the BoP mass market. These include frugal engineering (Soni & Krishnan, 2014; cost innovations (Zeschky, Winterhalter & Gassman, 2014); bricolage and jugaad innovations (Agnihotri, 2015); Gandhian and indigenous innovations (Brem & Wolfram, 2014; von Zedtwitz, Corsi & Frega, 2015); and disruptive innovations (Hart & Christensen, 2002; Christensen *et al.*, 2017; Li, 2013). Our study focuses on disruptive innovations as a practical strategy for new entrepreneurs to employ for successful innovating in BoP environments. Frugal engineering involves technological re-engineering that may require costly investments in research and development. This calls for increased financial resources that startups in emerging economy environments do not usually have access to. Cost innovations often gain market share through price competitiveness but are often dependent on lower factor costs, such as cheap labour, that can be eroded over time. Furthermore, competing on price alone is a source of advantage that can be easily imitated by competitors. Bricolage and Gandhian innovations bring to mind a chaotic effectuation type process of doing business which is typical of subsistence entrepreneurs. As Karnani (2009) and Agnihotri (2015) point out, these types of micro-entrepreneurs may help their own families out of poverty, but they usually never become fully competitive and do not grow the economy or create meaningful employment.

Existing literature on disruptive innovations in emerging economies contends that the large populations of low-income consumers and large income gaps in these environments make disruption an ideal strategy to follow at the BoP (Markides, 2013; Li, 2013). There are several documented successful examples of disruptive innovations at the BoP, among them the Luyuan electronic bikes, GE Logiq Book ultrasound machine, Tata Nano car, Suzlon wind turbines (Yu and Hang, 2011), Media-Tek (Zhou, Li & Tong, 2013), M-Pesa and Tolaram Noodles (Christensen *et al.*, 2017), and M-Kopa solar products (Adegbile and Sarpong (2018).

What is missing in the literature reviewed are the specific contextual features in the various emerging economy BoP environments that enable disruptive innovation capability as different emerging economies are exhibiting varying levels of success with commercialising successful disruptive innovations in their BOP environments. Literature on disruptive innovations at the BoP, and innovating in resource-constrained environments in general, has tended to focus on analyses of India and China (Li, 2013; Prahalad, 2012; Markides, 2013; Hang, Chen & Yu, 2011; Hang, Garsey & Ruan, 2015; Yu and Hang, 2011; Prahalad and Mashelkar, 2010). Consequently, there is a lack of understanding as to why small entrants in South Africa seemingly lag behind

their emerging economy counterparts in developing and commercialising successful disruptive concepts.

Furthermore, existing literature on disruptive innovations does not adequately deal with the opportunities and threats that small entrant entrepreneurs confront in developing disruptive innovations. Most existing research conducted on disruption theory to date has been focused on its impact on incumbent businesses; how incumbents can cope with attacks from disruptive entrants (Christensen, 1997; Christensen *et al.*, 2015; Habtay, 2012) or how they can successfully introduce their own disruptions (Christensen & Raynor, 2003; Habtay & Holmén, 2014; Raynor, 2011; Evans, Ralston & Broderick, 2009; Thurston & Singh, 2010). Scholars such as Yu & Hang (2010) and Habtay (2012) point out that disruptive innovation literature is missing the resource-constrained entrant business' perspective.

When the literature on disruptive innovations and innovating in resource-constrained BoP environments are taken together it highlights the following research problem: ***there is a lack of understanding with regards to the organisation-specific and contextual factors that influence disruptive innovation capability of small businesses operating in South Africa's BoP environment.***

DEFINING DISRUPTIVE CAPABILITY

Innovation capability has been defined as the capacity to transform knowledge and ideas into commercially valuable products, processes and systems on a continuous basis (Saunila, Ukko & Rantanen, 2014). Innovation capability has been linked to superior business performance (Saunila *et al.*, 2014; Lawson & Samson, 2001). Assink (2006) defines a disruptive innovation capability as an internal organisational capability to explore new ideas by experimenting with opportunities detected in a market's white space. This suggests that entrepreneurs need to align their resources to external market conditions in order to develop a disruptive capability. We, therefore, propose that disruptive innovation capability can be investigated from a resource-based perspective and systems of innovation perspective. The national systems of innovation (NSI) framework offers explanations regarding how the external environment in which small entrants exist affect their innovation outcomes and performance. The resource-based view (RBV) explains how organisations attain competitive advantage by harnessing internal resources in order to compete successfully in varying environments. The NSI and RBV perspectives are divergent in their focus of what influences competitive advantage but both of them combined offer factors that give a holistic explanation of new business competitiveness and survival.

The NSI framework contends that national and geographic settings in which organisations operate have a significant impact on how individual entrepreneurs behave and how businesses ultimately perform (Acs, Audretsch, Lehmann & Licht, 2017; Autio & Levie, 2017). Entrepreneurs learn and gain knowledge, that is, innovativeness through their own efforts and through spillovers from their external environment. The external environment in which entrepreneurs operate shapes their strategies and how they innovate in that specific environment. This systemic view of innovation holds that innovation cannot succeed in isolation and requires an entire ecosystem in interaction which includes private and public interrelated components, relationships, and institutions. The components of the NSI include universities, governmental organisations, industry, household demand, macroeconomic stability, environmental competition, informal networks, and resource availability within a region or nation-state (Lundvall, 2007; Niosi, Saviotti & Bellon, 1993). The NSI framework can be used as an evidence-based way to understand the contextual factors that might influence the disruptive innovation capability of small new businesses in the South African environment.

The characteristics of the entrepreneurs and the resulting businesses they form also play a role in performance outcomes. The resource-based perspective provides theories that are analytical at the organisational level (Peteraf & Barney, 2003). The RBV contends that

resources are differentiable among organisations and, thus, organisations with resources that are in superior use can deliver greater value to consumers and achieve competitive advantage (Barney, 1991). Fledgeling businesses operating in emerging and developing economies face strong resource constraints and have to develop capabilities that allow them to create customer value and competitive advantage in volatile market conditions (Brem & Wolfram, 2014). Dynamic capabilities give new enterprises the ability to build, integrate or reconfigure operational capabilities in order to address volatile business operating environments (Teece, 2018; Helfat & Peteraf, 2003). Scholars argue that developing a disruptive innovation capability is facilitated by the organisation's dynamic capabilities (Pandit, Joshi, Gupta & Sahay, 2017).

A small business' resources and how they are employed and deployed reflect its strategic orientation or posture. Slater and Narver (1990) and Grawe, Chen & Daugherty (2009) equate strategic orientation with business culture as it reflects the behaviours entrenched in the business in the pursuit of competitive advantage and survival. The resource-based perspective provides a useful way to investigate how small businesses coordinate internal resources in order to achieve a disruptive innovation capability.

It is therefore proposed that disruptive innovation capability can be investigated at the nexus of internal factors like organisational resources and capabilities as typified by resource-based theories, and contingent factors as typified by the national systems of innovation framework.

CONCEPTUAL FRAMEWORK

We posit that disruptive innovation capability, like any innovation capability, is affected by factors both external and internal to the organisation attempting a disruption strategy. Following is a conceptual framework with proposed contextual and organisation-specific influencers of disruptive innovation capability in South Africa's BoP environment.

CONTEXTUAL FACTORS

Disruptive innovations are influenced by specific drivers in the external environment that influence the pace and fate of how a potentially disruptive innovation penetrates the market and how it evolves in the market. Hang, Chen & Yu (2011) have identified life- style changes, changing demographics, legislation (both governmental and regulatory), technological shifts and availability of a large enough foothold market for an entrant to introduce their product, as the specific drivers that influence disruptive capability. Nogami & Veloso (2017) also include aspects of consumer behaviour such as low in- comes and poor of access to information that leads to poor adoption and diffusion rates that is specific to the BoP populace. Any changes in the business or consumer environ- ment will create new dominant drivers (Paap & Katz, 2004).

Existing literature notes that disruptive innovations require enabling technologies for successful implementation. The enabling technology allows for the combination of a dis- ruptive idea or strategy with a technology that can propel the innovation forward (Yu & Hang, 2011; Shaughnessy, 2016). The speed with which the disruptive innovation diffuses and is adopted in the foothold, and eventually into the mainstream markets, has been found to be dependent on how quickly the enabling technology improves over time (Christensen *et al.*, 2015). For example, the speed with which mobile banking is adopted in BoP markets will greatly depend on internet access in remote areas as well as smartphone penetration rates. Most documented cases of disruptive innovations have been as a result of enabling technologies as they allow small businesses to scale up quickly without a corresponding increase in costs (Christensen & Raynor, 2003; Markides, 2008). This leads to the following propositions:

P_{1a}: Technological, social and demographic changes; as well as consumer behaviour in BoP environments influence the ability of small entrant businesses to develop a disruptive inno- vation capability

P_{1b}: The availability and progression of enabling technologies facilitate disruptive innovation capability of small entrants in BoP environments.

Our review of the literature showed that the entrepreneurial ecosystem in which SMEs conduct business has an impact on how they create and exploit entrepreneurial opportunities (Lamotte & Colovic, 2015; Acs et al., 2017). The entrepreneurial ecosystem has been defined by Autio & Levie (2017) as a dynamic and institutionally embedded collection of various public and private actors that interact to create and sustain the success of new entrepreneurial businesses. For example, SMEs with greater access to funding and financial resources through venture capitalists, financial institutions and other forms of investment and financing have been found to perform better in the long term (Omri, Frikha & Bouraoui, 2015). Governmental agencies, policymakers, and public administrators play a crucial role in fostering a sustaining environment for small business development through various macro- and micro-economic interventions (Buckley & Davis, 2016). In addition, policies around business creation and contract enforcement can either inhibit or encourage innovativeness of small businesses or their ability to survive the business environment (Lamotte & Colovic, 2015; Prashantham & Yip, 2017). This leads to the following proposition:

P₂: A robust entrepreneurial ecosystem in terms of enabling policies, funding, supporting institutions and knowledge transfers facilitates disruptive innovation capability of small businesses in BoP environments.

ORGANISATION SPECIFIC FACTORS

We propose that an organisation's strategic orientation affects its disruptive innovation capability. As per the resource-based perspective, an organisation's unique internal resources and how they are employed to provide customer value influence its strategic posture or orientation (Zhou et al., 2005).

When exploring new markets, entrants are faced with a strategic choice between either, taking a disruptive path or taking a sustaining path to market (Christensen et al., 2015; Hang, Garnsey & Ruan, 2015). The notion that entrepreneurs have the power of choice between competing options echoes Lumpkin and Dess' (1996) concept of entrepreneurial orientation which theorises that entry into new markets can be successfully undertaken by active and effortful enactment on the part of the entrepreneur, given the various choices and options available to them. Christensen et al. (2018) point out that an innovation is not innately disruptive. It is up to the entrepreneur to situate the innovation in a strategically disruptive way. A review of the literature suggests that the types of strategic orientations that support a potentially disruptive entrant include its entrepreneurial orientation and an emerging market orientation.

An entrepreneurial mindset is essential when operating at the BoP as the unique environmental conditions call for new ways of doing things (Wanasika, 2013). It is important to assess the impact of different entrepreneurial orientation markers such as innovativeness and proactiveness, on the probability that a small entrant will develop a disruptive capability.

In the business environment, innovation includes any new approach to conducting business along its entire value chain (Grant, 2008), including new technologies, products, processes, and business models (Taneja, Golden-Pryor & Hayek, 2016). Current scholarship on disruptive innovations deemphasises the role of technological innovativeness in enabling disruptive capability and emphasises the importance of business model innovativeness as a more decisive factor (Habtay & Holmén, 2014; Christensen, Bartman & van Bever, 2016). This leads to the following proposition:

P_{3a}: Innovativeness, especially along the business model dimensions, is likely to facilitate disruptive innovation capability of small businesses in BoP environments.

Proactive entrepreneurs, who take initiatives as shown by anticipating and pursuing new opportunities as well as participating in emerging markets, have been shown to perform better in the nascent stages of an industry's development as well as in dynamic environments

characterised by rapid change and uncertainty (Lumpkin & Dess, 1996). Skarzynski & Rufat-Latre (2011) used various case studies of successful disruptive innovators to posit that a critical capability for would-be disruptors is the ability to proactively anticipate and act on market discontinuities and unmet customer needs. The ability to sense and shape threats and opportunities, and seize opportunities presenting in the market is a dynamic capability that leads to competitive advantage (Teece, 2018). This leads to the following proposition:

P_{3b}: Market and innovation proactiveness have a positive effect on the disruptive capability of small businesses in BoP environments.

Literature also indicates that successful disruptors always enter the market by developing solutions for the low-end and fringe markets first while reserving entry into established markets for later (Hang et al., 2015; Christensen et al., 2015). Focusing on the mainstream and high-end markets in predominantly BoP environments has been found to severely restrict the potential market size and growth opportunities of local entrepreneurs in developing and emerging economies (Prahalad & Mashelkar, 2010). An emerging market orientation, which is a search for new and fringe sectors of the customer environment (Govindarajan, Kopalle & Daneels, 2011), is essential for success with a disruptive strategy.

Therefore:

P₄: An emerging market orientation is positively related to the likelihood of developing a disruptive innovation capability by small businesses in BoP environments.

The human capital controlled by an organisation deserves specific mention. The characteristics of the founder, founding team, and other employees tend to facilitate the development of a strategic orientation which eventually enables or inhibits disruptive capability. Sargut & Gunther-McGrath (2011) posit that a disruptive innovation capability is influenced by the mindset, cumulative experience and collective capital of the entrepreneurial team in terms of past affiliations, relationships, and financial capital as these affect organisational strategy.

Scholars agree that founder/founder team level of formal education, prior experience, and training play a critical facilitating role in innovation success and business performance of new enterprises (Spender, Corvello, Grimaldi & Rippa, 2017; Omri et al., 2015). The intellectual base for a startup's initial strategies in the formative stages of the business can be attributed to the mindset of the founder/founder team. Prior knowledge and experience shape these formative strategies (Saemundsson & Candi, 2014). This suggests the following proposition:

P₅: The human capital controlled by the new enterprise's founding team in terms of collective knowledge, networks, relationships, and experience influences the relationship between strategic orientation and disruptive innovation capability in BoP environments.

In his seminal work, Christensen (1997) found that of the new entrants who entered the disk drive industry in the period under investigation (1956-1990), only 6% of entrants who entered with sustaining innovation flourished compared to 37% of entrants who launched disruptive innovations. Other studies by Carayannopoulos (2009), Raynor (2011) and Thurston and Singh (2010) also echo these findings by concluding that the disruptive innovation framework enhances the survival of smaller entrants in an existing market. This is because the perceived lack of legitimacy of small businesses that initially targets fringe markets offers them the advantage of low competitive visibility (Markman and Waldron, 2014) allowing them to survive market entry better. This leads to the following proposition:

P₆: Developing a disruptive innovation capability is positively related to improved small business survival prospects in BoP environments.

Current literature on disruptive innovations does not offer definitive conclusions in the area of how contextual influences such as specific country features, entrepreneurial environments, and organisational attributes affect disruptive innovation capability of small businesses in resource-constrained environments. We propose that clusters of internal and external factors influence the disruptive innovation capability of small businesses in BoP environments.

Figure 1 represents our proposed new framework which provides for an analysis of how organisation-specific and contextual influences affect disruptive innovation capability in BoP environments.

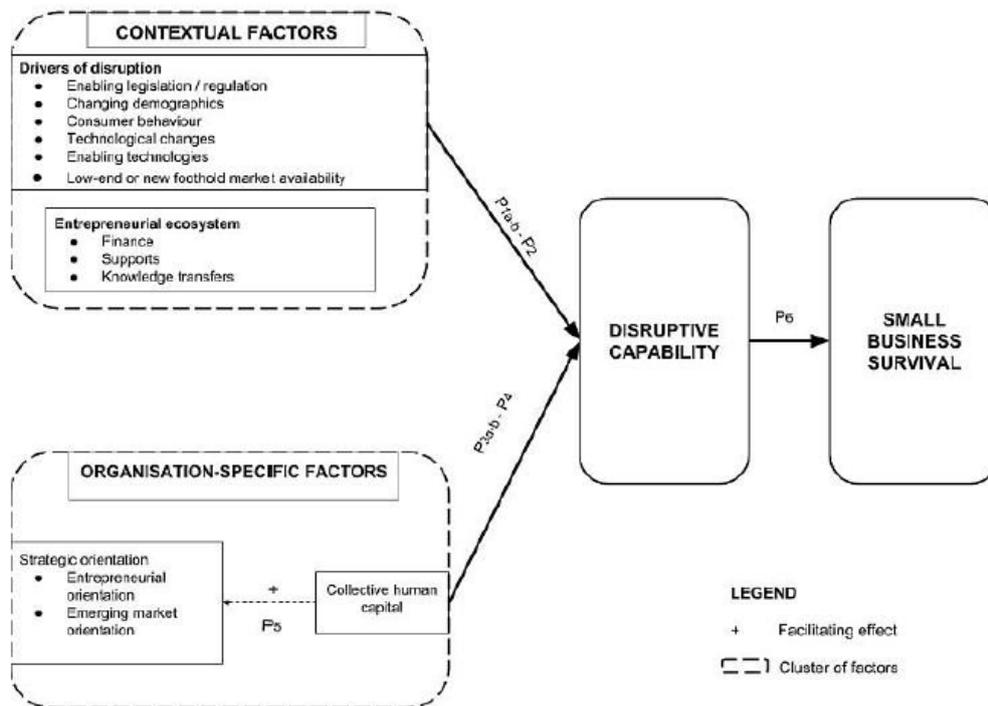


Figure 1: Conceptual framework of determinants of disruptive innovation capability in BoP environments

CONCLUSIONS AND FUTURE WORK

Several resource-constrained innovations are suggested in literature under the term frugal innovations. This paper investigated disruptive innovation capability of small entrant businesses in the resource-constrained environments of the BoP. An extensive literature review elicited a number of important findings. Among these are that a disruptive strategy may be seen as a strategic tool for improved small business survival; developing a disruptive innovation capability requires an enabling external environment in the form of a conducive entrepreneurial ecosystem, enabling technologies and it is also dependent on prevailing consumer behaviours. Developing a disruptive capability also requires purposeful action on the part of the entrepreneur with regards to their strategic posture.

An analysis of the literature led us to develop a number of propositions, and on the strength of these, a preliminary conceptual framework of determinants of disruptive innovation for BoP environments has been developed. It is hoped that our framework will assist new entrants at the

BoP with strategically positioning themselves to develop a disruptive capability for enhanced business survival. Our paper contributes to the existing body of literature by offering an integrated theoretical exploration of the factors that are likely to influence the disruptive innovation capability of small businesses in resource- constrained BoP environments. The framework may further enable policymakers or other actors such as venture capitalists and incubators to assess the types of small entrant businesses that are likely to succeed given the contextual environments they operate in.

Limitations: the framework we have proposed might not be applicable to all small businesses operating in BoP environments. It is more consistent with small businesses that operate in industries with a technology focus or that can benefit from an enabling technology. Also, the nascent framework is still very general in its focus and will need to be tested on new technology-based companies for it to better address the SME context.

Future work in this area may be pursued along a number of avenues: A comprehensive survey among stakeholders may reveal additional propositions to enhance the framework. The scalability of the resultant framework among BoP entrants should thereafter be investigated at a larger scale. All these could be followed by the development of a maturity model for the disruptive innovation framework proposed.

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