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Entrepreneurial Self-Efficacy, Intrinsic Motivation, and Entrepreneurial Intention as Antecedents of Nascent Necessity-Entrepreneur Business Start-Up Behaviour in South Africa: A Longitudinal Study

by

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Preliminaries

Glossary of Select Terms

Term	Definition/description
AMOS	**A**nalysis of **Mo**ment **S**tructures
B-BBEE	Broad-Based Black Economic Empowerment. The legislation, known as Broad-Based Black Economic Empowerment (B-BBEE) was introduced in 2003 and was followed by the introduction of B-BBEE Codes of Good Practice
Bollen-Stine p bootstrap	AMOS calculates the Bollen-Stine p bootstrap to address multivariate non-normality. The Bollen-Stine p bootstrap produces standard errors through repetitive bootstrap sampling routines.
Bootstrapping	Bootstrapping is a procedure where same sample sizes are repeatedly drawn from the original database sample, allowing for replacement after each draw (Hair et al., 2010).
CET	Cognitive Evaluation Theory (CET) as a sub-theory to their original Self-Determination Theory (SDT). CET specifies factors in social contexts that will produce variability in levels of intrinsic motivation (Deci & Ryan, 1985).
CFA	Confirmatory Factor Analysis (CFA) is a confirmatory technique of measurement theory applied within the SEM framework.
Chi-square	A non-parametric test that establishes the independence or otherwise between two nominal variables (Cavana, Delahaye, & Sekaran, 2001).
Comparative Fit Index (CFI).	The CFI is an improvement on the NFI (normed fit index). The value measures the level of improvement in the fit of the model proposed by the researcher against a baseline model (i.e. the independence model).
Congeneric	A set of tests is said to be congeneric if the tests measure the same trait except for errors of measurement (Jöreskog, 1971).
Congeneric measurement model	Tests that will be conducted prior to testing of the full model are one-factor congeneric measurement model tests. Congeneric essentially means that indicator variables or items measure the same trait and these items are not necessarily equally weighted.
Cronbach Alpha	The Cronbach alpha reliability coefficient is the diagnostic measure traditionally used to assess internal consistency of responses across a set of items (Schumacker & Lomax, 2004), and is the most widely used measure of internal consistency (Robinson, Shaver, & Wrightsman, 1991).
Dependent variable	A variable of primary interest to the researcher; with a view to explain its variability or predict it.
Discriminant validity	Discriminant validity is the degree to which constructs/concepts are not correlated and are truly different from each other (Cavana, Delahaye, & Sekaran, 2001).
Entrepreneurship education	The term entrepreneurship education can be considered as having two meanings: either learning about entrepreneurship as a phenomenon or learning the requisite skills in order to become an entrepreneur.
GEM	Global Entrepreneurship Monitor

Term	Definition/description
Goodness-of-Fit index (GFI)	The goodness-of-fit index is an absolute index, and results from initial attempts to establish a fit statistic that would be more robust for different sample sizes.
HDI	Historically Disadvantaged Individuals is the legal definition to describe individuals who, due to the apartheid policy that had been in place, had no franchise in national elections, prior to the introduction of the Constitution of the Republic of South Africa, 1983 (Act No 110 of 1983).
Invariance testing	Measurement invariance (also referred to as equivalence) considers whether construct generated scores retain their same meaning given different conditions.
Longitudinal repeated measures design	With a longitudinal repeated-measures design, measurements are taken over time on each participant in the study. Longitudinal designs are suggested to be "mandatory" design issues where there is an interest in the prevailing trend over time and where conducting a cross-sectional study will not provide the requisite predictive ability (Weiss, 2005).
Mahalanobis distances	Mahalanobis distances refer to the Mahalanobis distance statistic used for measuring outliers, and "indicates the distance in standard deviation units between a set of scores (vector) for an individual case and the sample means for all variables (centroid), correcting for inter-correlations" (Kline, 2011).
Maximum Likelihood (ML)	Maximum Likelihood (ML) is the most commonly used approach in SEM. ML assumes joint distribution of the variables to be a multivariate normal distribution (Bollen, 1989).
Nascent	With nascent-entrepreneurs being at the heart of this study, the term "nascent" justifies some clarification. The Oxford dictionary defines nascent as "budding, emerging or embryonic". In entrepreneurial parlance, nascent refers to "would-be entrepreneurs."
Necessity-entrepreneurs	Those entrepreneurs who seek to establish businesses out of need are referred to as "necessity" or "survivalist" entrepreneurs (Reynolds, Bygrave, Autio, Cox, & Hay, 2002).
NQF	National Qualifications Framework
Opportunity-entrepreneurs	Those entrepreneurs who establish businesses - not necessarily because they "have to" but because they have identified a perceived (viable) market opportunity that they believe can be exploited. The entrepreneurs in the latter category are referred to as "opportunity entrepreneurs" (Reynolds et al., 2002).
Parcelling	Parcelling is a suggested approach when a model has too many parameters to estimate given its sample size, resulting in weak statistical power to detect key parameters (Yang, Nay, & Hoyle, 2010).
PASW	**P**redictive **A**nalytics **S**oft**W**are
Root Mean-Square Error of Approximation (RMSEA)	An absolute goodness-of-fit index resulting from initial attempts to establish a fit statistic that would be more robust for different sample sizes.
Root-Mean-square Residual (RMR)	RMR is a measure of the square root of the mean of these squared residuals (i.e. the residual is stated in terms of the covariances).

Glossary of Select Terms

Term	Definition/description
Satorra-Bentler chi-square (SBχ2)	The Satorra‑Bentler chi‑square (SBχ2) is used to correct the normal chi‑square statistic when maximum likehood is used. West, Finch, and Curran (1995) recommend Satorra‑Bentler when substantial departures from normality is evidenced.
SDT	Self‑Determination Theory (SDT). SDT sought to determine which social and environmental factors would facilitate versus undermine intrinsic motivation (Deci & Ryan, 1985).
SEE	Shapero's (1982) "entrepreneurial event" (SEE) model. The SEE model was potentially considered as an intentions‑model for this study
Self-Efficacy	Self-efficacy refers to the individual's beliefs in his/her capabilities to successfully meet the demands of specific tasks (Bandura,1977) and involves people's assessment of their own abilities and capacity to mobilise the motivations, cognitive resources, and/or courses of action needed to exercise control over life's events (Wood & Bandura, 1989).
SEM	Structural Equation Modeling. SEM is defined as a multivariate technique combining aspects of multiple regression and factor analysis allowing simultaneous examination of a series of interrelated dependence relationships among the measured variables and latent constructs as well as between several latent constructs (Hair et al., 2010).
SETA	Sector Education Training Authority in South Africa (equivalent to Industry Skills Councils in Australia).
SGB	Standards Generating Body
TPB	Theory of Planned Behaviour (Ajzen,1991).
T-Tests	A T-Test is used for two samples assuming unequal variance (Cavana, Delahaye, & Sekaran, 2001).
Tucker-Lewis Index (TLI) /Non-Normed Fit Index (NNFI)	The non-normed fit index (NNFI), also known as the Bentler-Bonnett non-normed fit index and Tucker-Lewis indices (TLI), are similar and known as *incremental indices* of fit.
UNDP	United Nations Development Program
WEIRD	Western, Educated, Industrialised, Rich, and Developed nations (Heinrich, Heine, & Norenzayan, 2010).

Glossary of Select Terms

Thesis Abstract

This research examines the inter-relationships among entrepreneurial self-efficacy, intrinsic motivation, and entrepreneurial intention as antecedents to entrepreneurial start-up behaviour. The research participants were South African nascent necessity-entrepreneurs. Theoretical foundations for the research are derived from Ajzen's (1991) theory of planned behaviour.

The research design involved a repeated measures longitudinal study over 4.5 years that included an entrepreneurship training, mentoring, and incubation intervention program. This was introduced during the first 12-months of the study. Repeated measures of the variables of interest were collected at T_1 (baseline), T_2 (immediately at the end of the 12-month entrepreneurship intervention program), and T_3 (end-of-study). A structural model comprised of the variables of interest was developed and structural equation modelling (SEM) was used to analyse the data. The research questions addressed centred upon the extent to which entrepreneurial self-efficacy, intrinsic motivation, and entrepreneurial intention were inter-related and the extent to which they contributed toward nascent necessity-entrepreneur entrepreneurial start-up behaviour.

The longitudinal nature of the research allowed for an understanding of the dynamic nature of the variables of interest over the three points where measurements were taken. This was important since changes in the means of the three antecedent variables were observed to various degree immediately after the entrepreneurship training, mentoring, and incubation intervention program (T_2) and at the end-of-study (T_3) - compared to T_1 and T_2. These changes highlighted the shortcomings in cross-sectional studies where variables of interest are known to be unstable over time.

While previous studies have examined the inter-relationships among entrepreneurial self-efficacy, entrepreneurial intention, and entrepreneurial start-up behaviour, this research

adds to current theory by examining to what extent intrinsic motivation is an important antecedent contributor (along with entrepreneurial self-efficacy) to entrepreneurial behaviour. It also makes a contribution to theory by examining the variable inter-relationships in a South African nascent necessity-entrepreneur context (other entrepreneurial intention studies have focused on opportunity-oriented entrepreneurs).

The research makes a contribution to practice by providing insights into the design, development, and delivery of effective entrepreneurial training, mentoring, and incubation programs. The research also provides valuable insights for policy makers in the framing of policy aimed at stimulating the entrepreneurial training of nascent necessity-entrepreneurs as a means of assisting them in the new venture creation process.

Thesis Declaration

I, Anton Jordaan, certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

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Anton J. Jordaan
24th April 2014

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This journey could not have been traversed without the support of others along the way. Having undertaken this study a bit later (than most) in life, carried with it a range of additional demands - beyond the already substantial academic challenge of a doctoral study. On the other hand, this opportunity had presented me with the benefit of reflection and appreciation that I would almost certainly not have had twenty years ago. It is therefore within this context, and with a sense of gratitude, that I would like to express my appreciation to a number of individuals at this juncture.

First, I would like to thank my academic support team from the ECIC during this endeavour. In this regard, I would like to acknowledge my initial co-supervisor Dr Dennis List, who passed away during the earlier stage of the study. I would also like to extend my appreciation to current co-supervisor Distinguished Professor Sul Kassicieh for his support and willingness to act in this role during this study. Professor Noel Lindsay (my principal supervisor and final member of my ECIC academic support team) deserves a sincere word of thanks for his unwavering support and encouragement during this journey. His interest, enthusiasm, and passion for his subject area is indeed indefatigable, as so many of his students can attest.

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Finally, I am deeply grateful to have this opportunity to acknowledge and thank my parents. Their encouragement and unfailing support has been a vital ingredient in my life. I am fortunate to have a mother with a *"can-do"* attitude, who, through example has developed my sense of self-efficacy, and a father who has a quiet and innate wisdom – the kind which cannot be acquired through a university education. It is often said that we do not get to choose our parents; if this is indeed true, then I consider myself extraordinarily lucky. However, if it should ever transpire that the converse applied, then it was the most astute decision I ever made.

24th April 2014

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Chapter 1: Introduction to Thesis

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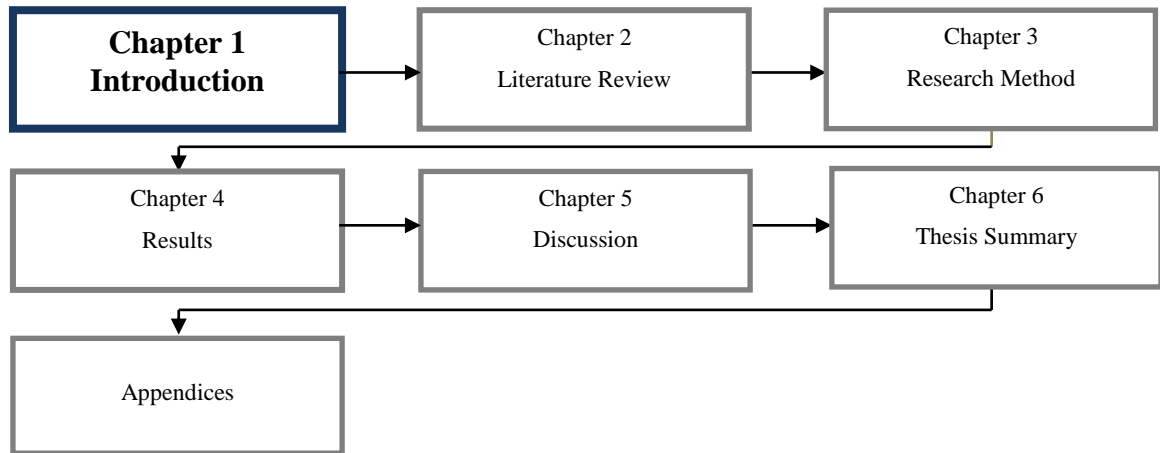
1.0 Introduction

This research concerns the use of an entrepreneurship training, mentoring, and incubation program in a socially and economically disadvantaged context in South Africa where the participants were long-term unemployed nascent necessity-entrepreneurs.

In this research nascency refers to "intending", or "wanting to be"; and necessity-entrepreneurs mean those who set up business because they *have to*, not because they *want to* (Acs & Szerb, 2007, as cited in Herrington, Kew, Simrie, & Turton, 2011).

In a developing country like South Africa there is little in the way of social security support for the long-term unemployed. There has been a focus of the South African government in supporting the delivery of entrepreneurship training and mentoring programs in order to address the inability of formal sector growth to meet employment demand. The Global Entrepreneurship Monitor (GEM) report (Herrington, Kew, Simrie & Turton, 2011) provides support that entrepreneurship training programs enhance economic development; thus, such research acts as a substantive reference to argue for the continued support and expansion of such policies and program initiatives.

However, in South Africa in particular, there has been mixed success in terms of the number of business start-ups resulting from government policy initiatives (Herrington, Kew, Simrie & Turton, 2011).

Chapter 1 provides a context for this research together with an overview of the thesis framework. It inter-alia discusses the research setting, the purpose of undertaking the research, its importance, the research aims, motivations, and the contribution this study will make to both theory and practice.

The thesis constructs are depicted in a conceptual model. These constructs are represented by independent variables (entrepreneurial self-efficacy, intrinsic motivations, entrepreneurial intentions), and business start-up behaviour - the ultimate dependent variable. These variables are examined at the individual level of analysis, and the study investigates the interrelationships between and among these constructs.

The individuals in the study participated in a government funded one-year entrepreneurship training, mentoring and incubation program. The program consisted of a nationally recognised vocational education certificate program (*The National Certificate in New Venture Creation NQF4*), coupled with ongoing mentoring in a business incubator environment. Learning outcomes were assessed based on the individual's level of performance (competence) in both knowledge (theory), and practical application (applied knowledge) components of the program.

The individuals who participated in the study articulated their intention to create their own business ventures at completion of the intervention (or if not immediately, in a reasonable period thereafter). The venture creation imperative was advocated and reinforced by the government funding agency prior to commencement of the program. In so doing, the agency clearly aligned the venture creation activity in this study with its own key performance indicator (KPI) reporting to national government.

Participants were selected from unemployed historically disadvantaged individuals[1] in the Gauteng Province of South Africa. Although Gauteng is the smallest province in South Africa[2] (by land area), it is the most densely populated, and delivers the highest economic output in the country[3]. It comprises the main cities of Johannesburg (which includes Soweto), and Pretoria (City of Tshwane). The complete intervention (classroom training, mentoring, and incubation) took place at two separate venues in Braamfontein, adjacent to the Johannesburg Central Business District (CBD).

All participants (but one) were black South Africans who had completed at least one post-secondary school qualification (certificate, diploma, or degree) prior to commencement of the training intervention. A limited monthly stipend contribution of R800 (approximately US\$100) was paid to participants to defray transport and meal costs while attending classes. Without this travel and subsistence contribution most of the participants would not have been able to attend and complete the program.

The variables in the model were repeatedly measured (three repeated sets) by using participant questionnaires. The first *(baseline)* measurement was taken immediately prior to commencement of the first formal classroom intervention (T_1); the second measurement (T_2) was conducted on the final day the group completed their formal learning program (during the week of the final classroom sessions), and the final measurement was taken three-and-a-half years after completion of the learning program (T_3). The duration from the baseline observation at T_1, and the final end-of-study measure at T_3, was a total of four-and-a-half years.

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[1] Historically Disadvantaged Individuals (HDI) is the legal definition to describe individuals who, due to the apartheid policy that had been in place, had no franchise in national elections, prior to the introduction of the Constitution of the Republic of South Africa, 1983 (Act No 110 of 1983) (Parliament of the Public of South Africa, 2012).
[2] The land area of Gauteng Province is 18,171 km^2, representing just 1.4% of the total area in South Africa.
[3] Economic output as measured by gross domestic product (GDP) indicates that Gauteng produces 35% of national output (South African Government Information, 2012).

2.0 The Research Setting

There are a number of reasons why South Africa was selected as the contextual setting for the research project.

(i)   Around the time when the training intervention took place, South Africa was in the formative stages of establishing a new national vocational education and training framework. Qualifications were created to accommodate the needs of a growing economy, where standards underpinned a national qualifications framework (NQF). These standards were generated through a formal consultative process with industry, academic and labour stakeholders.

My interest in this process came about by being an industry representative appointed to a standards generating body (SGB). The SGB was the legislated statutory body responsible for developing national education and training standards for vocational qualifications; in this instance the development of standards for entrepreneurship qualifications. Consequently, much of the deliberation in this forum centered on what program content might be appropriate to equip nascent, unemployed nascent, as well as existing entrepreneurs with the requisite skills to support successful business start-up activity and growth. Although the SGB made recommendations with regard to entry level criteria for the various qualifications, it did not extend to providing guidelines for candidate selection in programs like the National Certificate in New Venture Creation.

An entrepreneurship education program is merely one contributing variable to potentially enhance venture creation foundation and outcomes; another is the ability to identify individuals that are more likely to convert entrepreneurial intent into business start-up behaviour. This is particularly relevant where the

individual is a nascent entrepreneur with no prior demonstrable evidence of, or experience in, venture creation activity.

(ii) As a developing country, South Africa provides the ideal opportunity to further extend research theory in a developing country context (South Africa is considered as a developing country as measured by the United Nations Development Program (UNDP) classification (United Nations Statistics Division, 2013).

Unsurprisingly, current top tier publications in the field of behavioural psychology appear substantially predisposed to research undertaken in developed countries and regions - such as the USA, and Western Europe (Heinrich, Heine, & Norenzayan, 2010). As a result, a general cautionary should apply when drawing on current theory in a developing country context – as sample generalisability across broader populations may be limited. Such limitations are expected to be even more acute where the study of indigenous nascent-entrepreneurs is considered.

This limitation has been encapsulated by Heinrich, Heine, and Norenzayan (2010) as the *Western, Educated, Industrialised, Rich, and Developed* (*WEIRD)* phenomena. WEIRD represents publications that emanate from within the context of *Western, Educated, Industrialised, Rich, and Developed* societies. Heinrich et al., (2010) remark that WEIRD subjects (representing a mere 12% of the world's population), are poor representatives to generalise across broader societies.

South Africa has a diverse population, yet the majority of its populace would not typically align themselves with Western, Educated, Industrialised, Rich, and Developed values and culture; and in large sections of the population tribal

beliefs still predominate. These tribal beliefs have however not dissuaded younger generations to embrace consumerism and pursue better educational outcomes.

(iii) Having lived and worked in South Africa for a large part of my life provides a specific cultural context which would not have been available to me had the study been undertaken in another (developing) country. The benefit of a contextual perspective provides an opportunity for enhanced analysis and interpretation of the results emanating from the research.

In a country like South Africa, context is very important given the turbulent political and social history. For the majority of the population, access to economic resources largely came about post-1994 when the first democratic elections were held. In response, government has sought to accelerate economic opportunity and extended participation through the introduction of a range of broad-based black economic empowerment (B-BBEE) legislation and policies. Although the impact of B-BBEE policy is not considered in this study, it is conceivable that the (unintended) consequence of this policy may be impacting on the quantity and quality of indigenous entrepreneurial activity and venture creation behaviour.

(iv) An opportunity exists to participate in the national discourse to inform future policy. In my opinion, there is an opportunity to make a contribution to improving screening and assessment processes and tools. Improving the cost-versus-benefit metric for entrepreneurship funding initiatives is likely to increase the number of indigenous nascent entrepreneurs migrating through to actually starting ventures. Furthermore, it is conceivable that evidence of improved

efficacy in this regard may encourage other organisations to fund similar initiatives.

(v) Investigating the inter-relationships among entrepreneurial self-efficacy (ESE), intrinsic motivations (IM), entrepreneurial intentions (EI), and entrepreneurial start-up behaviour (ESB), should inform training policies around the design, development, and delivery of entrepreneurship training and incubation programs for nascent necessity-entrepreneurs. Thus, this research contributes towards enhancing the quality of future entrepreneurship training, mentoring and incubation programs.

3.0 Research Foundations

The thesis is underpinned by an entrepreneurial intentions model. In social psychological literature, intentions are considered to be the best predictors of planned behaviour. Ajzen (1987, 1991) supports this assertion and considers intentions to act as a type of medium in securing a better understanding of the behavioural act itself. To this end, the model applied is Ajzen's (1991) theory of planned behaviour (TPB). In the context of this study, the behavioural act is defined as exhibiting *"entrepreneurial start-up behaviour"*.

The TPB has been extensively utilised, and its predictive ability comprehensively validated. There are three principal driving factors at its nucleus: the individuals' *attitude towards the behaviour*, the presence and *influence of subjective norms*, and *self-efficacy* (the perceived ability to perform the behaviour). It is therefore plausible that an individual is likely to perform an act when it engenders positive feelings, receives strong social support, and when the individual has both the psychological and physical resources to do so (Ajzen, 2005). Consequently, the TPB provides the requisite theoretical foundation for appropriate measurement of the constructs of interest to this study. These constructs are:

entrepreneurial self-efficacy (ESE), intrinsic motivation (IM), entrepreneurial intention (EI), and business start-up behaviour (ESB).

4.0   The Research Problem, Aims, Importance, Motivations, and Contributions

The *research problem* emanates from a relative dearth of prior entrepreneurship research regarding inter-relationships between *intrinsic motivation and business start-up behaviour*; *entrepreneurial self-efficacy and intrinsic motivation; and entrepreneurial self-efficacy and business start-up behaviour.* Edelman, Brush, Manalova, & Greene (2010) observed that few studies by way of race/ethnicity have examined the differences in the motivations of black entrepreneurs to start new ventures.

The paucity of research is further exacerbated when examining these constructs outside of the WEIRD *(Western, Educated, Industrialised, Rich, and Developed)* context, as is the case in this thesis. Non-WEIRD societies account for 88% of the world's population (Heinrich, Heine, Norenzayan, 2010). It is therefore implausible that theory from WEIRD societies where opportunity entrepreneurship predominate (Reynolds et al., 2002; Acs, 2007 as cited in Herrington, Kew, Simrie, & Turton, 2011) is sufficiently generalisable to developing societies where necessity-entrepreneurship is more prevalent (Reynolds et al., 2002; Acs, 2007 as cited in Herrington, Kew, Simrie, & Turton, 2011).

In addition to the aforementioned limitations of contextual generalisability, limited prior research seem to exist where these constructs have been subjected to repeated measures over an extended time period. Hence, the following question would likely be of interest: "*How do nascent necessity-entrepreneurs transition from the intention of starting a business to exhibit business start-up behaviours over an extended period of time?*"

The *aim of this study* is to gain an improved understanding regarding the extent to which entrepreneurial self-efficacy, intrinsic motivation, and entrepreneurial intention

contribute toward business start-up behaviour among indigenous nascent necessity-entrepreneurs in South Africa.

The *importance of the research* is demonstrated by the nexus between entrepreneurial activity and economic growth (Reynolds et al., 2002; Acs, 2007 as cited in Herrington, Kew, Simrie, & Turton, 2011). Growth is generally considered as a measure of entrepreneurial success (Davidsson, 1991). In developing countries in particular, governments are faced with economic growth rates that are insufficient to provide employment; unemployment leads to political and social instability and overwhelms social support systems. The development of indigenous nascent necessity-entrepreneurs in these economies fosters a culture of self-reliance, with the additional prospect of creating employment for others. Consequently, governments need to gain a better understanding around the processes where nascent necessity-entrepreneurs can be identified, developed, encouraged, and supported.

The *research motivation* underpinning this study is to gain an improved understanding of the construct inter-relationships as they impact on business start-up behaviours of nascent necessity-entrepreneurs in a developing country (like South Africa). As most of the prior entrepreneurship intentions/start-up behaviour research has been conducted in developed (WEIRD) countries or societies, differences may be observed between nascent opportunity-entrepreneurs and nascent necessity-entrepreneurs (though any comparisons between nascent opportunity and nascent necessity entrepreneurs is outside of the scope of this study).

The research study contemplates making a *theoretical contribution* as well as a *contribution to practice*. From a foundational perspective, investigating the entrepreneurial self-efficacy – entrepreneurship intention construct relationship using Ajzen's (1991) intentions-based TPB model is not entirely novel. On the other hand, only a limited number

of prior entrepreneurship studies have been undertaken regarding the intrinsic motivation – entrepreneurial intention, and intrinsic motivation – entrepreneurial self-efficacy - entrepreneurial intention relationships; consequently a contribution is made in this regard.

Moreover, this research seeks to build on previous studies by examining the inter-relationships among the four constructs of interest - but viewed through the contextual lens of *indigenous nascent necessity-entrepreneurship*. A repeated measures longitudinal study of the variables will provide further richness as to the evolving nature of the intentions of indigenous nascent necessity-entrepreneurs to start a business, through to observing business start-up behaviour.

There are a number of practical/applied contributions. First, substantial funding commitments are currently being made in developing countries to develop nascent entrepreneurs. However, this funding is often allocated without necessarily identifying candidates who may actually demonstrate behaviours that are more likely to lead to business start-up activity. This study seeks to identify such relationships among the variables that could assist funding organisations to gain improved cost-benefit outcomes. Evidence of the existence of such relationships can form the basis of informing the design and development of candidate sourcing, screening, and assessment instruments for entrepreneurship education and training programs as well as framing government policy.

A further applied contribution concerns the design, development, and delivery of entrepreneurial training, and incubation programs. Many different entrepreneurship training programs exist; yet, few appear to differentiate between educating nascent opportunity-entrepreneurs versus nascent necessity-entrepreneurs; thus providing an opportunity to incorporate any identified differences in entrepreneurial course redesign.

5.0   Research Questions

The research questions (RQ), together with the corresponding hypotheses (H) to be tested are presented in Exhibit 1.1.

Exhibit 1.1: Research Questions and Related Hypotheses

	Research questions posed		**Hypotheses developed for testing**
RQ1	To what extent is entrepreneurial self-efficacy (ESE) related to entrepreneurial intention (EI) in nascent necessity-entrepreneurs?	*H1*	*There will be a relationship between entrepreneurial self-efficacy (ESE) and entrepreneurial intention (EI) in nascent necessity-entrepreneurs.*
RQ2	To what extent is intrinsic motivation (IM) related to entrepreneurial intention (EI) in nascent necessity-entrepreneurs?	*H2*	*There will be a relationship between intrinsic motivation (IM) and entrepreneurial intention (EI) in nascent necessity-entrepreneurs*
RQ3	To what extent is intrinsic motivation (IM) related to entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs?	*H3*	*There will be a relationship between intrinsic motivation (IM) and entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs*
RQ4	To what extent is entrepreneurial intention (EI) related to entrepreneurial start-up behaviour (ESB) in nascent necessity-entrepreneurs?	*H4*	*There will be a relationship between entrepreneurial intention (EI) and entrepreneurial start-up behaviour (ESB) in nascent necessity-entrepreneurs.*
RQ5	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with an immediate change in intrinsic motivation (IM) in nascent necessity-entrepreneurs?	*H5*	*There will be an increase in intrinsic motivation (IM) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*
RQ6	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with an immediate change in entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs?	*H6*	*There will be an increase in entrepreneurial self-efficacy (ESE) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*
RQ7	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with an immediate change in entrepreneurial intention (EI) in nascent necessity-entrepreneurs?	*H7*	*There will be an increase in entrepreneurial intention (EI) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*
RQ8	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with a sustained change in intrinsic motivation (IM) in nascent necessity-entrepreneurs?	*H8*	*There will be an extended increase in intrinsic motivation (IM) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*

Research questions posed		Hypotheses developed for testing
RQ9	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with a sustained change in entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs?	*H9*	*There will be an extended increase in entrepreneurial self-efficacy (ESE) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*
RQ10	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with a sustained change in entrepreneurial intention (EI) in nascent necessity-entrepreneurs?	*H10*	*There will be an extended increase in entrepreneurial intention (EI) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*
RQ11	To what extent will nascent necessity-entrepreneurs who say they will start businesses actually start them subsequent to completing an entrepreneurship training, mentoring, and incubation program?	*H11*	*Not all nascent necessity-entrepreneurs will achieve complete business start-up (ESB) subsequent to completing an entrepreneurship training, mentoring, and incubation program.*
RQ12	To what extent does nascent necessity-entrepreneur intrinsic motivation at one point in time influence intrinsic motivation at a subsequent point in time?	*H12*	*There will be a positive relationship between nascent necessity-entrepreneur intrinsic motivations (IM) at different points in time.*
RQ13	To what extent does nascent necessity-entrepreneur entrepreneurial self-efficacy at one point in time influence entrepreneurial self-efficacy at a subsequent point in time?	*H13*	*There will be a positive relationship between nascent necessity-entrepreneur entrepreneurial self-efficacy (ESE) at different points in time.*
RQ14	To what extent does nascent necessity-entrepreneur entrepreneurial intention at one point in time influence entrepreneurial intention at a subsequent point in time?	*H14*	*There will be a positive relationship between nascent necessity-entrepreneur entrepreneurial intention (EI) at different points in time*

6.0   Thesis Overview

The thesis comprises six Chapters followed by a Reference section and Appendices. Each chapter will be introduced with a brief description of its content and relevant fit within the overall thesis framework.

Chapter 1 – Thesis Introduction: Chapter 1 provides an introduction to the thesis. It discusses the reason why South Africa was selected as the research setting; the existing

research problem; aims of the research, importance, motivations, and the applied practical and theoretical contribution being made by the study.

Chapter 2 – Literature Review: Chapter 2 provides an overview of the theoretical foundations, and identifies the resultant conceptual model developed and applied in this research. It discusses the model constructs, considers the inter-relationships among these variables, and identifies the hypotheses developed to examine the constructs. With the level of analysis being the individual, the motivations construct is given particular attention since motivation is at the core of the entrepreneurial process. The Chapter creates the distinction between necessity or survivalist entrepreneurs (who establish businesses because they need to support themselves to survive), and those who seek to exploit perceived opportunities in the marketplace (opportunity-entrepreneurs).

Although the entrepreneurial program dimensions are not assessed, the research uses a one-year entrepreneurship training, incubation and mentoring intervention as a means of investigating the constructs of interest. Thus, a review of current entrepreneurship pedagogy is appropriate, highlighting key issues for consideration by entrepreneurship education and training course designers, developers and presenters.

*Chapter 3 - Research Method***:** Chapter 3 discusses the study's adopted research methodology describing the research approach and the (longitudinal repeated measures) research design. It identifies the participants involved in the research and addresses the *"who, what, why, where, and when"* questions; before detailing the one-year integrated entrepreneurial training, mentoring, and incubation intervention, the research questionnaire, the scales used to measure the key constructs, and the data analysis method utilised.

*Chapter 4 - Results***:** Chapter 4 presents the results of the analyses of the data collected at three points in time: T_1 (baseline); T_2 (end of training intervention); and T_3 (end-of-study). It is presented in two sections. The first section provides the results of the

basic analyses undertaken on the data (reliabilities, means, and standard deviations); ensuring that it would be ready for further advanced analyses. As the requisite minimum "hurdle" levels/metrics were achieved, advanced analyses were undertaken (latter half of the Chapter). SPSS Version 19 was primarily used for the initial part of the analyses, whilst structural equation modelling (SEM) was mainly used for the second part of the analyses - utilising AMOS Version 19.

Chapter 5 - Discussion of Results: Chapter 5 presents the level of support for the stated hypotheses, interprets and discusses the results taken at three different points in time – T_1, T_2 and T_3. The discussion focuses on the relationships among the variables over time, and the variables themselves at each point in time.

Chapter 6 - Thesis Summary: Chapter 6 summarises the research. It highlights inherent limitations of the study and the resultant generalisability of the results; in turn, suggesting future areas for research exploration that may seek to extend some parts of the research. Lastly, reference is made to the dual contributions of the study to the areas of theory and practice.

Chapter 6 is followed by a References section and the study is brought to a close with the inclusion of supporting Appendices that are referenced in the study.

7.0   Chapter Summary

Chapter 1 provides a broad-brush contextual introduction to the study undertaken. It discusses the research setting, explaining why the research was undertaken in a developing country like South Africa. The Chapter identifies Ajzen's (1991) extensively validated TPB intentions-model as being appropriate to measure the constructs of interest in the research, being intrinsic motivation, entrepreneurial self-efficacy, entrepreneurial intention, and entrepreneurial start-up behaviour of nascent necessity-entrepreneurs.

The inter-relationships among these variables are precursors of entrepreneurial start-up behaviour; the dynamism between these constructs will be observed in a repeated-measures longitudinal study spanning four-and-a half years.

The Chapter contextualises the research problem; the research aims, research importance, research motivations, and identifies the theoretical and applied contributions made. The Chapter concludes with a high-level overview of the six Chapters.

Chapter 2: Literature Review

Chapter 1 Introduction	**Chapter 2 Literature Review**	Chapter 3 Research Method
Chapter 4 Results	Chapter 5 Discussion	Chapter 6 Thesis Summary
Appendices		
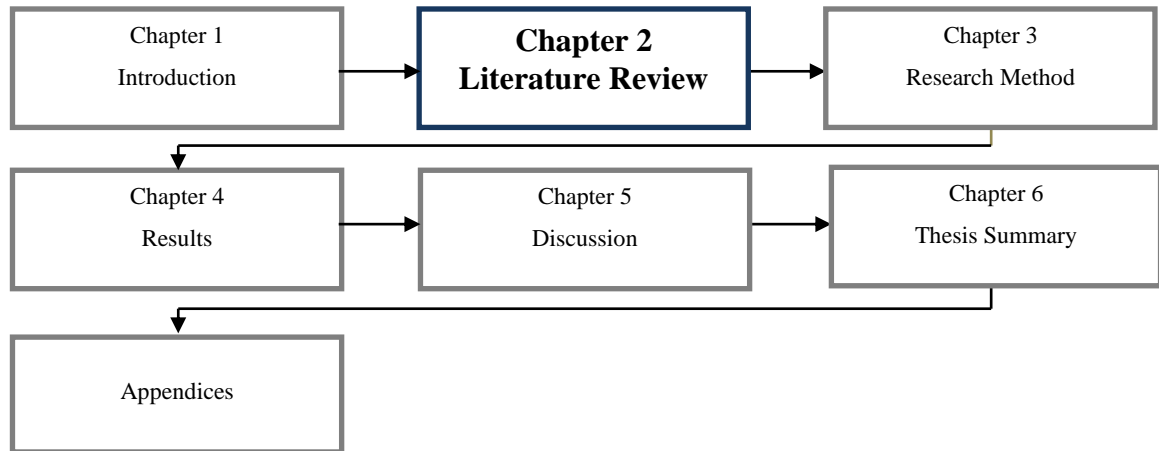
1.0 Introduction

Chapter 2 presents an overview of the proposed model developed in this research. It reviews the constructs appearing in the model, the relationships among these constructs, the hypotheses that relate to the relevant constructs, and construct inter-relationships. Additionally, it discusses and contextualises the theoretical foundations underpinning the conceptual model used in this study.

This Chapter provides insight into the motivations and justifications of entrepreneurs seeking to establish businesses. Reynolds, Bygrave, Autio, Cox, and Hay (2002) differentiate between those entrepreneurs who seek to establish businesses out of need (referred to as "necessity" or "survivalist" entrepreneurs) and those entrepreneurs who establish businesses - not necessarily because they "have to" but because they have identified a perceived (viable) market opportunity that they believe can be exploited. The entrepreneurs in the latter category are referred to as "opportunity entrepreneurs" (Reynolds et al., 2002). The chapter also considers the similarities and differences between nascent ("would-be") entrepreneurs and existing entrepreneurs, since the reach of the model includes both of these categories.

2.0   Opportunity versus Necessity Motivations of Entrepreneurs

The motivation construct is at the heart of the entrepreneurial process. Without motivation, the demands of the entrepreneurial process will go unfulfilled. It is considered a key antecedent for growth to ensue (Ginn & Sexton, 1989). Theoretical support in understanding motivation in the venture creation process can be found in the *effort-performance-outcome model* of expectancy theory (Gatewood, Shaver, Powers & Gartner, 2002). Gatewood et al. (2002) posit that (nascent) entrepreneurs are likely to expend effort towards creating a new venture if their belief is that the effort expended will result in desired outcomes.

Consequently, some entrepreneurs can be voluntarily "enticed" into starting businesses as a result of the attractiveness or specific allure of an opportunity *(hence "opportunity" entrepreneurs),* yet, not all entrepreneurs will be intrinsically motivated to accept the prevailing risks presented by the characteristics of a specific opportunity. Conversely, some entrepreneurs might not have the relative luxury of time or circumstance to voluntarily aggregate information in a ordered, systematic and linear manner before they engage in entrepreneurship behaviour. What might the reasons be for this motivational inequity?

Since 2001, the Global Entrepreneurship Monitor (GEM) has highlighted two different forms of entrepreneurship: (i) necessity-based entrepreneurship and (ii) opportunity-based entrepreneurship (Reynolds, Bygrave, Autio, Cox & Hay, 2002). The fundamental difference between the two forms can be found in their innate motivation (or willingness) to start a new venture.

Necessity-entrepreneurs – as the term suggests - start businesses through sheer necessity. They do so as a consequence of having "no better choices for work" (Reynolds et al., 2002; Shane, Locke, & Collins; 2003), and because they see no realistic prospect of

being employed in one form or another in the near future. As a result, and in the absence of having the "luxury" of time, necessity-entrepreneurs may not be driven by the same factors as opportunity-entrepreneurs (Reynolds et al., 2002). It is, therefore, important that policymakers and funding providers are conversant with, and are able to understand and identify, the underlying entrepreneurial motivational drivers for this group of entrepreneurs.

Given such distinctly disparate motivational drivers contributing towards the entrepreneurial start-up event, policymakers would be sensible to acknowledge and understand the existence of these drivers. By pro-actively identifying, understanding and articulating these differences, more appropriate and targeted resource allocation and structural support can occur to improve entrepreneurial event outcomes. Previous research has demonstrated that relevant work experience, managerial skills, and prior entrepreneurial experience will have a significant impact on entrepreneurial success (Robinson & Sexton, 1994).

It has been argued that opportunity-entrepreneurs who start their ventures voluntarily have more knowledge and/or knowledge of a higher quality than necessity-entrepreneurs. Opportunity-entrepreneurs are more likely to prepare thoroughly and systematically in anticipation of the risks and challenges of venture creation. As a result, opportunity-entrepreneurs are considered to have invested more by way of cerebral/psychological capital necessary to succeed as a business owner (Block & Sandner, 2009).

For the most part, a case can be made that opportunity-entrepreneurs are likely to contribute more to economic development than necessity-entrepreneurs (Reynolds et al., 2002; Acs & Szerb, 2007). It can therefore be argued that entrepreneurial policy should favour, support and encourage opportunity-based entrepreneurship activity. However, Block and Sandner (2009), by not fully subscribing to this view, qualify their position with a cautionary reminder. They posit that necessity-entrepreneurs might not necessarily be

less successful than opportunity-entrepreneurs, and that success is wholly dependent on how "success" might be defined and subsequently measured. The inferred notion is that politicians / policymakers and entrepreneurship scholars are likely to hold divergent views of what might actually constitute *"success"* in the realm of business start-ups. Generally speaking, growth is widely considered to be one measure of entrepreneurial success (Davidsson, 2006); however, pursuing growth as an objective is not necessarily the intention of all small businesses (Ginn & Sexton, 1989).

One of the objectives for undertaking this study is to make a contribution towards policymaking in developing economies like South Africa. Overcoming the country's endemic unemployment challenges through entrepreneurship training and support of nascent black entrepreneurs will require significant resources, patience and time. Many efforts are being made; however, the 2011 GEM report has shown that outcomes to date have been largely uninspiring (Herrington, Kew, Simrie & Turton, 2011).

Sound entrepreneurial policy and directed strategies are required to improve funding efficacy and overall quality of outcomes. To add to this challenge, few research studies by way of race or ethnicity have been undertaken to examine the differences in the motivations of nascent black entrepreneurs to start and grow new businesses (Edelman, Brush, Manalova & Greene, 2010). Considering that entrepreneurship is broadly viewed as a key enabler of social upliftment and community development, it is becoming increasingly important to obtain a deeper understanding as to why and how people of colour become entrepreneurs (Shane, Locke, & Collins, 2003).

Lundstrom and Stevenson (2005) define entrepreneurial policy as *"encompassing those measures that intend to directly influence the level of entrepreneurial activity in a country or region and the consequences of that action for society"* (p.9). Kauffman (2006, as cited in Acs & Szerb, 2007), while considering policy formulation in entrepreneurial

economies, encapsulates the challenge that confronts policymakers by raising the question: *"How can policymakers maintain – and ideally accelerate – the continuing transition toward a more entrepreneurial economy?"* (p.112).

While entrepreneurs are present in all countries, there are differences between the type and level of entrepreneurial activity found in developed and developing countries. Necessity-entrepreneurs tend to be more prevalent in developing countries than is the case with their developed country counterparts (Reynolds et al., 2002; Acs & Szerb, 2007). Government's social support policies appear to have an impact on the necessity-entrepreneur category (Hessels, Van Stel, Brouwer & Wennekers, 2007).

In a developed country like Australia, where there is a supportive social security system, there is arguably less of a need for unemployed individuals to take a leap of faith and be "pushed" into self-employment as an alternate to being economically inactive. This does not imply that there is an absence of necessity-entrepreneurship activity in Australia; however, this would appear to have an impact on its prevalence. The ratio of *opportunity-to-necessity entrepreneur*s in Australia was estimated to be around six to one in 2006; that is, for every six opportunity-based entrepreneurs, there was one necessity-based entrepreneur (Hancock, Klyver, Lindsay, & Hindle, 2007).

In contrast, developing countries generally have more restricted social support systems than developed countries. In South Africa, where the participants of this study are located, government social assistance principally comprises a limited number of child support, old-age, and disability grants (South Africa Government Services, 2012). In addition, an unemployment grant is available to individuals who have lost their full-time employment, and is based on a percentage of the final month's earnings. This proportional grant is paid for a period of approximately three months, and is reasonable to presume that this payment is unlikely to meet an individual's basic subsistence for any extended period.

Previous research suggests that the given social support / welfare structures present in a country are likely to influence the entrepreneurship adoption rate, and its distribution across productive and non-productive activities (Henrekson, 2005).

With South Africa's national unemployment officially reported at 24.9% in 2012 (Statistics South Africa, 2012) it is extremely likely that individuals - in particular young people with no work experience, and those who become unemployed, will be confronted with the reality of not being able to secure employment in the short or medium term. Being presented with such a dire set of circumstances, and with the prospect of limited social / government support, it might be expected that such individuals will, through sheer necessity, be driven towards some form of self-sustaining economic activity as a means of keeping body and soul together. In prevailing environments such as these, the *"opportunity-to-necessity-entrepreneur ratio"* is bound to reflect key structural differences compared with developed countries where more extensive social support systems exist. This view is supported by Reynolds, Carter, Gartner, & Greene (2004) who indicates that higher levels of entrepreneurial activity are often witnessed among necessity-entrepreneurs in developing countries.

Interestingly, the 2005 and 2011 GEM report analyses the *"prevalence of entrepreneurial motives"* indicated South Africa to be at joint second (highest) position on the "necessity motive" scale at 39% in 2005, compared with 35% (fourth highest) in 2011 (Herrington, Kew, Simrie & Turton, 2011). Australia (57%) featured in equal first position for "independence motives" and Chile (42%) equal first in "increase wealth" motive (Minniti, Bygrave, & Autio, 2005). This motivational variance across countries is consistent with previous studies (Shane, Kolvereid, & Westhead, 1991).

The ratio of opportunity-to-necessity-entrepreneurs is a key indicator of economic development (Acs & Szerb, 2007). It is considered that the higher the opportunity-to-

necessity-entrepreneur ratio, the higher the level of economic development present in a country (Acs & Szerb, 2007). As a result, an aspirational imperative might exist within government to "convert" those entrepreneurs who set their businesses up out of necessity (and which may not be built upon real business opportunities) to support and encourage them toward becoming opportunity-based entrepreneurs. The success of such an initiative will, however, be dependent on a range of external environmental forces, including: (i) the role of government policy and preferential procurement; (ii) access to capital (iii) the improvement of management competencies and the expansion of potential markets (Brush et al., 2007 as cited in Edelman et al., 2010); and (iv) the emergence of entrepreneurship incubation, supporting entrepreneurs through mentoring and coaching activities (Brush et al., 2007 as cited in Edelman et al., 2010).

An important addition to the aforementioned list of priority activities is the need for necessity-entrepreneurs to understand, appreciate and embrace innovation along the path to developing more sustainable, robust businesses. Although innovation does not necessarily appear to be directly linked to the business start-up decision (Kropp, Lindsay, & Shoham, 2006), it is indeed a factor in existing businesses, and is related to sustainability and continued performance (Kropp, Lindsay, & Shoham, 2006).

In order to recognise and adequately address the opportunity-versus-necessity differences, it appears that a range of differentiated entrepreneurial policies targeting opportunity-entrepreneurs as well as nascent and existing necessity-entrepreneurs needs to be formulated. This is particularly relevant to developing countries like South Africa as the funding of "micro-entrepreneurs" is seen as a strategic policy initiative to create self-sustainability and employment. It is essential that necessity entrepreneurs are included in policy framework initiatives that are specifically designed to educate nascent business owners about the importance of founding their businesses upon real opportunities, and

subsequently developing a level of innovation capability (Kropp, Lindsay, & Shoham, 2008).

3.0   Analysis Level – The Individual Entrepreneur

The term *"entrepreneur"* originally stems from the French verb *"entreprendre"* meaning to *"undertake, try or to adventure"* (Carland, Hoy, & Carland, 1988, p.33). With "nascent-entrepreneurs" being at the heart of this study, the terms – *"nascent"* and *"entrepreneur"* justify some clarification.   The Oxford dictionary defines nascent as *"budding, emerging or embryonic"*. In entrepreneurial parlance, nascent refers to *"would-be entrepreneurs"* or *"entrepreneurs-to-be"*.

The scholarly definition of what an entrepreneur actually is, has remained rather elusive (Carsrud, Olm, & Edy, 1985). Entrepreneur definitions spanning several decades include: McClelland (1961, p.65) as *"someone who exercises some control over the means of production and produces more than he can consume in order to sell or exchange..."*. Hornaday and Aboud (1971, p.50) consider a (successful) entrepreneur as *"a man or woman who started a business where there was none before, who had at least eight employees and been established for at least five years."* Brockhaus (1980, p.510) regards an entrepreneur as a *"major owner and manager of a business venture not employed elsewhere."* More recently, Frederick, Kuratko, and Hodgetts (2007) describe an entrepreneur as someone who is both an innovator and developer, identifying and seizing opportunities; adding value through a combination of time, energy, money and skills and exhibits some propensity for risk in exchange for potential reward.

It is evident that the degree of convergence has been fairly limited over time. Brockhaus and Horwitz (1985, p.42) conclude that *"The literature appears to support the argument that there is no generic definition of the entrepreneur, or if there is, we do not have the psychological instruments to discover it at this time."* Shane and Venkataraman

(2000) in turn suggest that the greatest challenge in creating a conceptual framework for entrepreneurship has been its definition. Some authors suggest that the desire of inventing a better definition has diverted research energy away from a useful theory of entrepreneurship (Bull & Willard, 1993, as cited in Kuratko, 2005).

The entrepreneur definition was primarily attempting to distinguish between entrepreneurs and business owners. Initial attempts to distinguish entrepreneurs from non-entrepreneurs focused purely on identifying selected personality traits. Consequently, there was no conclusive evidence that a uniquely identifiable *"entrepreneurial personality"* exists; hence, this theoretical approach was eventually excluded (Gartner, 1988). In this regard, Robinson et al., (1991) remarked that, *"it is the specific reaction to circumstance, not a given set of demographic characteristics that determines entrepreneurship"* (p.16).

Notwithstanding the views expressed in the preceding paragraph, many researchers have continued to develop a body of knowledge with the specific objective of identifying entrepreneurs. This has led to range of approaches in the realm of social and personal psychology; notably through the use of psychological profiling (McClelland, Atkinson, Clark, & Lowell, 1953; McClelland, 1961; Brockhaus, 1975; Brockhaus & Horwitz, 1986), using demographics (Brockhaus, 1982) and, attitudes (Robinson, Stimpson, Huefner & Hunt, 1991; McCline, Bhat, & Baj, 2000).

These approaches have met with varying levels of success, with the first two – *demographics* and *psychological profiling* - having been regarded as flawed, primarily as a result of individuals other than entrepreneurs (for example, business managers) demonstrating a range of the same entrepreneurial attributes (Gartner, 1988; Carsrud & Johnson,1989).

In pursuit of building a body of entrepreneurship theory, early entrepreneur research focused on the individual's *demographic characteristics* (McClelland, 1961; Churchill &

Lewis, 1986). This assumption is considered to be flawed as entrepreneurs are responsive to their circumstances when creating new ventures, rather than being "energised" through a set of randomly assigned demographic characteristics. Moreover, demographic factors are almost all historical references and cannot be used to influence future behaviour. Another shortcoming along this developmental pathway encompassed assigning personality traits based on demographical characteristics, together with the resultant lack of predictive validity of who will, or who will not be, an entrepreneur (Gartner, 1988).

Investigating *psychological profiling/personality trait* theories and their impact on business start-up intentions, result in low explanatory power and even smaller predictive validity (Krueger, Reilly, & Carsrud, 2000). The concern is not the absence of distinguishing psychological characteristics between entrepreneurs and non-entrepreneurs, but rather the theories and methods used in identifying these characteristics (Carsrud & Johnson, 1989). The inability of personality theory and the demographic approach to provide an appropriate model to assist with the prediction of entrepreneurial activity, demands the development of alternate theories.

One such theory – referred to as *attitude theory*, has the potential to address previous shortcomings. The *attitude* construct is considered to show greater promise in predicting differential behavioural tendencies between existing entrepreneurs and non-entrepreneurs. Entrepreneurs displayed entrepreneurial attitudes, whereas non-entrepreneurs did not (Robinson, Stimpson, Huefner, & Hunt 1991; McCline, Bhat, & Baj, 2000). Consequently, entrepreneurial attitude has provided a constructive basis of differentiation between entrepreneurs and non-entrepreneurs. McCline, Bhat, and Baj (2000) pose a rhetorical question of whether these entrepreneurs might have held such entrepreneurial attitudes prior to venturing into business or whether these attitudes were only shaped post-immersion in the experiential entrepreneurial realm (McCline, Bhat, & Baj 2000). Ajzen and Fishbein

(1977) caution against attitude as being limited and one dimensional; and Lindsay, Lindsay, and Kropp (2009) in their study of nascent necessity entrepreneurs, suggest that caution needs to be exercised as entrepreneurial attitudes can, and do change, over time.

Gartner (1989) considers that the desire to answer the *"Who is an entrepreneur?"* question, might risk returning the research focus to the personality traits and attributes approach discussed previously; and will not contribute to a definition of entrepreneurship, nor a better understanding of what entrepreneurship is. He believes that the study of the entrepreneur is closely aligned to what the phenomenon of entrepreneurship actually *"is"*, given the fact the entrepreneur is inexorably part of the complex process of creating a new venture. Gartner (1985) advocates an approach where the business is treated as the primary level of study and analysis, whilst the individual is considered in the context of what activities he/she might undertake in the process of ensuring business creation. Consequently, research should not focus on what an entrepreneur is, but what he/she does.

Venkataraman (1997) takes this position a step further and argues that the conceptual framework needs to be extended beyond who the entrepreneur is or what the entrepreneur does. He argues that the problem with the *"who/what"* approach is that entrepreneurship comes into being as the direct result of the simultaneous presence of a perceived viable opportunity together with an enterprising individual or individuals.

In the process of distilling a suitable entrepreneurship definition to adopt for this study, three definitions warrant closer examination. Firstly, Gartner (1990) provides a reasonably concise definition for entrepreneurship by identifying eight central yet recurring themes of entrepreneurship, being: *personality traits of the entrepreneur, innovation, venture creation, creating value, profit or non-profit, growth, uniqueness, and owner-manager.* Shane and Venkataraman (2000, p.218) linked their entrepreneurship definition to *"the sources of opportunities; the processes of discovery, evaluation, and exploitation of*

opportunities; and those individuals who discover, evaluate and exploit them". Frederick, Kuratko, and Hodgetts, (2007) defined entrepreneurship as a dynamic process requiring vision, change, and creation; demanding the application of focus, passion and energy towards the creation and implementation of new ideas and innovative solutions. Their definition relies on key ingredients such as the willingness to take calculated financial and non-financial risks, the skill to compile and lead an effective founding team, to direct needed resources, to compile a robust business plan, and lastly, the vision to identify opportunity where others see contradiction, obstacles and chaos.

As this study specifically focuses on the start-up behaviour of nascent entrepreneurs, a more recent definition by McGee, Peterson, Mueller, and Sequeira (2009) is adopted for use in this study:

> *"Nascent entrepreneurs are those who have never owned a business and did not currently own a business"; and "nascent entrepreneurs were designated as those who had participated in at least two of the following six behaviours currently or in the past: (i) attending a "start your own business planning" seminar or conference; (ii) writing a business plan or participating in seminars that focus on writing a business plan; (iii) putting together a start-up team; (iv) looking for a building or equipment for the business; (v) saving money to invest in the business; and (vi) developing a product or service"* (p.977).

3.1   Identified Limitations of Focusing on the Individual Entrepreneur

As discussed in the preceding section, a number of definitional challenges exist pertaining to the concepts of entrepreneurs and/or entrepreneurship. Several of these limitations stem from the application of the demographic/trait approach models in predicting entrepreneurial behaviour. Given these limitations, an intentions-based approach is adopted in this study. It does this longitudinally while including and entrepreneurship education and training program intervention in its experimental design. Commenting on the impact of enterprise education programs, Peterman and Kennedy (2003) concluded that, *"the research provides empirical evidence to support the inclusion of an additional*

exogenous variable in intention models, namely exposure to entrepreneurship or enterprise education" (p.141).

4.0 Best Practice in Entrepreneurship Course Development and Delivery

This research uses an extended formal entrepreneurship education, training, incubation and mentoring intervention as a means of investigating the dynamic nature of the constructs of interest. The formal qualification pursuant to the education, training and incubation intervention was developed around national standards and encompassed elements of considered best practice in the development of entrepreneurship programs as identified by leading scholars.

This section, therefore, discusses the key issues that require consideration by entrepreneurship education course designers, developers and presenters. It would appear that there is a lack of broad consensus of what might constitute best practice in this regard.

Exhibit 2.1 provides a summary of some of the key issues identified. The following discussion teases out the issues identified in this Table.

Exhibit 2.1: Summary of Key Issues Considered Important in Developing Quality Entrepreneurship Education programs

Year / Author	Key items identified in prior studies
1996 Chia	Chia considers cultivating "entrepreneurial imagination" as the most important activity that universities can contribute towards the entrepreneurial process and business community at large. This view is a direct response to the chaotic and unpredictable environment that the entrepreneur must confront on a day-to-day basis. Change is rapid and affects market structures, technology changes, business process redesigns and much more. Thus, it requires conceptualisation of *what might be*, rather than *what currently is*. Chia considers traditional approaches applied in business schools to be quite limiting (and even unproductive) in dealing with managers re-thinking their world-views. The proposed shift is radical, and demands a pedagogical transformation of what takes place in the classroom by both student and educator. Educators should no longer be focusing on trusted analytical problem-solving skills, but engender "paradigm-shifting" mentality. Such a shift will require entrepreneurial educators to move away from structured and linear thinking towards "intellectual-entrepreneurship". Intellectual-entrepreneurship will seek to excite the innate imagination hidden in all individuals – a process of powerful mental creativity that will allow students to create links and recognise patters between seemingly disparate thoughts and ideas. Chia posits that such illumination of the imagination will be facilitated through recourse to literature and the arts. He contends that literature and the arts – unlike sciences – have the best chance of cultivating powers of association. The scientific mentality seeks to simplify the complexity around us into manageable principles; literature and the arts seek to complexify our thinking of contemporary life. This "aesthetic consciousness" is the key to leveraging the entrepreneurial imagination. ***Teaching Paradigm Shifting In Management Education: University Business Schools and the Entrepreneurial Imagination. Chia (1996).***
2000a Fiet	Fiet believes that theory is the most practical thing that one can teach students. In this paper, he comments on the progress to date in developing entrepreneurial theory as well as the need to construct a more general theory of entrepreneurship in the future. In the analysis of prevailing syllabi, six leading topical areas are covered: • *Strategy/competitive analysis* • *Managing growth* • *Discovery/idea generation* • *Risk and rationality* • *Financing* • *Creativity*
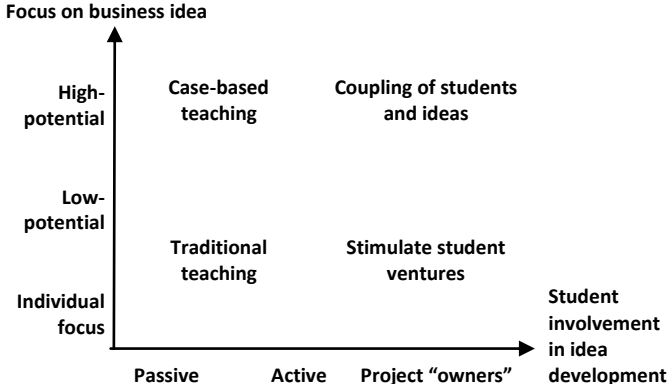
Year / Author	Key items identified in prior studies
	What became evident was the fact that most of these topics have roots in other disciplines, indicating that the syllabi do not distinctly emphasise the domain of entrepreneurship. Scholars are required to embrace and incorporate truth into the discipline - wherever it can be found. Some theoretical concerns are highlighted, although Fiet suggests that these can be resolved if entrepreneurship teachers apply the following approach: • *Ensure students are taught what they ought to do* • *To go beyond the mere emphasis and description of what entrepreneurs do* • *Teaching should accentuate more productive approaches as opposed to inductive ones* Fiet discusses and questions a number of assumptions and possible causes as well as opportunities for the aggregation of related theories. In the final analysis, the core of his argument and findings are encapsulated as follows: • *Scholars have the responsibility to teach aspiring entrepreneurs the value of theory* • *Scholars have a larger institutional responsibility to the overarching entrepreneurship domain to move toward a general theory of entrepreneurship* • *Before that shift to the general theory is made, one can teach aspiring entrepreneurs to use what is current known and available on a contingent basis* • *It is important to concede theoretical limitations without becoming apologetic that current entrepreneurship theory represents unfinished business* • *The business of our separate endeavours is to construct a more accurate, general theory about the future* ***The Theoretical Side of Teaching Entrepreneurship. Fiet (2000a).***
2000b Fiet	In this follow-up paper, Fiet discusses what he considers to be an effective strategy for teaching theory to students. It explores an approach where the actual theory is student-approved and monitored by teachers. He argues that entrepreneurial educators must link theory with classroom teaching to succeed in honing student competencies. He believes that entrepreneurship scholars ought to pursue theory-driven research agendas, and entrepreneurship educators must ensure that their students understand that there are a number of theoretical explanations for variability in entrepreneurial outcomes. A strategy for teaching theory-based entrepreneurial competencies should be discussed and consented to by students, and the subsequent outcomes monitored by educators to establish process and model efficacy. Through a student-approved system, students are required to practice specific skills until they are competent. The teachers' primary role in this strategy is therefore to achieve student approval of the learning "contract" and identify the range of competencies to be mastered. This is done by initiating discussion and facilitating the learning process, rather than uni-directional instruction.

Chapter 2: Literature Review

Year / Author	Key items identified in prior studies
	Fiet summarises by identifying the following advantages of theory-based activities. • *Avoiding institutionalised boredom by engaging students as key enablers in a facilitated and interactive learning environment* • *It positions the instructor as a facilitator/coach rather than a lecturer* • *Following this learning process has the potential to engage every student in the learning and competency development process* ***The Pedagogical Side of Entrepreneurial Theory. Fiet (2000b).***
2000 Laukkanen	Laukkanen posits that entrepreneurship is understood to mean the emergence and growth of new ventures. Entrepreneurship is a central policy tool for creating structural change, enabling economic growth and acts as an accelerant of employment in developed and developing economies. Universities and tertiary institutions have a "strategic response obligation" to support such environments with appropriate and effective entrepreneurial education and training interventions. This obligation has the potential to raise environmental stakeholder expectations; exploring alternative approaches to entrepreneurial education at universities. It suggests universities should act as regional innovation systems. Thus, universities should not only be mandated to produce entrepreneurially competent and innovative individuals from their entrepreneurship programs, but should seek to reproduce the social mechanisms that support and facilitate venture creation through the adoption of business-oriented entrepreneurship approaches. Further consideration is given to thinking about current teaching approaches which include: • *The academic attitudes towards entrepreneurial education* • *The dominant, linear mindset of the prevailing individual-centred entrepreneurship education strategy* • *Reproducing societal evolution/generating mechanisms through the supply of new, sustainable business ventures* • *A suggested parallel strategy in entrepreneurial education* • *A proposed business generating strategy model* ***Exploring Alternative Approaches in High-level Entrepreneurship Education: Creating Micro-mechanisms for Endogenous Regional Growth. Laukkanen (2000).***
2002 Gibb	This paper stresses the need for a new approach to the study of entrepreneurship and adopts a new paradigm as a basis for delivering entrepreneurship education. The study highlights the limitations and inadequacy of the existing business-centred approach. There is a need for existing business schools, particularly in Europe, to provide capacity to take up this challenge which requires a strategic rethink of the concept of entrepreneurship in an educational context.

Year / Author	Key items identified in prior studies
	Gibb points out that *the enterprise* has become the dominant theme in European discourse in the context of enhancing competitiveness in a global economy; thus the need for a new paradigm for enterprise education and learning. He inter-alia identifies a range of issues that are to be dealt with in the current culture of learning: • *The entrepreneurial concept* • *Academic acceptability* • *Client segmentation needs* • *Organisation of knowledge and pedagogy* • *Teacher supply and competency* • *Evaluation and assessment* • *Funding* Overall, considerable challenges are posed, necessitating a fundamental shift in institutional arrangements. It is necessary to focus on the *"nature of enterprise in individuals"*, and on the ways effective *enterprising behaviour* can be encouraged in organisational, social and economic contexts. This conceptual confusion has substantially affected the approach to entrepreneurship education. In order to meet the challenge in the learning context, a number of entrepreneurial capacities need to be met which would direct the focus of curriculum development. These include the capacities to: manage the entrepreneurial "life world", design and cope with entrepreneurial governance systems and design and develop entrepreneurial organisations to name a few. Culture plays an important role in developing an understanding of entrepreneurship. There is a need for empathy with the entrepreneurial way of seeing, feeling, doing, thinking and learning. The following factors are key to for the successful shift in thinking: • *Learning as a social development process* • *The organisation of knowledge* • *Capacity to learn from different sources* • *Reinforcing enterprising behaviours through pedagogy* • *Breadth of knowledge, responses and motivations to learning* Considering a more pluralistic concept of enterprise coupled with a number of associated ontological and epistemological challenges, leads to the conclusion that the correct place for enterprise education may well lie outside of the formal business school. A radical shift in enterprise education is required; without transformation of traditional methods, progress will not be made. ***In Pursuit of a New 'Enterprise' and 'Entrepreneurship' Paradigm for Learning: Creative Destruction, New Values, New Ways of Doing Things and New Combinations of Knowledge. Gibb (2002).***

Year / Author	Key items identified in prior studies
2007 Fastré and Van Gils	Fastré and Van Gils (2007) distinguish between the competencies that are needed for successful entrepreneurship education and development and for universities to deliver relevant entrepreneurship curricula. The authors differentiate between general and specific competencies. General competencies refer to the managerial skills that are independent of the firm context, specific competencies (being those related to the industry the firm is operating in), and the technological knowledge required within it. Out of these, a total of *six major entrepreneurial competencies* are derived: • *Opportunity competencies* • *Relationship competencies* • *Conceptual competencies* • *Organising competencies* • *Strategic competencies* • *Commitment competencies* Given the need for these competencies to be embraced by the entrepreneur, a paradigm shift is required. This includes the ability of universities to prepare future entrepreneurial managers for the complexities of functioning in a volatile global environment. A pre-requisite of such a transformation includes a shift in the knowledge base, attitude, and behaviours amongst teaching staff. Educational institutions need to stimulate entrepreneurial interest and behaviour within the individual. Competence statements represent an ideal starting point for discussing content and process issues in the development or reformulation of university curricula. Integrating entrepreneurship and leadership courses into the university curriculum will broaden and enhance the six entrepreneurial competencies identified. ***Competence Development in Entrepreneurship. Fastré and Van Gils (2007).***
2005 Kuratko	Kuratko's study is a call to action to ensure the recognition of entrepreneurship education as a worthy management discipline – through gaining more acceptance and recognition within the various educational institution faculties by entrepreneurship scholars assuming positions of leadership within their academic environments. He highlights the following challenges currently confronting entrepreneurship education: • *The maturity / stagnation / complacency trap* • *A research / publications dilemma and faculty / pipeline shortage* • *Technology challenge and the "dot-com" legacy* • *The academia versus business congruence challenges*

Chapter 2: Literature Review

Year / Author	Key items identified in prior studies
	• *The "dilution effect"* • *The security risk dilemma* • *Administrative leadership revolving door issue* • *The power of one challenge* Entrepreneurship is about continuous innovation and creativity. Kuratko views entrepreneurship as the future of business schools - and as such should assume an increased leadership role. Today, we broadly decree innovation by using words such as: *dream!..create!..explore!..invent!..pioneer!*, and *imagine!* Such slogans should not only serve as a call to action for students, but should apply in equal measure to entrepreneurship educators. The emerging generation of entrepreneurship educators must avoid the paradigm paralysis that has consumed so many business disciplines. Professors need to become more competent in the use of academic technology and also expand their pedagogies to include new and innovative approaches to the teaching of entrepreneurship. ***The Emergence of Entrepreneurship Education: Development, Trends and Challenges. Kuratko (2005).***
2006 Rasmussen and Sørheim	Rasmussen and Sørheim emphasise action-based entrepreneurship education in their study. The focus is more geared towards institutions that encourage learning by doing activities in a group-setting and a networking context. The authors deliberate whether it is possible to educate individuals to become entrepreneurs, or whether an entrepreneur is more likely to be recruited from people already motivated to become entrepreneurs. Through this study we see an educational model that is indicative of a traditional (linear) approach to learning, and this is offset against various action-orientated learning environments. Exhibit 2.2 presents university strategies for action-based entrepreneurship education. **Exhibit 2.2: University Strategies for Action-Based Entrepreneurship Education** Focus on business idea High-potential — Case-based teaching — Coupling of students and ideas Low-potential Individual focus — Traditional teaching — Stimulate student ventures — Student involvement in idea development Passive — Active — Project "owners" **E.A. Rasmussen, R. Sørheim / Technovation 26 (2006) 186 Action-based Entrepreneurship Education**

Year / Author	Key items identified in prior studies
	There is an increased focus on start-ups in each of the studies conducted at various Swedish universities. Although all universities differed widely in their approaches to learning and development, all activities were very action-orientated and required a high degree of student involvement. It should however be noted that all institutions where students either simulated or actively started their own businesses were highly dependent on both financial and practical support.
	Rasmussen and Sorheim suggest that these action-based entrepreneurship programmes were related to, and dependent on, the contribution of external resources and well developed and supportive network opportunities within a regional business community.
	Although entrepreneurship education typically involves many ambiguities, students are able to participate in collective start-ups in close cooperation with inventors and external mentors.
	Given sufficient infrastructure and mentoring capacity, this type of action-based approach avails students the opportunity to explore and develop their entrepreneurial skills.
	Action-based Entrepreneurship Education. Rasmussen and Sorheim (2006).
2007 Wing Yan Man and Wai Mui Yu	Wing Yan Man and Wai Mui Yu's objective of this study was to investigate the impact of social interaction with team members in enterprise education. The study was conducted amongst adolescents and shows a number of references to action-orientated learning studies.
	It identifies the inability of such learning to introduce the importance of social interaction in the learning and development process. The study indicates the necessity to create an environment that raises the learners' awareness, yet simultaneously encourages opportunities for real-life settings - hence the view that the social interaction aspect is equally important in providing enterprise education for youths, as is experiential learning.
	Enterprise education for adolescents needs to be such that it provides in-depth understanding of, and insights into, entrepreneurial and business development processes whilst developing and maintaining a positive attitude towards entrepreneurship.
	An enterprise model of teaching was considered to be more suitable than a linear model to stimulate enterprising behaviours, skills, and attributes. This model allows for action learning elements such as workshops, simulators, and games which adds value to the process and positively contributes to the development of the adolescent learner. The development of this hypothesis was broken into two types of foci, namely: • *Interaction with the facilitator* • *Interaction among fellow team members* Facilitators and educators are instrumental in the smooth delivery through support, interaction and encouragement. Team members are the variables that determine the type of social interaction that takes place within the venture team context.

Year / Author	Key items identified in prior studies
	The hypothesis was designed and measured using a number of dependent and independent variables and the conclusion drawn from these results is that there is a significant correlation between the two independent variables; i.e. interaction with the facilitator and interaction with the team members. The effort of the facilitators and atmosphere with the team is crucial in effecting learners' entrepreneurial attitudes. The authors conclude that social constructivist learner-centred approaches are considered to be more effective for successful delivery of enterprise education for youth than traditional approaches. ***Social Interaction and Aadolescent's Learning in Enterprise Education: An Empirical Study. Wing Yan Man and Wai Mui Yu (2007).***
2009 Pittaway, Hannon, Gibb, and Thompson	This paper explored the validity of education research on assessment with specific focus on assessment practice in enterprise education. Assessment is an important part of academic practice and affects the quality of teaching and learning and has been neglected as a subject in the development and delivery of enterprise training/learning. The dichotomies and philosophical tensions in assessment practice have led to considerable variation in forms of assessment in higher education. It is therefore important to ensure that assessment is *valid, reliable, consistent and appropriate* and should always form an integral component of course design. Assessment should consider how students learn; conventional ways might not be as effective as educators would like. More attention to aligning learning outcomes, assessment tasks and creation of learning opportunities is called for. Educators need to understand how 'entrepreneurs' or 'enterprising people' learn before they start making judgements about the forms of education activity that can promote such learning. This will enable educators to identify the learning outcomes to be embedded in the educational activities. Several focus groups were carried out during this study to explore various forms of assessment strategies that entrepreneurship educators deemed appropriate. The results varied across all groups, but what was evident was the complexity and diversity of assessment practice in enterprise education. More consideration from both research and practice perspective is required. It is important to develop innovative assessment practices to support innovative educational designs. The outcome of the focus groups provides a range of possibilities and techniques, which are organised according to particular entrepreneurial learning outcomes. ***Assessment Practice in Enterprise Education. Pittaway, Hannon, Gibb, Thompson (2009).***

This summary encapsulates the dichotomous nature of the challenge facing entrepreneurship education and training[4], being the matter of theory; i.e., *what should be taught* in the first instance, and secondly pedagogy; i.e., *how the content should be delivered* in order for for teachers and students to optimise students' learning experience.

Klofsten (2000) considers how tertiary education institutions like universities can educate successful entrepreneurs. According to Klofsten (2000), there are three basic activities aimed at stimulating entrepreneurship that should be prevalent at a university. First, create and maintain an enterprising culture throughout the university by integrating entrepreneurship within all courses and research activity. Second, offer separate courses in entrepreneurship to all students, and finally, offer focused training programs for individuals who aspire to start their own business.

While there appears to be an extensive range of topics taught in entrepreneurship programs, Laukkanen (2000) asserts that entrepreneurship education has been primarily based on an individual-centered mindset. This individualistic entrepreneurship education strategy aims to provide general education to individuals on how to become entrepreneurs. Laukkanen (2000) suggests adopting a dual strategy in entrepreneurship education by adding a business generation imperative. Such a strategy would require specific training in business venture start-up, with due consideration of the given environment and context. This strategy appears to be consistent with recent developments in entrepreneurship education, where certain courses mandate the establishment of an actual business as part of the education (McMullan & Gillin, 1998).

The dominant and prevailing model of education has been focused on moulding single individuals to become entrepreneurs (Laukkanen, 2000). In short, candidates receive

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[4] *The term entrepreneurship education can be considered as having two meanings; either learning about entrepreneurship as a phenomenon, or, learning the requisite skills in order to become an entrepreneur (Pittaway et al.,2009).*

knowledge and capabilities through a structured and linear educational process, or what Gibb (1993) refers to, as a didactic model. It is then expected that these individuals are more likely to start new ventures after finishing their studies. While there is no reason to doubt the general efficacy of professional entrepreneurship education programs following this model, the approach has elicited some criticism (Laukkanen, 2000). These remarks are directed at the prominence assigned to single individuals, while the role of teams, context, and business concepts are not recognised. Such a departure point is more likely to emphasise that entrepreneurial capabilities are inborn, rather than learned. This individual-centered model reflects the traditional individual focus in the academic system (Laukkanen, 2000). Within this context, the traditional focus in entrepreneurship education is considered inadequate (Gibb, 2002).

Etzkowitz (2003) argues that there is an ongoing shift or expansion from an individualistic to a group focus: *"although some persons may not be willing or able to become entrepreneurs individually; they are able to do so collectively"* (p.112). Johannisson, Landstroom, and Rosenberg (1998) underscore an action-oriented approach from the perspective that entrepreneurship demands a series of specific and directed activities to give birth to a venture; and believes that stimulating the individual's action-rationality would be central to this requirement. Johannisson et al., (1998) found that students' action capability is positively impacted by university training.

Offering an alternative to the individual focus, Laukkanen's (2000) 'business generation model' constructs an alternate educational strategy for entrepreneurship education. The objective is to cultivate the necessary conditions for new ventures to flourish. These conditions would extend beyond start-up ventures to include the strategic expansion of existing regional small and medium size enterprises; the generation and integration of viable business models and concepts; as well as entrepreneurs, resources, and

creating a rewarding environment. In an educational setting, students would be required to workshop ideas and conceptualise a realistic business concept from the outset.

5.0   Conceptual Model Overview

Exhibit 2.3 provides an overview of the conceptual model developed in this research which focuses on the individual. There is a growing trend in entrepreneurship research to focus research efforts at the firm level (Davidsson, Delmar, & Wiklund, 2006). Research into nascent entrepreneurs, however, needs to focus on the individual since the firm has not yet come into existence in the intention phase. Consequently, the focus of analysis in this research study is at the individual level.

Building upon existing theory of Ajzen (1991) and others, the conceptual model identifies inter-relationships among entrepreneurial self-efficacy (entrepreneurial self-belief/ entrepreneurial confidence), intrinsic motivations (at the individual level), entrepreneurial intentions (to actually start a business), and their influence on entrepreneurial start-up behaviour (defined in terms of to what extent a venture is actually started).

Prior studies have examined aspects of the model; however, this research empirically examines the combined construct inter-relationships in an entrepreneurial context that reflects the transformation, over time, of nascent necessity-entrepreneurs as they evolve to become entrepreneurs subsequent to being exposed to an entrepreneurship training and mentoring intervention. Consequently, this research builds upon elements of existing entrepreneurship theory together with theory drawn from the psychology discipline. The theoretical foundations of the research are underpinned by Ajzen's (1991) Theory of Planned Behaviour (TPB).

Exhibit 2.3: The Conceptual Model
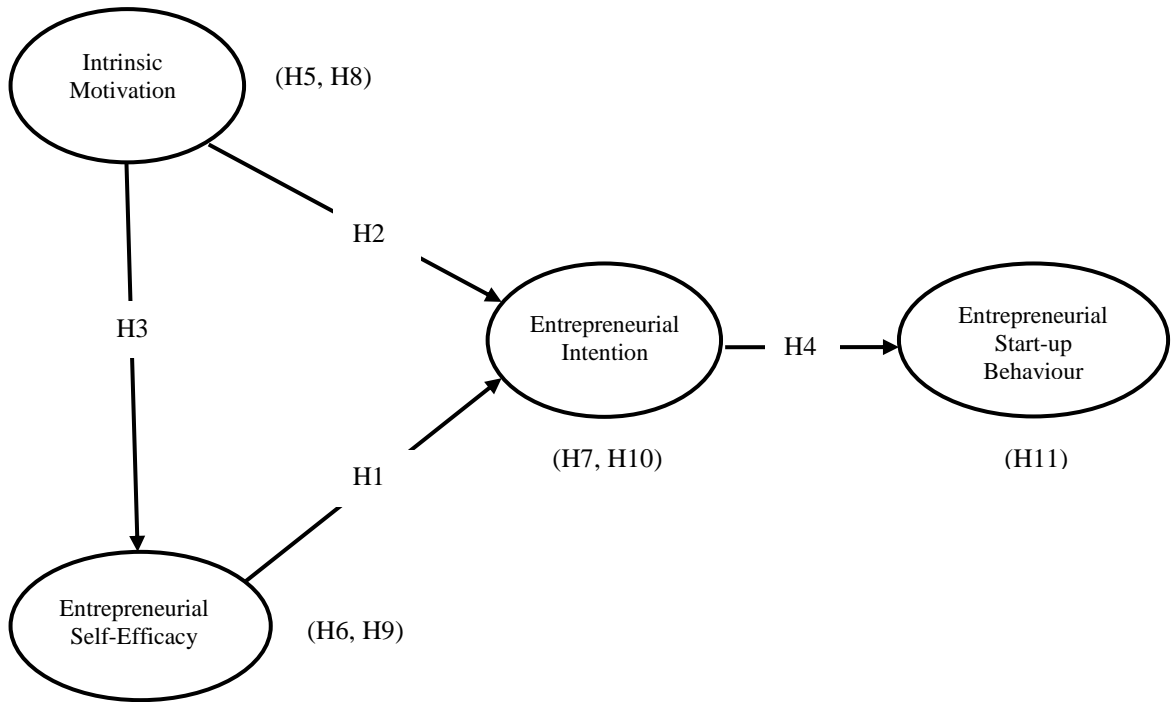
To investigate some of the research questions and associated hypotheses, the constructs were measured at three points in time. Exhibit 2.4 depicts the longitudinal nature of the conceptual model.

Exhibit 2.4: Longitudinal Nature of the Conceptual Model
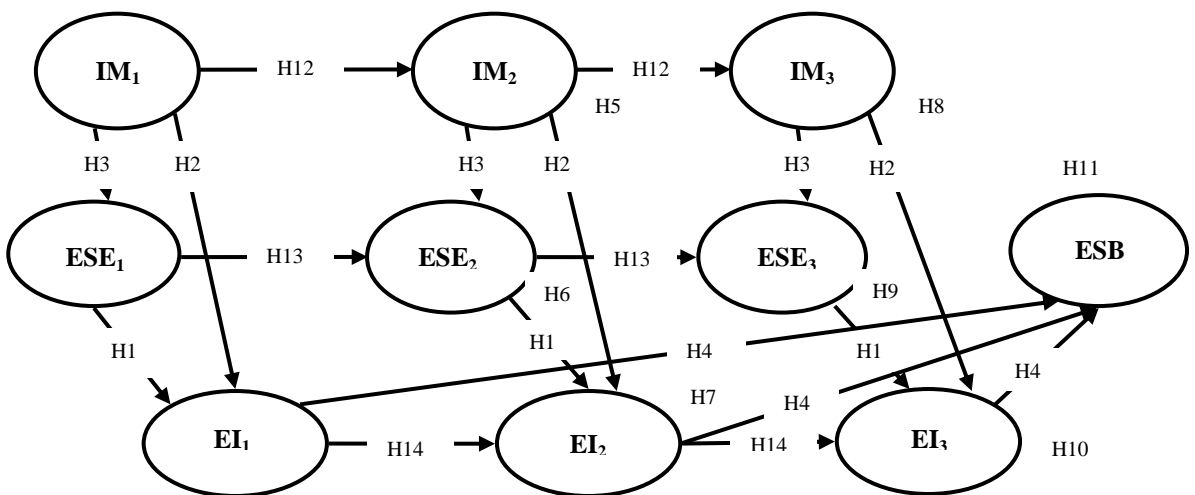
5.1 Research Foundations

This study draws upon Ajzen's (1987, 1991) theory of planned behaviour as its intentions-model. The TPB has been extensively applied to the domain of social psychology and its predictive ability has been extensively validated.

Conceptually, the TPB considers that intentionality is driven by three factors; (i) a personal factor (or *attitude* of the individual *towards the behavior*), (ii) an element influenced by perceived social pressure (to undertake, or not undertake, a given behavior; *or subjective norm*), and (iii) a control element (the sense of the ability to perform the behavior of interest, or *self-efficacy,* also referred to as *perceived behavioural control*). It follows that an individual will generally be more likely to perform a behavior when he/she reflects on it positively, senses strong social support (or pressure) from family, friends or colleagues to commit to do so, and is confident of having the means and capacity to do so (Ajzen, 2005).

The entrepreneurial intentions construct was selected for this study on the basis that intentions have best predicted planned behaviour in psychological literature. Ajzen (1987, 1991) regards intentions as the conduit to better understanding the behavioural act itself; Bagozzi, Baumgarten, and Yi (1989) conclude that intentions are the single best predictor of planned behaviour. Furthermore, intentions have proven to be particularly useful where behaviour is uncommon, hard to observe and where unpredictable time delays occur (Krueger, Reilly, & Carsrud, 2000). Having made the decision to use an intentions-based model, this does not suggest intentions are the only valid construct to predict behaviour.

Within the general context of the intention-behaviour prediction theory of the TPB, the study of social psychology continues to gain traction in entrepreneurship research. Bird (1988) highlighted that the construct of intentionality appeared to be at the heart of entrepreneurial behaviour; moreover, Katz and Gartner (1988, as cited in Shane &

Venkataraman, 2000) considered intentionality as a critical component of any start-up venture.

In addition to the TPB being used in the entrepreneurial context, other modified intentions-based entrepreneurship models exist. One such example is Shapero's (1982) "entrepreneurial event" (SEE) model. The SEE model was potentially considered as an intentions-model for this study. The essential differences between the Ajzen and SEE models can be encapsulated as follows: Ajzen (1991) proposes that intentions generally depend on perceived attractiveness of the opportunity, subjective social norms and perceived behavioural control. Shapero (1982) argues that entrepreneurial intentions depend on personal desirability, viability and the propensity to act.

The main difference between the two models is reflected in Shapero's final component - the *propensity to act*. The presumption is therefore that a general state of inertia exists, unless the status quo is changed through a happening or specific event. Such an event could manifest itself as a consequence of becoming unemployed or identifying a lucrative business opportunity - and when combined with the other two components (desirability and feasibility) will lead to changes in behaviour.

Krueger (1993) had tested the Shapero (1982) model and affirmed strong confirmation thereof, indicating possible application in the entrepreneurial literature. This led Krueger and Brazeal (1994) to investigate multiple applications within entrepreneurship contexts by augmenting insights gained from Ajzen to the Shapero (1982) model. Krueger (2000) subsequently compared both the TPB and Shapero (1982) models by undertaking a competing hypothesis test; and, in so doing, found the result supportive of their explanatory power. This led other entrepreneurship researchers to adopt these formal intention models; Kolvereid (1997) in particular has been prominent in the application of the TPB within the entrepreneurship domain.

Autio, Keeley, Klofsten, Parker, & Hay (2001) conducted a subsequent study having developed an integrated or hybrid "Ajzen-Shapero type model" and extended the reach to include multiple factors. Factors inter-alia included: demographic variables (age/gender), experience, perceived image of entrepreneurship, perceived success and rewards, entrepreneurial belief and start-up intent. It is posited that such hybrid models may be more beneficial in providing insight into a more complex range of factors than single factor models.

Another reason why TPB is considered the most appropriate for this study is the longitudinal design and nature of the research. Davidsson (2006) affirms that: *"The design suggested by the theory of planned behaviour, then, would be a longitudinal study of a representative sample from the working age population using validated operationalisations of the core concepts…"*, and *"…if supportive, a well-designed test of this kind would lead us to conclude that TPB is valid for entrepreneurial behavior"* (p.41).

Some researchers have questioned whether the TPB's formative intentions-model may be too linear in its assumption of antecedents behaving uni-directionally in combining to form an end variable (Elfving, Brannback & Carsrud, 2009). Expressing a different perspective, Liska (1984) posits that antecedents may well comprise a more reflective model. Likewise, Krueger et al. (2007) seem to indicate the effect of intentions on antecedents seem to be greater than the other way around (antecedents on intentions), raising the question of whether correlations appear as strong as a result of a dynamic, bi-directional process?

Although these issues are receiving more attention from scholars, Ajzen's TPB model is considered as being the most appropriate for this longitudinal study. TPB provides an underlying theoretical robustness to adequately measure the constructs of this study: entrepreneurial self-efficacy (ESE), intrinsic motivation (IM), entrepreneurial intention

(EI), and business start-up behaviour (ESB). Each of the model constructs are now discussed in turn.

5.2   Entrepreneurial Self-Efficacy

This section commences with a general discussion of the self-efficacy construct as it pertains to the psychology literature. This section is subsequently followed by an examination of self-efficacy as it applies in an entrepreneurial context.

Self-efficacy emerged from Bandura's (1997) social learning theory. The self-efficacy construct has emerged as a central variable within social psychological research (Mauer, Neergaard, & Kirketerp Linstad, 2009, p.233, as cited in in Carsrud & Brannback, 2009). Self-efficacy widely impacts on a person's cognitive decision-making and psychological stability (Bandura & Locke, 2003). Self-efficacy has been applied in a number of areas of management and business activity, spanning general achievement (Chandler & Jansen, 1997; Endler, Speer, Johnson, & Flett, 2001), competency in the use of computers (Igbaria & Iivari, 1995), innovation adoption (Tabak & Barr, 1999), and organisational innovation.

Self-efficacy refers to the individual's beliefs in his/her capabilities to successfully meet the demands of specific tasks (Bandura,1977); and involves people's assessment of their own abilities and capacity to mobilise the motivations, cognitive resources, and/or courses of action needed to exercise control over life's events (Wood & Bandura, 1989).

McGee et al. (2009) consider self-efficacy to *"capture an individual's perception of their ability to successfully perform a variety of tasks across a variety of situations"* (p.969). Breakwell (1992) explains that *"people's perceptions of their own capabilities influence how they act, their motivation levels, their thought patterns, and their emotional reactions in demanding situations…without the subjective belief that it is possible to act in*

certain ways, action is unlikely to occur" (p.35). The belief in one's own capabilities appears to be the central theme.

Bandura (1997) remarks: *"Efficacy belief therefore is a major basis of action. People guide their lives by their beliefs of personal efficacy. Unless people believe they can produce the desired effects by their actions, they have little incentive to act"* (p.2). Conversely, those with low self-efficacy are doubting of their abilities and are more inclined to occupy their thoughts with "worst-case scenario" thinking (Bandura, 1997).

One important implication however is that individuals choose situations in which they expect high levels of personal control and seek to avoid situations where they might have low control. Consequently, individuals assess activities in terms of the perception of their ability to competently deal with those activities. Unsurprisingly then, an individual's past experiences, level of performance, and capacity to deliver will, by necessity, inform their level of self-efficacy (Mauer et al., 2009, p.233 as cited in in Carsrud & Brannback, 2009).

Perceived self-efficacy refers to the subjective probability of being able to perform a designated course of action (Ajzen, 2005); and, as having belief in one's abilities to successfully undertake requisite actions to produce stated goals or outcomes (Bandura, 1997). Perceived self-efficacy is thus omnipresent in the choices individuals make and the subsequent levels of success achieved. Bandura (1997) remarks:

> *"People's beliefs in their efficacy have diverse effects. Such beliefs influence the courses of action people choose to pursue, how much effort they put forth in given endeavours, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patters are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing demands, and the level of accomplishments they realize"* (p.3)

As self-efficacy has a strong influence on an individual's behaviour individuals strive to raise their level of self-efficacy with a view to enhancing their feelings of 'competence' and 'degree of control' (Axelrod & Lehman, 1993). It follows that without

self-efficacy, individuals will lack confidence and belief in their capability and this will in turn adversely influence their abilities to perform everyday behaviour. Bandura and Locke (2003, p.87) argue that *"among the mechanisms of human agency, none is more central or pervasive than beliefs of efficacy...whatever other factors serve as guides and motivators, they are rooted in the core belief that one has the power to produce desired effects; otherwise one has little incentive to act or to persevere in the face of difficulties"*. Thus, self-efficacy is ubiquitous and influences how individuals feel, think, achieve, and motivate themselves. Those with a high level of efficacy are able to create images of ultimate success, and these images serve to provide, and positively support their performance.

Bandura (1997) comments that (perceived) self-efficacy and self-esteem are sometimes considered as being similar concepts describing the same phenomena; however, this misconception is immediately clarified by affirming these two concepts as different constructs. Perceived self-efficacy infers judgements of personal performance capability, while self-esteem is concerned with assessment of self-worth. Bandura (1997) asserts that more than high self-esteem is required to do well in life's pursuits. Mone, Baker, and Jefferies (1995), as cited in Bandura, 1997), have a different view (though this appears to not be widely held):

> *"People need firm confidence in their efficacy to mount and sustain the effort required to succeed. Thus, in ongoing pursuits, perceived personal efficacy predicts the goals people set for themselves and their performance attainments, whereas self-esteem affects neither personal goals nor performance"* (p.11).

A number of studies investigating the effects of self-efficacy have demonstrated the strong relationship between this construct and task performance, such that many researchers consider self-efficacy to be the most effective predictor of performance (Wood & Bandura, 1989; Bandura, 1993). Consequently, the evidence linking self-efficacy to performance is of particular interest to entrepreneurship researchers (McGee et al., 2009). In this context, self-efficacy has been applied to aspects of the study of entrepreneurship, referred to as

entrepreneurial self-efficacy (ESE). This includes ESE as a theoretical consideration of the intention to start a new business (Boyd & Vozikis, 1994). In addition, ESE has been implemented in empirical entrepreneurship studies including the influence of founder self-efficacy on new venture performance (Chandler & Jansen, 1997); the influence of education programs on students' perceptions of entrepreneurship (Peterman and Kennedy, 2003); the differences between entrepreneurs and managers (Chen, Greene, & Crick, 1998); and the entrepreneurial intentions of innovators and students in Slovenia and the Czech Republic (Drnovsek & Glas, 2002).

Entrepreneurial Self-Efficacy (ESE) is defined as one's beliefs in their capabilities to successfully achieve the tasks of entrepreneurship (Boyd & Vozikis, 1994; Chen et al., 1998; DeNoble, Jung, & Ehrlich, 1999). These entrepreneurial tasks include 'developing new products or market opportunities', 'building an innovative environment', 'initiating investor relationships, 'defining core business purpose', 'coping with unexpected challenges, and 'developing critical human resources' (DeNoble et al., 1999).

Experience, education and "pre-ownership" are strong contributors to increasing entrepreneurial self-efficacy. ESE can be developed through experiencing successes and accomplishments (Chandler & Jansen, 1997). Less participative activities such as "observational learning" (Gist, 1987) and "social persuasion" have a limited impact on developing self-efficacy (Gist & Mitchell, 1992).

Entrepreneurial self-efficacy measures an individual's belief in his/her ability to successfully launch an entrepreneurial venture. It is a construct that encompasses both personality and environmental factors and is considered to be a strong predictor of entrepreneurial intentions (another construct included in this study), and ultimately, entrepreneurial start-up behaviour. ESE is derived from Bandura's (1977) self-efficacy theory which originated from social learning theory. Self-efficacy, which has been

discussed earlier in this section, has also been described as *"a motivational construct with the potential to influence people's choice of activities, persistence levels, personal goals, as well as performance in a variety of contexts"* (Zhao, Siebert, & Hills, 2005, p.1266). Self-efficacy is an important concept in explaining both human behaviour and behavioural changes (Robertson & Sadri, 1993).

The perceptions of individuals concerning their own capabilities will directly influence how they act, their motivations, their cognitive thought patterns, and the way they respond when faced with demanding or challenging situations (Breakwell, 1992). This reality is manifestly present in small and medium size businesses, where the lead entrepreneur's own capabilities and behaviours are innately interwoven with the business's strategies, to the extent that the entrepreneur is considered to "be the business" (Lumpkin & Dess, 1996). In this regard, Chen, Greene, and Crick (1998) were able to demonstrate that entrepreneurial self-efficacy had the potential to distinguish entrepreneurs from non-entrepreneurs. Thus, ESE provides an indicator that, along with other indicators, may be able to differentiate entrepreneurs from both business owners and non-entrepreneurs (Chen et al., 1998). The level of ESE of business owners would therefore directly impact on the entrepreneurial and strategic direction (also referred to as entrepreneurial orientation) of their businesses (Poon, Ainuddin, & Junit, 2006). Businesses with an "entrepreneurial orientation" perform better than non-entrepreneurial businesses (Wiklund & Shepherd, 2005 as cited in Davidsson, 2006).

An individual's self-efficacy plays an important role in developing his/her entrepreneurial intentions as well as ultimately influencing entrepreneurial activity. Over the last decade, the ESE construct has received considerable attention among entrepreneurship researchers (Boyd & Vozikis, 1994; Krueger & Brazeal,1994; Chandler

& Jansen, 1997; Chen et al.,1998; DeNoble, et al., 1999; Drnovsek & Glas, 2002; Lindsay & Balan, 2005; Hmieleski & Corbett, 2008; Carsrud & Brannback, 2009).

Empirical evidence supports the proposition that entrepreneurial self-efficacy is positively related to entrepreneurial performance (Chandler & Jansen, 1997; Lindsay & Balan, 2005; Zhao, Seibert, & Hills, 2005; Hmieleski & Corbett, 2008). ESE affects performance by influencing the entrepreneur's interests, motivations and perseverance levels (Chen et al., 1998).

Entrepreneurs with high levels of self-efficacy set higher goals for themselves and for their businesses. These entrepreneurs are also more persistent in their efforts to try and achieve these goals (Boyd & Vozikis, 1994; Erikson, 2002). Furthermore, entrepreneurs are faced with numerous challenges and uncertainties in the day-to-day running of their business, so their level of self-efficacy affects their ongoing ability to deal with these challenges (Chen et al., 1998). Entrepreneurial self-efficacy re-doubles effort, which, in turn strengthens performance, and can also influence the effectiveness with which entrepreneurs manage their business (Chandler & Jansen, 1997; Kickul & D'Intino, 2005).

Lindsay and Balan (2005) in their study of over 300 business managers found a positive relationship between entrepreneurial self-efficacy and personal entrepreneurial success. They also identified a relationship between ESE and business performance. Furthermore, Lindsay and Balan (2005) concluded that entrepreneurial self-efficacy's effect on performance is based on the entrepreneur being able to reduce or eliminate levels of self-doubt. They argued that *"it is difficult to perform at your best when you doubt your abilities; hence the efficacy-performance relationship"* (Lindsay & Balan, 2005, p.1). Thus, individuals with higher levels of self-efficacy will have lower levels of self-doubt. In the entrepreneurship context, business owners with low self-efficacy may completely avoid certain tasks because they lack the belief in their ability to succeed at these tasks. Chen et

al. (1998) posit that reducing self-doubt enables the entrepreneur to be "*actively engaged in entrepreneurial tasks, more persistent in the face of difficulty and setbacks, and more confident in meeting challenges*" (p.296). ESE is therefore a significant contributor to personal and business performance (Hmieleski et al., 2006) and, therefore, to entrepreneurial intention since intentions are a precursor to planned behaviour. *As a result,...*

H1	There will be a relationship between entrepreneurial self-efficacy (ESE) and entrepreneurial intention (EI) in nascent necessity entrepreneurs

Although the relationship has been investigated between ESE and organisational performance, there has been no research into ESE being related to personal performance. Achieving organisational performance success, does not necessarily translate to "success" from the perspective of the individual entrepreneur. However, individuals tend to migrate toward where they perceive themselves as being successful (Wood & Bandura, 1989). Since entrepreneurs are energised by creating and growing businesses, achieving success at the organisation level may at least in part be considered a type of surrogate for achieving personal success.

Consequently, ESE most likely converts to not only being a driver of organisational performance in existing businesses, but also becomes a driver of personal performance; leading to the creation of a virtuous circle where achieving organisational success will reinforce individual success, which in turn will drive enhanced individual performance – leading to achieving individual success, and resulting in enhanced organisational performance. Therefore, it seems reasonable to assume that training that reinforces self-belief will lead to (in part at least) an increase in self-belief – in the short and medium terms. Thus, increases in self-efficacy at one point in time will reinforce self-efficacy at subsequent points in time. This leads to the following hypotheses …

H6	There will be an increase in entrepreneurial self-efficacy (ESE) immediately after an entrepreneurship training and mentoring program in nascent necessity entrepreneurs
H9	There will be an extended increase in entrepreneurial self-efficacy (ESE) (over Baseline) after nascent necessity entrepreneurs complete an entrepreneurship training and mentoring program
H13	There will be a positive relationship between nascent necessity entrepreneur entrepreneurial self-efficacy (ESE) at different points in time

5.3   Intrinsic Motivation

In the introductory part of this chapter, motivation (opportunity versus necessity) is considered to be at the core of the entrepreneurial process; without motivation, the demands of the entrepreneurial process will indeed go unfulfilled.   Moreover, motivation is considered a key antecedent for growth to ensue (Ginn & Sexton, 1989).

In this section, the ***motivation*** construct is discussed from a broader perspective emanating from the realm of the psychology literature. Given that a nascent entrepreneur may be motivated by opportunity or necessity (in this research, it is by necessity), ***intrinsic motivation*** is reviewed as a construct within the specific context of this research.

Since the origin of humanity, individuals have been motivated to survive. From a biological perspective, strong inherent motivational needs have driven humanity to survive. Maslow (1946, as cited in Carsrud, Brannback, Elfving & Brandt, 2009), in his well known work on motivation, has defined motivation through a spectrum of base‑level human needs (satisfying the body's needs to survive), to the highest level of motivational needs (known as achievement motivation).

Achievement motivation (Ach) was initially championed by Atkinson building on prior theories which incorporatedd levels of aspirations (Atkinson, 1957, 1964; McClelland & Winter, 1969). A uni‑dimensional approach was initially adopted, although subsequently

broadened by others to acknowledge a multi-dimensional approach (Carsrud, Olm, & Thomas, 1989). McClelland (1985) identifies *motives, values*, and *skills* as three key factors that are seminal in determining what people do in their lives.

Extensive research has been undertaken in the motivations area since the turn of the last century. The proponents of this early literature argued that *motives* were synonymous with *instincts*; essentially describing the specific element or core behavioural "driver" where the goal is to succeed, survive and generally avoid failure. Freud considered motivations to influence behaviour on both conscious and subconscious levels (Freud, 1900, 1915, 1924 as cited in Carsrud, Brannback, Elfving & Brandt, 2009; Maslow, 1946 as cited in Carsrud et al., 2009; Deutsch & Krauss, 1965). Ryan and Deci (2000) in turn, view motivation at the heart of cognitive, biological and social regulation.

In the traditional sense, motivation researchers essentially posit three types of questions: *(i) what activates a person?; (ii) what makes a person select one behaviour in preference to another?;* and, *(iii) why do the same motivational stimuli create a different response among different people?* Perwin (2003) considers the triumvirate of questions to give rise to three important aspects of motivation, being: *activation, selection-direction, and preparedness of response.*

Current motivational theories are classified in two broad categories, referred to as *incentive theories* and *drive theories* (Freud, 1924 as cited in Carsrud et al., 2009). *Incentive theories* describe a "motivational pull" or end-game goal inducement that inexorably draws the individual towards it; this motivational goal is identified as *achievement motivation (Ach);* often applied in the context of entrepreneurial performance (Carsrud & Olm, 1986). *Drive theories* in turn, posit that such motivations emanate from the individual's desire to negotiate a range of activities that will seek to alleviate causal tension. The presence of an internal stimulus or driver in the individual (for example lower

level biological needs such as safety, fear or hunger) would move to reduce this existential dissonance by invoking tension reduction strategies (Freud, 1924 as cited in Carsrud et al., 2009). Push factors are consequently ubiquitous in drive theories (Carsrud & Brannback, 2011).

The preceding paragraph suggests a relationship between goals and motivations. Locke and Latham (2004) consider the impact of goals or goal-setting as vital elements in motivations. Unsurprisingly, goals have attracted a fair level of interest in the area of motivational research. Perwin (2003) considers goals to be mental representations of future end-states, providing an underlying orientation to individuals (such as entrepreneurs) not to give up (Bagozzi & Dholakia, 1999). Goals are "activators" that create the enabling bridge between intention and action (Nuttin, 1984, as cited in Locke, 2000).

Bay and Daniel (2003 as cited in Carsrud, & Brannback, 2009) conceptualised a hierarchy of goals, postulating a difference in motivational intensity when deciding to pursue a goal. The ability of being able to change motives and goals allow individuals to respond to changing external environments, and to strategically craft contingencies for themselves (Carsrud & Brannback, 2011). It is therefore plausible that such motivational changes may alter the setting of intermediate and final goals. In this regard, Nuttin (1984, as cited in Locke, 2000) and Elfving (2008) identify two contextual modes of motivation. The first, called *instrumental motivation*, describes any action performed by an individual which might indirectly contribute to the final goal. The second, referred to as *final motivation*, describes an activity when a final goal is actively pursued.

Ryan and Deci (2000) stated that motivation involves *"energy, direction, and persistence of activation as well as intention",* providing support for the existence of a link between goals and motives as predictors of behaviour; thus affirming an *"intentions-motivations-behaviours"* relationship. It is, however, important to note that this

relationship is not unidirectional or linear, particularly where passage of time is considered. Hence, intentions do not mechanically convert to direct or instantaneous action (Carsrud & Brannback, 2011). Similar views are held by Bagozzi and Warshaw (1990) who developed the *"theory of trying"*; expanding Ajzen and Fishbein's (1977) view of dealing with action as a singular activity. Bagozzi (1992) considers action as an attempt (or indeed a series of attempts) that are made with a view of progressing toward the final state. Consequently, the theory of trying accommodates both incremental or intermediate goals as well as end‑game goals (Bagozzi & Warshaw, 1990; Gollwitzer & Brandstatter, 1997).

The non‑linearity of the *intentions-motivations-behaviours* relationship continuum has been confirmed by other researchers. Firstly, there is a time‑dimension effect on the construct of achievement motivation (Ach) (Helmreich, Sawin, & Carsrud, 1986); and secondly, existing research supports a reciprocity effect across this continuum – hence, attitudes influencing behaviours, which in turn influence attitudes (Brannback et al., 2007, as cited in Carsrud & Brannback, 2011).

Although intentions are considered to be solid predictors of future actions, insufficient understanding exists around the intention‑action link (Bird & Schjoedt, 2009). To this end, Carsrud and Brannback (2011) believe motivations to be the vital "spark" that ignites latent intentions and energises these into demonstrable action. Consequently, motivations represent an *enabling link* between intentions and actions (Bird & Schjoedt, 2009). It is however surprising that given the importance of this area it remains substantially under‑researched (Edelman, Brush, Manolova & Greene, 2010; Kuratko et al., 1997).

Gollwitzer and Brandstatter (1997) provide a nexus between entrepreneurial intentions, entrepreneurial motivations, and entrepreneurial behaviours (all constructs in this study). Their study introduces the concepts of *"goal pursuits"* and *"implementation intentions"*. Goal pursuits are categorised as four action‑phases (pre‑decisional; pre‑

actional; actional; and post-actional). These action phases are linked through two transition points: goal intention and implementation intention. Gollwitzer and Brandstatter (1997) indicate that goal achievement probability is significantly enhanced in the presence of an implementation intention. Without the presence of such an implementation intention, entrepreneurial behaviour will not be forthcoming (Elfving, 2008).

Are entrepreneurial motivations different to motivations in the general sense? Entrepreneurs are no different when it comes to striving to meet needs and wants in their lives; *"they do not necessarily possess motivations that are distinct from others, but rather it is how they use those motivations that help determine the ultimate success of failure of their ventures"* (Carsrud, Brannback, Elfving, & Brandt, 2009, p.143). Entrepreneurs seek to create and grow ventures, rather than being employed in them. It is indeed the existence of entrepreneurial motivations that link entrepreneurial intentions (cognition) and entrepreneurial activity (behaviours) (Bird & Schjoedt, 2009; Carsrud, Olm, & Thomas, 1989; Elfving, 2008). Thus, it is expected that there will be a relationship between intrinsic motivation and entrepreneurial intention in this research.

H2	There will be a relationship between intrinsic motivation (IM) and entrepreneurial intention (EI) in nascent necessity entrepreneurs

Entrepreneurship is dependent on a range of decisions individuals make regarding the entrepreneurial process, and as such will be impacted by the attributes these individuals possess (Shane, Locke, & Collins, 2003). Although the trait-based approaches in entrepreneurship have been widely criticised as inconclusive (Gartner, 1989; Carsrud & Johnson, 1989), sociologist researchers like Aldrich and Zimmer (1986) acknowledge that motivation is inherently part of the entrepreneurial process. Additionally, they concur that entrepreneurial activity *"can be conceptualised as a function of opportunity structures and motivated entrepreneurs with access to resources"* (Aldrich & Zimmer, 1986, p.3).

Carsrud et al. (2009) are emphatic in their view that entrepreneurial motivations are not the same as uniquely entrepreneurial personality traits.

The entrepreneurial process is uniquely impacted by motivational differences to the extent that individuals have naturally varying perceptions toward venture risk and opportunity; unsurprisingly influencing entrepreneurial decision making (Shane & Venkataraman, 2000). It is therefore plausible for any individual to contemplate the application of financial, time, and other resources as well as the level of anticipated risk - and likelihood of a successful outcome - before committing such resources.

Cohen and Zimbardo's (1969) research into the power of cognitive dissonance and the aversion to failure, explains why entrepreneurs will seek to avoid failure at all cost. Their tenacity is evident in circumstances where non-entrepreneurs would have quit (Baum & Locke, 2004; Baum, Locke, & Smith, 2001; Cohen & Zimbardo, 1969). Such a dissonance-reduction response might result in (i) the entrepreneur lowering his/her success motivation (redefining what "success" may look like), or (ii) the motivation to avoid failure altogether. Atkinson (1957) has shown these two motivations are separate motivations and have varied behavioural implications.

The recognition of complexity in motivations at the individual level is an important consideration in gaining an understanding of entrepreneurial process (Palich & Bagby, 1995, as cited in Shane, Locke & Collins, 2003). Previous studies have contextualised the propensity for risk-taking purely as a personality trait, yet there is a growing need to acknowledge both risk and dissonance as strong motivators for entrepreneurs within the overall motivational paradigm (Carsrud et al., 2009).

Although human motivations are central to the entrepreneurial process, Shane et al. (2003) considers recent entrepreneurship research to have given insufficient consideration to the role of entrepreneurial motivation. Previous research has identified a range of

motivations and their impact on the various aspects of entrepreneurship (Shane et al., 2003). These aspects, inter-alia, comprise both quantitative and qualitative motivational concepts that influence the entrepreneurial process.

A selection of these motivational concepts is highlighted for review:

(i) ***Need for achievement (nAch).*** McClelland (1961) posits that entrepreneurship roles (typically requiring a high degree of individual skill, effort and responsibility), would require a higher demand for task attributes than other roles. Support for the relationship between nAch and entrepreneurial activity is supported by several researchers and confirmed by Collins, Locke, and Hanges (2000) in their meta-analysis.

(ii) ***Risk taking.*** Another motivation of interest emerging from McClelland's (1961) entrepreneurial research is the supposition that individuals with high achievement needs have intermediate risk-taking propensity, as these would provide a challenge. Uncertainty is unavoidably part of the entrepreneurial process, requiring the acceptance of risk in a range of guises: psychic well-being, financial well-being, career security, and social relationships (Liles, 1974, as cited in Gartner, 1985). In essence, the entrepreneur ultimately bears the residual uncertainty/risk for the venture in order to proceed (Venkataraman, 1997).

Conversely, Atkinson (1957) argues that individuals who score high on the motive to avoid failure will also seek to avoid intermediate risks, and opt for low-uncertainty environments with high success probabilities. Entrepreneurship literature has broadly defined risk-taking propensity as the willingness to accept moderate risks (Begley, 1995, as cited by Shane, Locke, & Collins, 2003). Douglas and Shepherd (1999. p.231) advise: *"the more tolerant one is of risk-bearing, the greater the incentive to be self-employed"*.

The risk perception construct has been studied within the context of entrepreneurial decision making, together with entrepreneurs' propensity to exhibit positive bias perception when evaluating risk exposure associated with their ventures.

(iii) ***Tolerance for ambiguity***. There is mixed support by way of research to consider tolerance for ambiguity as a motivation affecting any part of the entrepreneurial process (Begley, 1995, as cited by Shane, Locke, & Collins, 2003).

(iv) ***Locus of control.*** Locus of control presents as another motivational trait that has received attention. Locus of control is *"the belief in the extent to which individuals believe that their actions or personal characteristics affect outcomes"* (Shane et al., 2003, p.266). This motivation appears to have been unable to differentiate between entrepreneurs and non-entrepreneurs in cross-sectional studies (Brockhaus, 1982), or longitudinal studies (Hull, Bosley, & Udell, 1980, as cited in Shane, Locke & Collins, 2003).

(v) *Self-efficacy*. The motivational concept of self-efficacy has been shown to be a robust predictor of an individual's performance in a task, and explains why individuals with apparently equal skills and abilities perform differently (Bandura, 1977). Self-efficacy is *"the belief in one's ability to muster and implement the necessary personal resources, skills, and competencies to attain a certain level of achievement on a given task"* (Shane et al., 2003, p.267).

(vi) *Goal setting*. Longitudinal studies by Tracy, Locke, and Renard (1998, as cited by Hmieleski & Corbett, 2008), and Baum, Locke, and Smith (2001) found growth goals set by entrepreneurs to be significantly related to subsequent growth.

(vii) *Independence*. Independence/autonomy describes a preference for utilising one's own judgement rather than subordinating it to that which prevails in the wider group. Empirical evidence supports entrepreneurs being higher on the independence scale than other individuals (Aldridge, 1997).

(viii) *Perceived entrepreneurial success*. This refers to an individual's assessment of how important a particular reason is for establishing and developing a business, and how successful they believes they might be in achieving each of those reasons. It involves elements of goal-theory *(goal theory in essence states that the relationship between goals and performance is much stronger where commitment is high)*; to the extent that the individual's level of commitment would be dependent on the importance of realising that outcome (Carsrud, Brannback, Elfving, & Brandt, 2009).

Cooper, Woo, and Dunkelberg (1988) concur that gaining an understanding of perceived entrepreneurial success would be valuable in understanding business start-up behaviour: *"by examining how entrepreneurs perceive their prospects, should increase our understanding of entrepreneurial thinking and of the processes leading to the formation and development of new firms."* (Cooper, Woo, & Dunkelberg, 1988, p.98).

(ix) *Cognitive mapping*. Brannback and Carsrud (2009) highlight cognitive mapping (from the field of cognitive psychology) as another element that influences an entrepreneur's motivation for success; such cognitive maps (or maps of sense-making and action) are used by entrepreneurs to guide them through the venture creation process. The nexus between perceptions and actions are encapsulated by Brannback and Carsrud (2009, p.78): *"...cognitive maps are not only representation of individual perceptions; cognitive mapping study how people "see" things and how these sights differ and impact subsequent action"*.

Entrepreneurship involves human agency. The entrepreneurial process is brought to life by individuals acting on opportunities (Shane et al., 2003). As such, entrepreneurial motivation might consist of a single reason or indeed a multiplicity of reasons for starting a business, which could include: financial gain or wealth accumulation; personal satisfaction;

controlling one's own destiny; the realising of a vision; helping the local community; creating employment for others, and creating self-employment. Thus, greater motivation can be expected to be associated with greater self-belief. Motivations that are personal, intrinsic and about self, for example, to prove that *"I can do it"* such as starting a business, can be expected to be associated with personal belief (self-efficacy). Ultimately, however, all human action requires a combination of motivational and cognitive (ability, skill and intelligence) factors (Locke, 2000). Research indicates some nascent entrepreneurs have unrealistically high aspirations at the start-up stage, mainly as a consequence of being overly optimistic, inexperienced or incompetent; others exhibit more realistic aspirations (Davidsson, 2006). *Thus,...*

H3	There will be a relationship between intrinsic motivation (IM) and entrepreneurial self-efficacy (ESE) in nascent necessity entrepreneurs

Motivational paradigm differences can further be observed between necessity and opportunity entrepreneurs. The Global Entrepreneurship Monitor (GEM) studies (Reynolds et al., 2002) identify survival-oriented motivation in necessity entrepreneurs. These are entrepreneurs whose primary focus is to avoid starvation and meet basic needs, and are differentiated from opportunity entrepreneurs who are motivated to exploit a given opportunity for some form of benefit (Reynolds et al., 2002).

Carsrud et al. (2009) indicate that although many types of motivation exist, motivations essentially spring from two sources; internally (inside one's self) and externally (from one's outside environment). As a result, motivation can either be intrinsic or extrinsic in nature.

Ryan and Deci (2000), and Quigley and Tymon (2006) demonstrate that the quality of experience and given level of individual performance differs markedly depending on whether the behaviour is underpinned by intrinsic or extrinsic motivational drivers.

Intrinsic motivation refers to *"doing something because it is inherently interesting or enjoyable"* and where the individual acts to accept a challenge rather than acting as a result of external pressures (Ryan & Deci, 2000, p.55). Intrinsic motivation builds on positive/rewarding experiences that result from undertaking such activities; thus, building intrinsic motivation supports positive feelings and general orientation (Thomas, 2000). Achievement motivation *(nAch)*, (discussed earlier), is an example of intrinsic motivation (Carsrud et al., 1989).

Extrinsic motivation involves external rewards following an expected/given behaviour (Perwin, 2003); and *"doing something because it leads to a separable outcome"* (Ryan & Deci, 2000, p.55). Individuals might be obliged to perform extrinsically motivated activities out of resentment, fear, or disinterest – such externally driven motivations are considered as typical examples of *"passive"* or *"controlling"* extrinsic motivations. However, it is worth noting that extrinsically motivated objectives can also be adopted and self-endorsed by individuals, resulting in an elevated sense of *"active"* or *"volitional"* form of extrinsic motivation (Ryan & Deci, 2000).

Intrinsic and extrinsic motivations can exist in combination, and are not mutually exclusive (Kuratko, Hornsby, & Naffziger, 1997; Carsrud & Brannback, 2011).

Ryan and Deci (2000) consider intrinsic motivation to essentially be the "human motivation default setting", and highlight its importance:

> *"Intrinsic motivation is not the only form of motivation, or even volitional activity, but it is a pervasive and important one. From birth onward, humans, in their healthiest states, are active, inquisitive, curious, and playful creatures, displaying a ubiquitous readiness to learn and explore, and they do not require extraneous incentives to do so. This natural motivational tendency is a critical element in cognitive, social, and physical development because it is through acting on one's inherent interests that one grows knowledge and skills"* (p.56).

Even though intrinsic motivation is the more natural state of being, most activities that individuals engage in are not intrinsically motivated. A substantial decline in intrinsic motivation is noted after early childhood, given the increasing social demands, roles, and responsibilities individuals are required to perform (Ryan & Deci, 2000).

As this study straddles an entrepreneurship training and incubation program, it is appropriate to highlight that intrinsic motivation has emerged as a key consideration in enhancing teaching strategies of educators; however, care should be taken as outcomes are potential dichotomous - teacher interactions can either engender, or undermine, learning achievement (Ryan & Stiller, 1991). Intrinsic motivation supports and delivers high-quality learning, innovation and creativity, making it essential to identify supportive versus undermining forces of learning (Ryan & Deci, 2000). *Hence,…*

H5	There will be an increase in intrinsic motivation (IM) immediately after an entrepreneurship training and mentoring program in nascent necessity entrepreneurs

To this end, Deci and Ryan (1985) crafted their Cognitive Evaluation Theory (CET) as a sub-theory to their original Self-Determination Theory (SDT). SDT sought to determine which social and environmental factors would *facilitate* versus *undermine* intrinsic motivation. CET specifies factors in social contexts that will produce variability in levels of intrinsic motivation. These mutually-dependent factors comprise: (i) experiencing *feelings of competence* during an activity (cultivated through receiving rewards and/or positive feedback), which in turn enhance intrinsic motivation in relation to that activity; resultantly fulfilling a basic psychological need for competence; and, (ii) overlaying this feeling of competence with a *sense of autonomy* (Deci & Ryan, 2000).

Conversely, a range of factors exist that can undermine internal motivation. Deci, Koestner, and Ryan (1999) conducted a meta-analysis study which affirmed that every type

of tangible reward made contingent on the performance of a stated task undermined intrinsic motivation. Moreover, intangible "inducements" such as threats, deadlines, and competitive performance pressures further diminish intrinsic motivation as these factors are experienced as controlling of their behaviour and limiting autonomy (Amabile, DeJong, & Lepper, 1976). Van Gelderen and Jansen (2006) value autonomy in its own right as an intrinsic motive; Amabile (1996) asserts that autonomy (as an intrinsic motive) is furthermore related to creativity and innovation; and Corman, Perles, & Vancini (1988 as cited in Amabile, 1996) attest to autonomy being a primary motive for nascent entrepreneurs to create new ventures.

Quigley and Tymon (2006) present a model of intrinsic motivation for career self-management. All four components: *meaningfulness, choice, competence*, and *work progression/success* are considered as key components of intrinsic motivation (Thomas, 2000). When harmonised, these components powerfully build intrinsic motivation through the enabling of individual initiatives and interpersonal facilitation (Quigley & Tymon, 2006).

According to Gilad and Levine (1986), necessity entrepreneurs are more likely *"pushed"* into entrepreneurship through the existence of negative external forces. Examples of such external (extrinsic motivation) forces might be the inability to secure employment, job dissatisfaction, or inflexibility of current work arrangements, and are also referred to as necessity motives (Thurik et al., 2008).

The "*pull-theory"*, in contrast, engenders an attraction into entrepreneurship through a range of intrinsic/positive motivational forces, such as independence, self-fulfillment, value/wealth creation, and other affirming outcomes. Research indicates that more individuals are enticed into entrepreneurship by pull factors (Keeble, Bryson & Wood, 1992, as cited in Segal, Borgia & Schoenfeld, 2005). Push factors tend to be less prevalent

in Western countries (Hessels, Van Gelderen, & Thurik, 2008; Cassar, 2007). Push motives do however play a significant role in developing countries, and to a lesser extent in developed countries (Grilo & Thurik, 2008, as cited in Davidsson, 2006).

Necessity motivated entrepreneurs fully depend on their business survival to ensure their own economic existence, thereby suggesting positive aspirations with their business (Hessels, et al., 2008). These positive aspirations may however be difficult to realise as a result of constraints relating to technology access, availability of financial capital, and human resource availability. Consequently, the expectation would be the lowering of growth expectations which may lead to a situation of being forced into pursuing less promising opportunities (Morris et al., 2006, as cited in Hessels, van Gelderen & Thurik, 2008). *It is therefore anticipated that…*

H12	There will be a positive relationship between nascent necessity entrepreneur intrinsic motivation (IM) at different points in time

Some necessity entrepreneurs simply do not have the time to wait for better opportunities to emerge; thus, necessity entrepreneurship may actually inhibit opportunity entrepreneurship (Carsrud & Brannback, 2011). Unsurprisingly then, entrepreneurs with necessity motives are less oriented towards growth and innovation than those with opportunity motives (Hessels et al., 2008).

Edelman et al. (2010) remark that to date, limited research has examined new ventures by race/ethnicity. As the participants in this study are indigenous nascent entrepreneurs, an expectation exists that participants in this study might be represented by a broader set of entrepreneurial motivations for going into business (compared with non‐indigenous entrepreneurs). Such differences between indigenous and non‐indigenous entrepreneurs are noted by Hindle and Landsdowne (2005), who posits that non‐indigenous entrepreneurs might focus on issues such as developing innovation capability and

commercialisation of ideas and products, whereas indigenous entrepreneurs might give consideration to sacrificing individual gain for the greater communal good. Anderson (1999, as cited in Anderson, Giberson, Hindle, & Kayseas, 2004) concurs, noting that there is a divergence of focus - away from individual beneficiation towards beneficiation of the extended community; additionally, this phenomenon frequently underpins a desire from these communities to be self-sustaining and to re-assert and retain traditional values and heritage. These variations may inter-alia be attributed to differences in culture and values and are not further explored in this study.

A strong preference exists among individuals in some indigenous communities to craft, execute and manage their own entrepreneurial venture strategies (Anderson, 2002; Anderson et al., 2004). In these situations, it may be that personal intrinsic motivations may feature as a key factor influencing the intentions and behaviours of such individuals. However, to the extent that intrinsic motivation can be enhanced through, for example, training, has not been explored in any detail. The research attempts to provide some insight into this area by investigating whether intrinsic motivation can be enhanced both in the short term and the long term through exposure to training and mentoring. It is therefore suggested that a study of entrepreneurial motivations, aspirations and success among indigenous nascent entrepreneurs would need to include both economic and social measures (Lindsay, Lindsay, Jordaan, & Mapunda, 2007).

Thus, in summary, entrepreneurial motivations represent both internal intrinsic and external elements (Elfving, 2008; Quigley & Tymon, 2006), and may change over time (Cassar, 2007). Moreover, the definition and ultimate measurement of entrepreneurial success is highly dependent on both intrinsic and extrinsic motivational factors of the individual involved (Kuratko, Hornsby, & Naffziger, 1997). As motivation encompasses mental interpretation and organisation of sensory information, it is by necessity impacted by

a diverse range of cognitive factors (extending beyond the examples of goal theory, risk perception, and cognitive mapping discussed in this Chapter).

H8	There will be an extended increase in intrinsic motivation (IM) (over Baseline) after nascent necessity entrepreneurs complete an entrepreneurship training and mentoring program

5.4 Entrepreneurial Intentions

Given that entrepreneurial intention is one of the key constructs of this study, it may be useful to start by defining *intention*. Webster's Dictionary (2011) defines intention as: *"A determination to act in a certain way or to do a certain thing; a purpose; a design."* Krueger (2009) defines intention as *"the cognitive state temporally and casually prior to action"* (p.51).

The intention construct has proven to be consistently robust (Krueger & Brazeal, 1994; Krueger, Reilly, & Carsrud, 2000). As discussed in the theoretical foundation section, the theory of planned behaviour (TPB) is the intentions-based model used in this study. Ajzen's (2005) TPB postulates *"that a person's intention to perform (or not to perform) a behaviour is the most important immediate determinant of that action"* (p.117).

The TPB considers that there are three basic drivers that ultimately shape intentions (and behaviours); (i) a person's attitude toward the behaviour, (ii) social pressure/influence (subjective norm), and (iii) perceived control (the ability to perform the behaviour, or perceived behavioural control). When all three of these dimensions are positive, an individual is likely to have the intention to perform the behaviour (Ajzen, 2005). The TPB has proven empirically robust, and several meta-analyses have been undertaken that have provided ample support (Albarracin, Johnson, Fishbein, & Muellerleile, 2001).

Krueger's (2009) definition of *entrepreneurial intention* is adopted for this study, as *"the intent to start a business, to launch a new venture"* (p.55). Bird (1988) argues that

intentionality appears to be at the core of entrepreneurial behaviour; Krueger (2009) considers entrepreneurs to be "exemplars of intentionality". A key objective of this study is to gain a better understanding of how entrepreneurial intentions shape ultimate behaviour. This endeavour should provide further insight as to whether (or not) nascent entrepreneurs will advance from the mere cognitive intention to start a business to demonstrable business start-up activity. *Thus, building on current theory, it is expected that...*

H4	There will be a relationship between entrepreneurial intention (EI) and entrepreneurial start-up behaviour (ESB) in nascent necessity entrepreneurs

Krueger, Reilly, and Carsrud (2000) confirm that intention-models, for example, can describe how entrepreneurial education and training can shape intentions leading to subsequent business start-ups. As this study is largely undertaken within the ambit of an entrepreneurship education, training and incubation program, such an intention type model is particularly relevant. Intention based studies applying Ajzen's theory of planned behaviour have been undertaken among post-secondary students intending entrepreneurship as a career choice; results have affirmed the Ajzen factors as predictors of entrepreneurial intent (Bird, 1988; Kolvereid, 1997; Krueger & Carsrud, 1993; Autio et al., 2001). *As such, it can be expected that…*

H7	There will be an increase in entrepreneurial intention (EI) immediately after an entrepreneurship training and mentoring program in nascent necessity entrepreneurs
H10	There will be an extended increase in entrepreneurial intention (EI) (over Baseline) after nascent necessity entrepreneurs complete an entrepreneurship training and mentoring program

Prior studies have considered whether entrepreneurial start-up activities can be predicted by using demographic and personality traits, or even situational/personal factors -

such as employment status. Results from these approaches have been disappointing, providing low predictive validity (Krueger, Reilly, & Carsrud, 2000). As a result, the direct (unmediated) influences of attitude, personality, beliefs and/or demographics on behaviour are not explored in this study.

Given the measured and meticulous planning that generally precedes and underpins the creation of new business ventures, an intention-based approach would appear to be more appropriate than models measuring seemingly randomly distributed demographic factors and/or personality traits.

The importance assigned to the planning activity by nascent entrepreneurs is the direct result of seeking to limit the downside of future business uncertainty by considering the consequential risks that are allied to the start-up decision. It is for precisely this reason that Bird (1988), and Katz and Gartner (1988 as cited in Shane & Venkataraman, 2000) consider entrepreneurship as the ideal type of planned behaviour to apply to intention models. They concur that if intention models are useful to understand the intentions that underpin business start-up, they should also then provide a consistent and robust theoretical platform that is sufficiently generalisable for broader application and prediction.

Ajzen (1991), and Krueger and Carsrud (1993) state that the reasons nascent entrepreneurs offer for getting into business have a significant influence on whether they subsequently proceed to engage in entrepreneurial activity. These reasons are unsurprisingly diverse and might best be presented across a continuum, spanning from short-term, situational and need driven intentions (necessity/survivalist entrepreneurs), to longer term strategic intentions (opportunity based entrepreneurs) – fully anticipating and appreciating the impact of more complex external factors, such as disruptive technologies and changes to public policy and/or legislation.

It is therefore plausible to consider that the intention of individuals in the necessity category would have the potential to readily change (Krueger, 2009); particularly given an unexpected change in, for example, a personal circumstance or domestic situation, whereas an opportunity-based intention might be more robust and enduring given the benefit of extended risk review and prior contingency planning.

Both necessity and opportunity based entrepreneurs are likely to demonstrate non-linear decision making (Sarasvathy, 2001). Sarasvathy's effectuational thinking embraces the concept of an ever-changing pathway the entrepreneur needs to navigate in order to find the most desirable route towards the ultimate goal (Krueger, 2009). By understanding these reasons better may not only lead to building on and aggregating prevailing theory, but will contribute to the improvement in the quality of entrepreneurial education and training, policy design and decision making, and subsequent resource allocation where nascent entrepreneurial development initiatives are concerned.

Given this context, it follows that reasons provided by individuals to start new ventures (or reasons to decline to do so) are very important, as these reasons have traditionally been considered as the basis for intentions (Shaver, 1985 as cited in Carter, Gartner, Shaver, & Gatewood, 2003). New ventures are not created by accident, but through specifically directed entrepreneurial actions that are clearly intentional (Carter, Gartner, Shaver, & Gatewood, 2003). Extensive research has been conducted regarding reasons given by entrepreneurs for starting businesses. *Thus,...*

H14	There will be a positive relationship between nascent necessity-entrepreneur entrepreneurial intention (EI) at different points in time

In conclusion of this section, it is perhaps appropriate to raise a general note of caution when considering the inclusion of retrospective accounts of prior intentions. As might be expected, prior studies have provided a range of reasons why entrepreneurs have

proceeded to business start-up. For meaningful nascent entrepreneur comparisons, care has to be taken to ensure that respective international studies have used participants *prior* to setting up their businesses. In this context, Gartner (1989) has cautioned that there is substantial concern regarding validity of results, as there has been a question regarding the retrospective nature of responses from entrepreneurs long after they are in business. The reasons for concern are that retrospective accounts - when describing prior intentions - are likely to have a significant self-justification bias (Gartner, 1989). As this study has conducted measures at three different points in time, it is anticipated that such self-justification bias would not be present, or at least be significantly diminished.

It is recognised that the traditional intention-model used in the study assumes one-directional causality, thus, entrepreneurial intentions are the product of antecedents. Brannback et al. (2006), and Krueger et al. (2007) have recently questioned whether the antecedent-intentions path is more likely bi-directional and dynamic, rather than static. Krueger (2009, p.54) concludes by speculating that *"even if causation is reciprocal, what if intent influences its antecedents than vice versa?"*

5.5   Entrepreneurial Behaviour

"No opportunity is exploited nor does any venture come to exist, survive, or grow without entrepreneurs taking action; entrepreneurs' behaviour is a key construct in understanding how entrepreneurs create new organisations" (Bird, Schjoedt, & Baum, 2012, p.889).

Bird & Schjoedt (2009) define **entrepreneurial behaviour** as *"identifying and exploiting opportunities through creating and developing new ventures"* (p.327). Gartner, Carter, and Reynolds (2010) extend the definition by including exploration and opportunity creation in early-stage ventures. Kuratko, Ireland, Covin, and Hornsby (2005) recognise

entrepreneurial behaviour as the driving force behind innovation in existing organisations, and is credited for bringing about social change (Davidsson, Delmar, & Wiklund, 2006).

This study sets out to measure behavioural outcomes of nascent entrepreneurs, and treats the entrepreneurial behaviour construct as a dependent variable. This particular study is a by-product resulting from a South African government funding initiative that sought to support entrepreneurial training and incubation programs, with the objective of enticing participants into venture creation. As key funders of such initiatives in future, it stands to reason that governments (and investors) would have an interest in the efficacy of developmental spending; such efficacy should be greatly enhanced given a better understanding of nascent entrepreneurs' start-up behaviours. Such broader "beneficiation dividends" would extend to the "actors" (nascent entrepreneurs) themselves by allowing them to make the necessary behavioural changes to deliver better quality outcomes, as well as entrepreneurship educators and researchers (Bird, Schjoedt, & Baum, 2012). Although it is expected that entrepreneurship training and mentoring will contribute positively toward business start-up behaviour, it would be naive to expect that all nascent entrepreneurs who participate in such training programs will engage in business start-up. *Therefore,...*

H11	Not all nascent necessity entrepreneurs will achieve complete business start-up (ESB) subsequent to completing an entrepreneurship training and mentoring program

It is thus appropriate that the focus of this study is at the individual entrepreneur level, rather than the firm/organisational level. More pointedly, it is the *"concrete, theoretically observable actions of individuals (as solo entrepreneurs, or as part of a team of entrepreneurs) in the start-up or early stages of an organisation"* (Bird, Schjoedt, & Baum, 2012, p.890) that are of consequence in measuring this construct. Observing demonstrable actions are challenging as most such behaviours tend to be non-specific, self-reports; often difficult to connect to observable objective behaviours, resulting in inconsistent audience

interpretation (Bird & Schjoedt, 2009). Bird et al. (2012) provide greater granularity on the nature of behaviours:

> *"These behaviours are the proximal outcome of traits, knowledge, skills, abilities, cognition (e.g., perceptions, thoughts, mental models, and scripts), motivation and emotion. Behaviour is also the proximal individual-centric cause of venture outcomes (e.g. existence, sales, products, survival, and growth). The major goals of research on entrepreneurs' behaviour are to explain, predict and control (shape and change) behaviour at the individual and team level."* (p.890).

The area of entrepreneurial behaviour is considered to be significantly under-researched (Bird & Schjoedt, 2009). In response, there is a call for scholars to direct entrepreneurial behavioural research by focusing on *"human action in venture creation"* (Bird et al., 2012); *"physical and organisation creation"* (Bhave, 1994, as cited in Davidsson, 2006); and, *"actions toward organisational emergence"* (Gartner, Bird, & Starr, 1992).

In search of greater conceptual research clarity on entrepreneurial behaviour, Bird and Schjoedt (2009) propose that refinements might judiciously be sourced from the area of organisational behaviour. Prior to the discussion, some definitional structure is appropriate. Entrepreneurial behaviours are considered to be *"discrete units of individual activity that can be observed by an "audience" and that have meaning that is likely to be shared between actor and audience"*; and, *"behaviours need to be distinguished from results...writing a business plan is a behaviour, having a written business plan is a result"* (Bird et al.,2009, p.335).

Bird and Schjoedt (2009) identify four refinements that might be borrowed from organisational behaviour to ensure greater robustness in entrepreneurial behaviour research:

(i)   Focusing on meaningful units of behavioural activity *(molarity)*. Criticism is levelled at entrepreneurship researchers of having a propensity to make behavioural units too unwieldy. Behaviour psychologists (such as Edward Toleman), regard behaviour as being distinct or tangible, rather than abstract. The test of behaviour should therefore be either theoretically or practically discernible by a third party; evidenced through hearing, measuring, or observing the action.

(ii)   As entrepreneurial behaviours are consciously entered into, individuals can be approached to report on behaviours of interest. Self-reports are however subject to limitation of recall and social desirability bias (Chandler & Lyon, 2001), and scholars should seek to move away from self-reporting to more rigorous primary measurement methods. The caveat for utilising self-reports should be controlling for respondents who avoid reporting socially less-desirable activities (Arnold & Feldman, 1981, as cited in Bird, & Schjoedt, 2009).

Self-reports were utilised in this study, however, with the involvement of mentors and facilitators (trainers) in the incubation process, improved data integrity occurred as a result of this "oversight control".

(iii)   Poor construct measurement has been evident in early entrepreneurial trait research. Given the complexity of entrepreneurial behaviour in the venture creation process, quality measurement is very important (Boyd, Grove, & Hitt, 2005).

Issues regarding the suitability of relying only on single-item measures should be considered in the context of reliability and validity, since the meaning is dependent on the context of preceding items (Churchill, 1979).

(iv)   The cognitive *opportunity recognition-intention-behaviour-results* continuum marches to the beat of its own drum; it has no set pace to complete its stages; additionally, no one knows the exact duration a particular behaviour may take, or, when it starts and concludes. The time lag between forming an intention and resultant action relating to that intention is further subject to the distortion of historical effects (Bird & Schjoedt, 2009).

Bird and Schjoedt (2009) point to three potential areas of behavioural research focus for entrepreneurship researchers: *leadership, communication,* and *behavioural roles*; and two areas that are less-behavioural, yet still considered critical: *creativity,* and *opportunity discovery*. This research touches on, or at least, traverses entrepreneur behaviour outcomes.

This research opportunity arose through the participants of this study being immersed in a publicly funded one-year entrepreneurship training and mentoring program as part of a South African government initiative to create self-employment among unemployed youth. Prior to program commencement, participants were made aware that the creation of new ventures would be an expected behavioural outcome. Delivering successful outcomes would be of importance to the funders of such initiatives. Moreover, any model that is able to improve predictive ability of nascent necessity entrepreneurs to engage in venture

creation would be of particular interest to developing countries, as it has the potential to contribute towards economic growth and unemployment reduction strategies in these economies.

6.0 Chapter Summary

This Chapter presents the conceptual research model for the study. Within the context of the model, it reviews the nominated constructs, the construct inter-relationships, and hypotheses pursuant to the objectives of this study. Constructs of note are entrepreneurial self-efficacy (ESE), intrinsic motivation (IM), entrepreneurial intention (EI), and entrepreneurial start-up behaviour (ESB). These constructs which, at the core, are well embedded in various strands of psychology, are explored and discussed as part of a review of current theoretical foundations.

The Chapter positions the conceptual model within the prevailing external macro-economic and political environments, and expands its central theme – investigating the motivations, "drivers", and justifications of entrepreneurs in establishing businesses.

Entrepreneurs can broadly be categorised as either opportunity entrepreneurs, or necessity/survivalist entrepreneurs. As might be anticipated, these categories of entrepreneurs have vastly disparate motivational drivers. It is therefore incumbent upon governments to recognise such differences and to craft differentiated response strategies. The appropriateness of this response will not only enhance the probability of increased business start-up activity, but also the efficacy of various resourcing models.

The participants in this study are considered to be indigenous nascent necessity-entrepreneurs. Consequently, the level of analysis in the study is the individual.

Chapter 3: Research Method

Chapter 1 Introduction	Chapter 2 Literature Review	**Chapter 3 Research Method**

Chapter 4 Results	Chapter 5 Discussion	Chapter 6 Thesis Summary

Appendices
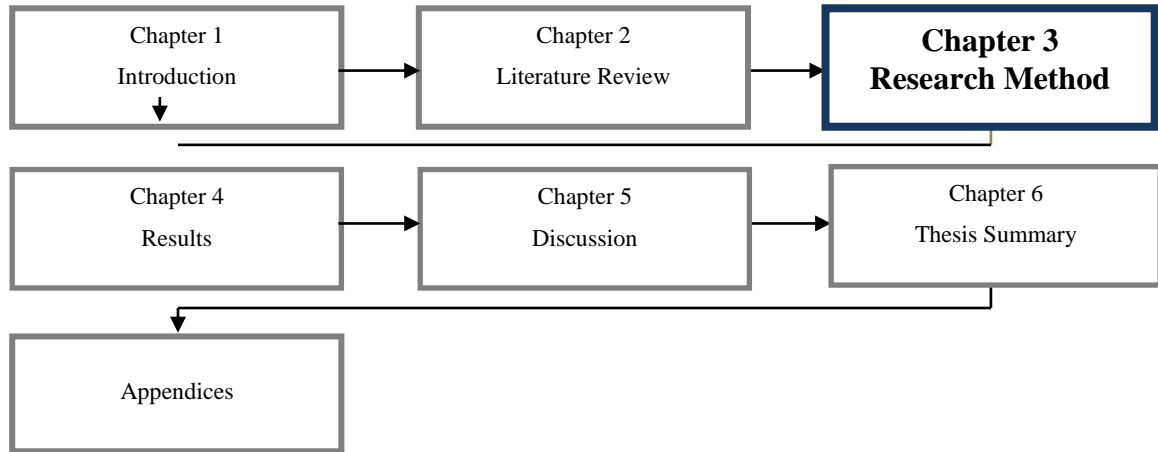
1.0 Introduction

Chapter 3 discusses the research methodology adopted in this study. It describes the research approach, research design, the participants involved in the research - their profile and process of recruitment (advocacy, sourcing, screening and selection), the one-year integrated entrepreneurial education and training intervention (classroom delivery, mentoring and incubation elements), the research questionnaire, the scales used to measure the key constructs and the data analysis method utilised.

2.0 Research Approach

Approaches to research have traditionally been book-ended by quantitative and qualitative research approaches. This long held, near bi-polar perspective, has dominated the research landscape for an extended period of time and is often reflected in the stance and unyielding opinions of researchers from either side of this continuum. Neuman (2006, p.14) points out that *"there is often ill will between the followers and respective styles of research"* and Neuman (2006, p.13) *"some find it difficult to understand or appreciate the other approach"*.

The reasons for the duality in the various approaches essentially lay within different paradigms. The *positivist research paradigm* is supported by quantitative research methods, whilst qualitative research methods are used within the *interpretivist paradigm.* At the core of the positivist research paradigm is the belief that universal laws of human behaviour "are out there" and can therefore be identified, with a view to control, manipulate and predict events. This view is echoed by Neuman's (2006, p.83) statement on the positivist view on human agency: *"deterministic relationships look for determining causes or mechanisms that produce effects."*

The interpretivist paradigm in turn, adopts a contrarian belief that humans are indeed complex, unpredictable and idiosyncratic beings who are subject to a vast range of individualised responses that nullifies the "universal laws of human behaviour" embraced by positivists (Cavana, Delahaye, & Sekaran, 2001). Developments in emerging literature indicate a trend whereby increased consideration is being given to mixed-method approaches (Creswell, 2009, p.18).

Quantitative research is characterised by the search for rigorous and exact measures. Objective observation, precise measurement, robust statistical analysis and verifiable truths are the bedrock on which to construct theory. Hypotheses are formulated and subsequently tested by meticulous data analyses, gained primarily through the use and manipulation of statistical tools. The conviction is that by following the quantitative approach, a law of universal behaviour will emerge. This universal law is established by infusing deductive and logical reasoning which can then be utilised to predict and control future human behavioural events (Cavana, Delahaye & Sekaran, 2001).

Deductive reasoning or *deduction* describes a systematic process whereby a researcher starts with a theoretical proposition and sets out to substantiate this proposition with empirical evidence involving correlation data analyses between two or more constructs or concepts. Neuman (1997) summarises quantitative research as *"an organised method for*

combining deductive logic with precise empirical observations of individual behaviour in order to discover and confirm a set of probabilistic causal laws that can be used to predict general patters of human activity"(p.63).

According to Creswell (2009, p.17), the following points constitute key elements of quantitative research, many of which are identified in this study:

- Reality as a concept is both singular and objective

- The researcher remains independent of that which is being researched, and consequently research is considered to be value-free and is unbiased

- That theory is mostly causal and deductive

- Hypotheses are posited by the researcher (as catalyst for the research) at the outset and are subsequently tested

- Concepts are used in the form of distinct constructs or variables

- Standardised measures are methodically created prior to data collection taking place

- Data is presented in the form of numbers resulting from precise measurements

- Analysis is undertaken by making use of statistics, tables and/or charts and an ensuing discussion as to whether these link to the set hypotheses.

For the purposes of this study, a positivist approach is considered appropriate because:

- theoretical positions (hypotheses) are stated

- by following processes of deductive reasoning, robust empirical evidence is aggregated towards proving or disproving set hypotheses (Creswell, 2012)

- quantitative data will be analysed using statistical methods to investigate possible causal relationships among the variables in the study (Creswell, 2012). In this

instance, statistical methods will include the use of structural equation modeling (SEM), and

- the study is ultimately seeking to achieve generalisable outcomes with a view to making general predictions of human behaviour

This research investigates causal relationships among selected variables with regards to business start-up activity. In addition to making a theoretical contribution, other more pragmatic outcomes are also envisaged – on the proviso that results are generally replicable. Such outcomes can inter-alia include informing the design, development and delivery of future entrepreneurial education training and incubation programs, and a contribution towards drafting entrepreneurial education policy frameworks and associated funding models.

3.0 Research Design

Exhibit 3.1 provides an overview of the research design. A longitudinal repeated-measures design has been adopted in this study. With a longitudinal repeated-measures design, measurements are taken over time on each participant in the study. Weiss (2005, p.10) considers longitudinal designs to be *"a mandatory design issue where there is an interest in the prevailing trend over time,"* and where conducting a cross-sectional study will not provide the requisite predictive ability.

Longitudinal designs provide for repeated measures analyses of variance and are frequently used with observed variables to empirically test for changes over a given period of time (Schumacker & Lomax, 2010). Structural equation modelling enables the inclusion of latent variable growth over time in longitudinal analyses using intercepts and slopes – referred to as latent growth models (Byrne & Crombie, 2003 as cited in Schumacker & Lomax, 2010).

Weiss (2005, p.2) espouses the defining feature of longitudinal data to be "*the multiple observations within a subject that can be ordered across time*". He classifies longitudinal data to be a particular form of repeated measures data. In this study, measures are repeated at three intervals during the period of the research.

Repeated measures are studies that are designed to examine individual parameter differences (of an individual) through repeated measures of the identified variables. The objective is to determine whether any generalisable trend changes might have emerged over the period of the study. Davidsson's (2005) process perspective on entrepreneurship supports the application of conventional longitudinal design techniques; however, when faced with a continuous dependent variable (as is the case in this study), he advocates longitudinal growth modelling (LGM). LGM can be applied to latent variable models as well as direct and indirect relationships.

In this study, entrepreneurial self-efficacy (ESE), intrinsic motivation (IM), entrepreneurial intention (EI), and entrepreneurial start-up behaviour (ESB) measures were repeated at three data points. This research design overview is presented in Exhibit 3.1.

Exhibit 3.1: Overview of the Research Design
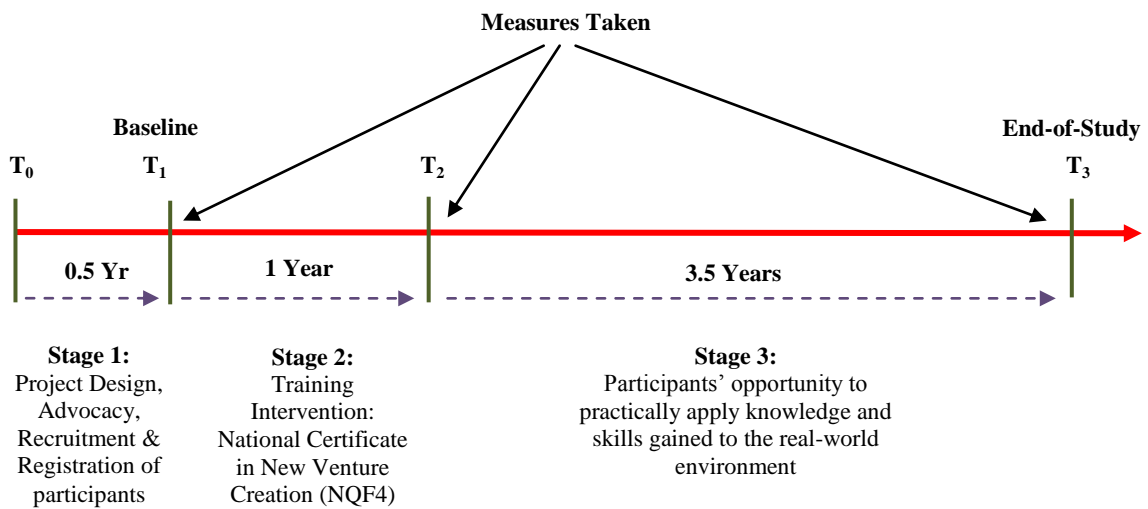
The duration of the overall research project (from T_0 to T_3) spanned 5 years and consisted of three distinct stages/phases. Measures were taken at three points during the research project. The first measure took place at point T_1 (which represented the *"Baseline"* measurement) just prior to commencement of the formal education and training intervention. This was followed by the second measurement (point T_2) taken upon completion of the integrated one‑year education and training intervention *("End-of-Intervention")*. The third and final measure *("End-of-Study"),* which was taken at T_3, was taken 3.5 years after the completion of the training intervention. The research design considered activities in each stage as appear in Exhibit 3.2.

Exhibit 3.2: High-level Overview of Key Project Stages and Activities

Stage	Duration	Activity during this phase
Stage 1 **(T_0 to T_1)**	**6 months**	• A steering committee ("Steercom") was established at (T_0) to oversee the strategic and operational aspects of the project. The Steercom comprised of representatives drawn from the research team, training provider organisation, business incubator, and the government's industry skills council (Sector Education and Training Authority - SETA). • Early stage activity involved the strategic design and project planning around both the implementation of the integrated 12-month training program (classroom, incubation and mentoring) and the research project.

Stage	Duration	Activity during this phase
		• Project deliverables included the advocacy of the government-funded entrepreneurship training initiative to previously disadvantaged communities. Care was taken to ensure that the early stage screening identified those who sought to enter and commit to a 12-month full-time learning programme, rather than identify this as a stop-gap bridging measure until a job was secured. • Extensive recruitment/sourcing was undertaken and all candidates were subject to a two-hour written screening assessment (care was taken to ensure that a culturally unbiased numeracy and literacy tool was used as all candidates were English Second Language speakers). The written assessment was followed by an interview (for those qualifying candidates who achieved the requisite scores on the numeracy and literacy assessment). • Contractual one-year agreements were concluded with participants in the form of learnership (apprenticeship) agreements; entered into between the learner, training provider, and representative employer. • Research questionnaires were administered and the first measure (T_1) was taken immediately prior to commencement of the formal training intervention.
Stage 2 (T_1 to T_2)	12 months	• The training implementation stage consisted of the integration of theoretical (classroom based) teaching, mentoring and business incubation. • Assessment criteria demanded the integration and evidence of theoretical and practical (skills based) learning. However, the primary focus was centred on mastering the essential skills to prepare individuals to start-up new business ventures. • The second measure (T_2) was taken just after completion of the last incubation, 12 months after (T_1).
Stage 3 (T_2 to T_3)	42 months	• The third and final stage commenced immediately after completion of the training intervention. In the intervening period of 3.5 years, participants had the opportunity to reflect on, and integrate the knowledge and skills taken from the training intervention, and act thereon (or to decide not to). • The third measure (T_3) was taken 42 months later.

4.0 Research Environment

The training intervention was funded by the South African National Government through the Department of Labour's National Skills Fund (NSF). The formal project owner was the SETA (Sector Education Training Authority). The project brief was to deliver a formal entrepreneurship qualification together with incubation and mentoring support to

450 unemployed individuals over a one‑year period, with a view of establishing as many self‑supporting new ventures as possible after the completion of the intervention. Agreement was reached with the SETA that project outcomes would be significantly enhanced if the project activity was located within the most populous and economically vibrant province in South Africa, Gauteng.

Although Gauteng Province is the smallest of the South‑African provinces as measured by land area (only 1.4% of South Africa), it has a population of 11.3 million people (per 2011 census) and contributes approximately 35% of national output and approximately 10% of the entire Gross Domestic Product (GDP) of the African continent (Statistics South Africa, 2012). The two largest cities in Gauteng are Johannesburg (whose greater area includes the *So*uth *We*stern *To*wnships – "*Soweto*"), and Pretoria which is situated about 60 kilometres to the north of Johannesburg.

The primary objective of government in funding this integrated training program was to provide unemployed and *previously disadvantaged individuals* (Black, Coloured and Indian people) with an opportunity to receive entrepreneurship training and mentoring to create ventures that would not only build economic activity to become self‑sufficient, but also have the prospect of creating employment for others. Unemployment in South Africa is high and although estimates vary, the official unemployment rate has exceeded 20% over the last five years (Statistics South Africa, 2012).

Understanding the relationship between entrepreneurial activity and national economic development is important, and has been of primary interest to the Global Entrepreneurship Monitor (GEM) research consortia since 1997. The GEM 2012 South Africa report re-affirms the focus of the research to be the role of the individual in the entrepreneurial process; and considers *"every person engaged in any behaviour related to new business creation, no matter how modest, is regarded as having an impact on the national level of entrepreneurship"* (Turton & Herrington, 2012, p.13).

Most pertinent to this study is the GEM's primary measure of entrepreneurship, being Total Early-Stage Entrepreneurial Activity (TEA) indexation, indicating the existence of early-stage nascent entrepreneurial activity in a given country. Turton & Herrington (2012) affirms that a consistent relationship exists between a country's stage of economic maturity and its level of entrepreneurial activity.

The decline in South Africa's TEA rate from 9.1% in 2011 to 7.3% in 2012 is disquieting, and remains well below the 13% average for other comparable efficiency-driven economies. Similarly, South Africa's entrepreneurial intentions measurement reflects a rate of 14% which is substantially below the efficiency-driven economies' average of 27%.

Low levels of literacy and numeracy generally exist in the Black and Coloured communities. These are, inter-alia, being addressed by the National Skills Development Strategy (NSDS). Given the rate of population growth coupled with the inability of commerce and industry to grow employment at a commensurate pace, the absorption of the unemployed into formal employment is likely to remain a serious socio-economic issue for government in future.

Policy and regulatory changes are occurring to help simplify the creation and establishment of start-up ventures for would-be entrepreneurs in South Africa, albeit at a very slow rate (Turton & Herrington, 2012).

To this end, government policy has enabled the following changes to assist start-up ventures: *(i) created a new Small Enterprise Funding Agency (SEFA) by merging three existing public sector funding enterprises and streamlining the fragmented approach that had existed before; (ii) made changes to the Companies Act (May 2011) by reducing the number of incorporation documents; (iii) lifted the small business tax threshold; and, (iv) no longer require small and medium enterprises to submit audited financial reports* (OECD 2013 Report). Further concessions supporting entrepreneurial development and alleviating

compliance requirements were announced in the 2014 Budget, together with the tax exemption of grants received by small and medium enterprises (National Treasury South Africa, 2014).

Despite these changes, the majority of GEM's South African experts consider the government's broader suite of economic policies to remain a major constraint in the business creation and development process (Turton & Herrington, 2012). Smorfitt (2008, as cited in Turton & Herrington, 2012), considers that there has been too much focus from government on direct funding to business rather than ensuring appropriate training in entrepreneurial skills. This view has largely been supported in the OECD 2013 Economic Report on South Africa, and there is a call for the expansion of entrepreneurship educational programs to develop entrepreneurship among youth in disadvantaged communities.

The prevailing socio-economic situation is further exacerbated by illegal immigration from neighbouring countries. It is evident that government must seek alternative solutions to the unemployment dilemma and the resultant social ills of crime, violence, and a general breakdown of the social fabric. This project is but one of an array of initiatives driven by the South African National Government to address the unemployment dilemma.

In addition to these external macro-economic factors, there are also some significant political legacy issues that affect the research environment. Although the vast majority of participants have prior tertiary qualifications, the research is undertaken fifteen years after the advent of a non-racial democracy in South Africa. Consequently, the participants are largely part of a first generation to have broad-based access to government supported tertiary education, training, and apprenticeship programs.

As might be expected in the course of redressing the political, economic and social imbalances of the former government, the African National Congress (ANC) controlled government has enacted a range of transformative enterprise legislation. The legislation,

known as Broad-Based Black Economic Empowerment (B-BBEE) was introduced in 2003 and was followed by the introduction of B-BBEE Codes of Good Practice (The South African Department of Trade and Industry, 2010) and is ubiquitous throughout business in South Africa.   B-BBEE legislation, inter-alia, directs: (i) mandatory preferential procurement from black-owned businesses by public and private sector organisations; (ii) applications for credit (including venture creation or acquisition funding) accelerated without traditional loan guarantees or surety requirements; (iii) mandated composition of employee demographics by race and gender for organisations to adhere to; (iv) business equity/ownership requirements dictating a stated share of black ownership; and (v) prescribing managerial-level staff quotas in organisations. From the perspective of this study, the general consensus and belief appears to be that these B-BBEE measures are strongly supportive to achieve the primary objective of this project, being the establishment of new ventures by indigenous nascent necessity-entrepreneurs.

Unsurprisingly, B-BBEE legislation has not been without its share of detractors. Most of these criticisms are unlikely to be directly relevant to this study, but one specific aspect has the ability to influence the participants' perception and behaviour in this study. This measure tangentially relates to the preferential procurement element within B-BBEE legislation. This particular element has been rather controversial as the appearance of inequitable awarding of public tenders (to individuals or organisations with political or other influence) leading to very rapid wealth accumulation for a relatively small number of beneficiaries.

The particular relevance of this issue in the context of this study might not be apparent at first, but is nonetheless important, as it has the potential to influence participants' perceptions that success in business is an "easy-ride" and depends largely on political or other favouritism; essentially a matter of "luck", endorsing the adage of *"who-you-know",* rather than *"what-you-know"*. Compared with the demands and complexities

of identifying opportunities, securing resources, assuming risks, and working hard – all fundamental tenets of the entrepreneurial process; entrepreneurship as an occupation might well appear too onerous and risky by way of outcomes to those seeking to gain financial independence through the businesses creation process. Such an orientation has the potential to influence the perception of entrepreneurial success, entrepreneurial intentions, intrinsic motivations, and business start‑up behaviours of participants in the study.

5.0   Research Participants

The participants were drawn from the greater Johannesburg and Pretoria metropolitan areas. As a result of the academic demands of the training program, participants with some evidence of post‑secondary study had been preferred. Initially, the minimum requirement to be considered was communicated as being in possession of a three‑year degree or degree equivalent diploma.

As sourcing and screening activities commenced, it was found that some candidates had not completed prior tertiary studies. Such candidates were then primarily assessed against the scores obtained on the screening/entrance assessments and interviews. If candidates achieved the qualifying criteria (quantitative score), they were allowed into the program. It is worth noting that the criteria set for entry was actually higher than the standard entry criteria for similar Certificate IV‑level programs (regular entry into this program mandated a Year 12 secondary school completion certificate as minimum requirement). Other (non‑academic) funding criteria stipulated that all participants: (i) needed to be unemployed; (ii) be from previously disadvantaged communities; and (iii) be below 35 years of age at commencement of the intervention.

5.1   Participant Advocacy: Participant Recruitment

Obtaining an unbiased randomly selected sample of the target population of nascent necessity‑entrepreneurs is a challenge. Most telephone users in South Africa do not use

fixed-line services (pre-paid mobile services are most prevalent). As a result, there are no up-to-date telephone directories to use for random selection of participants. Similarly, as a result of many people living in informal housing settlements, census records are incomplete. Consequently, alternate means of participant selection needed to be employed.

Effective advocacy in recruiting participants who met the the requisite grant funding criteria was one of the greatest challenges of the initial phase, and consequently required a substantial resource deployment. Community organisers were engaged and expression-of-interest posters and other notifications were placed at community centres/halls in consultation with community liaison representatives. In addition, some paid-for advertisements were placed in local and regional newspapers and airtime secured on regional/community radio stations. All communication channels were focused on directing interested parties to attend one of a series of briefing sessions held over a two month period.

Briefing sessions were conducted in English and considered essential as few people understood the concept of entrepreneurship and/or new venture creation. These town-hall type briefing sessions lasted about an hour each and allowed course details and other program information to be shared in an open forum with attendees. These face-to-face sessions further served as an ideal platform to deal with any questions prior to seeking the contractual learning commitment that was required to participate in the 12-month training intervention.

During these sessions, attendees were, inter-alia, informed of the following:

- That the vocational education and training program was a National Certificate in New Venture Creation at level 4 in the National Qualifications Framework (NQF), requiring a 12-month, full-time attendance commitment

- That during the 12-month period, the program would integrate theoretical classroom learning with mentoring and practical incubation-type activities

- Training fees for the participants would be fully funded by the government

- A limited learner subsistence allowance or stipend will be paid monthly to defray transport cost and meals while on the program

- That there is an expectation that the training intervention is a precursor to creating new ventures in the future

- That candidates would be required to undergo a written screening assessment together with a 20-minute interview process, to determine general literacy and numeracy skills, and a general awareness of venture creation

- That the intervention would form part of a longitudinal research project requiring the completion of questionnaires/surveys from time-to-time

- Attendees who were interested in the program were asked to complete and submit the program application form.

5.2   Participant Screening and Selection

The community hall advocacy sessions drew a total in excess of 1,400 interested individuals. Through the briefing session filtering process, it became obvious that some were *not* interested in creating new ventures. Others could not commit to the 12-month training and mentoring program without earning more money to economically sustain them; and some felt optimistic they could secure employment before the year was complete, necessitating premature withdrawal from the program.

Upon completion of the town-hall meetings, program applications from interested candidates totalled 1,107. The selection process required all applicants to undergo a two-phase screening assessment in English. The first assessment phase utilised a culturally fair and unbiased numeracy and literacy assessment instrument (designed for those who use English as a second language). The second assessment phase (which immediately followed the first assessment) involved a one-on-one interview undertaken by a member of the

steering committee. The purpose of the interview was to determine the applicant's personal goals and whether the applicant understood the full-time commitment required by the program. It included a discussion to ascertain whether the applicant had any previous entrepreneurial experience or if they had considered starting a business prior to attending the information session.

The numeracy and literacy test scores were added to the results of the interview. Candidates' total scores were then ranked from the highest to lowest scores. The minimum entry level criteria were met by more than 680 applicants. During the intervening process of the advocacy, screening and offer processes, some candidates managed to secure employment. This did not adversely affect the quality of the sample drawn from the eventual population from which the final participants were selected.

Contractual offers were subsequently made to the top-ranked candidates from the screening results. Some attrition occurred between the contractual offer process and the actual start of the intervention (T_1), as some candidates walked away from their signed contracts and decided not to commence with the program. As a result, 329 participants were considered to be serious about wanting to start businesses. These commenced with the program and represented the baseline nascent necessity participants at T_1.

5.3 Participant Profile

All of the selected 329 baseline participants indicated that they had intentions to start businesses, and were surveyed at T_1.

Participant demographics at T_1 appear in Exhibit 3.3 and Exhibit 3.4 "sub-parts" respectively. Exhibit 3.3 considers the gender distribution of the participants at commencement of the intervention.

Exhibit 3.3: Gender Distribution at T_1

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	171	52.0	52.0	52.0
Male	158	48.0	48.0	100.0
Total	**329**	**100.0**	**100.0**	-

The composition was weighted 52% female and 48% male. According to experienced vocational training managers represented on the project steering committee, these percentages were fairly consistent with similar 12-month government funded vocational programs at this level. In addition, their experience seemed to indicate that females appeared to be more committed to completing similar type programs, and generally produced better qualitative results overall than their male counterparts.

Exhibit 3.4 reflects the age distribution of this category. Even though a small number (less than 1%) of participants were in fact older than the 35 year age prescription, approval was obtained to retain these participants under the funding model.

Exhibit 3.4: Age Distribution at T$_1$

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18	2	.6	.6	.6
19	8	2.4	2.4	3.0
20	11	3.3	3.3	6.4
21	25	7.6	7.6	14.0
22	25	7.6	7.6	21.6
23	46	14.0	14.0	35.6
24	45	13.7	13.7	49.2
25	39	11.9	11.9	61.1
26	20	6.1	6.1	67.2
27	29	8.8	8.8	76.0
28	27	8.2	8.2	84.2
29	15	4.6	4.6	88.8
30	8	2.4	2.4	91.2
31	6	1.8	1.8	93.0
32	10	3.0	3.0	96.0
33	7	2.1	2.1	98.2
34	2	0.6	0.6	98.8
35	1	0.3	0.3	99.1
37	1	0.3	0.3	99.4
38	1	0.3	0.3	99.7
39	1	0.3	0.3	100
Total	**329**	**100.0**	**100.0**	-

The age distribution is 18 years to 39 years (age recorded at date of commencement of the program). However, given the program entry requirements, it is unsurprising that the highest frequency is distributed around the 21 to 28 age interval. It is also worthwhile noting that almost 90% of the participants are aged 30 and younger.

A significant number of participants in the 18 to 28 age interval did not have any prior working experience and viewed the program as important to enhance their skills. The remaining participants had some work experience but were unemployed and generally disillusioned with the prospects in the formal job market to secure employment. Their attitude generally reflected a necessity‑based desire to re‑skill themselves in order to

become self-sustaining given limited employment options in the formal economy. Exhibit 3.5 reflects the education level distribution at T_1.

Exhibit 3.5: Education Distribution at T_1

Highest Level Achieved	Frequency	Percent	Valid Percent	Cumulative Percent
Primary	1	.3	.3	.3
Secondary	48	14.6	14.6	14.9
Technical/Trade	21	6.4	6.4	21.3
Certificate	86	26.1	26.1	47.4
Diploma	108	32.8	32.8	80.2
UG Degree	43	13.1	13.1	93.3
PG Degree	22	6.7	6.7	100.0
Primary	1	.3	.3	.3
Total	**329**	**100.0**	**100.0**	**-**

The majority of the participants with post-school education had studied in the social sciences, and several had undertaken a range of information technology (mostly applications-based courses like Microsoft Word and Excel). Nearly 85% had earned a formal tertiary qualification, with the majority having graduated with a certificate or diploma. Exhibit 3.6 reflects prior experience in starting up a business.

Exhibit 3.6: Start-Up Experience Distribution at T_1

Started a Business Previously	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	104	31.6	31.6	31.6
No	225	68.4	68.4	100.0
Total	**329**	**100.0**	**100.0**	**-**

Nearly one-third (104 participants) had previously engaged in some form of entrepreneurial activity.

Exhibit 3.7 reflects the gender distribution at T_3. Although the number of respondents at T_3 had declined by 42 (down from 329 at T_1), there was no meaningful change in the gender distribution between T_1 and T_3.

Exhibit 3.7: Gender Distribution at T₃

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	146	50.9	50.9	50.9
Male	141	49.1	49.1	100.0
Total	**287**	**100.0**	**100.0**	**-**

Exhibit 3.8 considers the age distribution of participants at the end of the program (T₃).

Exhibit 3.8: Age Distribution at T₃

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18	2	.7	.7	.7
19	8	2.8	2.8	3.5
20	11	3.8	3.8	7.3
21	22	7.7	7.7	15.0
22	18	6.3	6.3	21.3
23	35	12.2	12.2	33.4
24	42	14.6	14.6	48.1
25	34	11.8	11.8	59.9
26	19	6.6	6.6	66.6
27	23	8.0	8.0	74.6
28	26	9.1	9.1	83.6
29	15	5.2	5.2	88.9
30	7	2.4	2.4	91.3
31	5	1.7	1.7	93.0
32	8	2.8	2.8	95.8
33	7	2.4	2.4	98.3
34	2	.7	.7	99.0
35	1	.3	.3	99.3
37	1	.3	.3	99.7
39	1	.3	.3	100.0
Total	**287**	**100.0**	**100.0**	**-**

Exhibit 3.9 provides details of the education distribution of participants at T₃. There was no discernible difference between T₁ (84.8%) and T₃ (85.1%) in the education distribution, given the attrition that had occurred.

Exhibit 3.9: Education Distribution at T_3

Highest Level Achieved	Frequency	Percent	Valid Percent	Cumulative Percent
Primary	1	.3	.3	.3
Secondary	41	14.3	14.3	14.6
Technical/Trade	17	5.9	5.9	20.6
Certificate	75	26.1	26.1	46.7
Diploma	91	31.7	31.7	78.4
UG Degree	41	14.3	14.3	92.7
PG Degree	21	7.3	7.3	100.0
Total	**287**	**100.0**	**100.0**	**-**

Exhibit 3.10 provides insights into the start‑up experience of participants during any time ‑ up to T_3. There was no discernible difference between T_1 (31.6%) and T_3 (32.4%) in the business start‑up distribution.

Exhibit 3.10: Start-Up Experience Distribution at T_3

Started a Business Previously @ T_1	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	93	32.4	32.4	32.4
No	194	67.6	67.6	100.0
Total	**287**	**100.0**	**100.0**	**-**

6.0 The Entrepreneurship Training, Incubation, and Mentoring Intervention

6.1 Introduction to the Training, Incubation, and Mentoring Program Activities

Prior to 2001, all post‑secondary education and training in South Africa was delivered ad‑hoc without a centralised, national quality framework. As a result, no provision was made for articulation between educational institutions, different vocational qualifications, or between vocational and university awards. Public sector universities had overseen their own quality assurance and degree reward processes, as did public sector technical colleges for their certificates and diplomas.

At the vocational end, this function was performed by individual Industry Training Boards/Councils in the interest of maintaining quality in their specific industry. Corporate courses and short training programs were not regulated in any way.

During 1999/2000, the government unveiled and implemented a national education framework to ensure quality delivery in the further education (vocational) and higher education (university) sectors. The National Qualifications Framework (NQF) would provide the impetus to enable previously disadvantaged individuals with access to nationally recognised vocational (skills-based) qualifications. The National Skills Development Strategy (NSDS) was released in the same year, and would become a key driver in addressing the pressing socio-economic issues of high unemployment exacerbated by low levels of skills in the workforce.

The NQF mandated all education and training to be quality assured by appointed statutory bodies within the centralised qualifications framework. These bodies, called *Sector Education Training Authorities* (*SETAs*), worked to enable learning pathways, and vertical and horisontal articulation in the design and development of national certificates (NQF levels 1 through 4), and national diplomas (NQF level 5) in the vocational environment. This brief resulted in a raft of new vocational programs being created (following a consultative process between employer and labour representatives) identifying the skill requirements of every industry.

Vocational learning programs (termed *learnerships*) require learners to combine theoretical and practical learning elements during the term of study while spending a stipulated period of time in a working environment. Final competency assessment is based on the ability to evidence a particular level of knowledge and demonstrable (practical) skill against a range of specific and predetermined assessment criteria.

The entrepreneurial education and training program that underpins this research study emanated from the newly developed NQF. The program was registered by the South

African Qualifications Authority (SAQA) at NQF Level 4 as a *National Certificate in New Venture Creation*. Graduates from this qualification can vertically articulate to level 5 (diploma) qualifications within the NQF if they wish to further their studies.

At the time of the intervention, this project was the first large-scale delivery of an Entrepreneurship/New Venture Creation program in South Africa. It was unique as a result of integrating three key components: (i) the classroom based training (academic theory) instruction; (ii) an incubation process; and, (iii) individual participant guidance and interaction via an on-site mentoring facility.

The *classroom-based learning* took place in a typical classroom setting. However, the "rules" of the learning environment encouraged a high level of interaction between the educator and participants (learners). Following outcomes-based teaching principles, the facilitator (educator) facilitated an open and participative learning environment where the sharing of ideas and experiences were encouraged. From a process perspective, the classroom phase provided the backbone of the intervention and was used to introduce the key theoretical concepts and activities within entrepreneurship and new venture creation to participants. Formative and summative assessment was undertaken against the individual units (subject areas) to determine competency.

The *incubation process* took place at a separate physical venue to the "theoretical instruction" facility. At the incubator, participants had access to designated practical work areas, equipment and tools, and storage facilities. Participants could advance their venture concepts and obtain technical and commercial guidance at the incubator.

Mentoring was a key part of the intervention. Mentoring provided the requisite direction and support to participants to help ensure the real-world integration of their business concepts and ideas. The mentoring was designed to assist participants in bridging the psychological chasm that exists between understanding the theory (and being confident in the chosen product or service), and taking the next steps to make the venture a reality.

This is a key activity where mentors played a significant role, by keeping the venture teams focused on completing their business plans and sample testing the concepts outside the safety of the incubator. A business plan was the ultimate tangible deliverable for participants from the incubation and mentoring phases.

Prior to the commencement of the formal training program, an extensive two-day induction was undertaken to complete administrative requirements and to communicate the details relating the overall intervention (classroom attendance, incubation responsibilities, access to mentoring, and venture creation). As part and parcel of the induction, it was considered worthwhile to immerse participants in a one-day business and life skills training session. The business and life skills training was facilitated with the aid of a monopoly-style board game. The game would require participants to make a range of simulated real-life decisions which would impact on their participation and success *(i.e. linking decision making and consequence)* in the game.

As a training tool, the game clarified such basic concepts as: (i) understanding why having insurance and assurance in both life and business is important; (ii) the importance of maintaining good health and the consequences of smoking, drug use, and unsafe sexual practices; (iii) the consequences attached to taking personal risks - being engaged in drug smuggling, gun-running, and other crimes; (iv) financial risks of not making provision for the unexpected through savings or life-insurance cover, and (v) the importance of education, together with its ability to accelerate future earnings and improve life and career opportunities. Addressing these types of challenges prior to, and during the early stages (regarding topics that focused on entrepreneurship), was necessary in order that participants could relate to some of the training modules that were core to the entrepreneurship training and mentoring program.

6.2   Program Structure

The National Certificate in New Venture Creation NQF4 qualification consisted of 27 unit standards (subjects) worth a total of 158 credit points, delivered in seven classroom phases over 12-months. Prescribed minimum notional learning hours for this qualification was 1,580 hours (ten hours for each credit point). Participants rotated between the classroom and the practical incubator facility after every phase throughout the program. The formal registration document for this qualification is included in Appendix 4.

A brief summary of the unit standards/units of competency that were included in the formal training program, in order of delivery phases appear in Exhibit 3.11:

Exhibit 3.11: Classroom Delivery Phases of the National Certificate in New Venture Creation NQF4

Classroom Training: Phase 1
Applying basic business principles
Demonstrate an understanding of the entrepreneurial profile

Classroom Training: Phase 2
Produce and use spreadsheets for business
Produce word processing documents from business
Accommodate audience and context needs in oral communication
Communicate verbally and non-verbally in the workplace
Interpret and use information from texts
Write texts for a range of communicative contexts
Introduction to business plans

Classroom Training: Phase 3
Apply knowledge of statistics in order to investigate life and work related problems
Apply innovative thinking to the development of a small business
Research the viability of new venture ideas / opportunities
Develop, implement and evaluate a marketing strategy for a new venture

Classroom Training: Phase 4
Develop, implement and evaluate a marketing strategy for a new venture
Finance a new venture
Manage finances of a new venture
Manage time productively

Classroom Training: Phase 5

Costing, pricing and banking within a new venture

Negotiate a new venture

Implement an action plan for business operations

Monitor productivity in a new venture

Classroom Training: Phase 6

Develop, implement, and monitor a quality policy for a new venture

Tender to secure business for a new venture

Determine and manage human resource needs of a new venture

Plan strategically to improve business performance

Classroom Training: Phase 7

Demonstrate an understanding of the function of the market mechanisms in a new venture

Produce business plans for a new venture

6.3 Teaching, Learning, and Assessment Design

To ensure program delivery encompassed appropriate theory and pedagogy, key contributions and suggestions from Fiet (2000a) and others were integrated in the instructional design, delivery, and assessment components of the program. Consequently, the training and incubation program was built upon best-practice learning from existing entrepreneurship theory. However, the most relevant reference in the context of the New Venture Creation program design was the work done by Fiet (2000a; 2000b).

Key pedagogical elements such as presentations, simulations, student role-plays, real-world scenarios, group-work, and case studies were embedded throughout the program. A great deal of attention was given towards ensuring that the three key elements (classroom delivery, assessment, and incubation) would be highly interactive, thereby maximising learning opportunities. Engagement was actively promoted (and structured) to facilitate open engagement between teachers and participants, participants and mentors, and participant-to-participant (peer group) activities. Learning opportunities were embraced through encouraging reciprocal discussions and challenges in a concerted attempt to try and break the typical uni-directional information flow often associated with regular tertiary teaching styles and methodologies.

The program was delivered against set national qualification standards; such standards identified the level of competency to be attained in each unit/subject which in turn was articulated through the obligatory use of specific assessment criteria, range statements, and critical cross-field outcomes (CCFO). Training providers are required to customise and contextualise assessment strategies to be workplace appropriate and consider learner needs. To achieve competency both formative and summative assessment methodologies must be utilised in compiling a Portfolio of Evidence (PoE) for every learner.

The actual delivery methodology combined with the preferred teaching and learning strategies were open to creative interpretation. As a result, a fair level of flexibility existed for customisation and contextualisation of the learning program and alignment of the incubation activity. Given the degree of freedom, many of the key pedagogical and theoretical contributions were accommodated in the overall intervention.

Chapter 2 highlights key contributions to the entrepreneurship education and training domain. Although diverse views exist around what might be included in such programs, primarily to improve student outcomes by converting this knowledge into venture creation activity, a brief review of key theoretical and pedagogical elements is appropriate here.

Fiet (2000a) emphasised that educators and course designers need to develop the cognitive skills of their students by increasing the theoretical content in pursuit of improving their decision making ability. Fiet (2000a) encapsulated his view as follows:

> *"Theory is an essential part of what we teach because we do not know any other way to help students anticipate the future, which is a key to entrepreneurial success, unless we counsel them on how to rely on luck and intuition. The limitation of luck and intuition is that we do not know how to teach either of them. If students could accurately anticipate the future, they could allocate their resources in the most productive manner, which would ensure their survival, satisfaction and prosperity. Despite the current limitations of our theorizing, theory still offers the most promise as course content for students."* (p.1).

In support of these stated tenets, the theoretical training component was alternated with an active "learning-through-doing" incubation activity. The incubator facility would avail mentors and serve as the practical "work-bench" for participants' ideas.

Under the guidance of experienced mentors, participants would convert newly acquired theoretical concepts into tangible, real-world deliverables such as creating business models, marketing plans, risk analyses, and financial forecasting into the business plan development and (ultimately) implementation. To further ensure learning integration, theoretical (classroom) assessments were conducted along with demonstrable (practical) competence assessments in the incubator environment.

A conscious decision was made to physically locate the incubator at different premises to the theoretical learning environment. The reason for this was primarily to ensure that participants would make the "psychological shift" between the theoretical learning and the applied "hands-on/real-world" components of the intervention.

7.0   Survey Questionnaire

The survey questionnaire consisted of 9 sections. These included a section on participant demographics and start-up intentions, and sections that contained scales to measure the constructs of interest in this study (entrepreneurial self-efficacy, intrinsic motivations, entrepreneurial intentions, and entrepreneurial start-up behaviour). The survey questionnaire appears in Appendix 3 to this Chapter. The questionnaire was provided to participants to complete at T_1, T_2, and T_3. The Entrepreneurship Incubator (a non-profit organisation) managed the training, mentoring, and incubation program. The organisation had a track record of successfully designing, developing, delivering and managing such programs.

The Entrepreneurship Incubator administered the survey and gave instructions to participants under the guidance of the research team. The Entrepreneurship Incubator

therefore owned the data collected but made this readily available to the research team. Appendix 1 provides a letter from the organisation stating that the researcher could use the data.

8.0   Measuring the Constructs

The constructs of interest were measured by scales previously used by other researchers. Key constructs of interest are entrepreneurial self-efficacy (ESE), intrinsic motivation (IM), entrepreneurial intention (EI), and entrepreneurial start-up behaviour (ESB). Together with the screening tools/instruments (that needed to be culturally fair and sensitive to English second language speakers), the scales similarly had to be appropriate to the research context. This was achieved by having successfully piloted the scales in the target population prior to the commencement of the study.

Levels of measurement are generally represented by four types of scales: *nominal, ordinal, interval, and ratio* (Davidsson, 2005). (The scales used in this research were of an interval nature.   Likert-scales were used for the major construct measures which were assumed to have equidistant points between each of the elements in the scale.)

The objective is to specify appropriate item measures that will reflect the factor structures of the constructs of interest in the study. In order to achieve this outcome, models need to be developed that will accurately measure the constructs in the model (together with the construct inter-relationships), thereby ensuring that the model is not mis-specified (Creswell, 2009).   In addition, a literature review process was conducted to ascertain whether the construct measures and measurement items were appropriate and whether they should be used.

Appropriate measures should meet two key criteria: (i) validity *(relative freedom of systematic error of measurement)* to avoid low validity resulting in estimating false relationships, and (ii) reliability *(relative freedom random measurement error),* as low

validity would lead to weak or no relationships (Davidsson, 2005). Validity and reliability is discussed in more detail in the section on *Data Entry, Preparation and Analysis*. The measures of the constructs of interest will now be discussed.

8.1 Entrepreneurial Self-Efficacy

Entrepreneurial Self-Efficacy (ESE) is a key construct examined in this study. ESE is considered an endogenous variable in the structural model, as its value is dependent on another factor or variable in the system (Pearl, 2000). The ESE utilised in this study is based on Bandura's (1997) general theory of self-efficacy. The ESE measurement continuum extends from "no confidence" to "complete confidence" with regard to a range of activities associated with becoming a successful entrepreneur. A scale developed by Zhao, Seibert, and Hills (2005) was adopted in this research to measure entrepreneurial self-efficacy. It uses a 5-point Likert-scale to measure items such as an individual's confidence to identify new business opportunities, create new products, think creatively, and commercialise an idea or new product development.

In addition a literature review process was conducted in relation to the construct measures and measurement items. As a result, in this research, the entrepreneurial self-efficacy scale was extended to be a 7-point Likert-scale. This step was taken (i) to bring it into line with the other 7-point Likert-scales used in this research, (ii) to align it with Ajzen's (1991) suggestion of adopting a 7-point scale for beliefs and evaluation items (Ajzen, p.192), and (iii) based on the research by Preston and Coleman (2000) and Barrett (2003) on the optimum number of response points to a Likert-type scale. The scale was piloted using both the original 5-point scale and the revised 7-point scale and there were no discernible differences in the results.

8.2   Intrinsic Motivation

Intrinsic motivation (IM) is an exogenous variable in the model as its value is independent from the states of the other variables in the model. Intrinsic motivation was framed in terms of the question: *"I want to start or buy a business…"* Responses, inter-alia, included reasons such as: "*…for personal satisfaction; …to be able to prove that I can do it, …to achieve a vision I have;* and, *…to become wealthy"*.

The scale used a 7-point Likert-scale anchored at one end as the item being "unimportant" and anchored at the other end as the item being "important". Intrinsic motivation is an endogenous variable in the model.

8.3   Entrepreneurial Intention

Entrepreneurial intention (EI) has been included in the model design as an endogenous variable. An *endogenous variable* is identified within a causal model if it is influenced by one or more of the independent variables (Pearl, 2000). Within the structural model, entrepreneurial intention (EI) is hypothesised to be influenced by intrinsic motivation (IM), and entrepreneurial self-efficacy (ESE).

The initial questionnaire posed the question to participants as to whether they intended starting a venture/business in the immediate future (suggested as within a three year time horison). A *"Yes/No"* response option was provided (this non-continuous response was not used in the analysis). In addition, participants were asked how likely was it that they would *start a business* within the foreseeable future. A 7-point Likert-scale was used to measure this item where "1" = "Extremely Unlikely" and a "7" = "Extremely Likely". This continuous response was used in the analysis.

8.4   Entrepreneurial Start-up Behaviour

For the purposes of this study, *entrepreneurial start-up behaviour* (ESB) is defined as the activity of setting up or starting a business venture. It is the ultimate endogenous and

dependent variable in the structural model and is influenced by the other independent variables; in particular, entrepreneurial intentions (EI) (Ajzen, 1991).

In the questionnaire, participants were asked two questions regarding entrepreneurial start-up behaviour. The first question: *"Have you started a business since the program started?"* was not used in the analysis; however, it formed the basis for obtaining an understanding from participants as to what extent they thought they had made progress in establishing their businesses. The question was not used because a business may have been started (thereby demonstrating entrepreneurial start-up behaviour), but it may not yet be *completely* operational. Hence, to this extent, entrepreneurial start-up behaviour was considered to be a continuous rather than a dichotomous variable.

Consequently, entrepreneurial start-up behaviour was measured using a 7-point Likert-scale, where "1" = *"Completely unoperational"* and "7" = *"Completely operational"*. Numbers in-between the two anchor extremes provided insights into situations where the business was partially operational. The question asked was: *"To what extent have you started a business since starting this program?"*

9.0   Data Entry, Preparation, and Analysis

As a result of the size of the sample and participants' varied classroom attendance schedules, it generally required a two-week cycle to ensure that all participants completed the questionnaires (participants were allocated among eight classes for the training intervention and were subsequently rotated between the classroom and incubation facility on alternate weeks). The questionnaires from all eight classes were collected and aggregated, and batches numbered by participant group and measurement date (being T_1, T_2, T_3). The data from the batches were entered into a customised Microsoft Excel spreadsheet template specifically designed to capture participant data.

Missing data arise in different ways. After dealing with completely at random missing data (MCAR) issues, the coded data was subsequently uploaded into SPSS (Statistical Package for Social Sciences). MCAR views missing data as statistically unrelated to values that would have been observed (Schumacker & Lomax, 2004). The April 2010 release of PASW (Version 18.0.2) was used to prepare data for the main analysis. SEM (Structural Equation Modelling) in turn was used to undertake the primary analysis.

Structural equations have been used in causal relationship models in the social sciences, seemingly as far back as Sewall Wright in the 1920's (Bollen & Pearl, 2012). Since then SEM has followed a similar developmental path, becoming more popular through its application across a range of disciplines by early stage pioneers as Blalock (1960, 1969), Duncan (1975), Jöreskog (1971). SEM data analyses were undertaken using AMOS (Analysis of Moment Structures) and PASW (Arbuckle, 2009).

The AMOS analyses encompassed: (i) confirmatory factor analysis (CFA); (ii) discriminant analysis; (iii) invariance testing; (iv) full structural model analysis, and (v) testing for non-normality and outliers. The PASW analyses undertaken were: (i) descriptive statistics; (ii) calculation of reliabilities; and (iii) paired samples T-tests.

The three key issues of validity, reliability, and the application of the SEM approach adopted in this study will now be explored.

9.1 Validity Issues

Validity is a key concept in research methodology. Essentially, validity seeks to address or respond to the question: "*Is this study valid?*". The response to the question might be couched in a general manner, or might require a more specific explanation and discussion regarding the four main threats to validity in research and statistics. These four types are: *(i) statistical (conclusion) validity; (ii) construct validity; (iii) external validity; and, (iv) internal validity* (Creswell, 2009).

Statistical validity refers to whether the tests are accurate. Thus, being mindful of statistical validity threats from the outset, care was taken to avoid unreliable measures. The identified risk of adopting unreliable measures was mitigated through the use of well validated measures (and scales) for the various constructs in the study (ESE; IM; EI, and ESB).

Construct validity seeks to determine whether the posited theory is the best explanation for the results, or whether alternate explanations exist for the results. To guard against construct validity threats, well validated constructs were used to build the theoretical predictions.

External validity considers whether the results could be applied to the broader population. An obvious concern at the heart of external validity is the risk of being of making use of an unrepresentative sample. Although this study uses a "sample of convenience" as a result of funding criteria limitations imposed on the training intervention, the sample is clearly described to ensure that the limits to generalisability are well-known. External validity limitations are acknowledged at the end of this study.

Internal validity addresses the question of whether the independent variable is responsible for the observed change/s in the dependent variable. Threats in this context occur from confounding variables. It is therefore imperative to control for, and reduce confounding through the use of pre-test and post-test design (Graziano & Raulin, 2010). Internal invalidity issues have the potential of impacting this study. Some brief observations regarding the possible impact of these issues and the steps taken to minimise or eliminate them are:

(i) *Selection bias*

Selection criteria were set by the South African National Government pertaining to racial composition, age, employment status (unemployed), and prior qualifications. All candidates had undergone the same qualitative and quantitative screening processes and selection was based on highest aggregate score achieved on the combined assessments.

(ii) *Maturation*

As the study has repeated measurements over a period of more than four years, maturation is an area of possible concern. From what was observed, no external event/s occurred that would impact on the validity other than the stated training and incubation intervention.

(iii) *Testing and re-testing*

Measurements were taken at extended intervals (T_1 and T_2 = 12 months; T_2 and T_3 = 42 months) thereby substantially reducing test-retest effects.

(iv) *Instrumentation*

No changes were made in the measurement method or tool. The same questionnaire was utilised at all three measurement intervals.

(v) *Experimental attrition*

Experimental mortality / attrition did occur. This is to be expected over an extended period. Attrition occurred as a result of some participants relocating cities, finding full-time employment, while others failed to meet requisite ongoing theoretical and practical competency assessments and gave up along the way. However, there appeared to be no systemised attrition pattern.

(vi) *Sequence effects*

As a result of the model design and measurement, performance on one measure is not related with previous experience with other measures.

(vii) *Statistical regression*

This is not seen as a risk from the perspective that participants were not selected based on extreme scores, but on scores generally acceptable for selection on training interventions at a level equivalent to this qualification (Graziano & Raulin, 2010; Cavana, Delahaye & Sekaran, 2001).

SEM was used in this study to examine construct and convergent validity of the entrepreneurial self-efficacy (ESE), intrinsic motivation (IM), and entrepreneurial intentions (EI) constructs and values. Hair, Black, Babin, and Anderson (2010, p. 709) remark that "the items that are indicators of a specific construct should converge or share a high proportion of variance in common, known as convergent validity." Estimating the relative amounts of convergent validity among the item measures can be done using factor loadings, average variance extracted, and construct reliability. High convergent validity would be indicated by high factor loadings converging on the common point, the latent construct.

Conventional wisdom suggests that standardised loading estimates need to be 0.5 or higher, and ideally 0.7 or higher. In terms of communality, the square of these standardised factor loadings indicate the level of variation in an item that can be explained by the latent factor (called variance extracted). On this basis, a loading of 0.71 squared would equal 0.5. Loadings below 0.7 may still be considered significant although more of the variance in the measure would then be attributable to error variance, rather than explained variance (Hair et al., 2010).

9.2   Reliability Issues

Reliability is generally inversely rated to measurement error. As reliability increases, relationships between a construct and indicators improve. Hair et al., (2010), define reliability in the SEM context as: *"the measure of a degree to which a set of indicators of a latent construct is internally consistent based on how highly interrelated the indicators are with each other. It represents the extent to which the indicators all measure the same thing."* (p. 636). This does however not imply that the measures indicate only one possible result.

In this study, reliability was calculated for the entrepreneurial self-efficacy and intrinsic motivation scales, thereby assessing the degree of internal consistency between multiple measurements of these variables. In this study, two forms of reliability were calculated: the test-retest, and, reliability coefficient (using both Cronbach's alpha and Coefficient H) (Hair et al., 2010).

Test-Retest

The test-retest reliability assessment was achievable through the longitudinal design of this study. The questionnaire was repeated three times during the study as previously documented. The scores obtained from the same set of respondents are called the test-retest coefficient (Cavana, Delahaye, & Sekaran, 2001).

The purpose with test-retest is to ensure that regardless of the duration of the questionnaire intervals across the period of the study, that the responses are not too varied, so that a measurement taken at any given point in time is reliable (Hair et al., 2010). However, during the research design phase, it was anticipated that changes might be expected in participant responses relating to entrepreneurial self-efficacy, intrinsic motivations, and entrepreneurial intentions (given the intensity of the entrepreneurial training and incubation intervention taking place in-between the first two measurements).

Internal Consistency

Internal consistency applies to the consistency among the items within a scale. Hair et al. (2010, p. 125) consider that *"the rationale for internal consistency is that the individual items or indicators of the scale should all be measuring the same construct and thus be highly intercorrelated."* Cronbach's alpha and Coefficient H are two measures of reliability calculated in this research.

The *Cronbach alpha* reliability coefficient is the diagnostic measure traditionally used to assess internal consistency of responses across a set of items (Schumacker & Lomax, 2004), and is the most widely used measure of internal consistency (Robinson, Shaver, & Wrightsman, 1991). Cronbach's alpha provides a lower bound estimate of the true construct reliability (Nunnally & Bernstein, 1994). In general, reliabilities below 0.60 are considered poor, those at 0.70 satisfactory, and those in the 0.80 range are considered to be good (Cavana, Delahaye, & Sekaran, 2001). The generally agreed lower limit for Cronbach's alpha is 0.70; however, allowance is made in the context of exploratory research where 0.60 is considered as an acceptable lower limit (Hair, et al., 2010).

Davidsson (2005) provides a cautionary note to not embrace Cronbach's alpha as the *"be-all-and-end-all"* of internal consistency measurements - in particular where the development of a measure with a small number of items are involved. Hair et al. (2010) concurs that the number of items will increase reliability value; therefore, more rigorous

requirements must be placed for scales that have a higher number of items. Robinson, Shaver, & Wrightsman (1991) consider Cronbach's alpha and factor structure assessments as but only two of a suggested thirteen criteria to assess validity and reliability. Davidsson (2005), following up on his earlier cautionary comments, underscores this view: *"researchers who are serious about validity should do more than checking factor structure and Cronbach alpha"* (p.107).

The second reliability measure that would be relevant for this study is Hancock & Mueller's (2001) *Coefficient H*. This particular measure maximises the reliability of congeneric measures (Jöreskog, 1971). *"Congeneric models are considered to be sufficiently constrained to represent good measurement properties"* (Hair et al., 2010, p. 698). In this research, it is assumed that the constructs of interest (entrepreneurial self-efficacy and intrinsic motivation) are congeneric since there is no fundamental explanation as to why factor loadings and unequal measurement errors should be equal.

As noted earlier, when Cronbach's alpha is used to assess reliability in a congeneric model, it provides only a lower-bound estimate of the true reliability (Nunnally & Bernstein, 1994). Mueller & Hancock (2001) consider one of Coefficient H's advantages over traditional construct reliability measures to be *"that it is never less than the best indicator variable's reliability (R^2), thereby drawing information from all indicators in a manner commensurate with their own ability to reflect the construct."* (p.5242). Consequently, Coefficient H provides a more indicative measurement of reliability.

For the purposes of this study, for simplicity reasons and in providing a more conservative reliability measure, Cronbach's alpha was calculated for the relevant scales. Coefficient H reliability measures were used in calculating the entrepreneurial self-efficacy and intrinsic motivation factor loading and error variance composite scores.

9.3 Structural Equation Modelling (SEM) in this Study

Prior reference was made to structural equation modeling (SEM), necessitating a closer look at SEM and its application. SEM was considered the preferred data analysis approach in this study. This decision was based primarily on the nature of the research design and the particular constructs and variables of interest in this research.

According to Hu & Bentler (1999, p. 2), structural equation modeling *"has become a standard tool in many scientific disciplines for investigating the plausibility of theoretical models that might explain the interrelations among a set of variables"*. SEM is defined as a multivariate technique combining aspects of multiple regression and factor analysis *"allowing simultaneous examination of a series of interrelated dependence relationships among the measured variables and latent constructs as well as between several latent constructs"* (Hair et al., 2010, p. 634). It is *"a class of methodologies that seeks to represent hypotheses about the means, variances, and covariances of observed data in terms of a smaller number of 'structural' parameters defined by a hypothesized underlying model"* Kaplan (2009, p. 1).

Thus, SEM is a collective of statistical models that investigate and explain relationships between (multiple) variables. The structures of the interrelationships are expressed as a list of equations. The equations in turn reflect all the relationships among the identified constructs, and can be independent or dependent variables in the model. The identified constructs are often unobservable, latent factors inaccessible to measurement and represented by multiple variables (entrepreneurial self-efficacy, intrinsic motivation, entrepreneurial intentions, and entrepreneurial behaviour in this study) (Bollen, 2002).

SEM combines interdependence and dependence multivariate techniques through combining multiple regression analysis and exploratory factor analysis (EFA) (Ullman, 2001). SEM is often colloquially referred to as *latent variable analysis, analysis of covariance structures, causal modelling,* or by some of its most widely used software

packages: AMOS, LISREL, and EQS (Schumacker & Lomax, 2004; Arbuckle, 2009). Of these packages, AMOS was selected as the most appropriate application for this study because of its ease of use and graphical nature allowing for the structural model to be visually depicted.

AMOS is relatively easy to use, has a user-friendly interface, and allows non-statisticians to deal with estimation and hypothesis testing challenges (Arbuckle, 2009). Providing further commentary on AMOS efficacy: *"....the publication-quality path diagrams of Amos provide a clear representation of models for students and fellow researchers. The numeric methods implemented in Amos are among the most effective and reliable available"* (Arbuckle, 2009, p.2).

Even though SEM models are tested in different ways, three characteristics are common to structural equation models, to the extent that: (i) they involve multiple and interrelated dependence relationships; (ii) they can represent latent, unobserved concepts in the relationships and assign measurement error, and (iii) they make use of a model to represent the theory as a systematic set of relationships that provides a reliable explanation of phenomena (Hair et al., 2010).

9.3.1   Stages in the SEM Process

The conventional approach to SEM was used in this study. The conventional approach consists of a number of sequential activities described in Exhibit 3.12 using Kaplan's *"Diagram of Conventional Approach to Structural Equation Modeling"* as a guide (Kaplan, 2009, p.8). Additional explanatory comments have been incorporated in Exhibit 3.12 (Arbuckle, 2009; Schreiber et al., 2006; Boomsma, 1983).

Exhibit 3.12: Diagram of Conventional Approach to Structural Equation Modelling

Conventional Structural Equation Modeling		
Theory	The process starts by presenting an underlying theory that is driven off the conceptual model's hypotheses. In this study, established theory exists in the areas of general self-efficacy (and entrepreneurial self-efficacy), and intentions. The prevailing theory is used as a basis for formulating and developing the model structure.
Model Specification	When applied as a confirmatory technique, exogenous and endogenous variables are identified. The model specification, i.e. constructs, measured variables and interrelationships, is visually portrayed following set protocols, and is referred to as a path diagram (or path analysis). Essentially, the model displays a succession of structural equations similar to calculating a range of regression equations.
Sample and Measures	A sample is selected and measures obtained from the sample. Sample size is important as it relates to the stability of parameter estimates. The sample in this study was drawn from the target market of socially and economically disadvantaged and unemployed people who indicated an interest in starting new businesses. Three measures were taken during the longitudinal study.
Estimation	Estimation assesses whether the estimated parameters can be measured. Consideration is given to the number of data points and the number of parameters that the model needs to estimate to be able to uniquely identify it. Thus, sufficient information must exist within the sample data in order to meet the parameters set out in the model's hypotheses.
Assessment of Fit	A measure of predictive accuracy or "fit" needs to be determined in terms of the fit of the overall model, rather than just single relationships. The variation between the observed covariance and estimated covariance matrices will determine model fit. If the variation is small, then the model fit is considered to be good.
Modification	If the assessment of the goodness-of-fit is unsatisfactory, further modification is required. This process is cyclical and continues until the requisite level of fit is reached. *See below for an extended discussion on modification and model fit.*
Discussion	Discussions might reflect on issues such as: sample size requirements; parameter estimates; goodness-of-fit; size of variance in endogenous variables; reliability of observed variables in relation to latent constructs; standardised residuals; and model modifications of the original hypothesised model and test used (e.g. chi-square).

9.3.2 Multivariate Normality of Data

Structural equation modelling – akin to all statistical methodologies - requires that certain underpinning criteria are satisfied to ensure that reliable inferences can be made. A key assumption underlying structural equation modelling is the issue of multivariate normality. SEM assumes that observations are drawn from a continuous and multivariate normal population (Kaplan, 2009). As data deviate from multivariate normality, a compensatory elevation in the "respondents-to-parameters-ratio" is necessitated. This ratio is considered to address deviations from normality at a level of 15:1 (15 respondents for each parameter identified in the model). Researchers are encouraged to allow for adequate sample sizes to ensure the impact of sampling errors are minimised. This is increasingly significant for non-normal data (Hair et al., 2010).

Maximum Likelihood (ML) is the most commonly used approach in SEM. ML assumes joint distribution of the variables to be a multivariate normal distribution (Bollen, 1989). In this regard, Schermelleh-Engel, Moosbrugger and Müller (2003) assert: *"if the observed data stem from a multivariate normal distribution; if the model is specified correctly; and if the sample size is sufficiently large, ML provides parameter estimates and standard errors that are asymptotically unbiased, consistent, and efficient."* (p.26).

A benefit of using maximum likelihood is that it allows for statistical testing of overall model fit even for "over-identified" models. However, weaknesses do exist within the very strong assumption of multivariate normality. Schermelleh-Engel, Moosbrugger and Müller (2003) caution: *"…violations of distributional assumptions are common and often unavoidable in practice and can potentially lead to seriously misleading results."* (p.26).

Other researchers consider maximum likelihood to be fairly robust against such violations of normal distributional assumptions (Curran, West, & Finch, 1996; Muthén & Muthén, 2002; West, Finch, & Curran, 1995). It is important to appreciate the impact of multivariate non-normality on ML estimation, together with other confirmatory factor

analysis estimators (Curran, West, & Finch, 1996). When dealing with smaller samples, bootstrapping may be an option to overcome this limitation (Creswell, 2009).

Key factors impacting on the determination of establishing relationships among multivariate data points (Schumacker & Lomax, 2004) include:

- level of measurement

- missing data

- nonlinearity

- restriction of range of data values (kurtosis, skewness, variability)

- sampling variation issues

- effect size

- significance

- outliers, and

- power addressed in bootstrapping estimates

Normality, as has been noted, is the foundational assumption in multivariate analysis. Normality refers to the shape of the plotted data distribution and its correlation to the benchmarked normal distribution. Consequently, if there is a significant variation from the normal distribution, the resultant statistical tests are considered to be invalid. Such a "fatally flawed" outcome necessitates the question: *How might the violation of the normality assumption be assessed?*

The response is encapsulated in two dimensions that influence the extent of non-normality: the sample size, and the shape of the errant distribution. The impact of the first dimension (sample size) will be discussed later in this Chapter; however, at this juncture, it is worth noting that what might be unacceptable at small sample sizes is likely to be "forgiven" in larger samples, as distribution effects are likely to be negligible.

The second dimension (shape/nature of the distribution) can be described by two measures: skewness and kurtosis (Hair et. al., 2010). Schumacker & Lomax (2004) noted a third measure, being the scaling of variables as ordinal rather than interval.

Skewness is a term that refers to the balance of the distribution. A normal distribution is centered and the mean and standard error present symmetrically with equal distribution of scores above and below the mean (Cavana, Delahaye, & Sekaran, 2001). A distribution is considered to be unbalanced or skewed when the distribution is not symmetrical; it can therefore either be skewed negatively (when distribution is predominantly towards the right and elongated tailing towards the left), or positively skewed (distribution presenting left of the mean and elongated tailing towards the right). The effect – whether positively or negatively skewed - is that data will occur more frequently on one side of the measurement scale, affecting the variance-covariance among variables (Schumacker & Lomax, 2004).

Kurtosis indicates the extent to which the height (flatness or peakedness) of the probability density distribution differs from that of a normal distribution (West, Finch & Curran, 1995). When data values are more peaked than a symmetrical (normal) distribution, it is considered to be leptokurtic. Conversely, platycurtic is when data values are elongated and more dispersed along the X-axis whilst maintaining a consistent low frequency on the Y-axis. A platycurtic (flatter) distribution indicates negative kurtosis; a leptokurtic (peaked) distribution, in turn, will indicate positive kurtosis. Generally, most statistical programs assign kurtosis and skewness as zero given a normal distribution.

Consequently, any shifting of values (above or below) zero would indicate some level of deviation from normality (Hair et al., 2010). In reality, a normal distribution carries a skewness value equal to 0, and a kurtosis value equal to 3.0. As a result, standard practice considers it necessary to adjust for any inequalities. The appropriate adjustment is made by subtracting a constant value of 3 from the kurtosis estimate, arriving at a normal distribution characterised by zero kurtosis and zero skewness (Curran, West, & Finch, 1996).

SEM software programs (such as AMOS, LISREL, ESQ) can detect the presence of kurtosis and skewness by using univariate and multivariate tests and measures of kurtosis and skewness, accessible in the dropdown menus of the programs (Schumacker & Lomax, 2004). The incidence of skewness and kurtosis (as non-zero third and non-zero fourth order moments) result in the parameter estimates being consistent, but not efficient. As a result, the lower range estimate of the maximum likelihood fit is no longer distributed as a large sample chi-square. Instead, this lower range/minimum estimate of the maximum likelihood fit function now generates an inflated and positively biased chi-square distribution estimate.

Thus, using chi-square to measure model fit under conditions of non-normality will inaccurately lead to an inflated (Type 1) error and model rejection; where, in fact, a model may well have been accepted (Curran, West, & Finch, 1996). Conversely, some models may be opportunistically modified as a result of multivariate non-normality variables, masking the reality that the model itself is deficient (MacCallum, Roznowski, & Necowitz, 1990, as cited in Curran, West, & Finch, 1996).

Schumacker & Lomax (2004) offer two approaches to deal with the issue of skewness: (i) resample a greater number of participants, or (ii) execute linear data transformation (square root, probit, or logit). A probit transformation is indicated to be the most successful of these linear transformations in correcting skewness. Kurtosis in turn, provides a greater challenge to resolve. Platycurtic data would demand additional subject sampling; alternately, bootstrapping approaches exist within SEM software. Leptokurtic data can be analysed using EQS estimation techniques (Schumacker & Lomax, 2004).

West, Finch & Curran (1995) consider non-normal data distributions to be extremely skewed when the skewness index values exceed 2.0 and Kline (2005) when it exceeds 3.0. The corresponding metric cited for kurtosis is 7.0+ (West, Finch, & Curran (1995). Kline (2005) considers it positive kurtosis when absolute values exceed 3.0, and negative kurtosis at values indicated below 3.0.

DeCarlo (1997), in a discussion concerning multivariate kurtosis in relation to outliers, describes the conventional approach for detecting multivariate outliers in multivariate data as follows:

> *"…examine the squared Mahalanobis distance for each case; a large value for case relative to other cases can indicate a multivariate outlier. Note that the Mahalanobis distances are also related to Mardia's measure of multivariate kurtosis (see Mardia, 1970, 1980), in that the average of the sum of the Mahalanobis distances raised to the fourth power gives Mardia's measure (see Mardia et al., 1979). In fact, Mardia's test of multivariate kurtosis has been shown to have good properties for detecting multivariate outliers in some situations (Schwager & Margolin, 1982)."* (p.298)

Mahalanobis distances refer to the Mahalanobis distance statistic used for measuring outliers, and *"indicates the distance in standard deviation units between a set of scores (vector) for an individual case and the sample means for all variables (centroid), correcting for inter-correlations"* (Kline, 2011, p. 54).

Mardia's measure of multivariate kurtosis is a statistical multivariate normality test produced when using programs such as AMOS (Mardia, 1970), EQS, or PRELIS (West, Finch, & Curran, 1995). Mardia's coefficient is expected to be zero when the distribution is multivariate normal. Similar to earlier discussions, a value equal to 3.0 would need to be subtracted from the kurtosis estimate when using AMOS. Although the absolute level of multivariate non‑normality is not defined, values of 3.0 or greater would be sufficiently high to elicit non‑normality concerns (Wothke, 1996).

Satorra and Bentler (1988) developed the Satorra‑Bentler chi‑square for use when there are non‑normal data distributions. The Satorra‑Bentler chi‑square (SBχ2) is used to correct the normal chi‑square statistic when maximum likehood is used. West, Finch, and Curran (1995) recommend Satorra‑Bentler when substantial departures from normality (i.e. skewness values = 2.0; kurtosis = 7.0) is evidenced. As a remedial measure in non‑normal environments, Satorra‑Bentler has proven robust and has garnered wide acclaim (Hu & Bentler, 1995; West, Finch, & Curran, 1995; Curran, West, & Finch, 1996).

Satorra-Bentler's chi-square (SBχ2) is not calculated in AMOS. AMOS calculates the *Bollen-Stine p bootstrap* to address multivariate non-normality. Bootstrapping is a procedure where the same sample sizes are repeatedly drawn from the original database sample, allowing for replacement after each draw (Hair et al., 2010; West, Finch & Curran, 1995). The Bollen-Stine *p* bootstrap produces standard errors through repetitive bootstrap sampling routines. These are subsequently used to calculate an adjusted chi-square goodness-of-fit (Bollen & Stine, 1993; West, Finch, & Curran, 1995).

9.3.3 Confirmatory Factor Analyses of the Measurement Models

Confirmatory Factor Analysis (CFA) is a confirmatory technique of measurement theory applied within the SEM framework. Measurement theory sets out the various relationships that propose how measured variables represent the unobserved or latent construct/s that are indirectly measured. Five elements are to be specified in a CFA. These are: (i) the variables to be measured; (ii) the unobservable or latent constructs in the model; (iii) the relationships among constructs; (iv) the item loadings on individual constructs; and (v) the error terms for each indicator (Hair et al., 2010). Mueller & Hancock (2001, p.5239) state that confirmatory factor analysis *"allows for the assessment of fit between observed data and an a priori conceptualized, theoretically grounded model that specifies the hypothesized causal relations between latent factors and their observed indicator variables."* Therefore, the conceptualised relationships among the latent or unobserved factors and observed variables are at the heart of CFA. Schreiber et al. (2006) note that when a CFA is conducted, *"the researcher uses a hypothesized model to estimate a population covariance matrix that is compared with the observed covariance matrix. Technically, the researcher wants to minimize the difference between the estimated and observed matrices."* (p.1).

Consequently, CFA provides an indication as to what extent theoretical specifications of the model's factors match the actual data; therefore indicating either a rejection or

confirmation of the stated model's theory (Hair et al., 2010). CFA provides discriminant and convergent validity of identified measures (Anderson & Gerbing, 1988). It is frequently engaged in the early stages of SEM's data analysis process (Jöreskog, 1993).

The identified *"formulate model theory + gather data + test data = rejection / confirmation"* approach is referred to as a strictly confirmatory approach (Jöreskog, 1993). Although the confirmatory approach provides an extremely robust test of a measurement model, Jöreskog (1993) acknowledges possible practical limitations. As a result, an alternate *model-generating-model approach* is proffered. Using this approach, the full theoretical model can be tentatively specified before the model is tested.

Other tests that will be conducted prior to testing of the full model are one-factor congeneric measurement model tests (*congeneric* essentially means that indicator variables or items measure the same trait and these items are not necessarily equally weighted - these are further defined and discussed in the next section). Questions might arise as to the appropriate number of indicators for every construct.

Within SEM, tests can practically be conducted with only a single item; good practice, however, considers no less than three, and strongly suggests four items per factor. Following this approach will ensure necessary coverage of the construct's theory, together with adequate representation of the latent constructs (Hair et al., 2010). Once individual constructs have each been subjected to the relevant measurement model tests, the full model can then be tested in its entirety. This approach was undertaken in this research.

9.3.4 One-Factor Congeneric Measurement Models

Jöreskog (1971) explains the term, *congeneric*, as follows: *"A set of tests is said to be congeneric if the tests measure the same trait except for errors of measurement. Any pair of such tests has linearly related true scores."* (p.109). Kline (2011) observes that a set of congeneric indicators can be tested using confirmatory factor analysis by comparing models

using the chi‑square difference test (the chi-square difference test is discussed as part of invariance testing later in this Chapter).

The least restrictive model most widely used for reliability estimation is the *one-factor congeneric model.* Congeneric indicators measure the same construct items, but may assign differential weightings to the items measured. The indicator variables in the CFA model are not constrained, and can therefore contribute (or load) differently on the same factor, allowing for error variances to differ. The congeneric model assumes that *"each individual item measures the same latent variable, with possibly different scales, with possibly different degrees of precision, and with possibly different amounts of error"* (Raykov, 1997, p.934).

In contrast, *parallel models* (Lord & Novick, 1968) are the most restrictive models. In addition to uni‑dimensionality, the (parallel) model assumes that *"all test items are exactly equivalent to one another. All items must measure the same latent variable, on the same scale, with the same degree of precision, and with the same amount of error"* (Raykov, 1997, p.934).

From the perspective of this study, congeneric models have been assumed. The reason for this presumption is that prevailing theory (in relation to the constructs of entrepreneurial self‑efficacy and intrinsic motivation) does not: (i) point toward equal contribution of the indicator variables to the two constructs of interest, and (ii) indicate that the error variances are alike. One‑factor congeneric models contain identical type indicator variables that contribute to the measurement of the unobserved (latent) variable.

The purpose of the indicator variables is to be a valid measurement of the unobserved trait they seek to measure. AMOS was used in this study to estimate factor variances, regression coefficients, and error variances of the measurement items.

9.3.5   Assessing Model Fit

The principal objective of structural equation modelling is to test theory. In order to achieve that outcome, a statistically significant theoretical model is required. The chosen theoretical model should therefore be practical and have substantive meaning (Schumacker & Lomax, 2004).

In order to properly evaluate and interpret structural equation modelling results, it is not only necessary to assess the method used to ascertain parameter estimates, but also to obtain the criteria against which the individual estimates and overall model will be evaluated. A comprehensive results presentation would demand complete transparency of parameter estimates and fit statistics, together with a justification for model modification and model comparisons (Hoyle & Panter, 1995).

The importance of understanding SEM fit criteria is underscored by Hu, Bentler & Kano (1992), by observing that not all estimation methods and fit indices result in the same inferential outcomes. Tanaka (1993) recommends that researchers provide an inferential context wherein the indices of (overall) fit are presented and interpreted prior to SEM results being reported.

It is considered that the contextual discussion should provide at least three sets of information: (i) a statement as to which overall-fit indices will be reported on along with justification for selecting those indices (such justification would typically include reasons for selecting those indices - based on characteristics of the particular study and an up to date literature review on the selected indices); (ii) a conceptual definition on each of the indices to be reported on, and (iii) the acceptable fit value of each index. This should be indicated prior to observing and reporting indice values. Apart from $\chi 2$, sampling distributions of overall-fit indices are not defined. As a result, "standard" minimum acceptance/critical values of model fit are not defined (Tanaka, 1993; Hu & Bentler, 1995).

The term "fit" as applied to SEM can generally refer to either *absolute fit* or *incremental fit* of the model. Hoyle and Panter (1995) distinguish these characteristics of fit as: *"**Absolute fit** concerns the degree to which the covariances implied by the fixed and free parameters specified in the model match the observed covariances from which free parameters in the model were estimated."* (p.165). Indices of absolute fit usually measure *"badness of fit"* as a good fit is indicated by a zero value. Increasing values (greater than zero) would therefore signify a movement "away from goodness".

Conversely, *"**Incremental fit** concerns the degree to which the model in question is superior to the alternative model, usually one that specifies no covariances among variables (i.e. the "null" or independence model), in reproducing the observed covariances."* Indices of incremental fit assess "goodness-of-fit" where increasing positive values usually designate model improvement.

It appears that limited agreement exists regarding the best indices of fit to use for SEM. There is, however, general support for reporting multiple indices of overall-fit (Bollen, 1989; Tanaka, 1993). Indices of overall-fit are used to assess data fit against the model. These indices include the Chi-square statistic (χ^2), Satorra-Bentler scaled chi-square ($SB\chi^2$), or Bollen-Stine *p* when using AMOS, Goodness-of-Fit index (GFI), Adjusted Goodness-of-Fit index (AGFI), Root Mean-Square Error of Approximation (RMSEA), Root-Mean-square Residual (RMR), Standardised Root-Mean-square Residual (SRMR), Tucker-Lewis Index (TLI) /Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI).

SEM's AMOS software used in this study calculates all aforementioned indices of fit; however, not all these indices are equally effective and reliability is often sample size dependent. A model is correctly specified when the *"acceptable level of fit"* is achieved. The acceptable levels of fit (also called goodness-of-fit) indices are indicators as to whether

the model is correctly specified. A correctly specified model should demonstrate adherence to one or more of the acceptable level of fit index ranges specified in the table below.

A brief summary of some of the more prominent indices and acceptable level of fit appear in Exhibit 3.13 below:

Exhibit 3.13: Overall Model Fit Indices and Acceptable Level of Fit

Indices (model fit criterion)	Reference	Description / Interpretation and Acceptable Levels of Fit
Chi-square ($\chi 2$) and Satorra-Bentler scaled Chi-square (SB$\chi 2$)	Hair et al. (2010), Satorra & Bentler (1994), Bollen (1989), Bollen & Stine (1993)	Hair et al. (2010) considers chi-square to be the fundamental *absolute-fit* index statistic. Large samples and multivariate normality are applied assumptions for this index. When the $\chi 2$ is used as a "goodness-of-fit" measure, a researcher is seeking low (non-significant) $\chi 2$ values (i.e. no or low differences between matrices) to support the model as being representative of the data. The $\chi 2$ prediction that supports an outcome of no discrepancies between the population covariances and those predicted by the model is called the exact-fit hypothesis. Reporting on $\chi 2$ is usually accompanied by sample size, degrees of freedom, and p-value. As discussed earlier in this Chapter, when non-normal distributions of the variables are encountered, Satorra and Bentler's (1988) (or the Bollen-Stine p) scaled chi-square should be reported with the unadjusted chi-square. For $\chi 2$, larger samples are preferred, however, consideration should be given that the mere increase in sample size will result in a challenge for the model to achieve a statistically insignificant goodness-of-fit. Furthermore, any additional indicators that are added to the model (as a result of the increase in the number of constructs) will increase the challenge of using $\chi 2$ to assess model fit. Thus, the $\chi 2$ goodness-of-fit is not recommended as a sole measure of goodness-of-fit. *Acceptable level of model fit:* For multivariate normal distributed data, the p-value should exceed 0.05. If the data is non-normally distributed, the Satorra-Bentler scaled SB$\chi 2$ (LISREL; Mplus) or the Bollen-Stine p (AMOS) should be used before testing model fit. Both values should likewise be > 0.05.
Goodness-of-fit index (GFI)	Jöreskog & Sorbom (1981), Jöreskog (2004), Bollen (1989), Kline (2011)	The goodness-of-fit index is an absolute index, and results from initial attempts to establish a fit statistic that would be more robust for different sample sizes. The Jöreskog and Sorbom goodness-of-fit index (GFI) estimate the proportion of covariances in the sample data matrix that is explained by the model. Thus, the goodness-of-fit measurement estimates to what extent the researcher's model fits as opposed to no model at all (Jöreskog,2004).

Indices (model fit criterion)	Reference	Description / Interpretation and Acceptable Levels of Fit
		GFI can be calculated for generalised least squares, unweighted least squares, or maximum likelihood estimates (Bollen, 1989). One limitation of GFI is that (expected) values tend to vary with sample size (Kline, 2011). Some SEM packages do not calculate GFI (e.g. Mplus) *Acceptable level of model fit:* Fit values vary between 0 (indicating no fit) through to 1.0 (best fit). Although GFI is less sensitive to model size than RMSEA, some goodness-of-fit values might fall outside the 0 to 1.0 range (Kline, 2011). In such instances, values > 1.0 are found to be associated with just-identified or over-identified models where $\chi2$ is close to zero. Although acceptable levels of fit greater than 0.90 was historically considered acceptable, recent studies coalesce around fit values at or above 0.95.
Adjusted GFI index **(AGFI)**	Jöreskog & Sorbom (1981), Jöreskog (2004), Hu and Bentler (1998), Kline (2011)	The adjusted goodness-of-fit index (AGFI) is adjusted for the degrees of freedom of a model relative to the number of variables. Similar to GFI, the AGFI index can either be used to compare two different models with the same data; alternately it can also be utilised to compare the fit of a single model using different data. The AGFI is a *parsimonious fit* index. *Acceptable level of model fit:* Fit levels are the same as those indicated in the GFI above, being values equal or greater than 0.95. Kline (2011) Hair et al.(2010), and Hu and Bentler (1998) advise against the use of both the AGI and AGFI indices as a result of (i) sample size issues; and (ii) an inconsistent sensitivity to model specification. For this reason, neither GFI or AGFI was calculated in this research.
Root Mean Square Error of Approx-imation **(RMSEA)**	Browne & Cudeck (1993), Hair et al. (2010), Schumacker & Lomax (2010), Kline (2011)	The RMSEA is a widely used measure that seeks to correct the propensity of the chi-square statistic to reject large samples or those with a large number of observed variables. Thus, it is a better representation of model-fit of a population rather than just a sample used for model estimation. RMSEA is a *parsimony-adjusted, "badness-of-fit" index*; with zero being the optimum fit. *Acceptable level of model fit*: The original "good-fit" cut-off value of RMSEA $\leq$ 0.05 was determined by Browne & Cudeck. Some debate exists as to what should be acceptable and whether setting an absolute cut-off level could be set, given the bounds of the confidence interval and possible asymmetrical distribution around the RMSEA sample value (Kline). In more recent times, values of less than 0.06 had been accepted as suggesting good model fit (Hu & Bentler, 1999) although values of less than 0.08 have been accepted as indicating reasonable fit (Browne &

Indices (model fit criterion)	Reference	Description / Interpretation and Acceptable Levels of Fit
		Cudeck, 1993). Based on recent research, Hair et al., (2010) consider it inadvisable to set a cut-off for RMSEA. Hair et al. (2010) reports that RMSEA is better suited for larger models (sample sizes exceeding 500 respondents). A key advantage of RMSEA is the compilation of a confidence interval, allowing for a range of RMSEA values to be generated at stated levels of confidence.
Root Mean Square Residual **(RMR)** & Standardised Root Mean Residual **(SRMR)**	Kline (2011), Hu & Bentler (1998), Holmes-Smith (2010)	Originally associated with LISREL, the Root Mean Square Residual (RMR) statistic can now be computed by other SEM programs. RMR is a measure of the square root of the mean of these squared residuals (i.e. the residual is stated in terms of the covariances). A range weakness exists in the interpretation of the RMR value in that it is related to the scaling of the observed variables (Kline, 2011). As a result, a better alternative to RMR is the Standardised Root Mean Square Residual (SRMR). *Acceptable level of model fit:* Perfect model fit occurs where RMR = 0. As values increase above and further away from 0 it indicates increasingly poorer fit. An acceptable value should be less than 0.06 (Hu and Bentler, 1998). Any SRMR value greater than 0.06 might indicate the presence of outliers (Holmes-Smith, 2010). Kline (2011) suggests that rather than reporting the SRMR statistic, a review of the correlation residuals matrix should be done, by describing the pattern as part of a diagnostic assessment of fit. Together with RMSEA and RMR, SRMR is considered as a *"badness-of-fit"* measure.
Tucker-Lewis Index **(TLI)** / Non-normed fit index **(NNFI)**	Tucker-Lewis (1973), Bentler & Bonnett (1980), Hoyle & Panter (1995), Holmes-Smith (2010), Schumacker & Lomax (2010)	The non-normed fit index (NNFI), *also known as the Bentler-Bonnett non-normed fit index* and Tucker-Lewis indices (TLI), are similar and known as *incremental indices* of fit. The TLI was originally developed for factor analysis before it was further adapted for application in SEM. Hoyle and Panter (1995, p.166) describe the TLI as *"comparing the lack of fit of a target model to a lack of fit of a baseline model. The value estimates the relative improvement per degrees of freedom of the target model over the baseline"* *Acceptable level of model fit:* The fit index ranges between 0 and 1, a perfect fit produces a TLI/NFI = 1. Values close to 0.95 reflect a good model fit. As the TLI is not normed, values can extend below 0 or above 1. When the value exceeds 1.0, the model is considered *overspecified* (not parsimonious) (Holmes-Smith, 2010). *"Model parsimony refers to the number of estimated parameters required to achieve a specific level of model fit"* (Schumacker & Lomax, 2010, p.89). Indices that indicate model parsimony are AGFI as well as the parsimony-normed-fit-index

Indices (model fit criterion)	Reference	Description / Interpretation and Acceptable Levels of Fit
		(PNFI).
Comparative fit index **(CFI)**	Hu and Bentler (1999), Hair et al. (2010), Kline (2011)	The Bentler Comparative Fit index (CFI) is another *incremental fit* index. The CFI is an improvement on the NFI (normed fit index). The value measures the level of improvement in the fit of the model proposed by the researcher against a baseline model (the independence model). Hair et al., (2010) comment that *"as a result of its relative (but not absolute) insensitivity to model complexity, it is among the most widely used indices."* (p.669). Hu & Bentler (1999) consider the use of the CFI together with SRMR to be most appropriate. *Acceptable level of model fit:* The normed value range for CFI is constrained between 0 and 1.0. Increased values signify better fit. The norm for a well fitting model is considered to be a CFI value greater than 0.90 (Hair et al.2010), and in excess of 0.95 (Kline, 2011).

9.3.6 Discriminant Validity

Discriminant validity is the degree to which constructs/concepts *(example: motivation and leadership; honesty and courage)* are not correlated and are truly different from each other. Consequently, if the inter-correlation between two variables (X and Y) is 0.90, it would be hard to demonstrate that they measure distinct constructs (Kline, 2011). Therefore, when discriminant validity is high, constructs are deemed to be unique and to capture incidences that other measures do not. Thus, as a result of discriminant validity it is possible to make an inference from the scores measured to the unobserved (latent) variable; in other words, the extent to which these scores indicate what they set out to measure. SEM's confirmatory factor analysis (CFA) is one of the tools that might be used for hypothesis testing of discriminant validity (Schumacker & Lomax, 2010).

Using well validated measures have the benefit of removing the need to re-establish the validity for each subsequent study; however, item reliability would still need to be tested (Cavana et al., 2001). Thompson (1997, p.3) argues that *"both factor pattern and factor structure coefficients should be interpreted in most CFA reports involving correlated*

factors." Structure coefficients need to be calculated, whilst pattern coefficients present as standardised factor loadings in AMOS output. Structure coefficients are calculated by multiplying the factor loadings for each of the items by the (latent) factor correlation. Thompson's (1997) approach was used to assess discriminant validity in this research.

9.3.7   Sample Size Requirements

Relative to other multivariate approaches, SEM requires a larger sample, principally as a result of some of the applied statistical algorithms, which tend to become unreliable in smaller samples. Although researchers have sought to adapt SEM techniques to smaller sample sizes, it is generally accepted that SEM efficacy is enhanced with large samples. Kline (2011) is of the opinion that some SEM estimates may not be accurate when the sample size is not sufficiently large, which in turn increases the probability of encountering technical problems in the analysis. Larger samples therefore offer greater stability of results.

Hence, consistent with all statistical models, the basis of estimation of the sampling error is driven off the given sample size. As larger samples are generally more costly to obtain than smaller ones, the vexing issue is therefore: *what sample size would be sufficiently large to produce valid and reliable results in SEM?* As might be expected, diverse opinions are found in response to the question; however, Hair et al. (2010) suggest five guideline considerations (that are dependent on model characteristics and analysis procedures) that will affect SEM sample size: (i) multivariate data normality and distributional characteristics of data; (ii) estimation techniques - and estimation algorithm applied; (iii) missing data issues; (iv) complexity of the model and the number of parameters involved (more parameters require more estimates), and lastly, (v) average error variance of indicators.

In environments of differing opinion, rules-of-thumb are often adopted and operationalised for general application. It is therefore unsurprising that such a rule has

emerged in relation to the *"what is large enough?"* question in relation to model complexity, as well as desired sample size. In response, Jackson (2003) provides some empirical support for such a rule-of-thumb, referred to as the *N:q rule*. The *N:q* rule applies when maximum likelihood is used as a estimation method (maximum likelihood is the default method used in most structural equation modelling tools).

By using maximum likelihood (ML), researchers approach this activity by considering a minimum sample size required in terms of cases *(N),* to the number of parameters in the model requiring statistical estimates *(q).* The relationship is subsequently expressed as a *"sample-size-to-parameters-ratio"or N:q.* Kline (2011) considers the ideal sample-size-to-parameters ratio to be 20:1. Consequently, given 15 model parameters requiring statistical estimates *(i.e.: p = 15)* the ideal sample size would be 300 cases. A ratio of 10:1 would be considered a minimum sample and would produce less than ideal outcomes.

Boomsma (1983) proposes a general rule of SEM sample sizes to be greater than 200 cases, but recommends 400. According a review done by Shah and Goldstein (2006), SEM median sample sizes typically tend to be 200 cases. Although 200 cases might be perceived as typical, Kline (2011) cautions that where the analysis of a complex model is involved 200 may well be insufficient; in particular, where the distribution is significantly non-normal or if a method other than ML is used. At the lower end, less than 100 cases would most likely preclude the use of SEM, except in cases where very simple models are being considered; thus affirming the lack of stability and low statistical power in small samples.

In instances where data is non-normally distributed, Satorra and Bentler (1994) suggest: (i) to use maximum likelihood estimation as it has proved to be efficient with smaller samples, and (ii) to make a post-hoc adjustment to the standard error estimates and the chi-square ($\chi2$) statistic. The rationale in this instance is to compensate for the fact that the $\chi2$ test of model-fit will be overstated, whilst at the same time the standard errors

associated with parameter estimates will be underestimated. In this study the Bollen-Stine p statistic was used where data was non-normally distributed.

However, it is worth noting that Gerbing & Anderson (1985) achieved fairly robust estimates with fewer than the recommended 200 case sample size; and identified several studies that concurred that the minimum satisfactory SEM sample size was 100 to 150 subjects. Hair et al. (2010) provide some qualified support to minimum sample sizes within a context of model complexity and measurement model characteristics. The suggestions pertaining to sample sizes below the suggested 200 case level appear in Hair et al. (2010, p.662):

> **For minimum sample sizes = 100**: Appropriate for models with five or fewer constructs, each with more than observed variables/items, and with item communalities of 0.6 or higher.
> **For minimum sample sizes = 150**: Appropriate for models with seven or fewer constructs, each with more than observed variables/items, and with item communalities of 0.5 and no under-identified constructs.

Contextualising the aforegoing sample size discussion to the specifics of this study, the sample size at T_3 was 287 nascent necessity entrepreneurs. As a result of the study's repeated-measures longitudinal-design, data was collected at three interval points. It was therefore possible to observe parameter estimates across three intervals to assess consistency. Parameter estimates were found to be stable across the three collection points during the study, suggesting adequacy of the sample size of the group surveyed.

Parcelling is a suggested approach when a model has too many parameters to estimate given its sample size, resulting in weak statistical power to detect key parameters (Yang, Nay, & Hoyle, 2010). The technique of parcelling (or item bundling) appears to originate in the work of Cattell (Cattell & Burdsall, 1975). Empirical justification for its use is offered by Bandalos and Finney (2001), as: *"...increasing reliability, achieving normality, adapting to small sample sizes, reducing idiosyncratic influences of individual items, simplifying interpretation, and obtaining better model fit."* (p.123).

There has been an increase in the use of parcelling in structural equation modelling in recent years. Bandalos and Finney (2001) reviewed SEM applications across more than 300 publications, and found that in those studies where SEM or confirmatory factor analysis (CFA) were applied, nearly 20% had used some form of parcelling.

Parcelling involves: (i) averaging item scores from two (or more) question item responses, splitting items into two parcels - for example even and odd numbers; (ii) balancing item discrimination over three or four parcels (Little, Cunningham, Shahar, & Widaman, 2002); (iii) randomly selecting three or four parcels, and (iv) parcelling items with similar factor loadings (Cattell & Burdsall, 1975). These parcelled item scores then replace the item scores (as construct indicator variables) in the SEM statistical analysis.

Conditions particularly suited to parcelling have been identified as containing more than 12 question items reflecting a uni-dimensional construct (Hall, Snell, & Singer Foust, 1999). With reference to small samples, Bagozzi and Edwards (1998) suggest that parcelling leads to a reduction in the number of parameter estimates, leading to a superior *"variable to sample-size ratio",* and improved stability of parameter estimates (Bagozzi & Edwards, 1998). Sample sizes need to be at least 100 to generate good results (Cunningham, 2008).

Parcelling has attracted vigorous discourse and, as can be expected, divergent and opposing views exist on its efficacy. Some researchers question the validity of the assumption that greater stability of the parameter estimates will always result from smaller "variable to sample-size ratios" (Cunningham, 2008).

An important proviso for the use of parcelling is uni-dimensionality of the items within each parcel. As a result of this uni-dimensionality dependence, it is a requirement that parcels are checked for uni-dimensionality before being parcelled. In the event where this supposition is not fulfilled, parcelling can introduce ambiguity and reduce factor structure clarity of data (Hall, Snell, & Singer Foust, 1999; West, Finch, & Curran, 1995),

conceal model misspecifications (Cunningham, 2010), and it can also lead to subjective estimates in other of the model's parameters (Hall et al., 1999).

Subject to the provisos discussed above, parcelling can be effective in small sample sizes by reducing the level of non-normality of data, whilst increasing the generalisability of results (Little, Cunningham, Shahar, & Widaman, 2002).

9.3.8 Invariance Testing

Measurement invariance (also referred to as *equivalence*) considers whether construct generated scores retain their same meaning given different conditions. Different conditions can relate to consistency regarding: (i) timing of measurement; (ii) measurement across groups, and (iii) methods used during testing - for example, using computer-based versus written responses (Meade & Lautenschlager, 2004). Measurement invariance testing (also called *configural invariance* or *equal form invariance*) is the most basic form of testing and would generally precede construct-level metric invariance / equal factor loadings testing (Kline, 2011).

Longitudinal measurement invariance refers to maintaining stability over time. It explores whether a set of indicators will have the same factor structure using repeated measurements across the longitudinal time period. Should this be the case, the measurement can be said to be invariant over time. The concern of longitudinal measurement invariance stands against the concept of *construct bias*. Construct bias is concerned that a measurement would actually measure something different in the construct for one group than for the other; e.g. male versus female groups (Kline, 2011).

Testing for construct bias *is directly relevant to this study.* Testing was conducted within the group at each time period for timing-of-measurement invariance; essentially investigating whether the questions were similarly interpreted within the group across time, between points T_1 and T_2, T_2 and T_3, and, T_1 and T_3. If no evidence of construct bias is

present, the measures are said to be invariant across test groups. Conversely, if bias does occur, then all comparisons between groups' constructs would be invalid (Cunningham, 2010).

Partial measurement invariance dispelled the assumption that testing multi‑group hypotheses was only possible where invariant factor loadings existed. Muthen and Christofferson (1981, as cited in Byrne, Shavelson, & Muthen, 1989), proffered that hypotheses could be tested under conditions where part of the loadings were invariant across groups; *i.e. partial measurement invariance*. This is possible through creating separate (and different) baseline models for all the test groups, thus making allowances for the underlying differences (Byrne, Shavelson, & Muthen, 1989).

Multi‑sample (multi‑group) confirmatory factor analysis (MCFA) is commonly utilised to test hypotheses about measurement invariance between groups (Brown, 2006; Jöreskog, 1971). Hair et al. (2010, p.759) describe the MCFA process as: *"a series of empirical comparisons of models with increasingly restrictive constraints. The fundamental measure of difference used is the chi-square difference. This measure allows for an overall comparison between two model specifications (one with and one without constraints)."* The chi‑square difference is used as a primary measure because it can be assigned a level of statistical significance (Hair et al., 2010). The expectation is that if constraints are progressively applied, and the chi‑square difference (model‑fit indicator) does not increase significantly from the earlier estimated less‑constrained model, then the set of constraints can be accepted (Cunningham, 2010).

Hair et al. (2010) describe six stages of the invariance testing process. At every new stage in the process, additional constraints are introduced to those in the previous model. The chi‑square difference test is then applied between models at each intervening stage of progression. The next step is only taken if the previous "hurdle" has been cleared.

The identified stages are:

(i)   ***configural invariance*** (ensuring existence of the same basic factor structure for all groups; confirming that each group CFA model has an equivalent number of constructs and construct items; evidencing that each group model attains acceptable levels of construct validity and model-fit)

(ii)   ***metric invariance*** (involves empirical comparison between MCFA model groups and the equivalence of factor loadings where loadings indicate relationships between latent constructs and indicators)

(iii)   ***scalar invariance*** (involves testing of the equality of the means on the construct; allowing for comparison of the number of latent constructs between groups)

(iv)   ***factor covariance invariance*** (this stage constrains the covariances between constructs; the tests determine whether constructs are related to each only in the same way across the groups)

(v)   ***factor variance invariance*** (the test now assesses equality of the variances of the constructs across groups)

(vi)   ***error variance invariance*** (this final stage tests the measurement error present in the indicators and the degree to which it is equivalent across models)

The process described above is adopted in this study.

10.0 Chapter Summary

Chapter 3 discusses the research method adopted in this study. It highlights key aspects of the research design. This included the longitudinal repeated measures nature of the 4.5-year study detailing the different phases and the repeated measures taken at three time intervals (T_1, T_2, and T_3).

The repeated measures taken at baseline T_1 and T_2 reflect the delivery of a one-year entrepreneurship education, training, and incubation intervention program that participants attended during this period. A final set of repeated measures were taken at T_3 - 3.5 years after the training and mentoring intervention ended (referred to as *end-of-study*). The study's total number of participants consisted of 329 unemployed individuals in the Gauteng Province, South Africa at baseline. There were 287 nascent necessity-entrepreneurs at the end-of-study.

The intervention program titled the National Certificate in New Venture Creation was delivered within the structure of the South African Government's National Qualification Framework (NQF) at Level 4. The intervention involved participants attending full‑time classes and mentored incubator activities over the 12‑month period. Formative and summative assessments were undertaken within both theoretical and practical domains to determine competency against South African national standards.

A structural model was developed around prevailing theory to include and measure the constructs of interest: entrepreneurial self‑efficacy (ESE), intrinsic motivation (IM), entrepreneurial intention (EI), and business start‑up behaviour (ESB). Validated scales were utilised to measure the constructs. Data was uploaded using PASW (SPSS) and primary analysis was undertaken using structural equation modelling's AMOS software program.

Chapter 4: Results

Chapter 1 Introduction	Chapter 2 Literature Review	Chapter 3 Research Method
Chapter 4 Results	Chapter 5 Discussion	Chapter 6 Thesis Summary
Appendices		
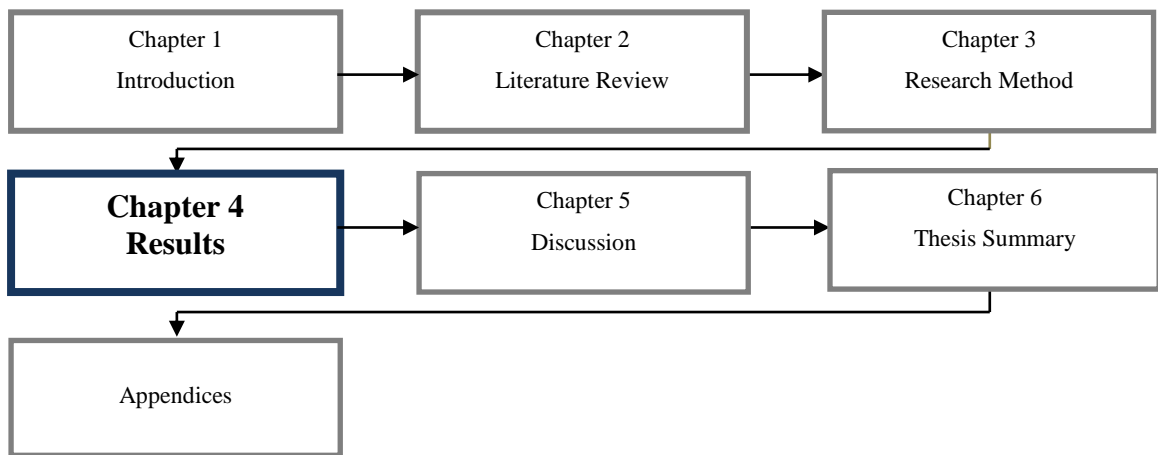
1.0 Introduction

Chapter 4 presents the results of the analysis of the data. It is presented in two sections. The first section provides the results of the preliminary analyses undertaken on the data. SPSS Version 19 was used primarily for this part of the analyses. The second section of the Chapter provides insights into more advanced analyses. Structural Equation Modelling (SEM) – AMOS Version 19 was used for these analyses.

To provide context for the analyses under discussion, Exhibit 4.1 presents the research questions that provide the basis for this research study.

Exhibit 4.1: Research Questions that Underpin this Research

No.	Research Questions
RQ1	To what extent is entrepreneurial self-efficacy (ESE) related to entrepreneurial intention (EI) in nascent necessity-entrepreneurs?
RQ2	To what extent is intrinsic motivation (IM) related to entrepreneurial intention (EI) in nascent necessity-entrepreneurs?
RQ3	To what extent is intrinsic motivation (IM) related to entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs?
RQ4	To what extent is entrepreneurial intention (EI) related to entrepreneurial start-up behaviour (ESB) in nascent necessity-entrepreneurs?
RQ5	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with an immediate change in intrinsic motivation (IM) in nascent necessity-entrepreneurs?
RQ6	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with an immediate change in entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs?
RQ7	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with an immediate change in entrepreneurial intention (EI) in nascent necessity-entrepreneurs?
RQ8	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with a sustained change in intrinsic motivation (IM) in nascent necessity-entrepreneurs?
RQ9	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with a sustained change in entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs?
RQ10	To what extent will an entrepreneurship training, mentoring, and incubation program be associated with a sustained change in entrepreneurial intention (EI) in nascent necessity-entrepreneurs?
RQ11	To what extent will nascent necessity-entrepreneurs who say they will start businesses actually start them subsequent to completing an entrepreneurship training, mentoring, and incubation program?
RQ12	To what extent does nascent necessity entrepreneur intrinsic motivation at one point in time influence intrinsic motivation at a subsequent point in time?
RQ13	To what extent does nascent necessity entrepreneur entrepreneurial self-efficacy at one point in time influence entrepreneurial self-efficacy at a subsequent point in time?
RQ14	To what extent does nascent necessity entrepreneur entrepreneurial intention at one point in time influence entrepreneurial intention at a subsequent point in time?

These research questions are linked to the structural model that is examined in this research. Exhibit 4.2 presents the structural model.

The model contains the following components:

- The latent variable, Intrinsic Motivation, (*Intrinsic_Motivations1*, *Intrinsic_Motivations2*, and *Intrinsic_Motivations3* to reflect measurement of these variables at the three points in time – T_1, T_2, and T_3) that is comprised of four indicator variables with associated error terms (this is an exogenous variable)

- The latent variable, Entrepreneurial Self-Efficacy (*ESE1*, *ESE3*, and *ESE3* to reflect measurement of these variables at the three points in time – T_1, T_2, and T_3), comprised of four indicator items and associated error terms (this is an endogenous variable)

- Entrepreneurial Intention (*intenta* to reflect measurement of this variable at the three points in time – T_1, T_2, and T_3) measured as a single indicator item that focuses on the extent to which a participant had intentions to establish a business (this is an endogenous variable), and

- Entrepreneurial Start-up Behaviour (*Operbiza* – measured at T_3), which is a single indicator item that measures the extent to which a participant's business is operating. This is the ultimate dependent variable (and endogenous variable) in the model.

The model hypothesises that there are inter-relationships among intrinsic motivation (IM), entrepreneurial self-efficacy (ESE), and entrepreneurial intention (EI). Consistent with prevailing theory (Ajzen, 1991), the model also hypothesises that there is a relationship between entrepreneurial intention (EI) and entrepreneurial start-up behaviour (ESB).

Exhibit 4.2: Structural Model
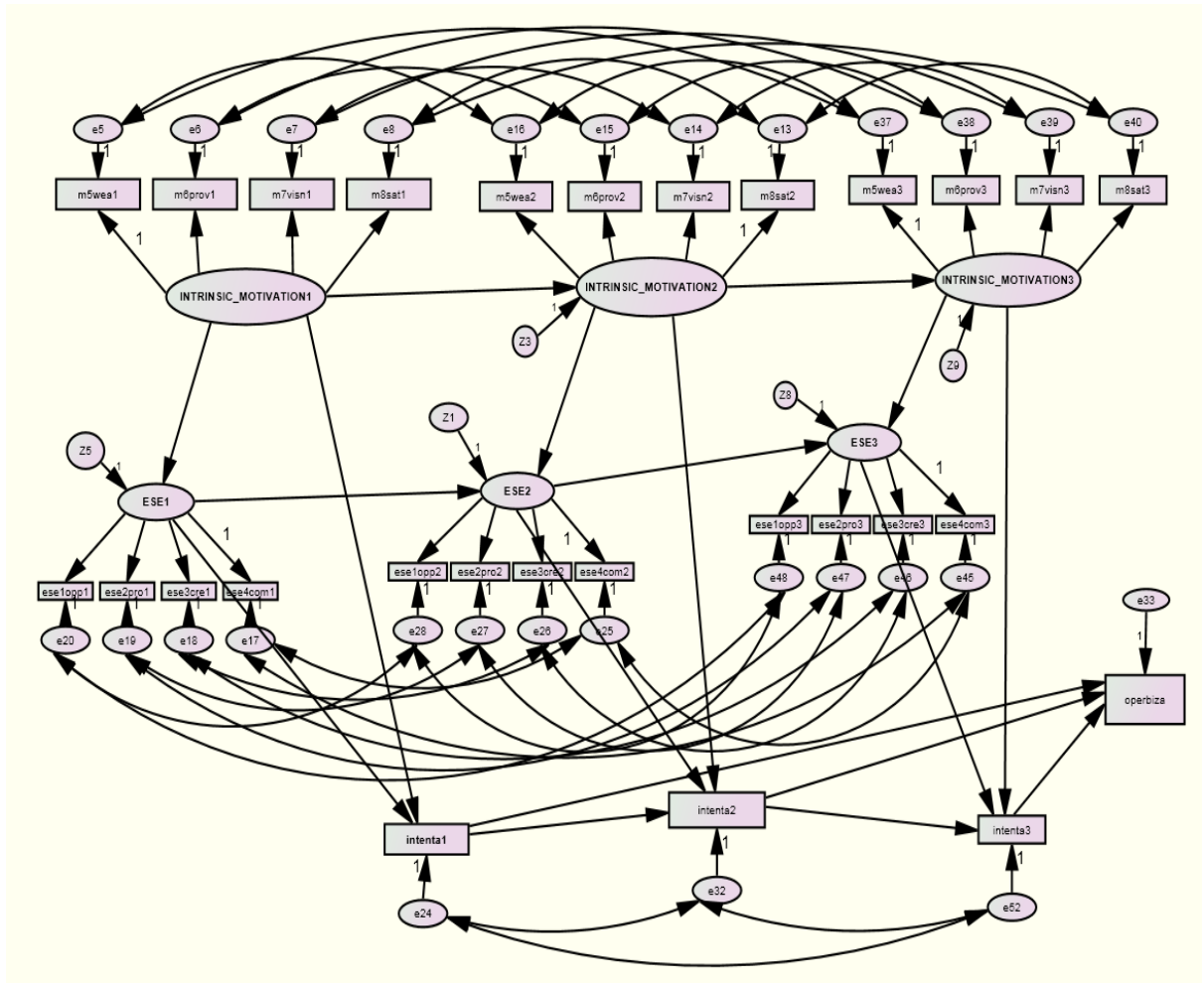
Exhibit 4.3 presents the hypotheses that underpin the model. These were developed as part of the literature review in Chapter 2 and are re‑presented here. These hypotheses form the foundation for the analyses undertaken that are described in the following sections.

A discussion regarding the levels of support (that is: partially supported; supported; not supported) for each of the hypotheses (based on the results achieved from the analyses) occurs in Chapter 5.

Exhibit 4.3: Underlying Hypotheses Examined

No.	Hypothesis
H1	*There will be a relationship between entrepreneurial self-efficacy (ESE) and entrepreneurial intention (EI) in nascent necessity-entrepreneurs.*
H2	*There will be a relationship between intrinsic motivation (IM) and entrepreneurial intention (EI) in nascent necessity-entrepreneurs*
H3	*There will be a relationship between intrinsic motivation (IM) and entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs*
H4	*There will be a relationship between entrepreneurial intention (EI) and entrepreneurial start-up behaviour (ESB) in nascent necessity-entrepreneurs.*
H5	*There will be an increase in intrinsic motivation (IM) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*
H6	*There will be an increase in entrepreneurial self-efficacy (ESE) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*
H7	*There will be an increase in entrepreneurial intention (EI) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*
H8	*There will be an extended increase in intrinsic motivation (IM) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*
H9	*There will be an extended increase in entrepreneurial self-efficacy (ESE) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*
H10	*There will be an extended increase in entrepreneurial intention (EI) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*
H11	*Not all nascent necessity-entrepreneurs will achieve complete business start-up (ESB) subsequent to completing an entrepreneurship training, mentoring, and incubation program.*
H12	*There will be a positive relationship between nascent necessity-entrepreneur intrinsic motivation (IM) at different points in time.*
H13	*There will be a positive relationship between nascent necessity-entrepreneur entrepreneurial self-efficacy (ESE) at different points in time.*
H14	*There will be a positive relationship between nascent necessity-entrepreneur entrepreneurial intention (EI) at different points in time*

2.0 Preliminary Analyses

This section inter-alia examines the data collected from the following perspectives:

- Reliability of the data using *Cronbach's alpha* (Nunally, 1979)

- Means and Standard Deviations; and

- Paired-Samples T-Tests over time.

2.1 Reliabilities

Exhibit 4.4 presents the reliabilities for the latent variables of interest (intrinsic motivations and entrepreneurial self-efficacy). Cronbach's alpha was used to evaluate the scale reliabilities. This assesses the internal consistency (or average correlation) of items in a survey instrument. All the scale reliabilities were above 0.70 which provide support for the reliability of the adopted scales (Nunnally, 1979). Consequently, it can be assumed that the scales used in this research were internally consistent.

Exhibit 4.4: Reliabilities at T_1, T_2, and T_3

Latent Variable	T_1	T_2	T_3
Intrinsic Motivation	.920	.774	.820
Entrepreneurial Self-Efficacy	.770	.762	.809

2.2 Means and Standard Deviations

This section presents the means and standard deviations of the variables that appear in the model (intrinsic motivation, entrepreneurial self-efficacy, entrepreneurial intention, and entrepreneurial start-up behaviour). Exhibit 4.5 presents the means and standard deviations for these variables at T_1, T_2, and T_3. All scales were 7-point Likert-type scales.

Exhibit 4.5: Means and Standard Deviations of Intrinsic Motivation at T_1, T_2, and T_3

Latent Variable	T_1 Means (SDs)	T_2 Means (SDs)	T_3 Means (SDs)
Intrinsic Motivation	4.91 (.930)	5.02 (.661)	5.07 (.721)
Entrepreneurial Self-Efficacy	4.93 (.675)	4.91 (.651)	5.12 (.704)
Entrepreneurial Intention	5.51 (.844)	5.81 (.852)	5.69 (.863)
Entrepreneurial Start-up Behaviour	--	--	4.94 (1.350)

Exhibit 4.6 provides a graphical representation of the variable means at T_1, T_2, and T_3.

Exhibit 4.6: Graph of the Means of All Variables at T_1, T_2, and T_3
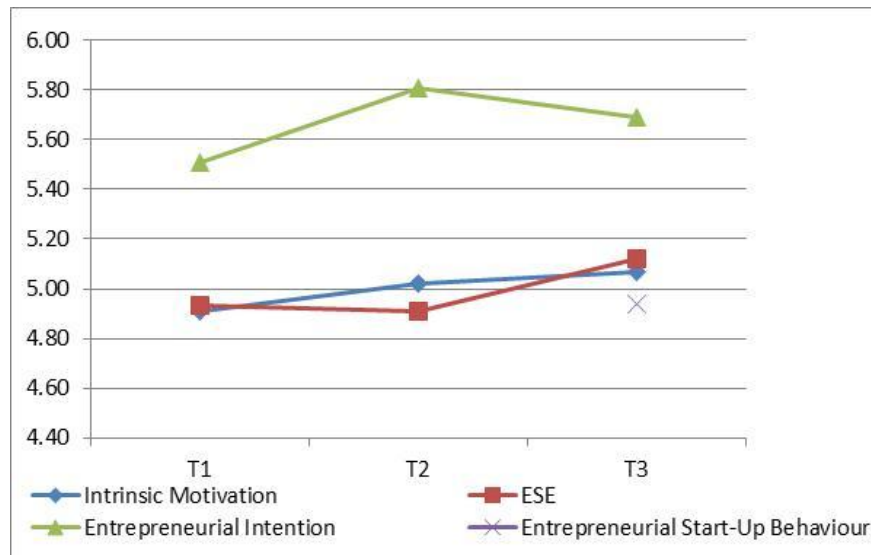
The following sections present the individual mean graphs for each variable and the results of a series of Paired-Samples T-Tests to determine whether there were significant differences between the means of the variables at T_1, T_2, and T_3.

2.2.1 Intrinsic Motivation

Exhibit 4.7 provides a graphical representation of the intrinsic motivation means at T_1, T_2, and T_3.

Exhibit 4.7: Graph of the Intrinsic Motivation Means at T_1, T_2, and T_3
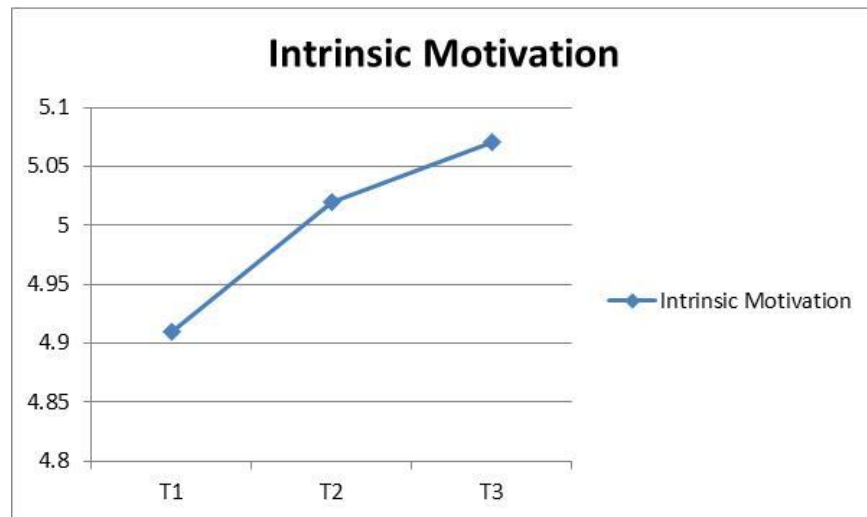
Exhibit 4.8 provides details of the Paired-Samples T-Tests. As can be seen from the Paired-Samples Test, there are significant intrinsic motivation means changes between T_1 and T_2, and T_1 and T_3, but not between T_2 and T_3. The T_3 intrinsic motivation mean (5.0723) was significantly higher ($p < 0.000$) than at T_1 (4.9077) (4.5 years after the commencement of the program at the business start-up stage) with intrinsic motivation peaking at T_3. There also was a significant difference between the T_1 and T_2 means ($p < 0.002$) immediately after the entrepreneurship training, mentoring and incubation intervention. Hence, intrinsic motivation increased marginally after the entrepreneurship training and mentoring intervention but the T_2 to T_3 increase was not significant.

Exhibit 4.8: Paired-Samples T-Tests for Intrinsic Motivation at T_1, T_2, and T_3

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	tim1	4.9077	287	.93036	.05492
	tim2	5.0192	287	.66083	.03901
Pair 2	tim2	5.0192	287	.66083	.03901
	tim3	5.0723	287	.72103	.04256
Pair 3	tim1	4.9077	287	.93036	.05492
	tim3	5.0723	287	.72103	.04256

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	tim1 & tim2	287	.762	.000
Pair 2	tim2 & tim3	287	.652	.000
Pair 3	tim1 & tim3	287	.773	.000

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	tim1 - tim2	-.11150	.60427	.03567	-.18171	-.04129	-3.126	286	.002
Pair 2	tim2 - tim3	-.05314	.57862	.03415	-.12036	.01409	-1.556	286	.121
Pair 3	tim1 - tim3	-.16463	.58993	.03482	-.23318	-.09609	-4.728	286	.000

2.2.2 Entrepreneurial Self-Efficacy

Exhibit 4.9 provides a graphical representation of the entrepreneurial self-efficacy means at T_1, T_2, and T_3.

Exhibit 4.9: Graph of the Entrepreneurial Self-Efficacy Means at T_1, T_2, and T_3
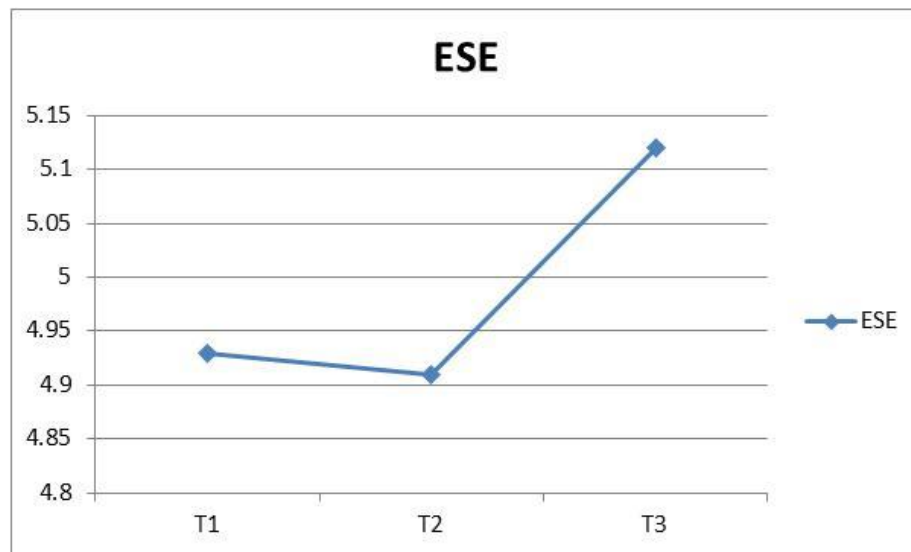
Exhibit 4.10 provides details of the Paired-Samples T-Tests. As can be seen from the Paired-Samples Test, there are significant entrepreneurial self-efficacy means changes between T_1 and T_3, and T_2 and T_3, but not between T_1 and T_2. The T_3 Entrepreneurial Self-Efficacy mean (5.1159) was significantly higher (p < 0.000) than at T_1 (4.9268) (4.5 years after the commencement of the program at which point it peaked).

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There also was a significant difference between the T_2 and T_3 means ($p < 0.000$) with entrepreneurial self-efficacy peaking at T_3. Thus, the entrepreneurship training, mentoring, and incubation intervention (which completed at T_2) appeared to have limited impact upon participant entrepreneurial self-efficacy (in fact in dropped marginally at T_2 but this was not considered significant) even though this had increased significantly when the next set of measures were taken at T_3.

Exhibit 4.10: Paired-Samples T-Tests for Entrepreneurial Self-Efficacy at T_1, T_2, and T_3

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	tese1	4.9268	287	.67475	.03983
	tese2	4.9111	287	.65141	.03845
Pair 2	tese2	4.9111	287	.65141	.03845
	tese3	5.1159	287	.70360	.04153
Pair 3	tese1	4.9268	287	.67475	.03983
	tese3	5.1159	287	.70360	.04153

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	tese1 & tese2	287	.809	.000
Pair 2	tese2 & tese3	287	.701	.000
Pair 3	tese1 & tese3	287	.800	.000

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	tese1 - tese2	.01568	.40991	.02420	-.03195	.06330	.648	286	.517
Pair 2	tese2 - tese3	-.20470	.52652	.03108	-.26588	-.14353	-6.586	286	.000
Pair 3	tese1 - tese3	-.18902	.43626	.02575	-.23971	-.13834	-7.340	286	.000

2.2.3 Entrepreneurial Intention

Exhibit 4.11 provides a graphical representation of the Entrepreneurial Intention means at T_1, T_2, and T_3.

Exhibit 4.11: Graph of the Entrepreneurial Intention Means at T_1, T_2, and T_3
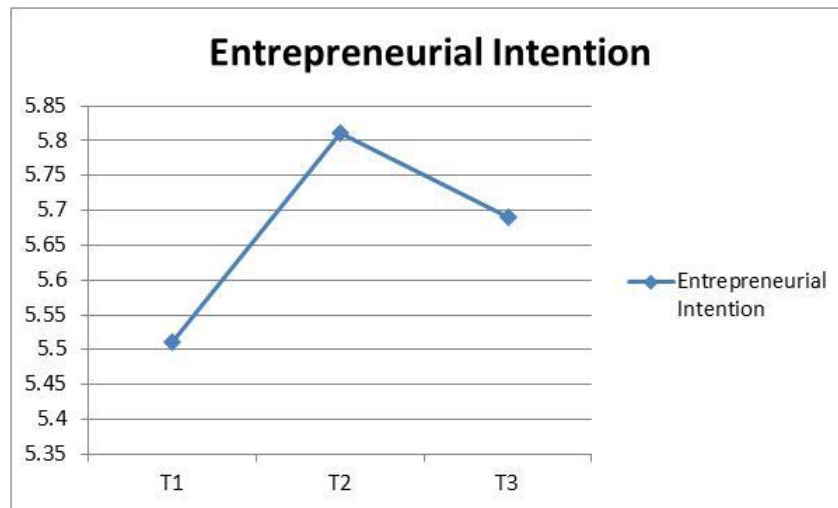
Exhibit 4.12 provides details of the Paired-Samples T-Tests. As can be seen from the Paired-Samples Test, there are significant entrepreneurial intention means changes between T_1 and T_2, T_2 and T_3, and T_1 and T_3. The T_3 entrepreneurial intention mean (5.69) was significantly higher ($p < 0.000$) than at T_1 (5.51) (4.5 years after the commencement of the program) but was significantly lower ($p < 0.001$) than at T_2 (which was where it peaked at 5.81 immediately after the entrepreneurship training, mentoring and incubation intervention).

Exhibit 4.12: Paired-Samples T-Tests for Entrepreneurial Intention at T1, T2, and T_3

Paired-Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	intenta1	5.51	287	.844	.050
	intenta2	5.81	287	.852	.050
Pair 2	intenta2	5.81	287	.852	.050
	intenta3	5.69	287	.863	.051
Pair 3	intenta1	5.51	287	.844	.050
	intenta3	5.69	287	.863	.051

Paired-Samples Correlations

		N	Correlation	Sig.
Pair 1	intenta1 & intenta2	287	.756	.000
Pair 2	intenta2 & intenta3	287	.753	.000
Pair 3	intenta1 & intenta3	287	.701	.000

Paired Samples Test

		Paired Differences							
				Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Mean	Std. Deviation		Lower	Upper			
Pair 1	intenta1 - intenta2	-.300	.592	.035	-.368	-.231	-8.575	286	.000
Pair 2	intenta2 - intenta3	.118	.603	.036	.048	.189	3.329	286	.001
Pair 3	intenta1 - intenta3	-.181	.660	.039	-.258	-.105	-4.651	286	.000

2.2.4 Entrepreneurial Start-up Behaviour

Exhibit 4.13 provides a graphical representation of the entrepreneurial start-up behaviour means at T_1, T_2, and T_3. This represented the extent that participants had engaged in operating their businesses. If all had completely operational businesses, the mean would be 7.0 (the maximum value on the Likert-scale). The mean for this variable was 4.94 (out of 7.0). Consequently, not all participants had fully operational businesses at T_3.

Exhibit 4.13: Graph of the Entrepreneurial Start-up Behaviour Means at T_1, T_2, and T_3
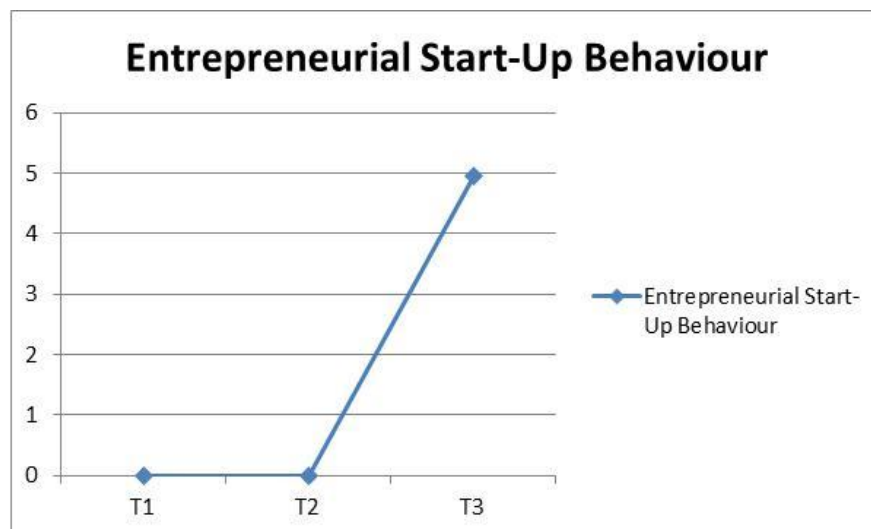
No Paired-Samples T-Test was undertaken for entrepreneurial start-up behaviour because there was only one point where the data was collected (T_3).

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3.0 More Advanced Analyses

Section 3 builds upon the previous section. It examines the following:

- Normality of the data (the underlying assumption of structural equation modeling is that the data is multivariate normal)

- One factor (congeneric) measurement models to ensure that the data fits the individual measurement models (essential before any structural model analysis is undertaken)

- Discriminant validity analyses to determine whether the indicator items on one factor are cross-loading on another factor

- Invariance testing to determine whether the data was collected from the same population across time (T_1, T_2, and T_3)

- Analysis of the structural model to examine (direct effect) inter-relationships among the variables in the model, and

- Tests for indirect effects in the model to determine whether one variable affects another variable via another (mediating) variable.

As noted in the Chapter introduction, AMOS Version 19 was used for most of these analyses.

3.1 Normality of the Data

An underpinning assumption of SEM when maximum likelihood (ML) is used is that the observations come from a continuous and multivariate normal population. If the data is not multivariate normal, two problems are likely to occur. First, the chi-square goodness-of-fit index may not produce a correct assessment of fit and may reject a "true" model, and second, tests of parameter estimates may be biased resulting in (too many) significant results (Anderson & Gerbing, 1988). It is therefore essential to examine the data for skewness (the symmetry of a distribution) and kurtosis (the "peakedness" of a distribution – the extent to which scores group together). Absolute values of skewness and kurtosis that exceed 2 and 7 respectively suggest moderately non-normal distributions (West et al., 1995).

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However, even if univariate distributions are normal, any joint variable distributions could depart from multivariate normality. As such, multivariate normality needs to be reviewed. In this regard, multivariate normality can be examined by employing Mardia's coefficient for multivariate kurtosis - this is one of the features that can be deployed in AMOS (Mardia, 1970). Mardia's coefficient has an expected value of zero when data is multivariate normally distributed. There is no specifically defined value of what this should be to indicate concern. As a result, Wothke (1996) suggests that a value of 3 or greater should suggest such concern. Because excessive kurtosis (in particular) can adversely affect the chi-square statistic together with associated standard errors when based on maximum likelihood (ML) estimates, an estimation method that does not assume normality should be used (or the standard errors derived from ML need to be adjusted) (Bollen & Stine, 1993).

Bollen-Stine bootstrap p statistic: In AMOS, the Bollen-Stine bootstrap *p* can be used when there is data that is not multivariate normal. The Bollen-Stine bootstrap *p* statistic is a post-hoc adjustment that accounts for non-normality and it produces adjusted (appropriate) standard errors through potent bootstrapping routines. It is a modified version of the chi-square statistic to test model fit and it adjusts for any distributional problems associated with a model by adjusting for the lack of any multivariate normality (Bollen & Stine, 1993).

Tests for kurtosis: The results of the tests for kurtosis in the data using Mardia's coefficient appear in the individual one factor (congeneric) measurement model results in the following section. Where Mardia's coefficient is 3 or more, the Bollen-Stine bootstrap *p* is presented (along with the chi-square statistic). For multivariate normally distributed data, the chi-square statistic should be non-significant (less than 0.5); for multivariate non-normal distributions, the Bollen-Stine bootstrap *p* statistic should be non-significant (less

than 0.5). The chi-square statistic may be less than 0.5 in multivariate non-normal distributions; however, this is ignored in favour of the Bollen-Stine bootstrap *p*; that is, model fit is considered in terms of the Bollen-Stine bootstrap *p* rather than the chi-square statistic when the distribution is multivariate non-normal.

3.2   One Factor (Congeneric) Measurement Models

This section examines the measurement models for the multi-item latent variables (intrinsic motivation and entrepreneurial self-efficacy). The purpose of the analysis is to determine whether the data fits the respective measurement model. In this regard, a confirmatory factor analysis (CFA) is undertaken.

A number of goodness-of-fit indices (discussed in Chapter 3), including chi-square, are used in this research and provide insights into model fit. Of note is that smaller samples (n<200) may have chi-squares that are more susceptible to not being significant which can result in Type II errors, (whereas larger samples (n>200) are more likely to produce significant chi-squares leading to Type I errors. Consequently, it is advisable to use a suite of goodness-of-fit indices since there can be uncertainty concerning the appropriateness of model fit if this is based on chi-square alone (Bentler, 1990; Cheung & Rensvold, 2002; Hu & Bentler, 1995).

Model fit indices that are often used and that are applied in this research are:

- *Chi-Square statistic* – referred to as "CMIN" in AMOS (used for multivariate normal distributions) – should be less than 0.05

- *Bollen-Stine bootstrap p* (for multivariate non-normal distributions)) – should be less than 0.05

- *Root Mean Square Error of Approximation (RMSEA)* – ideally should be less than 0.06 (Hu and Bentler, 1998) although values of less than 0.08 indicate reasonable fit (Brown and Cudeck, 1993). Note that this statistic can be examined in

association with its confidence interval. If the confidence interval around RMSEA is entirely greater than 0.5, then the null hypothesis that the model has close fit would be rejected (otherwise, there is support for close fit of the model) (Brown & Cudeck, 1993).

- *Tucker-Lewis Index (TLI)* – sometimes referred to as the Non‑Normed Fit Index or NNFI – should be greater than 0.95

- *Comparative Fit Index (CFI)* – should be greater than 0.95

- *Standardised Root-Mean-Square Residual (SRMR)* – ideally should be less than 0.05 (Byrne, 1998; Diamantopoulos & Siguaw, 2000) though 0.08 (Hu & Bentler, 1998, 1999) is acceptable with larger values suggesting that there may be outliers in the data

These indices are presented along with Mardia's coefficient for each multi‑item latent variable at T_1, T_2, and T_3.

Congeneric versus Parallel Measurement Models: The one factor measurement models used in this research are assumed to be congeneric. With congeneric models, the factor loadings and error variances are freely estimated. The underlying assumption is that the underlying items contribute to the latent variable in varying ways. In contrast, parallel measurement models assume that the indicator items contribute equally to the latent variable and that the measurement error variances are equal.

3.2.1 Intrinsic Motivation @ T_1

The intrinsic motivation latent variable was comprised of four indicator items at T_1. The one factor measurement model for this variable appears in Exhibit 4.14. Exhibit 4.15 presents the regression weights, standardised regression weights, variances, squared correlations, sample covariances, and sample correlations.

All indicator items were significant. The sample correlations suggest that item redundancy is not a major problem (correlations greater than 0.7 indicate there may be data redundancy). The eigenvalues indicate that a one-factor solution is reasonable. The item reliabilities (squared correlations) exceed 0.50 (corresponding to approximate factor loadings of 0.70) which is preferred (though item reliabilities in excess of 0.30 are deemed acceptable) (Cunningham, 2008).

Exhibit 4.14: Intrinsic Motivation Measurement Model @ T1
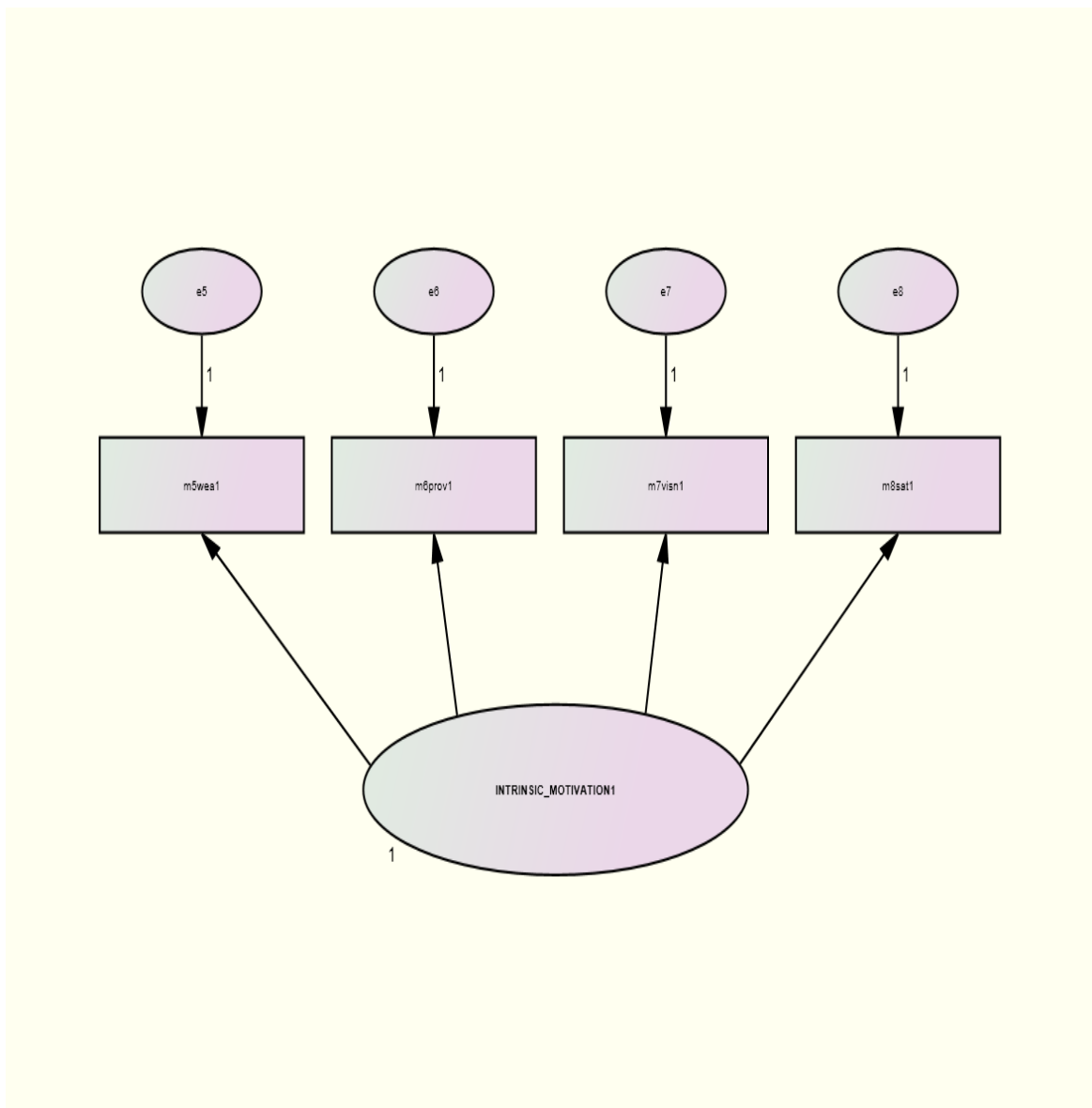
Exhibit 4.15: Intrinsic Motivation @ T$_1$ Estimates and Sample Moments

Regression Weights: (Default - Default model) *note: p<0.01*

			Estimate	S.E.	C.R.	P	Label
m5wea1	<---	INTRINSIC_MOTIVATION1	.807	.043	18.935	***	
m6prov1	<---	INTRINSIC_MOTIVATION1	.894	.049	18.185	***	
m7visn1	<---	INTRINSIC_MOTIVATION1	.979	.054	18.270	***	
m8sat1	<---	INTRINSIC_MOTIVATION1	.893	.053	16.876	***	

Standardised Regression Weights: (Default - Default model)

			Estimate
m5wea1	<---	INTRINSIC_MOTIVATION1	.892
m6prov1	<---	INTRINSIC_MOTIVATION1	.870
m7visn1	<---	INTRINSIC_MOTIVATION1	.873
m8sat1	<---	INTRINSIC_MOTIVATION1	.830

Variances: (Default - Default model)

	Estimate	S.E.	C.R.	P	Label
INTRINSIC_MOTIVATION1	1.000				
e5	.167	.021	8.000	***	
e6	.257	.029	8.800	***	
e7	.300	.034	8.719	***	
e8	.361	.037	9.748	***	

Squared Multiple Correlations: (Default - Default model)

	Estimate
m8sat1	.688
m7visn1	.761
m6prov1	.757
m5wea1	.796

Sample Covariances (Default)

	m8sat1	m7visn1	m6prov1	m5wea1
m8sat1	1.157			
m7visn1	.869	1.258		
m6prov1	.815	.866	1.057	
m5wea1	.711	.799	.719	.818

Condition number = 18.432
Eigenvalues
3.484 .343 .274 .189
Determinant of sample covariance matrix = .062

Sample Correlations (Default)

	m8sat1	m7visn1	m6prov1	m5wea1
m8sat1	1.000			
m7visn1	.720	1.000		
m6prov1	.737	.751	1.000	
m5wea1	.731	.787	.773	1.000

Condition number = 15.607
Eigenvalues
3.250 .295 .246 .208

The goodness‑of‑fit indices appear in Exhibit 4.16. As can be seen from this Exhibit, the indices are within the acceptable range; consequently, the model is consistent with the data and construct validity is confirmed.

Exhibit 4.16: Intrinsic Motivation Measurement Model Fit Indices @ T_1

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 2.041$ with 2 df and p = 0.360	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -3.804)	1.000	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0069	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.008 PCLOSE = 0.581 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.000	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

3.2.2 Intrinsic Motivation @ T_2

The intrinsic motivation latent variable was comprised of four indicator items at T_2. The one factor measurement model for this variable appears in Exhibit 4.17. Exhibit 4.18 presents the regression weights, standardised regression weights, variances, squared correlations, sample covariances, and sample correlations. All indicator items were significant.

The sample correlations suggest that item redundancy is not a problem. The eigenvalues indicate that a one‑factor solution is reasonable. The item reliabilities (squared correlations) exceed 0.30. Although item reliabilities of 0.50 (corresponding to approximate factor loadings of 0.70) are preferred, item reliabilities in excess of 0.30 are deemed acceptable (Cunningham, 2007).

Exhibit 4.17: Intrinsic Motivation Measurement Model @ T$_2$

Exhibit 4.18: Intrinsic Motivation @ T$_2$ Estimates and Sample Moments

Regression Weights: (Default - Default model) *note: p<0.01*

			Estimate	S.E.	C.R.	P	Label
m5wea2	<---	INTRINSIC_MOTIVATION2	.515	.052	9.870	***	
m6prov2	<---	INTRINSIC_MOTIVATION2	.489	.043	11.390	***	
m7visn2	<---	INTRINSIC_MOTIVATION2	.658	.056	11.714	***	
m8sat2	<---	INTRINSIC_MOTIVATION2	.666	.051	13.148	***	

Standardised Regression Weights: (Default - Default model)

			Estimate
m5wea2	<---	INTRINSIC_MOTIVATION2	.599
m6prov2	<---	INTRINSIC_MOTIVATION2	.676
m7visn2	<---	INTRINSIC_MOTIVATION2	.692
m8sat2	<---	INTRINSIC_MOTIVATION2	.766

Variances: (Default - Default model)

	Estimate	S.E.	C.R.	P	Label
INTRINSIC_MOTIVATION2	1.000				
e13	.474	.047	10.101	***	
e14	.285	.031	9.099	***	
e15	.470	.053	8.809	***	
e16	.314	.044	7.147	***	

Squared Multiple Correlations: (Default - Default model)

	Estimate
m8sat2	.586
m7visn2	.479
m6prov2	.457
m5wea2	.358

Sample Covariances (Default)

	m8sat2	m7visn2	m6prov2	m5wea2
m8sat2	.758			
m7visn2	.436	.902		
m6prov2	.329	.321	.524	
m5wea2	.342	.345	.248	.739

Condition number = 6.090
Eigenvalues
1.775 .467 .390 .291
Determinant of sample covariance matrix = .094

Sample Correlations (Default)

	m8sat2	m7visn2	m6prov2	m5wea2
m8sat2	1.000			
m7visn2	.527	1.000		
m6prov2	.521	.467	1.000	
m5wea2	.457	.422	.398	1.000

Condition number = 5.299
Eigenvalues
2.400 .617 .531 .453

The goodness-of-fit indices appear in Exhibit 4.19. As can be seen from this Exhibit, the indices are within the acceptable range; thus, the model is consistent with the data and construct validity is established.

Exhibit 4.19: Intrinsic Motivation Measurement Model Fit Indices @ T$_2$

| Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	χ^2 = .124 with 2 df and p = 0.940	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = 0.188)	Not required as data is normally distributed	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0036	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.970 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.019	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

3.2.3 Intrinsic Motivation @ T$_3$

The intrinsic motivation latent variable was comprised of four indicator items at T$_3$. The one factor measurement model for this variable appears in Exhibit 4.20. Exhibit 4.21 presents the regression weights, standardised regression weights, variances, squared correlations, sample covariances, and sample correlations.

All indicator items were significant. The sample correlations suggest that item redundancy is not a problem. The eigenvalues indicate that a one-factor solution is reasonable. The item reliabilities (squared correlations) exceed 0.30. Although item reliabilities of 0.50 (corresponding to approximate factor loadings of 0.70) are preferred, item reliabilities in excess of 0.30 are deemed acceptable (Cunningham, 2007).

Exhibit 4.20: Intrinsic Motivation Measurement Model @ T$_3$
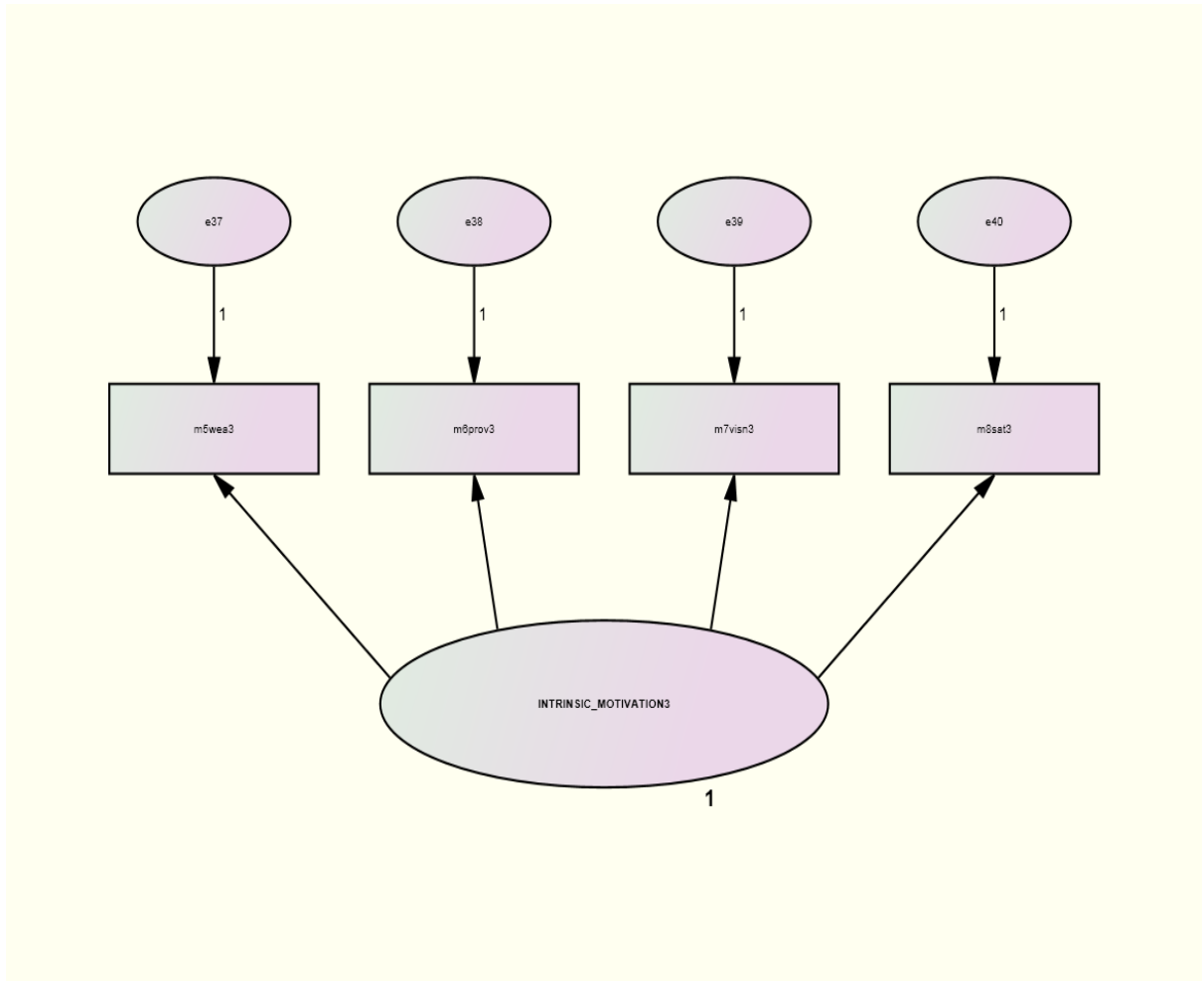
Exhibit 4.21: Intrinsic Motivation @ T$_2$ Estimates and Sample Moments

Regression Weights: (Default - Default model)

			Estimate	S.E.	C.R.	P	Label
m5wea3	<---	INTRINSIC_MOTIVATION3	.688	.049	14.067	***	
m6prov3	<---	INTRINSIC_MOTIVATION3	.585	.049	11.908	***	
m7visn3	<---	INTRINSIC_MOTIVATION3	.688	.053	12.963	***	
m8sat3	<---	INTRINSIC_MOTIVATION3	.648	.049	13.273	***	

Standardised Regression Weights: (Default - Default model)

			Estimate
m5wea3	<---	INTRINSIC_MOTIVATION3	.775
m6prov3	<---	INTRINSIC_MOTIVATION3	.680
m7visn3	<---	INTRINSIC_MOTIVATION3	.727
m8sat3	<---	INTRINSIC_MOTIVATION3	.741

Variances: (Default - Default model)

	Estimate	S.E.	C.R.	P	Label
INTRINSIC_MOTIVATION3	1.000				
e37	.314	.040	7.915	***	
e38	.398	.041	9.687	***	
e39	.422	.047	8.963	***	
e40	.346	.040	8.701	***	

Squared Multiple Correlations: (Default - Default model)

	Estimate
m8sat3	.549
m7visn3	.529
m6prov3	.462
m5wea3	.601

Sample Covariances (Default)

	m8sat3	m7visn3	m6prov3	m5wea3
m8sat3	.766			
m7visn3	.447	.896		
m6prov3	.371	.411	.739	
m5wea3	.451	.467	.403	.787

Condition number = 6.447
Eigenvalues
2.079 .402 .385 .323
Determinant of sample covariance matrix = .104

Sample Correlations (Default)

	m8sat3	m7visn3	m6prov3	m5wea3
m8sat3	1.000			
m7visn3	.539	1.000		
m6prov3	.493	.505	1.000	
m5wea3	.581	.556	.528	1.000

Condition number = 6.286
Eigenvalues
2.602 .519 .464 .414

The goodness-of-fit indices appear in Exhibit 4.22. As can be seen from this Exhibit, the indices are within the acceptable range; as a result, the model is consistent with the data and construct validity is established.

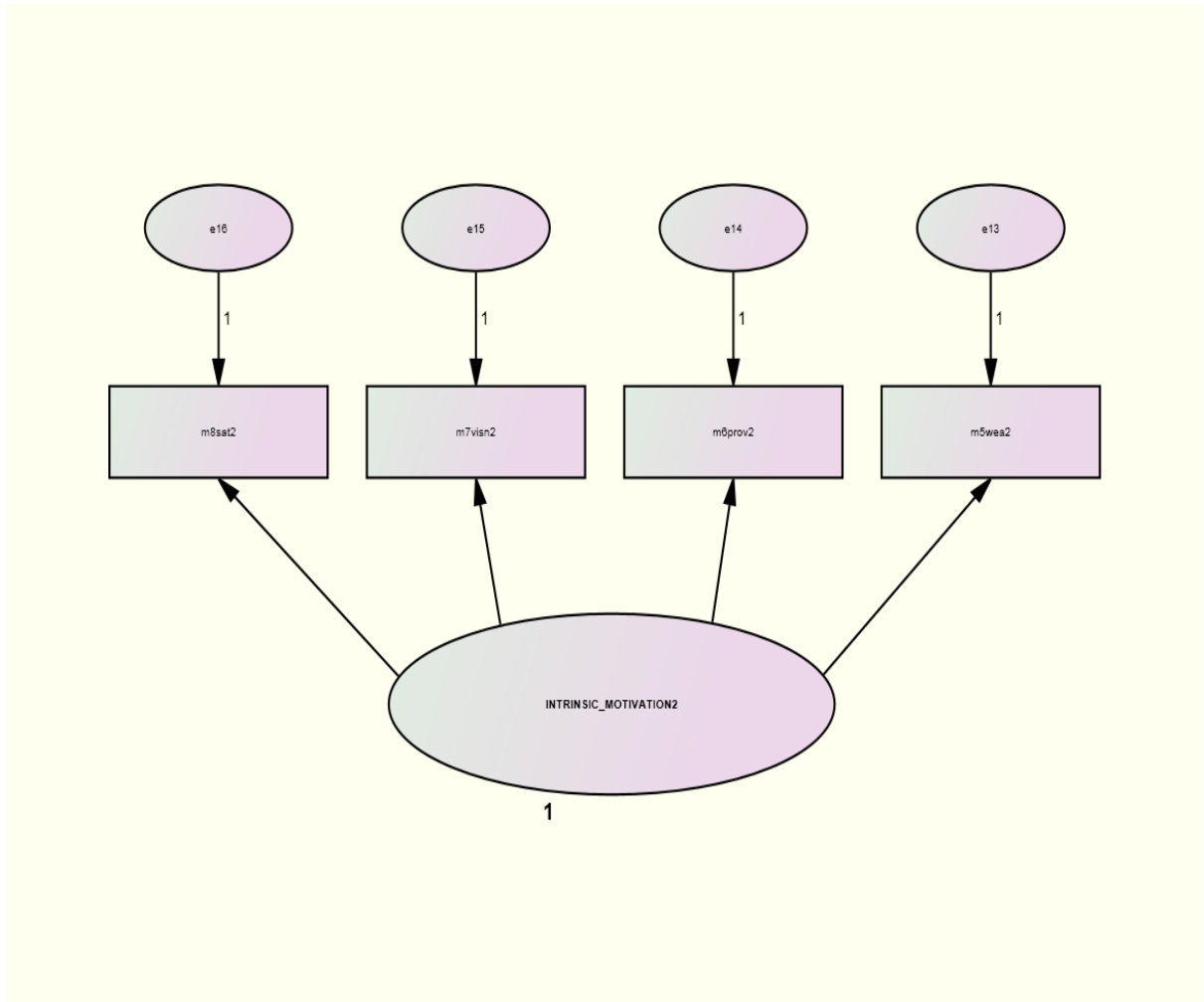**Exhibit 4.22: Intrinsic Motivation Measurement Model Fit Indices @ T_3**

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	χ^2 = .410 with 2 df and p = 0.815	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = 0.482)	Not required as data is normally distributed	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0057	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.903 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.013	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

3.2.4 Entrepreneurial Self-Efficacy @ T_1

The entrepreneurial self-efficacy latent variable was comprised of four indicator items at T_1. The one factor measurement model for this variable appears in Exhibit 4.23. Exhibit 4.24 presents the regression weights, standardised regression weights, variances, squared correlations, sample covariances, and sample correlations.

All indicator items were significant. The sample correlations suggest that item redundancy is not a problem. The eigenvalues indicate that a one-factor solution is reasonable. The item reliabilities (squared correlations) exceed 0.30. Although item reliabilities of 0.50 (corresponding to approximate factor loadings of 0.70) are preferred, item reliabilities in excess of 0.30 are considered acceptable (Cunningham, 2007).

Exhibit 4.23: Entrepreneurial Self-Efficacy Measurement Model @ T₁

Exhibit 4.24: Entrepreneurial Self-Efficacy @ T₁ Estimates and Sample Moments

Regression Weights: (Default - Default model)

			Estimate	S.E.	C.R.	P	Label
ese4com1	<---	ESE1	.498	.064	7.834	***	
ese3cre1	<---	ESE1	.596	.073	8.202	***	
ese2pro1	<---	ESE1	.475	.069	6.894	***	
ese1opp1	<---	ESE1	.704	.077	9.088	***	

Standardised Regression Weights: (Default - Default model)

			Estimate
ese4com1	<---	ESE1	.661
ese3cre1	<---	ESE1	.689
ese2pro1	<---	ESE1	.593
ese1opp1	<---	ESE1	.754

Variances: (Default - Default model)

	Estimate	S.E.	C.R.	P	Label
ESE1	1.000				
e17	.319	.049	6.534	***	
e18	.394	.064	6.197	***	
e19	.417	.058	7.161	***	
e20	.376	.073	5.147	***	

Squared Multiple Correlations: (Default - Default model)

	Estimate
ese1opp1	.569
ese2pro1	.351
ese3cre1	.474
ese4com1	.438

Sample Covariances (Default)

	ese1opp1	ese2pro1	ese3cre1	ese4com1
ese1opp1	.872			
ese2pro1	.321	.643		
ese3cre1	.418	.304	.750	
ese4com1	.363	.234	.284	.567

Condition number = 5.269
Eigenvalues
1.704 .423 .381 .323
Determinant of sample covariance matrix = .089

Sample Correlations (Default)

	ese1opp1	ese2pro1	ese3cre1	ese4com1
ese1opp1	1.000			
ese2pro1	.428	1.000		
ese3cre1	.517	.438	1.000	
ese4com1	.516	.387	.436	1.000

Condition number = 5.194
Eigenvalues
2.364 .631 .549 .455

The goodness-of-fit indices appear in Exhibit 4.25. As can be seen from this Exhibit, the indices are within the acceptable range; therefore, the model is consistent with the data and construct validity is established.

Exhibit 4.25: Entrepreneurial Self-Efficacy Measurement Model Fit Indices @ T$_1$

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	χ^2 = .945with 2 df and p = 0.624	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -1.978)	Not required as data is normally distributed	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0141	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.717 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.023	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

3.2.5 Entrepreneurial Self-Efficacy @ T$_2$

The entrepreneurial self-efficacy latent variable was comprised of four indicator items at T$_2$. The one factor measurement model for this variable appears in Exhibit 4.26. Exhibit 4.27 presents the regression weights, standardised regression weights, variances, squared correlations, sample covariances, and sample correlations.

All indicator items were significant. The sample correlations suggest that item redundancy is not an issue. The eigenvalues indicate that a one factor solution is reasonable. The item reliabilities (squared correlations) exceed 0.30. Although item reliabilities of 0.50 (corresponding to approximate factor loadings of 0.70) are ideal, item reliabilities in excess of 0.30 are deemed acceptable (Cunningham, 2007).

Exhibit 4.26: Entrepreneurial Self-Efficacy Measurement Model @ T$_2$

Exhibit 4.27: Entrepreneurial Self-Efficacy @ T$_2$ Estimates and Sample Moments

Regression Weights: (Default - Default model)

			Estimate	S.E.	C.R.	P	Label
ese4com2	<---	ESE2	.499	.049	10.193	***	
ese3cre2	<---	ESE2	.677	.052	13.114	***	
ese2pro2	<---	ESE2	.472	.050	9.372	***	
ese1opp2	<---	ESE2	.628	.055	11.515	***	

Standardised Regression Weights: (Default - Default model)

			Estimate
ese4com2	<---	ESE2	.620
ese3cre2	<---	ESE2	.778
ese2pro2	<---	ESE2	.577
ese1opp2	<---	ESE2	.691

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Variances: (Default - Default model)

	Estimate	S.E.	C.R.	P	Label
ESE2	1.000				
e25	.398	.041	9.732	***	
e26	.299	.046	6.479	***	
e27	.448	.044	10.208	***	
e28	.431	.050	8.588	***	

Squared Multiple Correlations: (Default - Default model)

	Estimate
ese1opp2	.477
ese2pro2	.333
ese3cre2	.605
ese4com2	.385

Sample Covariances (Default)

	ese1opp2	ese2pro2	ese3cre2	ese4com2
ese1opp2	.825			
ese2pro2	.287	.671		
ese3cre2	.443	.302	.758	
ese4com2	.289	.280	.332	.646

Condition number = 5.246
Eigenvalues
1.709 .481 .384 .326
Determinant of sample covariance matrix = .103

Sample Correlations (Default)

	ese1opp2	ese2pro2	ese3cre2	ese4com2
ese1opp2	1.000			
ese2pro2	.385	1.000		
ese3cre2	.560	.423	1.000	
ese4com2	.395	.426	.475	1.000

Condition number = 5.478
Eigenvalues
2.336 .663 .575 .426

The goodness-of-fit indices appear in Exhibit 4.28. As can be seen from this Exhibit, with the exception of RMSEA, the indices are within the acceptable range. RMSEA = 0.08; however, this is considered reasonable (Brown & Cudeck, 1993) and, in any event, the PCLOSE and LO 90 confidence level are within the acceptable range. Thus, the model is consistent with the data and construct validity is established.

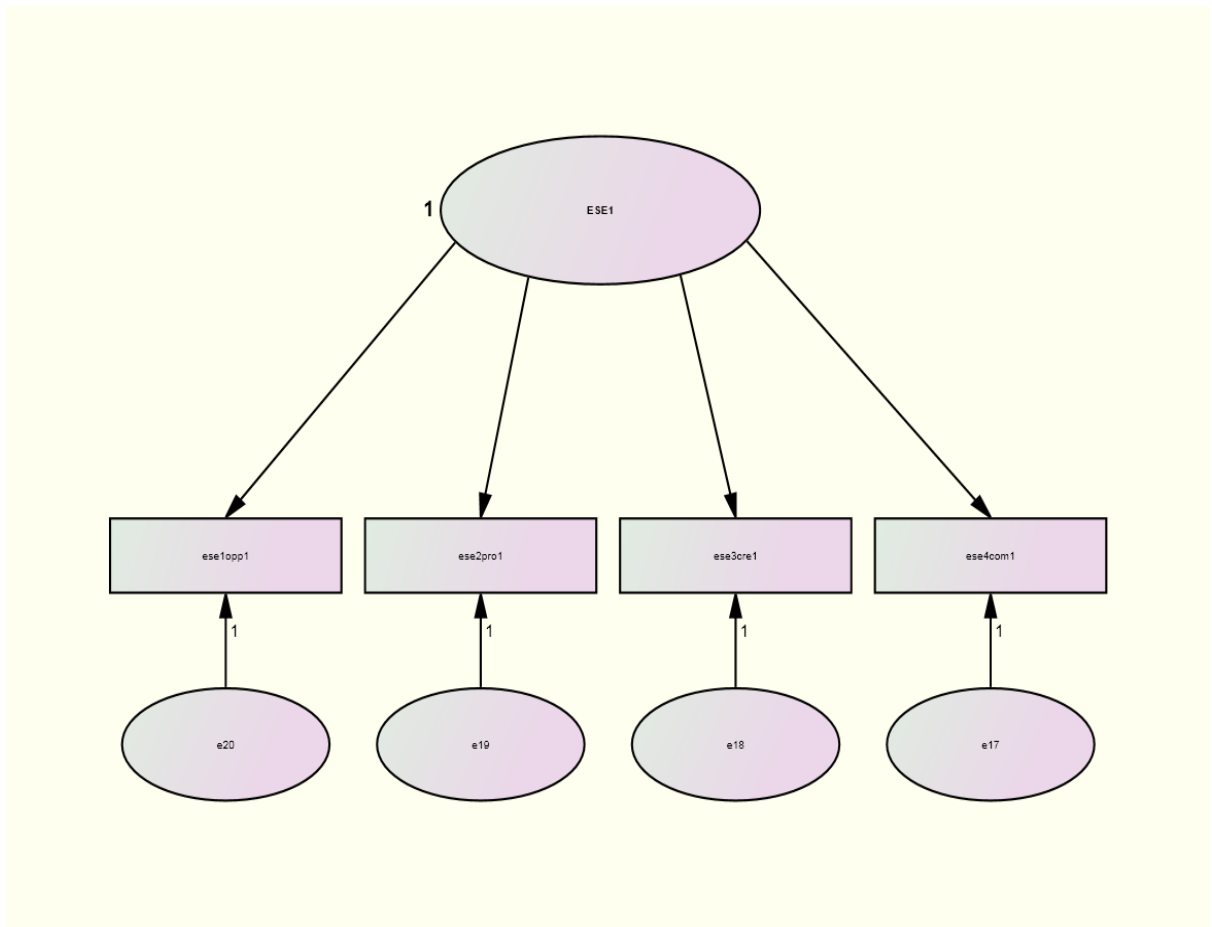**Exhibit 4.28: Entrepreneurial Self-Efficacy Measurement Model Fit Indices @ T_2**

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 5.748$ with 2 df and p = 0.056	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -0.760)	Not required as data is normally distributed	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0268	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.081 PCLOSE = 0.186 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 0.959	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 0.986	CFI > 0.95

3.2.6 Entrepreneurial Self-Efficacy @ T_3

The entrepreneurial self-efficacy latent variable was comprised of four indicator items at T_3. The one factor measurement model for this variable appears in Exhibit 4.29. Exhibit 4.30 presents the regression weights, standardised regression weights, variances, squared correlations, sample covariances, and sample correlations. All indicator items were significant. The sample correlations suggest that item redundancy is not a problem. The eigenvalues indicate that a one factor solution is reasonable. The item reliabilities (squared correlations) exceed 0.30. Although item reliabilities of 0.50 (corresponding to approximate factor loadings of 0.70) are preferred item reliabilities in excess of 0.30 are deemed acceptable (Cunningham, 2007).

Exhibit 4.29: Entrepreneurial Self-Efficacy Measurement Model @ T₃

Exhibit 4.30: Entrepreneurial Self-Efficacy @ T₃ Estimates and Sample Moments

Regression Weights: (Default - Default model)

			Estimate	S.E.	C.R.	P	Label
ese4com3	<---	ESE3	1.000				
ese3cre3	<---	ESE3	1.078	.102	10.576	***	
ese2pro3	<---	ESE3	.940	.098	9.573	***	
ese1opp3	<---	ESE3	1.197	.112	10.698	***	

Standardised Regression Weights: (Default - Default model)

			Estimate
ese4com3	<---	ESE3	.728
ese3cre3	<---	ESE3	.739
ese2pro3	<---	ESE3	.652
ese1opp3	<---	ESE3	.753

Variances: (Default - Default model)

	Estimate	S.E.	C.R.	P	Label
ESE3	.360	.056	6.420	***	
e45	.320	.037	8.720	***	
e46	.348	.041	8.491	***	
e47	.431	.044	9.871	***	
e48	.394	.048	8.180	***	

Squared Multiple Correlations: (Default - Default model)

	Estimate
ese1opp3	.567
ese2pro3	.425
ese3cre3	.546
ese4com3	.530

Sample Covariances (Default)

	ese1opp3	ese2pro3	ese3cre3	ese4com3
ese1opp3	.910			
ese2pro3	.383	.750		
ese3cre3	.480	.366	.767	
ese4com3	.432	.359	.373	.680

Condition number = 6.090
Eigenvalues
1.987 .442 .351 .326
Determinant of sample covariance matrix = .101

Sample Correlations (Default)

	ese1opp3	ese2pro3	ese3cre3	ese4com3
ese1opp3	1.000			
ese2pro3	.464	1.000		
ese3cre3	.575	.483	1.000	
ese4com3	.549	.503	.517	1.000

Condition number = 6.150
Eigenvalues
2.547 .560 .479 .414

The goodness-of-fit indices appear in Exhibit 4.31. As can be seen from this Exhibit, the indices are within the acceptable range; consequently, the model is consistent with the data and construct validity is established.

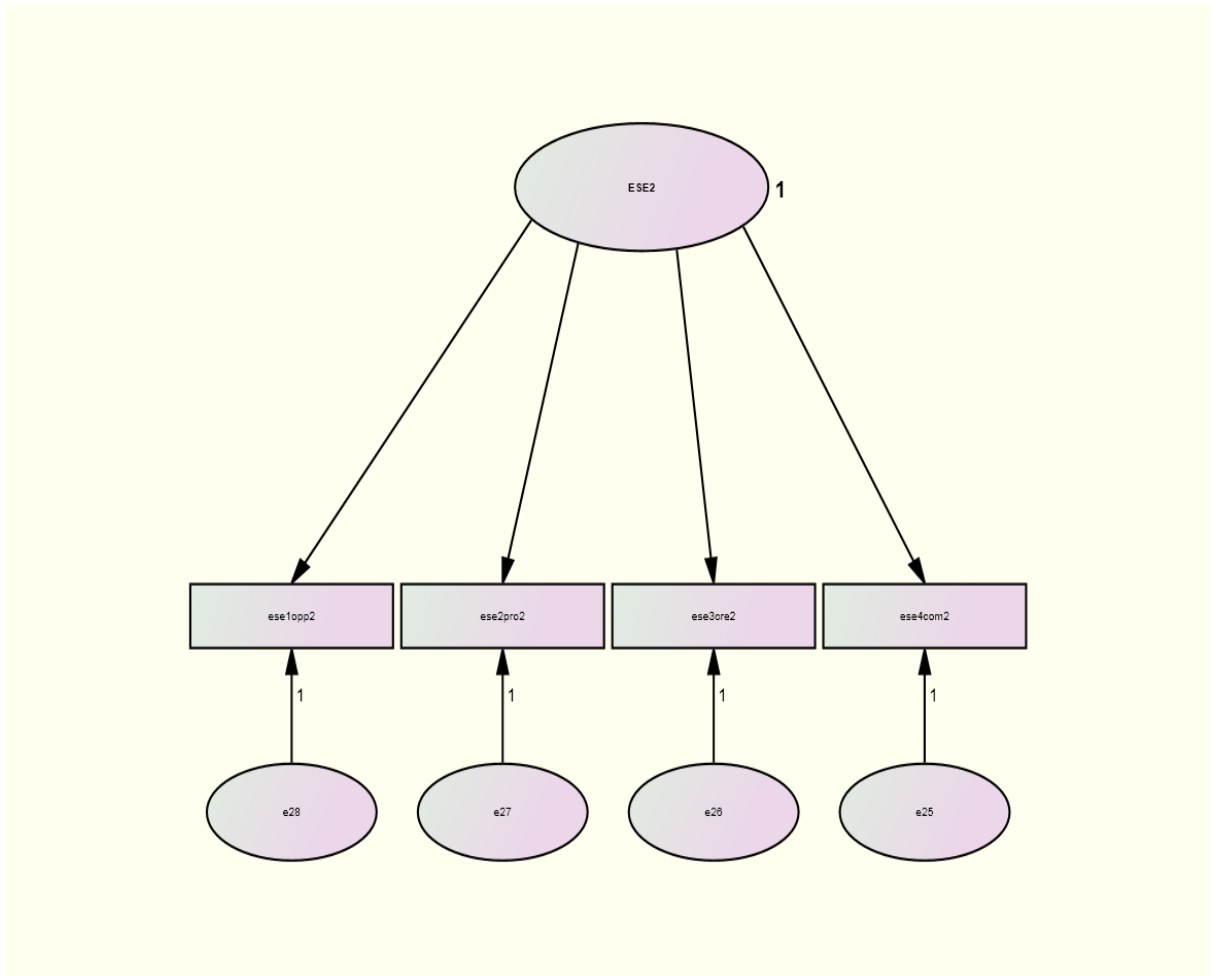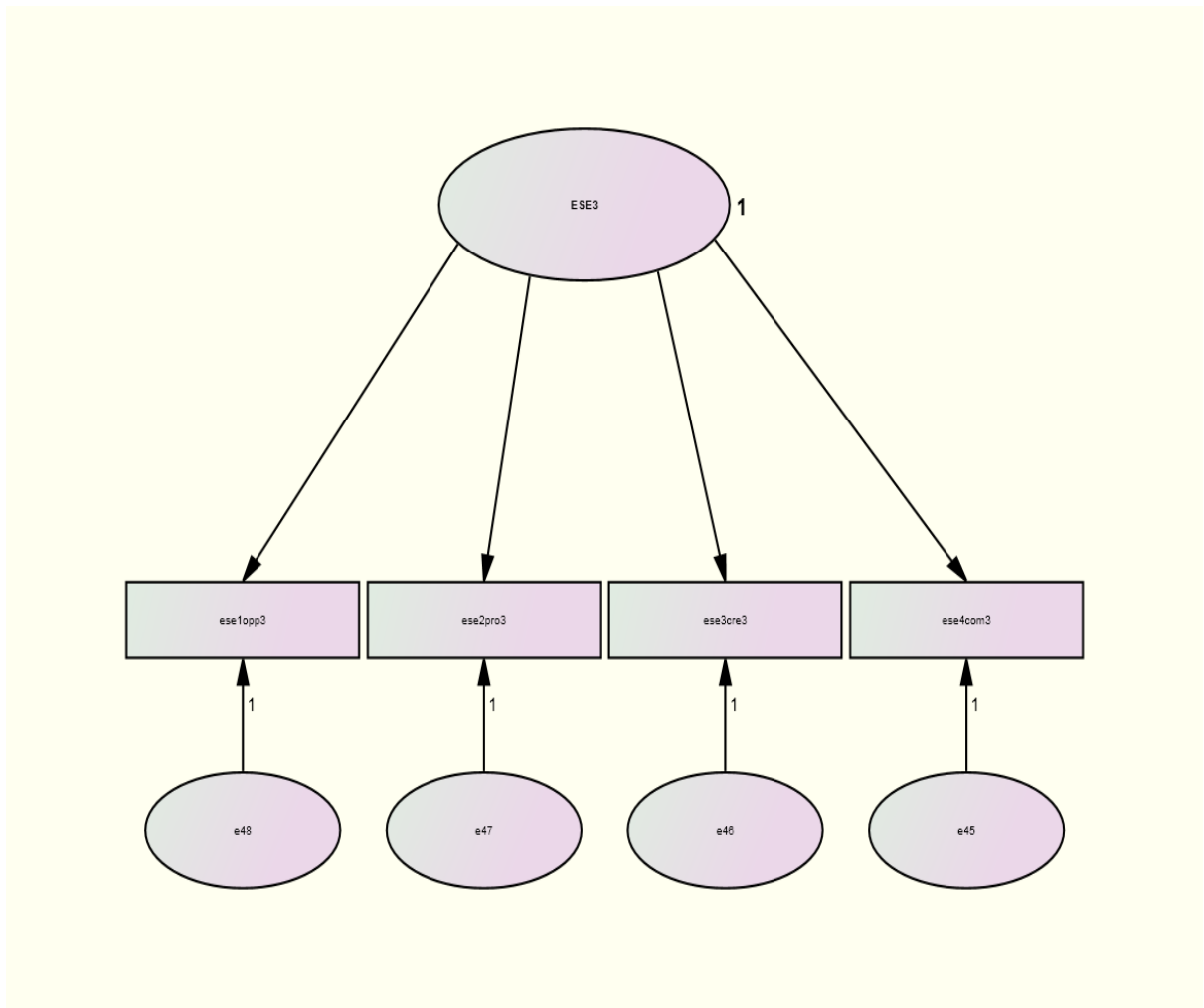**Exhibit 4.31: Entrepreneurial Self-Efficacy Measurement Model Fit Indices @ T$_3$**

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 2.831$ with 2 df and p = 0.243	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = 1.102)	Not required as data is normally distributed	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0153	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.038 PCLOSE = 0.462 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 0.993	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 0.998	CFI > 0.95

3.3 Discriminant Validity

Discriminant validity denotes the extent to which model constructs are dissimilar to each other. Assessing discriminant validity is particularly important when factors are inter-related (Cunningham, 2010).

In this section, the latent variables, intrinsic motivation and entrepreneurial intention, are examined at T$_1$, T$_2$, and T$_3$ to determine to what extent, if any, the respective items of each construct "load" on the other. The approach adopted is that based on Thompson (1997) where the pattern coefficients (standardised factor loadings) are compared with the structure coefficients (calculated by multiplying the latent variables correlation by factor loadings of each item). The pattern coefficients should be significant and should be greater than the structure coefficients. AMOS is used to produce the relevant model comparisons and the results at each time period appear below.

3.3.1 Discriminant Validity: Intrinsic Motivation and Entrepreneurial Self-Efficacy @ T$_1$

Exhibit 4.32 presents the latent variables, intrinsic motivation and entrepreneurial intention, at T$_1$ in preparation for the discriminant validity analysis. The model fit indices

appear in Exhibit 4.33. As can be seen, all indices are within the acceptable range. The results of the comparative analysis appear in Exhibit 4.34. As can be observed, the intrinsic motivation pattern coefficients (**bold**) exceed the entrepreneurial self-efficacy structure coefficients and vice versa. Hence, the two latent variables display discriminant validity.

Exhibit 4.32: Discriminant Validity Model: Intrinsic Motivation and ESE @ T_1
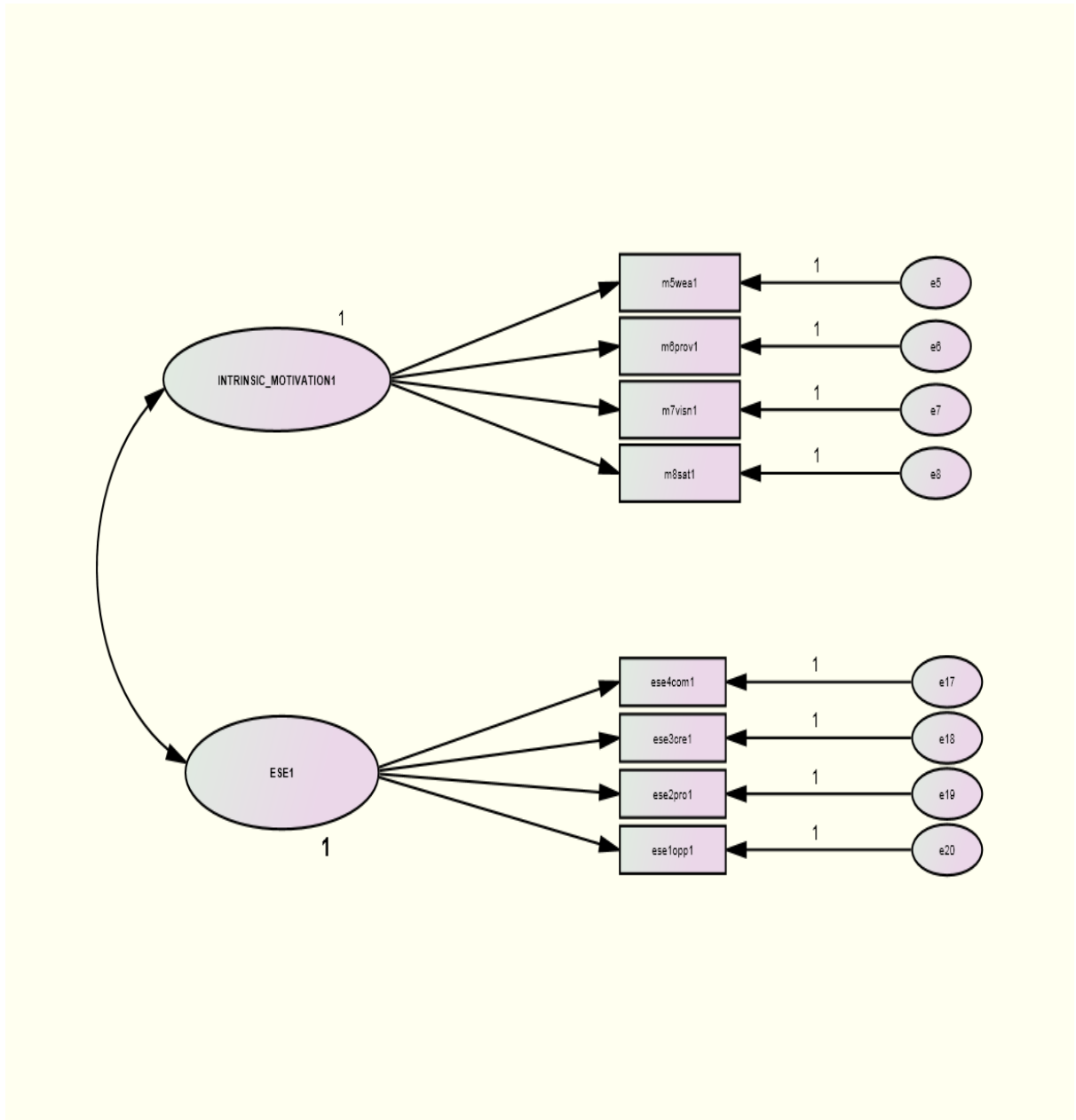
Exhibit 4.33: Discriminant Validity Model Fit: Intrinsic Motivation and ESE @ T_1

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = $ 12.381 with 19 df and p = 0.869	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -4.824)	1.000	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0225	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.996 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.008	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

Implied (for all variables) Correlations (Default - Default model)

Exhibit 4.34: Discriminant Validity Comparisons: Intrinsic Motivation and ESE @ T_1

	ESE1	INTRINSIC_ MOTIVATION1	ese1o pp1	ese2 pro1	ese3 cre1	ese4c om1	m8s at1	m7vi sn1	m6pr ov1	m5we a1
ESE1	1.000									
INTRINSIC_ MOTIVATION1	.246	1.000								
ese1opp1	**.770**	.190	1.000							
ese2pro1	**.562**	.138	.433	1.000						
ese3cre1	**.751**	.185	.578	.422	1.000					
ese4com1	**.622**	.153	.479	.350	.467	1.000				
m8sat1	.205	**.831**	.157	.115	.154	.127	1.000			
m7visn1	.215	**.874**	.166	.121	.162	.134	.726	1.000		
m6prov1	.214	**.870**	.165	.120	.161	.133	.722	.760	1.000	
m5wea1	.219	**.891**	.169	.123	.165	.137	.740	.778	.775	1.000

3.3.2 Discriminant Validity: Intrinsic Motivation and ESE @ T_2

Exhibit 4.35 presents the latent variables, intrinsic motivation and entrepreneurial intention, at T_1 in preparation for the discriminant validity analysis. The model fit indices appear in Exhibit 4.36. As can be observed, all indices are within the acceptable range. The results of the comparative analysis appear in Exhibit 4.37. As can be seen, the intrinsic motivation pattern coefficients (**bold**) exceed the entrepreneurial self-efficacy structure coefficients and vice versa. Thus, the two latent variables display discriminant validity.

Exhibit 4.35: Discriminant Validity Model: Intrinsic Motivation and ESE @ T2
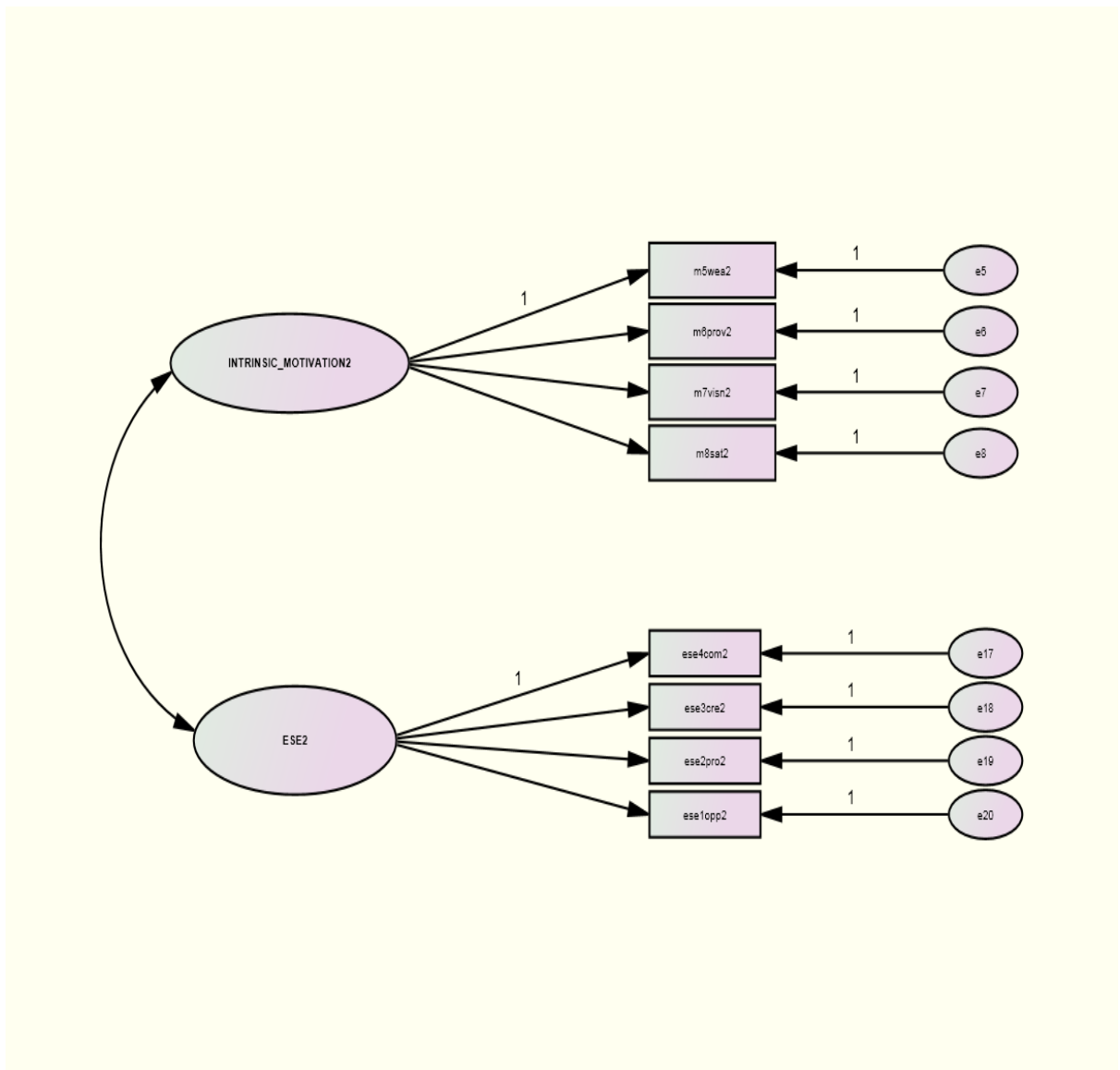
Exhibit 4.36: Discriminant Validity Model Fit: Intrinsic Motivation and ESE @ T_2

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 17.556$ with 19 df and p = 0.552	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = 0.462)	Not required as data is normally distributed	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0325	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.962 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.004	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

Implied (for all variables) Correlations (Default - Default model)

Exhibit 4.37: Discriminant Validity Comparisons: Intrinsic Motivation and ESE @ T_2

	ESE2	INTRINSIC_MOTIVATION2	ese1opp2	ese2pro2	ese3cre2	ese4com2	m8sat2	m7visn2	m6prov2	m5wea2
ESE2	1.000									
INTRINSIC_MOTIVATION2	.255	1.000								
ese1opp2	**.701**	.179	1.000							
ese2pro2	**.577**	.147	.404	1.000						
ese3cre2	**.772**	.197	.541	.445	1.000					
ese4com2	**.617**	.158	.432	.356	.476	1.000				
m8sat2	.196	**.766**	.137	.113	.151	.121	1.000			
m7visn2	.178	**.698**	.125	.103	.138	.110	.534	1.000		
m6prov2	.171	**.669**	.120	.099	.132	.105	.513	.467	1.000	
m5wea2	.153	**.599**	.107	.088	.118	.094	.459	.418	.401	1.000

3.3.3 Discriminant Validity: Intrinsic Motivation and ESE @ T_3

Exhibit 4.38 presents the latent variables: intrinsic motivation and entrepreneurial intention, at T_3 in preparation for the discriminant validity analysis. The model fit indices appear in Exhibit 4.39. As can be seen, all indices are within the acceptable range. The results of the comparative analysis appear in Exhibit 4.40. As can be observed, the intrinsic motivation pattern coefficients (**bold**) exceed the entrepreneurial self-efficacy structure coefficients and vice versa. Therefore, the two latent variables display discriminant validity.

Exhibit 4.38: Discriminant Validity Model: Intrinsic Motivation and ESE @ T_3
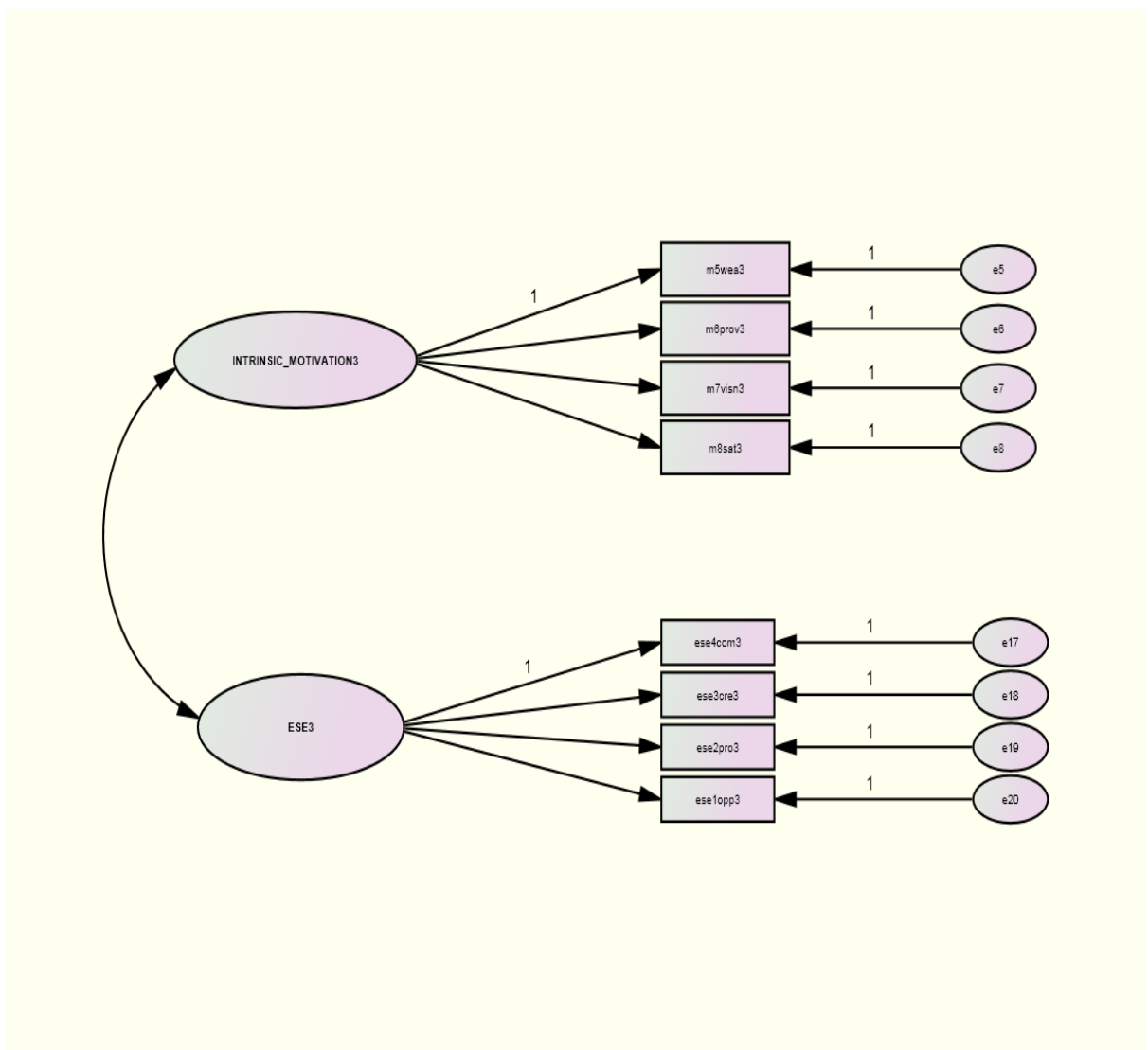
Exhibit 4.39: Discriminant Validity Model Fit: Intrinsic Motivation and ESE @ T_3

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 =$ 15.280 with 19 df and p = 0.705	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = 1.222)	Not required as data is normally distributed	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0283	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.984 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.007	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

**Implied (for all variables) Correlations (Default - Default model)**

Exhibit 4.40: Discriminant Validity Comparisons: Intrinsic Motivation and ESE @ T_3

	ESE3	INTRINSIC MOTIVATION3	ese1 opp3	ese2 pro3	ese3 cre3	ese4c om3	m8 sat3	m7v isn3	m6p rov3	m5 wea3
ESE3	1.000									
INTRINSIC_ MOTIVATION3	.306	1.000								
ese1opp3	**.754**	.231	1.000							
ese2pro3	**.654**	.200	.493	1.000						
ese3cre3	**.736**	.225	.555	.481	1.000					
ese4com3	**.728**	.223	.549	.476	.536	1.000				
m8sat3	.227	**.741**	.171	.148	.167	.165	1.000			
m7visn3	.223	**.729**	.168	.146	.164	.162	.540	1.000		
m6prov3	.210	**.687**	.158	.137	.155	.153	.509	.501	1.000	
m5wea3	.235	**.767**	.177	.154	.173	.171	.569	.559	.527	1.000

3.4 Invariance Testing

Measurement invariance, which involves evaluating the relationships between indicators and their respective latent variables, is a minimum requirement that needs to be established to allow any meaningful comparisons of groups (Widaman & Reise, 1997) and for longitudinal models (Cunningham, 2010).

Structural invariance is concerned with establishing equivalence between the means and covariances of latent variables. Testing for invariance typically proceeds in a hierarchical manner. Measurement invariance needs to be established first before any tests of structural invariance can be undertaken (Vandeberg & Lance, 2000).

In this research, invariance testing is undertaken between the groups across time to establish that they were drawn from the same population (T_1 to T_2, T_2 to T_3, and T_1 to T_3). This is because when comparing groups (such as across time – though it could be between groups at a point in time), an assumption is made that the survey instrument measures the same construct in all groups. If this assumption is false, then any comparisons are meaningless. Consequently, establishing measurement invariance is essential for any meaningful group comparisons to be made. Using AMOS Version 19, invariance testing was undertaken. The results appear in the sections that follow below.

3.4.1 Invariance Testing: Intrinsic Motivation T_1 and T_2

Exhibit 4.41 presents the intrinsic motivation model that was used in the analysis for the invariance testing for the data collected at the two points in time. The *Multiple-Group Analysis* function in AMOS was used to conduct the measurement invariance tests. Exhibit 4.42 presents the goodness-of-fit indices for the model. As can be seen, the model fit indices are within the acceptable range. Exhibit 4.43 presents the model comparisons. As can be seen metric invariance has been achieved (measurement weight p > 0.05).

Exhibit 4.41: Invariance Testing Model: Intrinsic Motivation $T_1 - T_2$
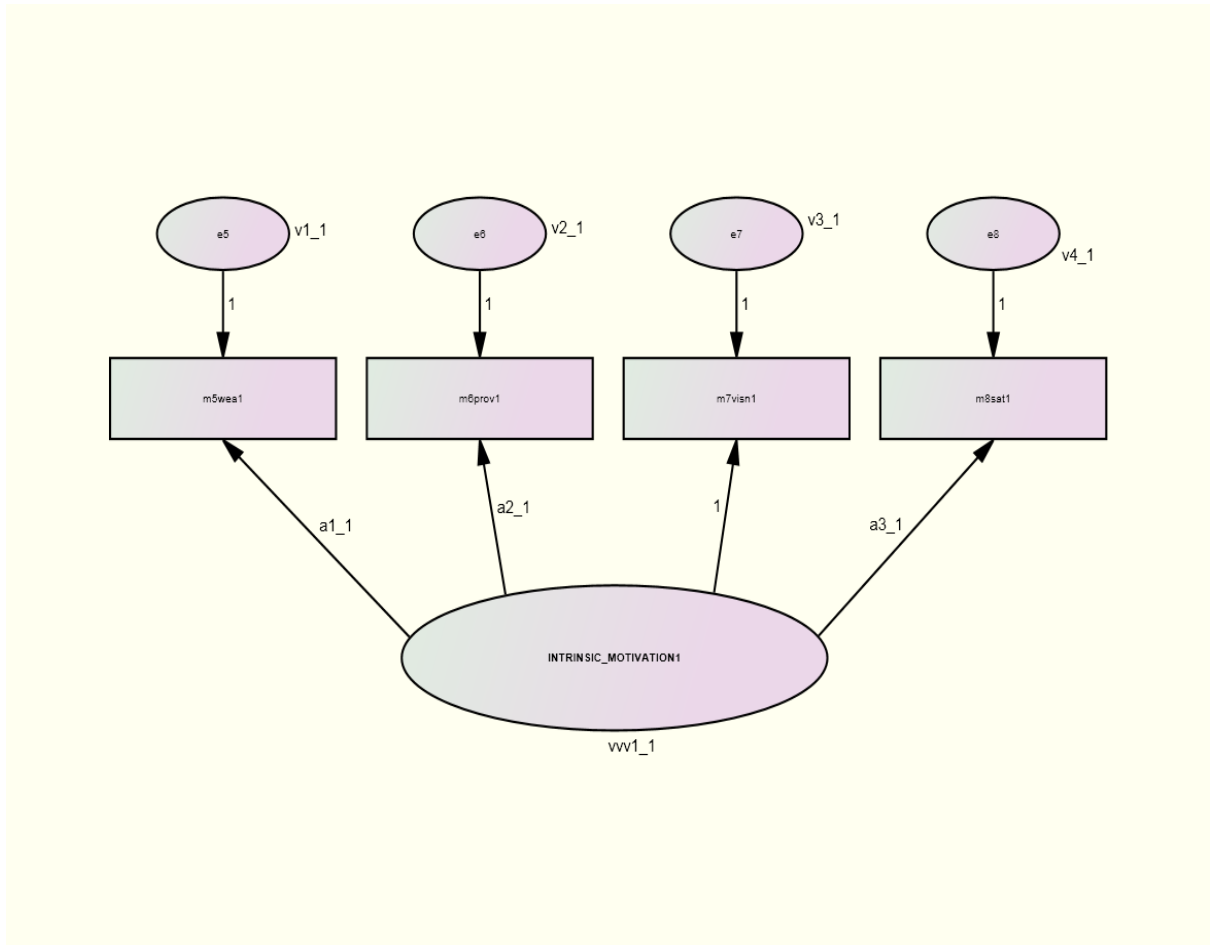
Exhibit 4.42: Invariance Testing Model Fit: Intrinsic Motivation $T_1 - T_2$

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 2.164$ with 4 df and $p = 0.706$	$p > 0.05$
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -3.804)	1.000	$p > 0.05$
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.960 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.005	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

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Exhibit 4.43: Invariance Testing Model Comparison: Intrinsic Motivation $T_1 - T_2$

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	3	7.356	**.061**	.006	.006	.008	.009
Structural covariances	4	46.011	.000	.040	.040	.057	.057
Measurement residuals	8	101.514	.000	.088	.088	.084	.085

3.4.2 Invariance Testing: Intrinsic Motivation T_2 and T_3

Exhibit 4.44 presents the intrinsic motivation model that was used in the analysis for the invariance testing for the data collected at the two points in time. The *Multiple-Group Analysis* function in AMOS was used to conduct the measurement invariance tests.

Exhibit 4.45 presents the goodness-of-fit indices for the model. As can be observed, the model fit indices are within the acceptable range. Exhibit 4.46 presents the model comparisons. Metric invariance has been achieved (measurement weight p > 0.05).

Exhibit 4.44: Invariance Testing Model: Intrinsic Motivation $T_2 - T_3$
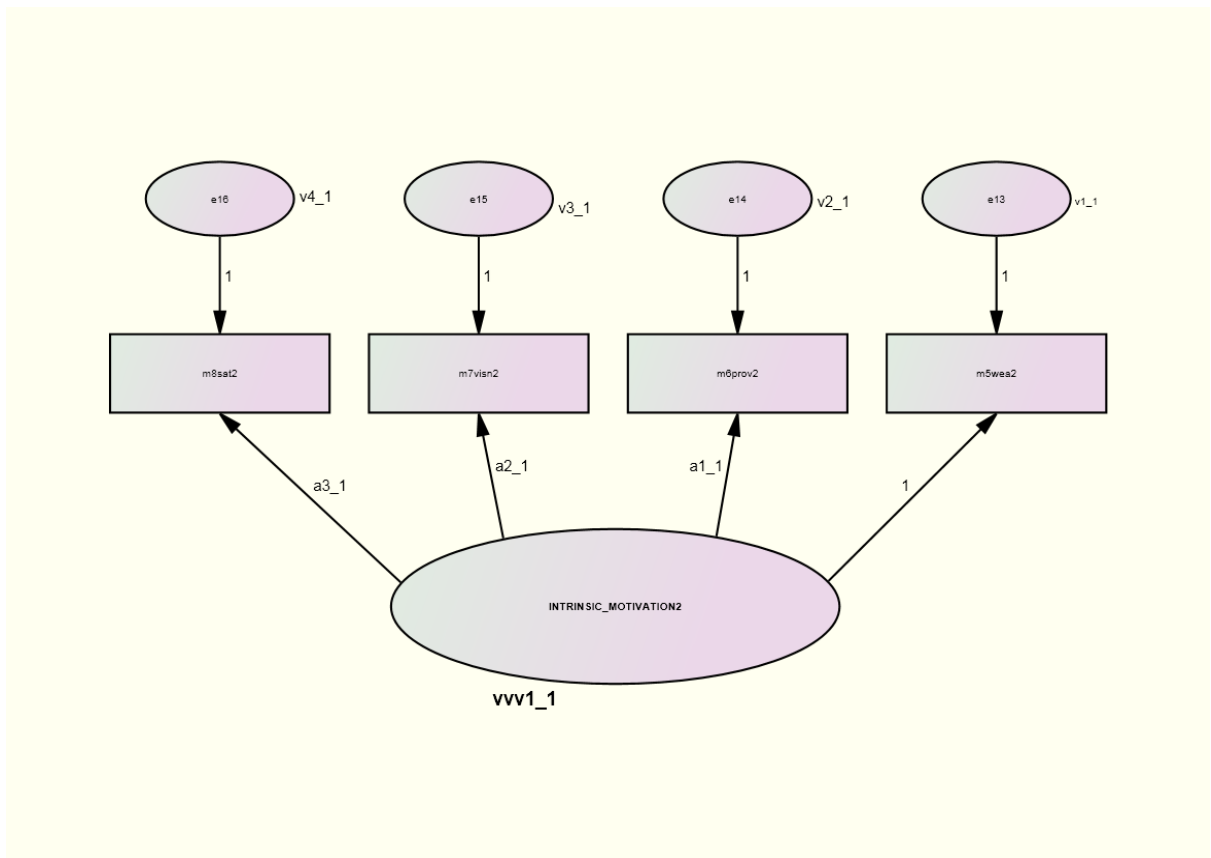
Exhibit 4.45: Invariance Testing Model Fit: Intrinsic Motivation $T_2 - T_3$

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = .533$ with 4 df and p = 0.970	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = 0.188)	Not required as data is normally distributed	p > 0.05
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.998 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.016	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

Exhibit 4.46: Invariance Testing Model Comparison: Intrinsic Motivation $T_2 - T_3$

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	3	5.777	**.123**	.008	.009	.014	.014
Structural covariances	4	7.876	.096	.012	.012	.016	.016
Measurement residuals	8	19.421	.013	.029	.029	.027	.027

3.4.3   Invariance Testing: Intrinsic Motivation T_1 and T_3

Exhibit 4.47 presents the intrinsic motivation model that was used in the analysis for the invariance testing for the data collected at the two points in time. The *Multiple-Group Analysis* function in AMOS was used to conduct the measurement invariance tests.

Exhibit 4.48 presents the goodness-of-fit indices for the model. As can be seen, the model fit indices are within the acceptable range. Exhibit 4.49 presents the model comparisons. As can be observed, metric invariance has been achieved (measurement weight p > 0.05).

Exhibit 4.47: Invariance Testing Model: Intrinsic Motivation $T_1 - T_3$
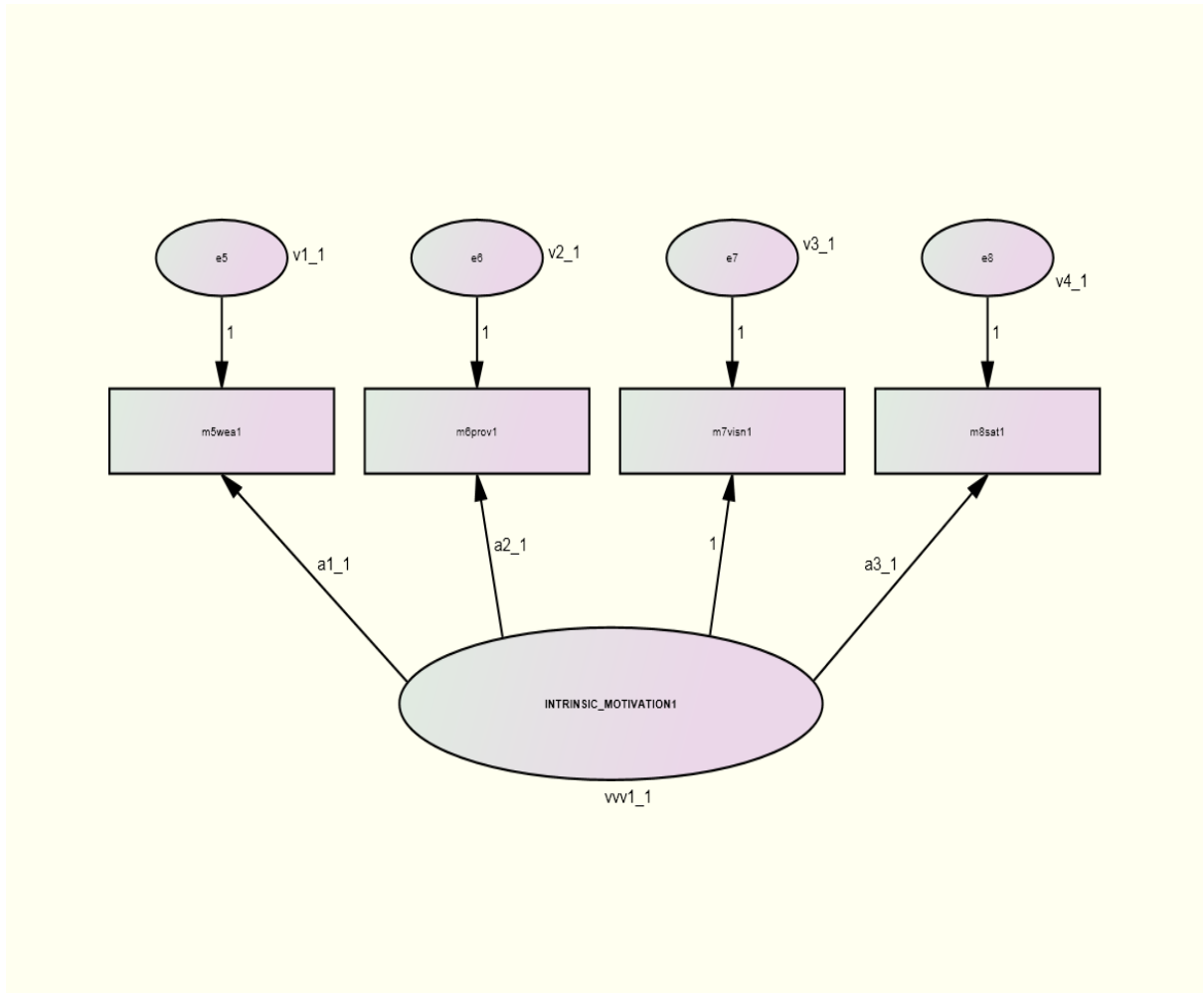
Exhibit 4.48: Invariance Testing Model Fit: Intrinsic Motivation $T_1 - T_3$

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 2.450$ with 4 df and p = 0.654	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -3.804)	1.000	p > 0.05
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.000 PCLOSE = 0.949 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 1.004	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 1.000	CFI > 0.95

Exhibit 4.49: Invariance Testing Model Comparison: Intrinsic Motivation $T_1 - T_3$

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	3	6.735	**.081**	.005	.005	.007	.007
Structural covariances	4	27.060	.000	.022	.022	.030	.030
Measurement residuals	8	61.841	.000	.050	.050	.046	.046

3.4.4 Invariance Testing: Entrepreneurial Self-Efficacy T_1 and T_2

Exhibit 4.50 presents the entrepreneurial self-efficacy model that was used in the analysis for the invariance testing for data collected at the two points in time. The *Multiple-Group Analysis* function in AMOS was used to conduct measurement invariance tests.

Exhibit 4.51 presents the goodness-of-fit indices for the model. As can be seen, the model fit indices are within the acceptable range. Exhibit 4.52 presents the model comparisons. As can be seen, metric invariance has been achieved (measurement $p > 0.05$).

Exhibit 4.50: Invariance Testing Model: Entrepreneurial Self-Efficacy $T_1 - T_2$
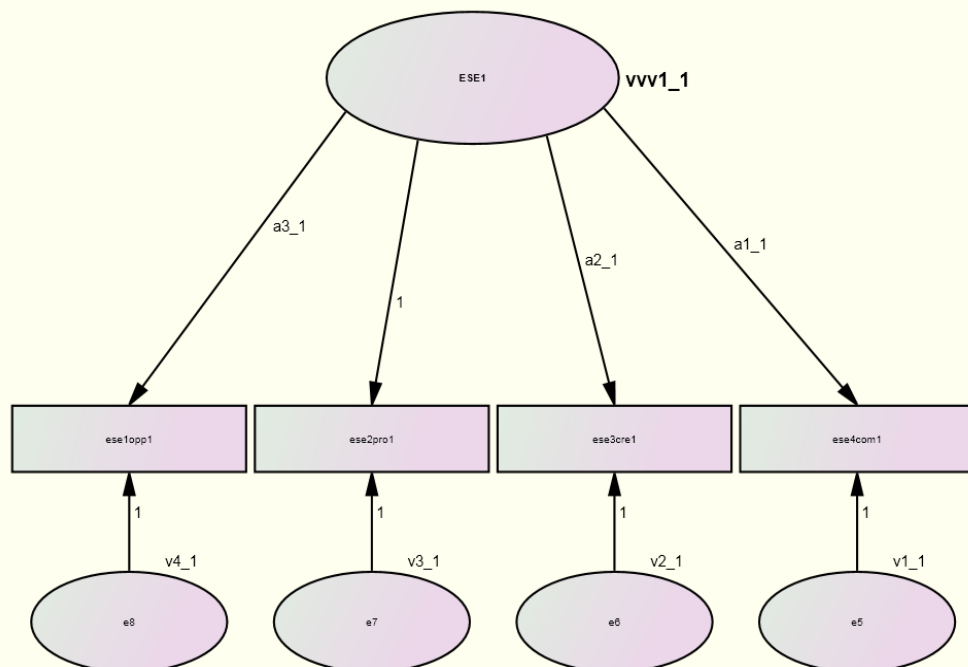
Exhibit 4.51: Invariance Testing Model Fit: Entrepreneurial Self-Efficacy $T_1 - T_2$

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 8.655$ with 4 df and p = 0.70	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -1.302)	Not required as data is normally distributed	p > 0.05
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.045 PCLOSE = 0.511 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 0.975	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 0.992	CFI > 0.95

Exhibit 4.52: Invariance Testing Model Comparison: ESE $T_1 - T_2$

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	3	2.196	**.533**	.004	.004	-.013	-.013
Structural covariances	4	2.728	.604	.005	.005	-.016	-.016
Measurement residuals	8	7.392	.495	.013	.013	-.017	-.018

3.4.5 Invariance Testing: Entrepreneurial Self-Efficacy T_2 and T_3

Exhibit 4.53 presents the entrepreneurial self‑efficacy model that was used in the analysis for the invariance testing for the data collected at the two points in time. The *Multiple-Group Analysis* function in AMOS was used to conduct the measurement invariance tests.

Exhibit 4.54 presents the goodness‑of‑fit indices for the model. As can be observed, the model fit indices are within the acceptable range. Exhibit 4.55 presents the model comparisons. As can be seen metric invariance has been achieved (measurement weight p > 0.05).

Exhibit 4.53: Invariance Testing Model: Entrepreneurial Self-Efficacy $T_2 - T_3$
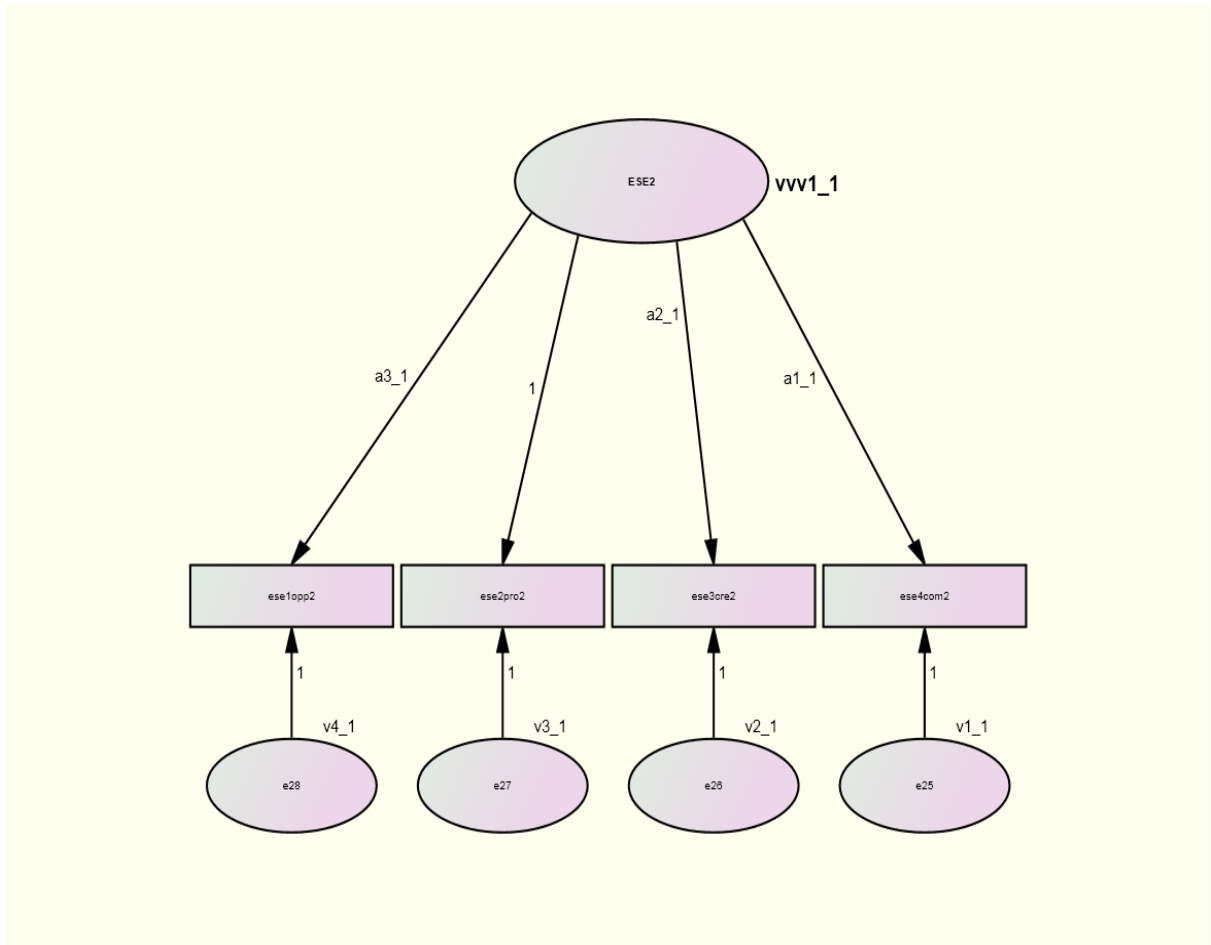
Exhibit 4.54: Invariance Testing Model Fit: Entrepreneurial Self-Efficacy $T_2 - T_3$

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 =$ 8.578 with 4 df and p = 0.073	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -0.760)	Not required as data is normally distributed	p > 0.05
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.045 PCLOSE = 0.516 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 0.978	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 0.993	CFI > 0.95

Exhibit 4.55: Invariance Testing Model Comparison: ESE T$_2$–T$_3$

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	3	3.214	**.360**	.005	.005	-.009	-.009
Structural covariances	4	4.811	.307	.008	.008	-.009	-.009
Measurement residuals	8	6.035	.643	.009	.010	-.017	-.018

3.4.6 Invariance Testing: Entrepreneurial Self-Efficacy T$_1$ and T$_3$

Exhibit 4.56 presents the entrepreneurial self-efficacy model that was used in the analysis for the invariance testing for the data collected at the two points in time. The *Multiple-Group Analysis* function in AMOS was used to conduct the measurement invariance tests.

Exhibit 4.57 presents the goodness-of-fit indices for the model. As noted, the model fit indices are within the acceptable range. Exhibit 4.58 presents the model comparisons. As can be observed, metric invariance has been achieved (measurement weight p > 0.05).

Exhibit 4.56: Invariance Testing Model: Entrepreneurial Self-Efficacy T$_1$ – T$_3$
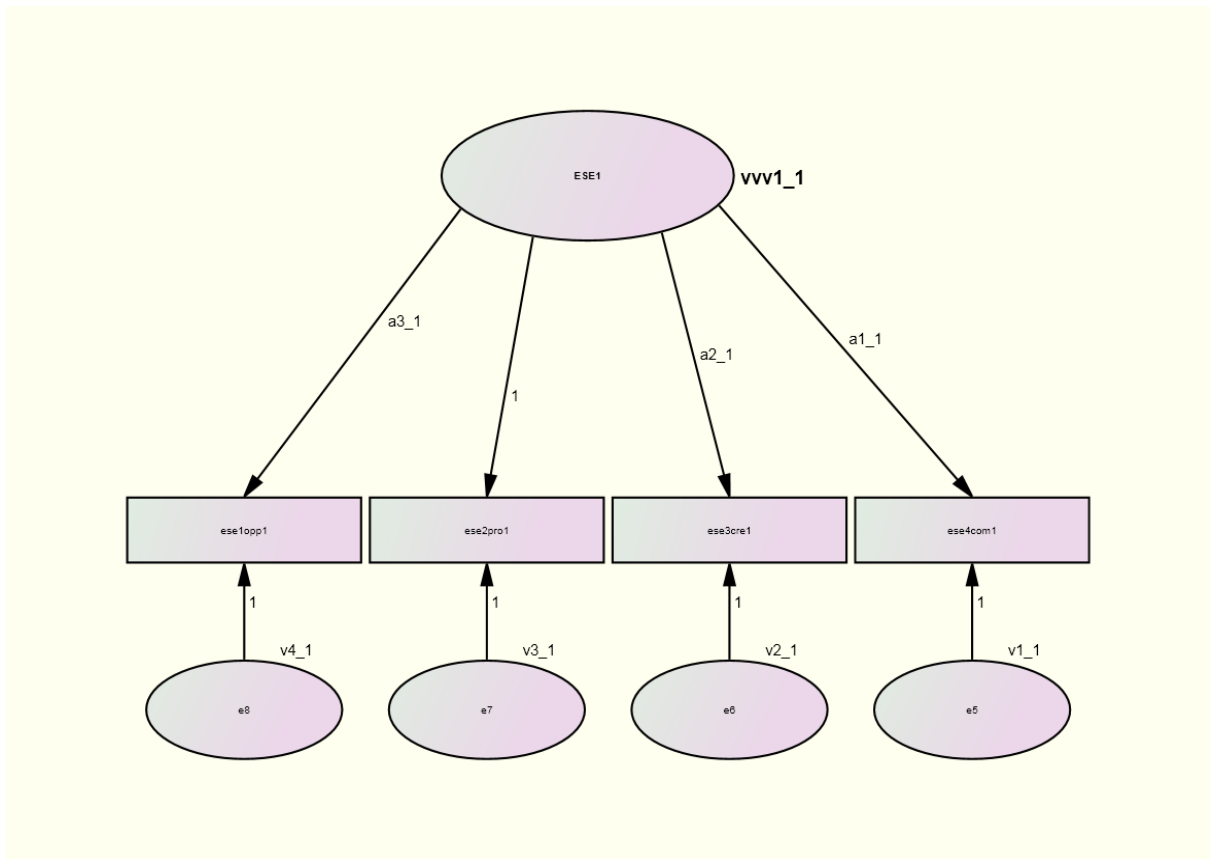
Exhibit 4.57: Invariance Testing Model Fit: Entrepreneurial Self-Efficacy $T_1 - T_3$

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 5.738$ with 4 df and p = 0.220	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = -1.302)	Not required as data is normally distributed	p > 0.05
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.028 PCLOSE = 0.739 LO 90 = 0.000	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 0.992	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 0.997	CFI > 0.95

Exhibit 4.58: Invariance Testing Model Comparison: ESE $T_1–T_3$

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	3	7.419	**.060**	.011	.011	.008	.008
Structural covariances	4	7.827	.098	.012	.012	.005	.005
Measurement residuals	8	10.805	.213	.016	.017	-.001	-.001

3.5   Full Structural Model Analysis

Exhibit 4.59 presents the structural model that underpins the research questions addressed in this research.   The model is comprised of the four variables: intrinsic motivation, entrepreneurial self-efficacy, entrepreneurial intention, and entrepreneurial start-up behaviour.

The error terms in the model at different points in time are correlated because a variable at T_3 will be a function of T_1 and T_2; the error terms at T_2 will be a function of T_1. A latent growth model was not employed in this research since the variables of interest did not grow linearly over time and only three waves of data was collected (Cunningham,2010). It is worth noting that for a non-linear quadratic function, at least four waves of data should be collected (Holmes-Smith, 2010).

Exhibit 4.59: Full Structural Model
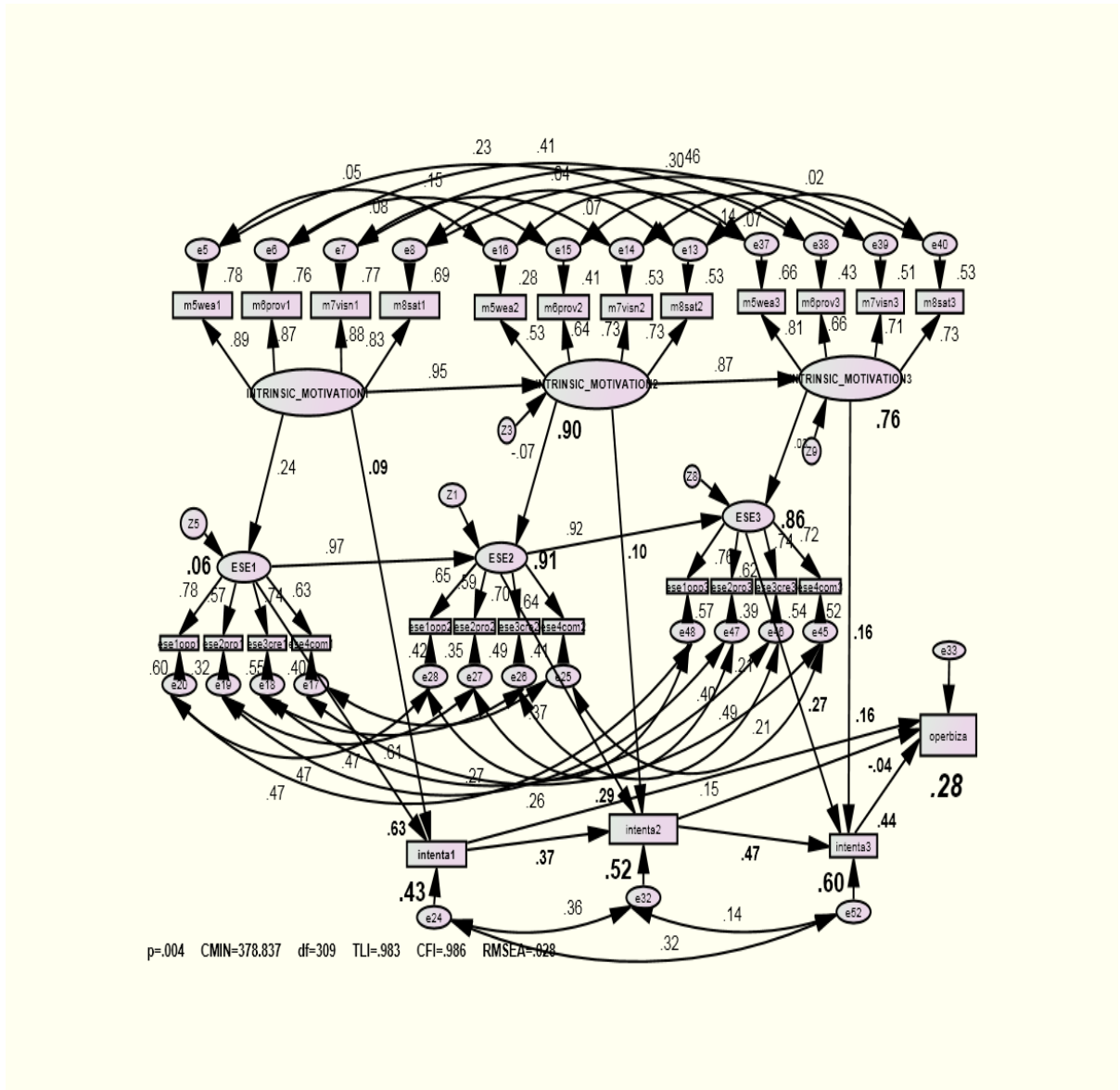
Exhibit 4.60 presents the goodness-of-fit indices. All are within the relevant range which suggests that the data and model fit.

Exhibit 4.60: Structural Model Goodness-of-Fit Indices

Model Fit Index	Model Fit Results	Acceptable Levels
Chi-Square	$\chi^2 = 378.837$ with 309 df and p = 0.004	p > 0.05
Bollen-Stine bootstrap p (Mardia's coefficient for assessment of kurtosis = 45.626)	0.315	p > 0.05
Standardised Root Mean-square Residual (SRMR)	SRMR = 0.0522	SRMR < 0.08
Root Mean-Square Error of Approximation (RMSEA)	RMSEA = 0.028 PCLOSE = 1.000 LO 90 = 0.017	RMSEA < 0.05 PCLOSE > 0.05 LO 90 = 0 (indicates an exact fit)
Tucker-Lewis Index (TLI)	TLI = 0.983	TLI > 0.95
Comparative Fit Index (CFI)	CFI = 0.986	CFI > 0.95

Exhibit 4.61 presents the scalar estimates (regression weights, standardised regression weights, variances, and squared correlations). All the indicator items for each of the latent variables were significant. Not all structural paths were significant. Note that 28% of the entrepreneurial start-up behaviour variance is explained in the model.

Exhibit 4.61: Structural Model Scalar Estimates

Scalar Estimates (Default - Default)

Maximum Likelihood Estimates

Regression Weights: (Default - Default)

			Estimate	S.E.	C.R.	P
INTRINSIC_MOTIVATION2	<---	INTRINSIC_MOTIVATION1	.757	.054	13.923	***
ESE1	<---	INTRINSIC_MOTIVATION1	.144	.042	3.464	***
ESE2	<---	ESE1	1.057	.098	10.816	***
INTRINSIC_MOTIVATION3	<---	INTRINSIC_MOTIVATION2	.993	.085	11.667	***
ESE2	<---	INTRINSIC_MOTIVATION2	-.060	.032	-1.865	.062
intenta1	<---	INTRINSIC_MOTIVATION1	.097	.054	1.800	.072
intenta1	<---	ESE1	1.112	.128	8.671	***
ESE3	<---	INTRINSIC_MOTIVATION3	.025	.039	.639	.523
intenta2	<---	intenta1	.370	.396	.934	.350
intenta2	<---	INTRINSIC_MOTIVATION2	.137	.098	1.390	.165
ESE3	<---	ESE2	1.059	.105	10.079	***
intenta2	<---	ESE2	.478	.397	1.202	.229
intenta3	<---	intenta2	.471	.256	1.837	.066

Chapter 4: Results

			Estimate	S.E.	C.R.	P
intenta3	<---	INTRINSIC_MOTIVATION3	.184	.065	2.841	.005
intenta3	<---	ESE3	.392	.192	2.038	.042
m5wea1	<---	INTRINSIC_MOTIVATION1	1.000			
m6prov1	<---	INTRINSIC_MOTIVATION1	1.134	.054	20.916	***
m7visn1	<---	INTRINSIC_MOTIVATION1	1.237	.059	21.063	***
m8sat1	<---	INTRINSIC_MOTIVATION1	1.123	.060	18.826	***
m8sat2	<---	INTRINSIC_MOTIVATION2	1.000			
m7visn2	<---	INTRINSIC_MOTIVATION2	1.092	.093	11.780	***
m6prov2	<---	INTRINSIC_MOTIVATION2	.729	.071	10.299	***
m5wea2	<---	INTRINSIC_MOTIVATION2	.718	.084	8.504	***
ese4com1	<---	ESE1	1.000			
ese3cre1	<---	ESE1	1.494	.150	9.967	***
ese2pro1	<---	ESE1	.974	.120	8.086	***
ese1opp1	<---	ESE1	1.560	.153	10.221	***
ese4com2	<---	ESE2	1.000			
ese3cre2	<---	ESE2	1.178	.123	9.542	***
ese2pro2	<---	ESE2	.935	.112	8.377	***
ese1opp2	<---	ESE2	1.131	.126	8.985	***
m5wea3	<---	INTRINSIC_MOTIVATION3	1.000			
m6prov3	<---	INTRINSIC_MOTIVATION3	.782	.069	11.320	***
m7visn3	<---	INTRINSIC_MOTIVATION3	.931	.075	12.432	***
m8sat3	<---	INTRINSIC_MOTIVATION3	.887	.070	12.671	***
ese4com3	<---	ESE3	1.000			
ese3cre3	<---	ESE3	1.082	.097	11.190	***
ese2pro3	<---	ESE3	.906	.094	9.635	***
ese1opp3	<---	ESE3	1.199	.104	11.495	***
operbiza	<---	intenta1	.259	.128	2.022	.043
operbiza	<---	intenta2	-.063	.138	-.454	.650
operbiza	<---	intenta3	.687	.125	5.500	***

Standardised Regression Weights: (Default - Default)

			Estimate
INTRINSIC_MOTIVATION2	<---	INTRINSIC_MOTIVATION1	.948
ESE1	<---	INTRINSIC_MOTIVATION1	.241
ESE2	<---	ESE1	.970
INTRINSIC_MOTIVATION3	<---	INTRINSIC_MOTIVATION2	.873
ESE2	<---	INTRINSIC_MOTIVATION2	-.073
intenta1	<---	INTRINSIC_MOTIVATION1	.092
intenta1	<---	ESE1	.628
ESE3	<---	INTRINSIC_MOTIVATION3	.030
intenta2	<---	intenta1	.366
intenta2	<---	INTRINSIC_MOTIVATION2	.102
ESE3	<---	ESE2	.922
intenta2	<---	ESE2	.291
intenta3	<---	intenta2	.467
intenta3	<---	INTRINSIC_MOTIVATION3	.155
intenta3	<---	ESE3	.272
m5wea1	<---	INTRINSIC_MOTIVATION1	.885
m6prov1	<---	INTRINSIC_MOTIVATION1	.873
m7visn1	<---	INTRINSIC_MOTIVATION1	.876
m8sat1	<---	INTRINSIC_MOTIVATION1	.829
m8sat2	<---	INTRINSIC_MOTIVATION2	.729

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			Estimate
m7visn2	<---	INTRINSIC_MOTIVATION2	.729
m6prov2	<---	INTRINSIC_MOTIVATION2	.638
m5wea2	<---	INTRINSIC_MOTIVATION2	.531
ese4com1	<---	ESE1	.631
ese3cre1	<---	ESE1	.744
ese2pro1	<---	ESE1	.566
ese1opp1	<---	ESE1	.778
ese4com2	<---	ESE2	.642
ese3cre2	<---	ESE2	.699
ese2pro2	<---	ESE2	.590
ese1opp2	<---	ESE2	.650
m5wea3	<---	INTRINSIC_MOTIVATION3	.812
m6prov3	<---	INTRINSIC_MOTIVATION3	.657
m7visn3	<---	INTRINSIC_MOTIVATION3	.712
m8sat3	<---	INTRINSIC_MOTIVATION3	.731
ese4com3	<---	ESE3	.721
ese3cre3	<---	ESE3	.736
ese2pro3	<---	ESE3	.624
ese1opp3	<---	ESE3	.757
operbiza	<---	intenta1	.162
operbiza	<---	intenta2	-.040
operbiza	<---	intenta3	.437

Covariances: (Default - Default)

			Estimate	S.E.	C.R.	P	Label
e32	<-->	e24	.134	.166	.812	.417	
e52	<-->	e32	.046	.114	.403	.687	
e52	<-->	e24	.111	.079	1.393	.164	
e20	<-->	e28	.195	.035	5.556	***	
e19	<-->	e27	.213	.033	6.508	***	
e18	<-->	e26	.243	.035	6.875	***	
e17	<-->	e25	.135	.027	5.045	***	
e25	<-->	e45	.052	.026	2.012	.044	
e26	<-->	e46	.077	.029	2.705	.007	
e27	<-->	e47	.093	.031	3.040	.002	
e28	<-->	e48	.115	.033	3.505	***	
e19	<-->	e47	.181	.032	5.617	***	
e18	<-->	e46	.186	.032	5.810	***	
e17	<-->	e45	.088	.025	3.575	***	
e20	<-->	e48	.173	.033	5.310	***	
e6	<-->	e15	.041	.020	2.040	.041	
e7	<-->	e14	.028	.026	1.088	.277	
e8	<-->	e13	.013	.025	.534	.593	
e5	<-->	e16	.014	.021	.671	.502	
e16	<-->	e37	.027	.027	.992	.321	
e15	<-->	e38	.024	.024	1.019	.308	
e14	<-->	e39	.060	.030	1.971	.049	
e13	<-->	e40	.006	.025	.222	.824	
e5	<-->	e37	.049	.018	2.683	.007	
e6	<-->	e38	.134	.025	5.360	***	
e7	<-->	e39	.165	.029	5.731	***	
e8	<-->	e40	.108	.027	4.044	***	

Chapter 4: Results

Correlations: (Default - Default)

			Estimate
e32	<-->	e24	.361
e52	<-->	e32	.144
e52	<-->	e24	.320
e20	<-->	e28	.473
e19	<-->	e27	.474
e18	<-->	e26	.609
e17	<-->	e25	.373
e25	<-->	e45	.146
e26	<-->	e46	.208
e27	<-->	e47	.207
e28	<-->	e48	.272
e19	<-->	e47	.397
e18	<-->	e46	.490
e17	<-->	e45	.262
e20	<-->	e48	.469
e6	<-->	e15	.146
e7	<-->	e14	.081
e8	<-->	e13	.037
e5	<-->	e16	.048
e16	<-->	e37	.071
e15	<-->	e38	.067
e14	<-->	e39	.139
e13	<-->	e40	.016
e5	<-->	e37	.226
e6	<-->	e38	.411
e7	<-->	e39	.460
e8	<-->	e40	.300

Variances: (Default - Default)

	Estimate	S.E.	C.R.	P	Label
INTRINSIC_MOTIVATION1	.631	.067	9.413	***	
Z5	.213	.039	5.488	***	
Z3	.041	.013	3.145	.002	
e24	.403	.039	10.429	***	
Z1	.023	.008	3.004	.003	
Z9	.124	.025	5.039	***	
e32	.344	.108	3.193	.001	
Z8	.051	.015	3.361	***	
e52	.297	.049	6.055	***	
e5	.174	.020	8.745	***	
e6	.255	.028	9.173	***	
e7	.293	.033	8.998	***	
e8	.361	.036	9.991	***	
e13	.356	.035	10.220	***	
e14	.423	.041	10.225	***	
e15	.311	.028	10.936	***	
e16	.529	.047	11.334	***	
e17	.343	.033	10.434	***	
e18	.407	.044	9.239	***	
e19	.457	.042	10.926	***	

Chapter 4: Results

	Estimate	S.E.	C.R.	P	Label
e20	.361	.042	8.611	***	
e25	.384	.037	10.285	***	
e26	.391	.040	9.717	***	
e27	.441	.041	10.753	***	
e28	.470	.046	10.155	***	
e33	1.300	.109	11.958	***	
e37	.269	.033	8.137	***	
e38	.419	.040	10.492	***	
e39	.440	.044	9.968	***	
e40	.357	.037	9.681	***	
e45	.327	.034	9.511	***	
e46	.353	.038	9.290	***	
e47	.457	.043	10.563	***	
e48	.379	.042	8.974	***	

Squared Multiple Correlations: (Default - Default)

	Estimate
ESE1	.058
INTRINSIC_MOTIVATION2	.899
INTRINSIC_MOTIVATION3	.762
ESE2	.913
intenta1	.431
ESE3	.857
intenta2	.524
intenta3	.596
ese1opp3	.574
ese2pro3	.389
ese3cre3	.541
ese4com3	.520
m8sat3	.534
m7visn3	.507
m6prov3	.432
m5wea3	.660
operbiza	.281
ese1opp2	.422
ese2pro2	.348
ese3cre2	.488
ese4com2	.412
ese1opp1	.605
ese2pro1	.320
ese3cre1	.554
ese4com1	.398
m5wea2	.282
m6prov2	.407
m7visn2	.532
m8sat2	.531
m8sat1	.688
m7visn1	.767
m6prov1	.761
m5wea1	.784

Exhibit 4.62 identifies those structural paths where there is a direct significant relationship.

Exhibit 4.62: Significant Structural Model Paths Summary *(note: p<0.01)*

			P
INTRINSIC_MOTIVATION2	<---	INTRINSIC_MOTIVATION1	***
ESE1	<---	INTRINSIC_MOTIVATION1	***
ESE2	<---	ESE1	***
INTRINSIC_MOTIVATION3	<---	INTRINSIC_MOTIVATION2	***
intenta1	<---	ESE1	***
ESE3	<---	ESE2	***
intenta3	<---	INTRINSIC_MOTIVATION3	.005
intenta3	<---	ESE3	.042
operbiza	<---	intenta1	.043
operbiza	<---	intenta3	***

4.0 Chapter Summary

Chapter 4 provides the results of the analyses of the data. The analyses were divided into two parts. The first part involved basic analyses of the data to ensure that it was in a proper state for more advanced analyses to be undertaken. The results of the basic analyses (reliabilities, means and standard deviations) provided support for further analyses to be undertaken since minimum levels were achieved where required - for example, reliabilities were in excess of 0.70 (Nunnally, 1979); but also provided fundamental insights into the data collected.

The second part of the analyses provided greater insight into the data collected. More complex analyses were undertaken, and to this end, structural equation modelling (SEM) was utilised.

Chapter 5: Discussion

Chapter 1 Introduction	**Chapter 2** Literature Review	**Chapter 3** Research Method
Chapter 4 Results	**Chapter 5** **Discussion**	**Chapter 6** Thesis Summary
Appendices		
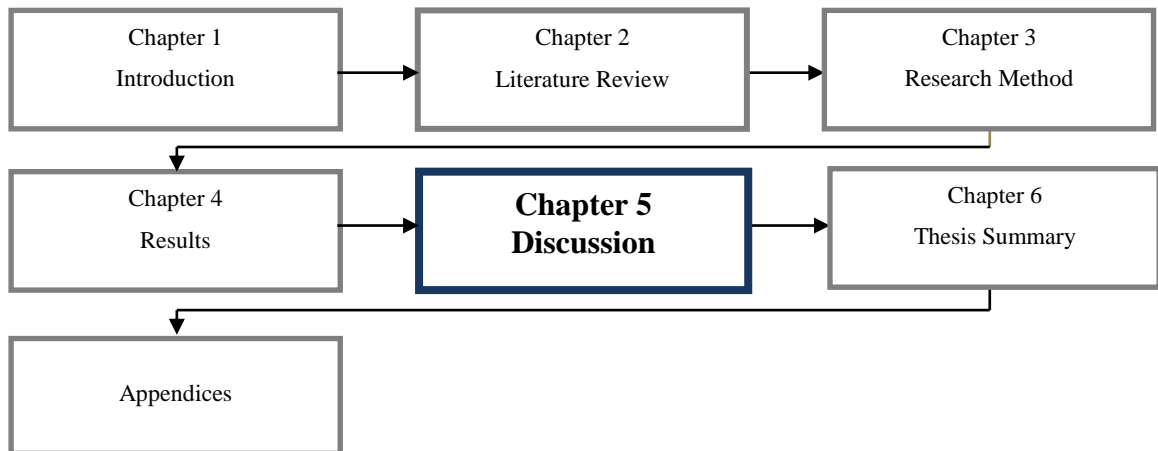
1.0   Introduction

Chapter 5 discusses the key points that flow from the results of the analyses conducted in Chapter 4. In the first instance, the stated hypotheses are presented together with the level of support for each. This provides the milieu for further discussion. Secondly, there is a discussion of the similarities and differences between the means at T_1, T_2, and T_3. Finally, there is a discussion surrounding the results of the structural model analysis results.

2.0   Hypotheses: Level of Support

Exhibit 5.1 presents the hypotheses and the level of support for each as reflected in the results that appear in Chapter 4.

Exhibit 5.1: Level of Support for Hypotheses

	Hypothesis	Level of Support
H1	*There will be a relationship between entrepreneurial self-efficacy (ESE) and entrepreneurial intention (EI) in nascent necessity-entrepreneurs.*	Partially Supported
H2	*There will be a relationship between intrinsic motivation (IM) and entrepreneurial intention (EI) in nascent necessity-entrepreneurs*	Partially Supported
H3	*There will be a relationship between intrinsic motivation (IM) and entrepreneurial self-efficacy (ESE) in nascent necessity-entrepreneurs*	Partially Supported
H4	*There will be a relationship between entrepreneurial intention (EI) and entrepreneurial start-up behaviour (ESB) in nascent necessity-entrepreneurs.*	Partially Supported
H5	*There will be an increase in intrinsic motivation (IM) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*	Supported
H6	*There will be an increase in entrepreneurial self-efficacy (ESE) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*	Not Supported
H7	*There will be an increase in entrepreneurial intention (EI) immediately after an entrepreneurship training, mentoring, and incubation program in nascent necessity-entrepreneurs.*	Supported
H8	*There will be an extended increase in intrinsic motivation (IM) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*	Supported
H9	*There will be an extended increase in entrepreneurial self-efficacy (ESE) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*	Supported
H10	*There will be an extended increase in entrepreneurial intention (EI) (over Baseline) after nascent necessity-entrepreneurs complete an entrepreneurship training, mentoring, and incubation program.*	Supported
H11	*Not all nascent necessity-entrepreneurs will achieve complete business start-up (ESB) subsequent to completing an entrepreneurship training, mentoring, and incubation program.*	Supported
H12	*There will be a positive relationship between nascent necessity-entrepreneur intrinsic motivation (IM) at different points in time.*	Supported
H13	*There will be a positive relationship between nascent necessity-entrepreneur entrepreneurial self-efficacy (ESE) at different points in time.*	Supported
H14	*There will be a positive relationship between nascent necessity-entrepreneur entrepreneurial intention (EI) at different points in time*	Not Supported

Chapter 5: Discussion

3.0 Discussion of the Variable Means

This section examines the results of the analyses of the means of the variables that are contained in the structural model. Section 4.0 discusses the inter-relationships among these variables. The variable means are indicated in Exhibit 5.2 and the graphical representation of these means over time is indicated in Exhibit 5.3.

Exhibit 5.2: Variable Means at T_1, T_2, and T_3

Variable	T_1 Means	T_2 Means	T_3 Means
Intrinsic Motivation	4.91	5.02	5.07
Entrepreneurial Self-Efficacy	4.93	4.91	5.12
Entrepreneurial Intention	5.51	5.81	5.69
Entrepreneurial Start-up Behaviour	--	--	4.94

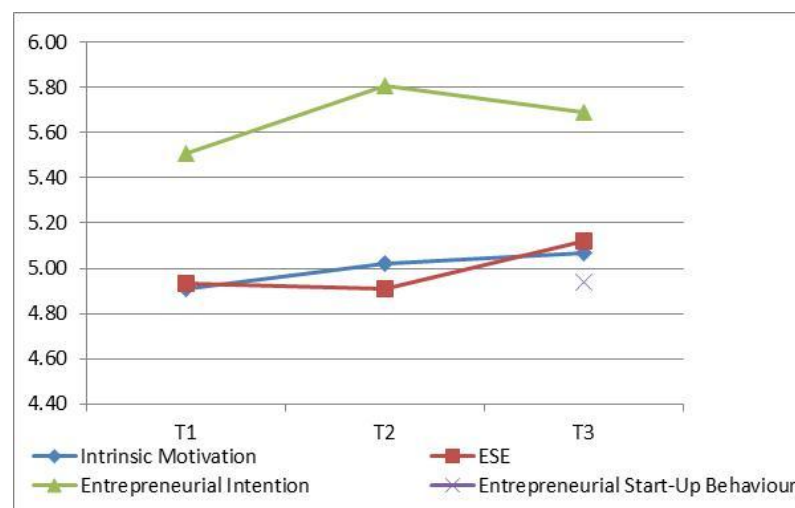**Exhibit 5.3: Graph of the Means of All Variables at T_1, T_2, and T_3**

Exhibit 5.4 summarises the similarities and differences between the means of the variables (from the Paired Samples T-Tests). A discussion of the relationships for each of the variables follows – mindful that the entrepreneurship training, mentoring, and incubation program intervention occurred between T_1 and T_2 (1 year duration), and that

entrepreneurial start-up behaviour was measured 3.5 years after completing the full-time intervention.

Exhibit 5.4: Variable Paired Samples T-Tests Results Summary: Differences between the Variable Means between Time Periods

Variable	Relationship	Significance
Intrinsic Motivation	T_1-T_2	Significant
	T_2-T_3	Not Significant
	T_1-T_3	Significant
Entrepreneurial Self-Efficacy	T_1-T_2	Not Significant
	T_2-T_3	Significant
	T_1-T_3	Significant
Entrepreneurial Intention	T_1-T_2	Significant
	T_2-T_3	Significant
	T_1-T_3	Significant

3.1 Intrinsic Motivation Mean Differences

The overarching motivation for participants intending to start businesses was borne out of necessity, because they were unemployed and had very limited (or no prospects) of gaining meaningful employment in the short to medium term. Because of the very limited social security benefits available to the unemployed in South Africa, starting a business is a real alternative to stealing, going hungry, and/or begging (none of these are mutually exclusive).

Although many individuals attempt to start businesses in South Africa, nascent entrepreneurship start-up rates are 5.2%, compared with new business ownership rates of 4%. Business sustainability is a major problem with the discontinuation rates of businesses at 5.6% being above the 4.3% average of comparable efficiency-driven economies (Herrington, Kew, Simrie & Turton, 2011). The reported 5.6% discontinuation rate is

arguably even lower as a result of the large number of undocumented survivalist enterprises that serve informal (housing) settlements.

Thus, while necessity entrepreneurship provides contextual motivation for participants, a more specific motivation was measured in terms of intrinsic motivation. The latent variable in this study, *Intrinsic Motivation*, focused on specific personal reasons the nascent entrepreneurs had sought to establish their businesses (in addition to their being purely necessity driven). These reasons included: *(i) to achieve a personal vision participants had; (ii) to be able to prove that they could set up a business enterprise; (iii) to create wealth for themselves; and (iv) for reasons pertaining to personal satisfaction.*

These were personal reasons and can be considered as "beyond" establishing a business for mere survival. These reasons were considered to be aspirational in nature, transcending the base needs of simply navigating through the challenges of day-to-day existence; they articulated the "*what might be*" and were about "*realising dreams*". These "*dreams*" centred on realising visions of individual potential; the nature of which would motivate a person to "get out of bed of a morning". The focus transcended the immediate "food on the table" need, and embraced other more intrinsic motivation effects, such as: "*What's in it for me?*".

Of interest is that there was a significant increase in intrinsic motivation after the training intervention completed after which it remained fairly constant. Although it cannot be affirmed that the training intervention caused the increased intrinsic motivation effects, the results suggest that it may have contributed to the increased level of motivation. Two factors most likely contributed to this situation: enhanced participant awareness of what is involved in establishing a business, and invited guest speakers who shared their entrepreneurial success stories and encouraged participants to replicate their successes.

Motivation for establishing a business and achieving success was supported through exposure to a range of similar activities.

What is also of interest is that the enhanced level of motivation remained 3.5 years after the training intervention had completed. It is therefore suggested that participants were more intrinsically motivated at the end of the program than before they started, and this enhanced motivation was sustainable during the life of this study (3.5 years).

In an environment where employment prospects are limited and inadequate social security support systems exist, emotional and psychological stresses will impact negatively on affected individuals. It is demoralising and disheartening. What the results of this study suggest (though further research needs to be undertaken to support this premise), is that by introducing participants to an extended entrepreneurship training, mentoring and incubation intervention, their increased intrinsic motivations may contribute toward alleviating the disheartened state that long-term unemployed people often find themselves in.

3.2 Entrepreneurial Self-Efficacy Mean Differences

In this research, entrepreneurial self-efficacy was interpreted to mean to what extent an individual has a belief in themselves that they could undertake certain activities associated with the entrepreneurial process. These involved: *(i) identifying new business opportunities; (ii) creating new products or services; (iii) thinking creatively and innovatively; and (iv) commercialising an idea or new development.*

Surprisingly, there was *no* increase in entrepreneurial self-efficacy after completion of the training intervention. Participants' beliefs in themselves that they could engage successfully in certain entrepreneurial-related activities did not improve; in fact it had marginally tailed off since T_1. This is contrary to what was expected as the exposure to new knowledge and skills (through mentoring and incubation) were thought to have an immediate (positive) effect. However, this did not transpire although there was a

significant improvement once participants could apply what they had learned "in the field". At the end of the study, there was a significant increase in entrepreneurial self-efficacy that accrued since the completion of the training and incubation intervention.

Consequently, at least for this research, necessity-entrepreneurs need to have the opportunity to apply the knowledge they acquired in the classroom, and once this occurs it serves to reinforce their beliefs leading to an increased level of entrepreneurial self-efficacy.

Furthermore, this suggests that when evaluating the effectiveness of an entrepreneurship training program, evaluations in the short-term may initially produce unauthentic results. Thus, it may be better to wait until participants have had the opportunity to "have a go" and "get their hands dirty" at establishing their businesses, before the true impact of such a program can be adequately assessed.

3.3 Entrepreneurial Intention Mean Differences

All participants in the research stated that they had intentions to start businesses at commencement of the entrepreneurship training and mentoring intervention (T_0). They were therefore described as nascent entrepreneurs, or *"entrepreneurs-to-be"*. Nascency was measured in terms of: *How likely is it that you will start a business within the foreseeable future?* As might be expected, the entrepreneurial intention means at all three measurement points were relatively high (compared to the other means), starting at 5.51 at T_1 (using a Likert-scale of 1 to 7 where 1 represented "extremely unlikely" and 7 "extremely likely" that you would start a business).

Unsurprisingly, participants' entrepreneurial intentions significantly increased at T_2, immediately after the entrepreneurship training intervention. Although it cannot be said that the training intervention caused their entrepreneurial intentions to increase, it is reasonable to assume that this contributed to the increase in some way. Being exposed to a

program of study that increased participants' knowledge about entrepreneurship and how to create and grow a new business would have positively influenced their intentions.

What was however unexpected, is that at T_3, there was a significant decline in entrepreneurial intentions from T_2 (measured immediately after the training intervention). Considering that the T_2 measure was taken the day after participants completed their one-year intervention, a feeling of euphoria experienced was possibly reflected at T_2. Given this milieu, the T_2 mean of 5.81 was ultimately not sustainable at this level, with participant intentions declining to 5.69 (at T_3). It is, however, worth noting that entrepreneurial intentions remained substantially above those indicated at T_1. Based on these results, it could be implied that entrepreneurship training will reinforce entrepreneurial intentions in nascent entrepreneurs in both the short and longer term.

3.4 Entrepreneurial Start-Up Behaviour

Entrepreneurial start-up behaviour was measured at T_3. One indicator item was used to measure this variable: *To what extent have you started a business since starting this program?* A "1" meant participants had not started their businesses and a "7" meant that participants businesses were fully operational. Any numbers rated in-between (that is, the "2" to "6" continuum) provided insight into how operational participants' businesses were at T_3; therefore, to what extent participants' businesses were partially operating (or not).

The results indicate that participants' businesses were not fully operational at T_3. However, it appeared that significant progress had been made towards starting businesses, since the mean was 4.94. This suggests businesses were somewhat operational (though not fully operational); as a mean of 7 would be required to indicate that all businesses were fully operational. The model explained 28% of the variance ($R^2 > 0.28$).

4.0 Discussion of the Relationships between the Variables

Whereas the previous section examined the means of the latent variables of interest in this research, this section discusses the inter-relationships between and among those variables over the 4.5 years' duration of the study. Exhibit 5.4 reproduces those structural paths where the analysis identified a direct significant relationship (Note: *** = $p < 0.000$).

Exhibit 5.5: Significant Structural Model Paths Summary

			P
INTRINSIC_MOTIVATION2	<---	INTRINSIC_MOTIVATION1	***
ESE1	<---	INTRINSIC_MOTIVATION1	***
ESE2	<---	ESE1	***
INTRINSIC_MOTIVATION3	<---	INTRINSIC_MOTIVATION2	***
intenta1	<---	ESE1	***
ESE3	<---	ESE2	***
intenta3	<---	INTRINSIC_MOTIVATION3	.005
intenta3	<---	ESE3	.042
operbiza	<---	intenta1	.043
operbiza	<---	intenta3	***

4.1 Relationship between the Intrinsic Motivation Means at Each of the Three Time Periods

The relationships between intrinsic motivation at T_1 and T_2, and T_2 and T_3 were significant ($p > 0.001$) with the amount of variance explained at T_2 being 90% ($R^2 = 0.90$), and at T_3 being 76% ($R^2 = 0.76$). Hence, the level of intrinsic motivation in the prior period appears to be closely related to the level of intrinsic motivation in the subsequent period; consequently, a prior period's level of intrinsic motivation may be a good predictor of a subsequent period's level of intrinsic motivation.

4.2 Relationship between the Entrepreneurial Self-Efficacy Means at Each of the Three Time Periods

The relationships between entrepreneurial self-efficacy at T_1 and T_2, and T_2 and T_3 were significant ($p > 0.001$) with the amount of variance explained at T_1 being 6% ($R^2 = 0.06$), T_2 being 91% ($R^2 = 0.91$), and at T_3 being 86% ($R^2 = 0.86$). Therefore, the level of entrepreneurial self-efficacy in the prior period appears to be related to the level of

entrepreneurial self-efficacy in the subsequent period; therefore, a prior period's level of ESE may be a good predictor of a subsequent period's level of ESE.

4.3 Relationship between the Entrepreneurial Intention Means at Each of the Three Time Periods

The relationships between entrepreneurial intention at T_1 and T_2, and T_2 and T_3 were *not* significant ($p > 0.350$ and $p > 0.066$ respectively) with the amount of variance explained at T_1 being 43% ($R^2 = 0.43$), T_2 being 52% ($R^2 = 0.52$), and at T_3 being 60% ($R^2 = 0.60$). Thus, the level of entrepreneurial intention in the prior period does *not* appear to be related to the level of entrepreneurial intention in the subsequent period and, consequently, a prior period's level of entrepreneurial intention may not be a good predictor of a subsequent period's level of entrepreneurial intention.

4.4 Relationship between the Intrinsic Motivation and Entrepreneurial Self-Efficacy Means at Each of the Three Time Periods

The relationship between intrinsic motivation and entrepreneurial self-efficacy at T_1 was significant ($p > 0.001$); however, there was no indicated relationship between these two latent variables at T_2 and T_3. ($p > 0.062$ and $p > 0.523$ respectively). As a result, the relationship between these two latent variables was not stable across time. Prior to the entrepreneurship training, mentoring and incubation intervention, there was a relationship between intrinsic motivation and entrepreneurial self-efficacy; however, this proved not to be the case at T_2 and T_3 (after the entrepreneurship training intervention).

This appears to be somewhat contra-intuitive as it was expected that the training may have contributed toward strengthening this relationship. However, it is noted that entrepreneurial self-efficacy did not increase immediately after the training intervention. Likewise, it could be expected that since participants' entrepreneurial efficacy beliefs in

themselves did not immediately increase at T_2, similarly then internal motivation would not increase.

However, participants' entrepreneurial self-efficacy did significantly increase at T_3 - after participants had the opportunity to reflect on the training and use this as a basis for establishing their new ventures. Nevertheless, no such relationship manifested itself between the two variables at T_3.

One possible explanation for this is that intrinsic motivation may have become less of an issue at this point (the intrinsic motivation mean reduced after T_2 to become aligned with the T_1 level (there was a non-significant increase of the intrinsic motivation mean at T_2 over T_1). It is perhaps worth contemplating that while the level of intrinsic motivation was relatively speaking high, (at stage T_3 compared to T_1), it became no longer just about "self" at this point - and perhaps became more about "others" (though this research question was not addressed in this research and raises a question for investigation to be addressed in future research).

4.5 Relationship between the Intrinsic Motivation and Entrepreneurial Intention Means at Each of the Three Time Periods

The relationship between intrinsic motivation and entrepreneurial intention at T_3 was significant ($p > 0.005$); however, there was no such relationship between these two variables at T_1 and T_2. ($p > 0.092$ and $p > 0.102$ respectively). As a result, the relationship between these two latent variables was not stable across time. Prior to the entrepreneurship training, mentoring, and incubation intervention and immediately after this, there was no relationship between intrinsic motivation and entrepreneurial intention; however, at T_3 – well after the entrepreneurship training intervention was completed – a relationship was established.

Therefore, as the time approached to establish a venture at T_3, entrepreneurial intentions reduced slightly in value (over their T_2 level – though remained significantly higher than their T_1 level) while intrinsic motivations increased slightly. This more aligned the means of these two variables resulting in a strengthened relationship.

4.6 Relationship between the Entrepreneurial Self-Efficacy and Entrepreneurial Intention Means across the Three Time Periods

The relationship between entrepreneurial self-efficacy and entrepreneurial intention at T_1 and T_3 was significant (p > 0.001 and p = 0.042 respectively); however interestingly, there was no such relationship between these two variables at T_2 (p > 0.229). Consequently, the relationship between these two latent variables was not stable across time. Prior to the entrepreneurship training, mentoring and incubation intervention, and at the point where ventures were being established, a relationship between the two variables existed.

As can be observed from Exhibit 5.3, there is a tendency for the means to approach each other at T_1 and T_3. Hence, it may be that the training intervention in some way interfered with the relationship at T_2 – immediately after the entrepreneurship training intervention – where no relationship was evident.

4.7 Relationship between the Entrepreneurial Intention Means at Each of the Three Time Periods and Entrepreneurial Start-Up Behaviour

The relationship between entrepreneurial intention and entrepreneurial start-up behaviour was significant at T_1 and T_3 (p = 0.043 and p > 0.001 respectively); however, there was no such relationship between these two variables at T_2 (p > 0.650). Thus, the relationship between these two latent variables was not stable across time.

Prior to the entrepreneurship training and mentoring intervention and at the point where ventures were being established, there was a relationship between the two variables.

Consequently, it may be that the training intervention in some way impeded the relationship at T_2 – immediately after the entrepreneurship training intervention – where no relationship existed.

5.0 Reflecting upon the Results: Longitudinal versus Cross-Sectional Studies

There was a range of significant differences among the three latent variables and their inter-relationships depending upon which time periods were being compared. None of the latent variables or their relationships was stable in the short term. This is not an insignificant point. The reason is because most behavioural research is cross-sectional in nature. Data is collected at one point in time and conclusions drawn upon the results achieved. However, as can be seen with this longitudinal study, depending on the point data is collected may yield a different set of results had the data been collected at a different point in time. Therefore, it is more ideal for behavioural research to be longitudinal in nature (wherever possible), unless it is established that the variables of interest are stable across time (for example, there have been a number of studies into "values" which have supported the notion of their stability over time (Schwartz, 1992).

As a minimum requirement, cross-sectional studies need to unambiguously state that of the results obtained, and give consideration that any conclusions drawn may be subject to change had they been collected at another point (or points) in time. Alternatively, replication studies need to be undertaken to determine if the results in these studies are consistent with previous studies asking similar research questions.

However, longitudinal studies are also subject to limitations. A key limitation is the time and resource cost involved to satisfactorily undertake such a study. Additionally, longitudinal studies carry their own set of threats to internal validity – these include

maturation, test‑retest threats, as well as the difficulties faced as a result of participant attrition from repeated‑measures longitudinal studies.

6.0 Summary

This Chapter attempted to interpret the results and provide meaning to these. What was obvious was that none of the variables and/or their relationships was stable over time. Adopting a repeated longitudinal research design provided valuable insights into the variables and their inter‑relationships – which would not have been obvious had a cross‑sectional research design been implemented. This highlights one weakness of cross‑sectional behavioural studies.

Chapter 6: Thesis Summary
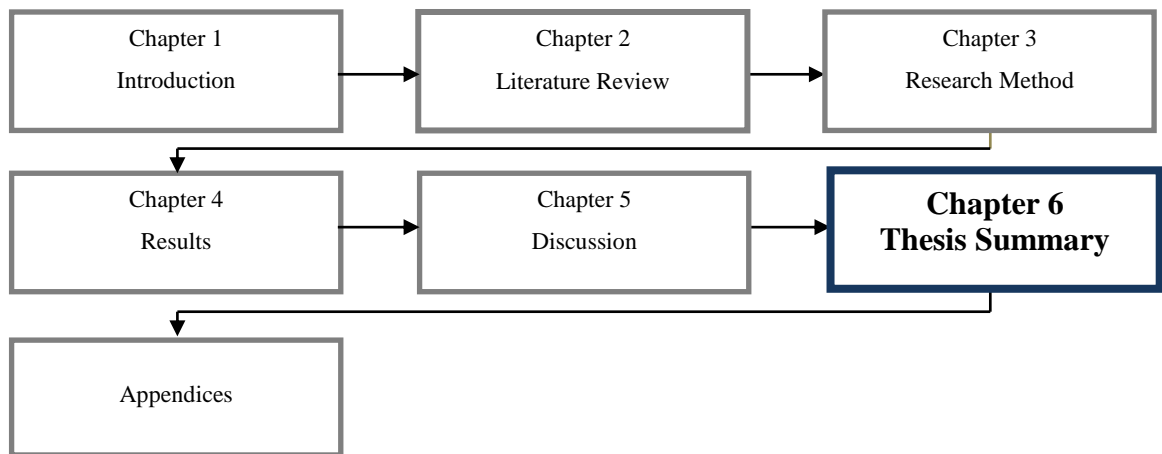
1.0 Introduction

Chapter 6 provides an overview of the research undertaken in this study. As the final Chapter of the thesis, it is appropriate to identify limitations of the research, and issue due caution where the results might not be generalisable across populations. Additionally, there are a number of associated research areas that have come to mind during this research which may be worthy of future exploration in the interests of extending knowledge in the area.

In Chapter 1 of the thesis reasons were provided why the research study was considered to be meaningful. These reasons essentially centered around two main objectives: (i) making a contribution to existing entrepreneurship theory, and (ii) contributing to practice. These two points will be expanded upon towards the end of this chapter.

2.0 Research Summary

The ultimate outcomes of this study are the findings flowing from the research and a discussion of what these may mean. The thesis sets out to contextualise the research setting and introduce the research foundations underpinning the study. The model's foundations

were embedded in intentions' theory (extracted from social psychological literature) using Ajzen's Theory of Planned Behaviour (TPB) (Ajzen, 1991). The predictive ability of the TPB was considered suitable as it had been comprehensively validated.

The ultimate behavioural activity (and dependent variable) measured in the study was entrepreneurial start-up behaviour. The aim of the study was to ascertain how the inter-relationships between (and among) a selection of constructs would contribute to the business start-up behaviour among a group of unemployed nascent necessity-entrepreneurs in South Africa. The identified constructs were entrepreneurial self-efficacy, intrinsic motivation, entrepreneurial intention (all independent latent variables), and business start-up behaviour (the ultimate dependent and endogenous variable in the structural model).

The research design adopted in this study was a longitudinal repeated-measures design. It was considered that utilising a cross-sectional study would not have provided the level of predictive validity (particularly in the context of the underlying one-year entrepreneurship training program). The repeated measures design objective was to ascertain the existence of any generalisable trend changes which might have occurred over the period of the study.

Consequently, participants were subjected to three interval measurements over the 4.5 year period of the research study. The intervals at which measurements were taken were: (i) prior to commencement of the entrepreneurial training intervention at T_1, (referred to as *baseline* in the research design); (ii) at completion of this 12-month intervention (T_2); and (iii) 3.5 years after completion of the intervention (T_3) – referred to as *end-of-study*. The measurements were then collated and analysed, facilitating comparison of the variables' behaviours at each point in time. Such insights are likely to be of interest to both social psychology and entrepreneurship researchers.

3.0 Research Limitations

This section provides commentary regarding limitations or potential weaknesses that have impacted the results (Cresswell, 2012). Limitations might result from issues such as inadequate measures, participant attrition, measurement errors, and questionable sample sizes. Highlighting such limitations will be useful to other researchers who might be considering similar studies; moreover, it allows readers to consider to what extent the findings are generalisable to their identified contexts.

Although the research referenced its strengths - such as the earlier notation pertaining to the benefits of longitudinal repeated measure designs versus cross-sectional studies - it is often the case that areas of perceived (or actual) weakness to exist. To this extent, the study parallels the general realities of life, together with its inherent limitations, which (often) produces less than perfect outcomes. However, to recognise that limitations and weaknesses exist does not negate or nullify the results, or infer that the study is fatally flawed. is the limitations are provided to aid other scholars to appropriately direct future research energy. It is within this milieu that the following issues relating to internal and external validity will now be discussed.

Internal validity addresses the issue of whether the independent variables (ESE/IM/EI) in the model were responsible for the changes in the dependent variable (ESB). These issues are:

(a) Selection bias refers to issues where the sample may carry a sample bias. This is relevant to this study as a result of the difficulty of identifying and randomly selecting from the socially and economically disadvantaged young nascent entrepreneur population. Given the difficulties faced in accessing this population, it is believed that the approach adopted in promoting the study via various means was the best that could be achieved. However, to the extent that some members of the target population were not contacted, then a sample

bias may be present. To the extent that the sample is not representative of the target population, the results should be interpreted with caution.

(b) *Maturation* refers to possible validity threats which may arise as a result of the participants becoming more mature over the period of the study. This can be a particular issue with longitudinal studies. As the study spans 4.5 years, it is worth contemplating potential effects that may lead participants to respond differently to the same questions at T_1, T_2 and T_3 (as a result of becoming more mature). There appear to be no extraneous reasons beyond the normal (older/wiser) maturation effects to have affected the participants (that is outside of identified the entrepreneurship training, mentoring, and incubation intervention) and all participants were exposed to these activities and the prevailing environment at the time. Consequently, maturation effects are considered inconsequential in this research.

(c) *History effects* originating from outside of the study can affect participants' attitudes and behavioural responses between repeated measure intervals: T_1, T_2 and T_3. The risk is that such events have the potential to effect change on the dependent variable (in this research, entrepreneurial start-up behaviour), making it impossible to assess whether the change was ultimately due to the independent variables or an external historical event. No such significant historical events that may have affected participants are known to have occurred during the study; save for regular and randomly distributed life-events (for example illness, death, or disability). The major historical event that affected all participants in the research was the entrepreneurship training, mentoring, and incubation program intervention. Hence, any external history effects on the study are considered insignificant.

(d) *Repeated testing effects* concern repeated measures testing at T_2 and T_3 (T_1 on T_2; T_1 and T_2 on T_3) which may lead to bias. Considering the measurement intervals between

T_1 and T_2 (12 months) and T_2 and T_3 (3.5 years), a repeated testing effect on the entrepreneurial start-up behaviour variable is highly unlikely. These two intervals are sufficiently far apart for participants to have the ability to remember their earlier responses and be influenced by these. Additionally, continued participation in the training intervention was not subject to (voluntary) completion of the questionnaires; hence, removing any threat of possible response conditioning. As a result, testing effects are considered to have had a negligible effect on the results.

(e) Experimental mortality occurred during the study, which is to be expected given the extended period. During the research period some participants were able to secure more attractive full-time employment, others relocated to other cities, and a small number found the training and assessment requirements too demanding and absconded from the training program. Thus, an assessment was undertaken of those who failed to continue with the program versus those who continued. This revealed no significant differences between the two groups and no systemic pattern of attrition was noted that could otherwise have threatened the internal validity of the study.

External validity addresses the extent to which the results of the study can be generalised to other situations and people from other populations. Since this research focused on nascent necessity-entrepreneurs from South Africa, caution should be exercised in generalising the results to other populations.

(a) Generalisability in other situations. This particular element is not considered to be a threat to validity, given the fact that the study was undertaken over an extended period of time. The participants' psychological responses were considered to be *"real"* and representative of responses to similar life events. To this end, much was done to immerse participants in real-world simulations through mentoring and hands-on incubation processes.

(b) Generalisability across people from other populations. Due to practical constraints such as location, time, and cost this issue is near impossible to avoid in social psychology research due to random sampling challenges. Ultimately, results can only be considered representative (of the behaviour of the population) if the participants were randomly selected from that population. To this end, the study is subject to the limitations and/or weaknesses identified in the discussion below:

(i) *Location of the study:* The first and most obvious limit arises from the fact that the study was undertaken in South Africa. South Africa is a developing country of great economic contrasts; often considered to have first and third world economies operating side-by-side, with a large part of the population unable to participate in the formal economy. Unsurprisingly, government policy is focused on creating opportunities for the poor and less fortunate (as was the case in this study) by funding entrepreneurship training and incubation programs for unemployed youth. The location and focus on the economically disadvantaged sector is, in and of itself, not a weakness. It does, however, represent a limitation to the extent that the research results are not generalisable to other populations or countries where such economic conditions are not prevalent - such as developed countries.

(ii) *Type of entrepreneurs:* Funding prescriptions mandated the selection of indigenous and unemployed individuals interested in creating new ventures. These entrepreneurs are considered to be nascent necessity-entrepreneurs - as they were motivated to consider entrepreneurship as an option in response to chronic conditions of high unemployment. As such, these conditions are much more likely to induce an individual into entrepreneurship (as a result of sheer necessity) than in countries where social support systems are more extensive. For this reason, generalisability across developed societies and countries (as identified by Heinrich, Heine, & Norenzayan, 2010) will be limited.

4.0 Future Research Considerations

Considerations for future research are identified - based on overcoming some of the limitations and weaknesses identified in Section 3. The discussion regarding the impact of internal validity issues were considered insignificant with the exception of selection bias and the external validity threat of a possible (probable) lack of generalisability to other populations is to be expected. The sample bias primarily results from not being able to access a centralised register of the target population - for example, not being able to access

a telephone directory or census data. In the absence of such tools and as a result of large numbers of people living in informal settlements, the potential to access every person for inclusion in the sample is near impossible.

In such conditions, the considered strategy was to promote the opportunity as extensively as practically possible; whilst being aware that through happenstance some indigenous nascent necessity-entrepreneurs may not have been aware of the opportunity, or others may have been aware but declined to participate. Hence, the limitation exists that these two non-participating categories in the population may have exhibited different responses to entrepreneurial intention, intrinsic motivation, and entrepreneurial self-efficacy measurements than the sample selected for the study. Given the identified contextual constraints, it is difficult to propose an alternate approach to overcome this in future research.

Another related limitation to generalisability is the location of the research - undertaken in South Africa, a developing country. Issues worth exploring might be whether the results are mediated through country-specific (cultural) variables, or stage of development. To this end, scholars may consider undertaking future (comparative research) in both developing and developed countries to ascertain if a country's stage of economic development or nation/culture specific traits acts as moderating variables.

Lastly, a model design consideration contemplates whether analyses may have been different if T_1, T_2, and T_3 were measured at different times (for example, shorter intervals) or additional collection points, (for example, T_4 or T_5). Such considerations should be wary of risking internal validity through repeated testing effects. Future research design could consider equidistant points of data collection across the period of study. In particular, should the research duration be approximate to this study then it is unlikely that additional measures would create repeated testing validity concerns.

5.0 Research Contributions

The research contribution made by the study consists of contributions to extending existing theory, and applied contributions to practice.

5.1 Contribution to Theory

There are a number of contributions to theory pursuant to this research:

- This research demonstrated the importance of adopting longitudinal research designs when psychological variables are being examined. By using a repeated measures longitudinal design to address the research questions, the changeability of the model constructs was able to be observed. Many studies opt for cross-sectional research designs (based on suitability considerations given the research questions being examined, and the relative ease of execution); and because it is less costly and more expedient compared with longitudinal designs. This research has highlighted the fact that depending on when cross-sectional data is collected, the results may well be different – potentially resulting in a different conclusion to that if the data had been collected at a different point in time. This is a consequence of psychological variables changing over time. Therefore, where appropriate, and subject to the research questions being considered, researchers should consider repeated measures longitudinal research designs; in particular where research is conducted at the individual psychological level.

- In this research the repeated measures longitudinal study design provided a richness to the study which would otherwise have been unable using a cross-sectional design by enabling insight into the transitioning of entrepreneurial intentions of nascent necessity-entrepreneurs to start businesses to exhibiting actual business start-up behaviour activity. This research demonstrated that when the aim of the research is to examine the variables associated with entrepreneurial

nascency as an antecedent to business start-up behaviour, a longitudinal research design is essential.

- The use of elements of Ajzen's intentions-based theory of planned behaviour model (TPB) to investigate the *entrepreneurial self-efficacy - entrepreneurship intention – entrepreneurial behaviour* relationship is not new, and has been applied to previous studies. The contribution to theory in this research, however, is enhanced by at least two factors: (i) application of the TPB in a nascent *necessity-entrepreneur* context; and (ii) incorporating intrinsic motivation as an antecedent to intention and behaviour. In terms of the former, a range of entrepreneurship-related studies exist that have implicitly (if not explicitly) focused on opportunity-based entrepreneurship in a developed country. As a result, this research extends the existing theory by examining inter-relationships among the model variables in a *developing country*, and with a specific focus on nascent *necessity-entrepreneurs*. The results further support the applicability of the TPB - even in socially and/or economically disadvantaged entrepreneurial contexts, where the focus is on *nascent necessity-entrepreneurs*. Considering the second factor, only a limited number of prior entrepreneurship studies have examined the *intrinsic motivation – entrepreneurial self-efficacy – entrepreneurial intention* variable relationships. To this end, the research extends current theory by undertaking a longitudinal examination of these inter-relationships as an antecedent to nascent necessity-entrepreneur behaviour.

5.2   Contribution to Practice

There are a number of contributions to practice pursuant to this research:

- Significant funding commitments are made in developing countries to train, assist, and develop nascent necessity-entrepreneurs as a means to escape unemployment

and establish self-sufficiency and support employment creation. The vexing issue for funding organisations is that funding is frequently allocated without necessarily identifying prospective candidates who demonstrate behaviours that are likely to support business start-up behaviour. This research investigated relationships among key variables and how they might support business creation activity among nascent necessity-entrepreneurs in a developing country. Evidence of the existence of such relationships inform the future design of *candidate sourcing, screening, and assessment instruments* for entrepreneurship education and training programs; consequently, improving the efficacy of such initiatives.

- A second applied contribution concerns the *design, development, and delivery of entrepreneurial training, mentoring, and incubation programs*. Chapter 2 reviews a range of entrepreneurship education and training program pedagogies; however, few appear to distinguish between nascent necessity-entrepreneurs versus nascent opportunity-entrepreneurs. This research provides insights into entrepreneurship training and mentoring when introduced into a nascent *necessity-entrepreneur* context. The results, therefore, provide a basis for future research to examine entrepreneurship training and mentoring in a necessity-entrepreneur context with that delivered in an opportunity-based nascent entrepreneur context. This will provide the opportunity to examine similarities and differences between the two contexts and the impact on good pedagogical design when the focus is opportunity versus necessity nascent entrepreneurs.

- A third practical research contribution concerns influencing and framing government policy initiatives associated with the development of nascent necessity-entrepreneurs. Although subject to further research, the results may suggest that intrinsic motivation as well as entrepreneurial intention may be

associated with business start-up behaviour. Consequently, when resources are scarce, policy makers may want to screen potential (nascent necessity) participants in entrepreneurial training, incubation, and mentoring programs in terms of both entrepreneurial intentions and intrinsic motivations.

- Lastly, a fourth applied contribution is that the research demonstrates that an integrated entrepreneurship training, incubation, and mentoring intervention can have a positive long-term effect on the entrepreneurial process (including the intrinsic motivation, entrepreneurial intention, and business start-up behaviour of nascent necessity entrepreneurs). Thus, implications for both practitioners and policymakers exist in that the results suggest that it is worth funding such interventions as part of key economic strategy in developing communities. The research does however not indicate whether the training and mentoring leads to more sustainable ventures compared with those who do not undergo such training, incubation, and mentoring programs. This consideration is outside the scope of this research.

6.0 Summary

This Chapter encompasses a summary of the various research activities undertaken as part of the thesis. It discusses research weaknesses and limitations of the study. Although internal and external validity issues are considered, no significant or fatal flaws are identified that will have an adverse impact on the results obtained.

Pursuant to identifying these perceived limitations, suggestions are made for future research by addressing some of the contextual limitations associated with this research. The last part of the Chapter concerns a review and discussion of the dual contribution made to theory and practice. Contribution to theory relates to extending existing theory - by way of the relationships among the identified constructs using a repeated-measures design, as well

as the context of nascent necessity-entrepreneurs. Contribution to practice concerns the design and development of screening and assessment tools to improve the quality of selection of candidates more likely to transition from intention to business start-up and, the improved design, development, and delivery of entrepreneurship training, mentoring, and incubation courses to meet the specific requirements of nascent-necessity entrepreneurs (rather than current pedagogy with a predilection toward nascent opportunity-entrepreneurs situated in developed countries).

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Appendix 1: Letter from Training Management Organisation

5 January, 2004

To whom it may concern

Granting of rights to data collected by, and owned by, The Entrepreneurship Incubator (Pty) Ltd

I advise that all data collected during the January 2004-December 2008 period (both quantitative and qualitative) for the South African longitudinal study that involves evaluating the effects of participants' enrolment in an *entrepreneurship training, mentoring, and incubating program* (hereafter referred to as "the training program" or "the program") was collected by, and is owned by, The Entrepreneurship Incubator (Pty) Ltd (here after referred to as "the Company"). The data was collected in an ethical manner by the Company and participants participated in the data collection process on a voluntary basis. The training program was developed by and was delivered by the Company and it owns all intellectual property rights associated with the program.

Although the Company owns the data and any rights associated with it, the Company grants Anton Jordaan unconditional access to this data and the rights to analyse the data for the purposes of his PhD research on the understanding that he makes the results of his analysis available to the Company. The Company may use these results to improve any future entrepreneurship training programs that the Company engages in. The Company also unconditionally grants Anton Jordaan the rights to publish the results of his research in his doctoral thesis, academic journal, book, magazine, newspaper, web site, and/or any other media form that he deems suitable.

Regards,

Rea Bachtis
Executive Officer

The Entrepreneurship Incubator (Pty) Ltd - section 21 - Reg: 2003/013342/08
3rd Floor Everite House, 20 De Korte Street, Braamfontein, 2001
P.O. Box 1255, Fontainebleau, 2032
Tel: 011 339 7994

Appendix 2: Research Documents Provided to Participants

Information Sheet

The Entrepreneurship Incubator (Pty) Ltd

A research study about how entrepreneurship training affects nascent entrepreneurs

The purpose of this study is to advance our understanding of the effects of an entrepreneurship training, mentoring, and incubation program on the behaviour of those participating in the program. The study is longitudinal and participants will be asked to complete a questionnaire three times: prior to commencement of the program; at the end of the formal training and mentoring; and subsequently after a suitable period has lapsed after the training and mentoring has been completed.

If you consent to participate, you will be provided with a questionnaire for you to complete. It is expected that the questionnaire will take around 20 minutes to complete.

You may also be asked to participate in a discussion forum and/or a face-to-face interview(s) during and/or after you have completed the program.

Benefits flowing from the study include making improvements to future entrepreneurship training and mentoring programs for those intending to start businesses based on the results and feedback received.

The results of this study will be published in academic and professional journals. However, your privacy, anonymity, and confidentiality will be assured. All the information you provide will be stored securely and will be accessible by the research team.

You are free to withdraw from the study at any time.

CONSENT FORM

The Entrepreneurship Incubator (Pty) Ltd

1.   I, ……………………………………………………………   *(please print name)*
     consent to take part in the research project entitled: "A research study about how entrepreneurship training affects necessity entrepreneurs"

2.   I acknowledge that I have read the attached Information Sheet entitled: "A research study about how entrepreneurship training affects necessity entrepreneurs"

3.   I have had the project, so far as it affects me, fully explained to my satisfaction. My consent is given freely.

4.   Although I understand that the purpose of this research project is to assist entrepreneurs, it has also been explained that my involvement may not be of any benefit to me.

5.   I have been given the opportunity to have an independent third party present while the project was explained to me.

6.   I have been informed that, while information gained during the study may be published, I will not be identified.

7.   I understand that I am free to withdraw from the project at any time.

9.   I am aware that I should retain a copy of this Consent Form, when completed, and the attached Information Sheet.

     …………………………………………………………………………………..
          (signature)   *(date)*

WITNESS
     I have described to   …………………………………………..   *(name of participant)*
     the nature of the research to be carried out. In my opinion she/he understood the explanation.
     Status in Project**: Observer**
     Name:
       …………………………………………………………………………...
     (signature)   *(date)*

Appendix 3: Survey Questionnaire

Appendix 3: Survey Questionnaire

Questionnaire

The results of this Questionnaire are strictly confidential; information about individuals will not be disclosed. There are no right or wrong answers, just tell us what you think.

Thank you for agreeing to participate in this survey.

The Entrepreneurship Incubator (Pty) Ltd

PART A: Please answer the following questions about yourself:

1. What is your gender?
     □ 1:Female   □ 2: Male

2. What is your age? ………………Years

3. What is the <u>highest</u> education level you achieved?
     □   1: Primary School
     □   2: Secondary (High) School
     □   3: Technical or Trade Qualification
     □   4: A Certificate after high school
     □   5: A Diploma after high school
     □   6: Undergraduate Degree
     □   7: Postgraduate Degree
     □   8: Other (specify)_____

4. What is your <u>current</u> employment status?
     □   1: I have a full time job
     □   2: I have an ongoing part time job
     □   3: I get casual work whenever I can
     □   4: I am self employed
     □   5: I am unemployed

5. If   you   are   not   working,   how   long   have   you   been   unemployed?
     _____

6. Have you ever started a business or bought into a business previously?
     □ 1:Yes   □ 2: No
7. Do you intend to <u>actually start</u> a business within the foreseeable future?
     □ 1:Yes   □ 2: No

8. How likely is it that you will<u> start</u> a business within the foreseeable future?

	Extremely Unlikely					**Extremely Likely**	
	1	2	3	4	5	6	7

9. Have you started a business since the program commenced?
     □ 1:Yes   □ 2: No

10. To what extent have you started a business since starting this program? (a "1" means you have not started a business at all; "7" means that your business is fully operational, and numbers rated in between (that is, the "2" to "6" range) provide insights into how operational your business is at this point in time – to what extent it is partially operating or not.)

	Completely Unoperational					**Completely Operational**	
	1	2	3	4	5	6	7

Appendix 3: Survey Questionnaire

PART B: Please answer the following questions about yourself.

How important is each of the following reasons for starting or buying your own business?

	Unimportant						**Important**

I want to start or buy a business …

1. For personal satisfaction reasons	1	2	3	4	5	6	7
2. To achieve a vision I have	1	2	3	4	5	6	7
3. To be able to prove that I can do it	1	2	3	4	5	6	7
4. To become wealthy	1	2	3	4	5	6	7

PART C: How confident are you in your present readiness for successfully managing or doing the items listed below.

	No Confidence		**Neutral**			**Complete Confidence**	

1. Identifying new business opportunities?	1	2	3	4	5	6	7
2. Creating new products	1	2	3	4	5	6	7
3. Thinking creatively?	1	2	3	4	5	6	7
4. Commercialising an idea or new development?	1	2	3	4	5	6	7

Your Name: …………………………………………………………………………………

Thank you for completing this survey

Appendix 3: Survey Questionnaire

Appendix 4: SAQA Cert IV in NVC - Qualification Rationale

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

National Certificate: New Venture Creation (SMME)

SAQA QUAL ID	QUALIFICATION TITLE		
20884	National Certificate: New Venture Creation (SMME)		

ORIGINATOR	ORIGINATING PROVIDER	
SGB Generic Management		

QUALITY ASSURING BODY		
-		

QUALIFICATION TYPE	FIELD	SUBFIELD
National Certificate	Field 03 - Business, Commerce and Manager Studies	Generic Management

ABET BAND	MINIMUM CREDITS	OLD NQF LEVEL	NEW NQF LEVEL	QUAL CLASS
Undefined	162	Level 4	NQF Level 04	Regular-Unit Stds Based

REGISTRATION STATUS	SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE
Passed the End Date - Status was "Registered"	SAQA 0741/02	2002-04-10	2005-04-10

LAST DATE FOR ENROLMENT	LAST DATE FOR ACHIEVEMENT
2006-04-10	2009-04-10

In all of the tables in this document, both the old and the new NQF Levels are shown. In the text (purp statements, qualification rules, etc), any reference to NQF Levels are to the old levels unless specifica stated otherwise.

This qualification is replaced by:

Qual ID	Qualification Title	Old NQF Level	New NQF Level	Min Credits	Replacement Status
23953	Further Education and Training Certificate: New Venture Creation (SMME)	Level 4	NQF Level 04	162	Complete

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose: In order to give effect to the above vision and framework, the qualification will have as its core purpose, qualifying learners to be competent in consistently using a variety of technical, business managerial and personal skills and strategies in the creation and sustenance of added value in any product, process or system in any context. The successful learner will have developed a sound foundation for the application of these skills to

explore a diverse range of entrepreneurial opportunities.

The conceptual framework of this entrepreneurial qualification is, in general, to create a union between an actor element (e.g. individual, team or organisation) and a project or process element (e.g. product, service or system) with added value as a core outcome. Within this context the qualification is grounded in the provocation of behavioural change. An added perspective is that these programmes will lead towards a more entrepreneurial society in a wide range of political legislative and social policies and practices.

Research has indicated that in order to qualify for the Certificate: Venture Creation, learners will need to demonstrate competence in the following:

 Acquisition of an Entrepreneurial Profile which includes, inter alia, an innovation orientation.
(The ability to use their understanding of the characteristics of successful entrepreneurs to develop these characteristics within themselves while having an appreciation of the importance of an innovation orientation to business success; and the knowledge of specific techniques for releasing creativity in the development of a viable business opportunity.)

 Acquisition of research skills relevant to Venture Creation viz Exploratory Market Research, Competitors Analysis, Industry Analysis, Consumer Research.

 Effective and efficient communication within the total business environment (not only as a critical cross field outcome under unit standards, but the integration of various skills to achieve this.)

 Awareness of and accounting for relevant legal and legislative requirements.

 Ability to mobilise resources to start a new venture.
[The ability to formulate deploy, review and implement policy and strategy into plans and action.]

 Ability to manage and use resources and information effectively and efficiently (Manage Operational Activities).

 Ability to structure and appropriately manage the market access component of their venture.
[The ability to determine the requirements and enhance expectations of customers and markets.]

 Ability to initiate and sustain quality leadership within the new venture.
[The ability to inspire, support and promote a culture of performance excellence.]

 Ability to identify, manage, review and improve business processes. (Business Improvement).

 Ability to release the full potential of self and others.

Rationale: The design and establishment of an entrepreneurship qualification must aim to:

 Develop appropriate skills and knowledge required for the establishment or development of an enterprise.

 Address the economic/administrative and behavioural (psycho-social) barriers that contribute to failures in starting and sustaining the enterprise.

South Africa has a plethora of small business training programmes and many small business structures and policies. However, there have been no appreciable related improvements in job creation or economic competitiveness to date. In fact, the government is on record for admitting that, despite the huge investment in support structures and training, there is little appreciable positive impact evident in the SMME sector. Entrepreneurship failure can mainly be assigned to the absence of much needed skills to become truly entrepreneurial.

In South Africa, higher education has come under the spotlight for its potential role in the development of entrepreneurs. A major challenge it faces is the aligning of curricula and objectives with the needs of society and the marketplace - and the production of learners who will be able to contribute to wealth creation for the nation. There is a need for a unifying framework for the development of entrepreneurs. It is in this context that this qualification is proposed.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

English literacy and numeracy at NQF 3 or equivalent.

Recognition of prior learning:
This qualification may be achieved in part through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience.

RECOGNISE PREVIOUS LEARNING? Y

QUALIFICATION RULES

☐ All the unit standards in the fundamental component (56 credits) are compulsory.
☐ All the unit standards in the core component are compulsory (93 credits).
☐ Learners must choose unit standards totalling a minimum of 13 credits for the elective component.

These standards may be taken from those listed as electives in the qualification or any other that suit the learning programme of the learner.

EXIT LEVEL OUTCOMES

1. The ability to build basic personal and interpersonal skills which will serve as a foundation for all further business learning. Specific outcomes: The qualified learner will be able to:

☐ Demonstrate the importance of teamwork in a business and improve his/her ability to effectively work with others in a team.

☐ Be able to display a knowledge of the effects of group dynamics and reflect these in the business.

☐ Be aware of the various behaviours that can interfere with team effectiveness and use this to overcome similar problems in his/her future business.

☐ Be able to enhance teamwork by employing motivational strategies which he/she can implement in his/her future business.

2. The ability to use their understanding of the characteristics of successful entrepreneurs to develop these characteristics within themselves. Specific outcomes: The qualified learner will be able to:

☐ Examine and analyse own value system in an ethical business context in order to be aware of, and adhere to, all apects of law in his/her future business venture.

☐ Apply characteristics of successful entrepreneurs and develop these characteristics within themselves.

☐ Appreciate the importance of an innovation orientation to business success and know the specific techniques for stimulating creativity in the development of a viable business opportunity.

☐ Be able to establish a base line of self-knowledge in respect of personality, interests, and aptitudes; and use this as a foundation for the development of appropriate business ideas.

3. The ability to apply sound basic business concepts to establish his/her own viable business venture. Specific outcomes: The qualified learner will be able to:

☐ Communicate effectively, both verbally and in writing, with all internal and external stakeholders.

☐ Use basic numeracy skills in a range of commonly used business calculations.

☐ Understand the economic realities of South Africa and use this to identify the opportunities that exist for SMME engagement.

☐ Identify the criteria for creating an effective business plan and its successful implementation.

☐ Effectively apply and implement the appropriate research techniques in identifying marketing opportunities.

☐ Identify the various forms of legal structure available for his/her new venture.

☐ Formulate and implement a marketing plan for his/her proposed business.

☐ Identify financing options, and access the finance required for the establishment of the business.

☐ Implement an action plan in order to execute the establishment his/her own business.

4. The ability to apply a range of business skills in sustaining his/her business venture. Specific outcomes: The qualified learner will be able to:

☐ Apply the principles of costing and pricing in his/her own business venture.

☐ Analyse and evaluate the market research undertaken in order to successfully penetrate the identified market.

☐ Use effective financial management tools and processes that will contribute to the profitability and efficiency of their business.

☐ Monitor business progress and take corrective action as required.

☐ Use maintenance management techniques and tools as a process for managing and anticipating expenditure.

5. The ability to use the resources at their disposal for business growth by aligning both internal and external environments in response to market conditions. Specific outcomes: The qualified learner will be able to:

☐ Identify support structures and create good working relationships, using these sources of support, to maximise his/her chances of success.

 Implement effective negotiation tactics to secure a favourable outcome in the bargaining process.

 Analyse his/her marketing objectives by ensuring that the correct strategy is being pursued; and know how and where the business`s attributes need to be developed.

 Take decisions concerning the future of his/her business with awareness of their implications.

 Be familiar with the elements of the exporting process which he/she could apply in the growth of the business.

ASSOCIATED ASSESSMENT CRITERIA

The assessment criteria of the qualification are embodied in the unit standards. The depth of technical expertise that will be assessed across the various specialist contexts are clearly articulated in the relevant specific outcomes, assessment criteria and range statements within these unit standards.

Integrated Assessment:
A summative integrated assessment framework is proposed as follows:

 Acquisition of an Entrepreneurial Profile which includes, inter alia, an innovation orientation. (Interdependence with: Know Yourself, Innovation Orientation for Entrepreneurs, Entrepreneurial Profile, setting personal Goals)

 Acquisition of research skills relevant to Venture Creation viz Exploratory Market Research, Competitors Analysis, Industry Analysis, Consumer Research. (Interdependence with Business idea selection, Marketing for a new venture, understanding the economy, IT, Numeracy)

 Ability to mobilise resources to start a new venture. (Interdependence with Strategic Planning, Financing a new business, Marketing for a new venture, Business Communication, determining profitability for a new venture, Working in Teams, Negotiating in a Business)

 Ability to manage an efficient and effective new business entity. (Interdependence with managing HR, Financial Management for a new enterprise, Business Performance Management, Working in a team)

 Ability to structure and appropriately manage the market access component of their venture. (Interdependence with Strategic Planning, Negotiation in business, Marketing, Business Ethics)

 Ability to initiate and sustain quality leadership within the new venture. (Interdependence with Working in a Team, Business performance management, Business Ethics, Quality management)

 Ability to implement a business improvement plan. (Interdependence with, Strategic Planning, Quality Management, Business Performance Management)

The identification and solving of problems, team work, entrepreneurial development of self and others, organising self, planning and managing processes within small business, implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, and informal learning and work experience.

Unit standards associated with the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflective competencies.

INTERNATIONAL COMPARABILITY

This qualification has been benchmarked against international standards and qualifications, specifically those of New Zealand, Australia and Scotland. International and South African support for the proposed conceptual framework and content is evidenced in the work of:

Amos, T.L. & Maas, G. (2001) Developing entrepreneurial students: A proposal of the what and how. University of Rhodes. Paper submitted at the 11th global IntEnt-Conference, 2nd to 4th July 2001, Kruger National Park, South Africa.

Begley, T.M. & Boyd, D.P. (1987). A comparison of entrepreneurs and managers of small businessfirms. Journal of Management, 13, pp. 99-108.

Davies, TA; Fagan, K. (1995). The Graduate Enterprise Programmes. Durban, South Africa. Siyakhana Holdings.

Davies, TA; (2001). Venture Creation : An Innovative Learnership Model for the Self-Employed. (Technikon Natal, Paper submitted to the IVEATA Conference, 11th - 15th November 2001, Tanzania)

Gartner, W.B. & Vesper, K.H. (1994). Experiments in Entrepreneurship Education: Successes and Failures. Journal of Business Venturing. New York.

Gibbs, A. (1992). The enterprise culture and education - understanding enterprise education and its links with small business, entrepreneurship and wider educational goals. International Small Business Journal. pp. 24.

Gorman, G.; Hanlon, D.; King, W. (April / June 1997). Some Research Perspectives on Entrepreneurship Education and Education for Small Business Management: A Ten-Year Literature Review. International Small Business Journal, pp. 22.

Solomon, G.T.; Winslow, E.K. & Tarabishy, A. (1997). Entrepreneurial Education in the United States An Empirical Review of the Past Twenty Years.

Terblanche, N.S.; Keyter, L. (1997). Creative Entrepreneurship. Pretoria, South Africa. Kagiso Tertiary.

Van Vuuren, J.J. & Antonites, A.J. (2nd to 4th July 2001). Recent developments regarding content of entrepreneurship training programs. Department of Business Management, University of Pretoria. Paper submitted at the 11th global IntEnt-Conference, Kruger National Park, South Africa.

Watson, C.H. (2nd to 4th July 2001). Topics for Entrepreneurship Education: Viewpoints of Practitioners in the Gauteng Province of South Africa. Technikon Pretoria. Paper submitted at the 11th global IntEnt-Conference, Kruger National Park, South Africa.

ARTICULATION OPTIONS

 National Diploma in Small Business Management.
 Certificate in Business Management.

MODERATION OPTIONS

 Anyone assessing a learner or moderating the assessment of a learner against this Qualification must be registered as an assessor with the relevant ETQA.

 Any institution offering learning that will enable the achievement of this Qualification must be accredited as a provider with the relevant ETQA.

 Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

 Moderation must include both internal and external moderation of assessments at exit points of the qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors need experience in the following areas:
 Interpersonal skills, subject matter and assessment.
(The assessor needs to be competent in the planning and conducting of assessment of learning outcomes and in the design and development of assessments as described in the unit standards. Plan and conduct assessment of learning outcomes NQF level 4. Subject matter experience must be well developed within the field of business development and small business management.) The assessor must have completed, at least:

 A business qualification at NQF level 5 or above with a minimum of 2 years own business experience; or

 A minimum of 5 years personal experience of business start-up and management.

Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

NOTES

This qualification has been replaced by qualification 23953 which is "National Certificate: New Venture Creation (SMME)", Level 4, 162 credits.

UNIT STANDARDS:

	ID	UNIT STANDARD TITLE	OLD LEVEL	NEW LEVEL	CREDITS
Core	114600	Apply innovative thinking to the development of a small business	Level 4	NQF Level 04	4
Core	114594	Apply the principles of costing and pricing to a business venture	Level 4	NQF Level 04	6
Core	114598	Demonstrate an understanding of an entrepreneurial profile	Level 4	NQF Level 04	5
Core	114595	Demonstrate an understanding of the function of the market mechanisms in a new venture	Level 4	NQF Level 04	5
Core	13940	Demonstrate knowledge and application of ethical conduct in a business environment	Level 4	NQF Level 04	4
Core	114587	Determine and manage the human resource needs of a new venture	Level 4	NQF Level 04	4
Core	114583	Develop, implement and evaluate a marketing strategy for a new venture	Level 4	NQF Level 04	8
Core	114588	Develop, implement and monitor a quality policy for a new venture	Level 4	NQF Level 04	4
Core	114584	Finance a new venture	Level 4	NQF Level 04	5
Core	114591	Implement an action plan for business operations	Level 4	NQF Level 04	4
Core	114586	Manage finances of a new venture	Level 4	NQF Level 04	5
Core	114589	Manage time productively	Level 4	NQF Level 04	4
Core	114590	Mobilise resources for a new venture	Level 4	NQF Level 04	4
Core	114618	Monitor productivity in a business venture	Level 4	NQF Level 04	5
Core	114607	Negotiate in a new venture	Level 4	NQF Level 04	4
Core	114585	Plan strategically to improve business performance	Level 4	NQF Level 04	4
Core	114592	Produce business plans for a new venture	Level 4	NQF Level 04	8
Core	114596	Research the viability of new venture ideas/opportunities	Level 4	NQF Level 04	5
Core	114593	Tender to secure business for a new venture	Level 4	NQF Level 04	5
Fundamental	8968	Accommodate audience and context needs in oral communication	Level 3	NQF Level 03	5
Fundamental	8969	Interpret and use information from texts	Level 3	NQF Level 03	5
Fundamental	8973	Use language and communication in occupational learning programmes	Level 3	NQF Level 03	5
Fundamental	8970	Write texts for a range of communicative contexts	Level 3	NQF Level 03	5
Fundamental	9015	Apply knowledge of statistics and probability to	Level 4	NQF Level	6

		critically interrogate and effectively communicate findings on life related problems		04	
Fundamental	8974	Engage in sustained oral communication and evaluate spoken texts	Level 4	NQF Level 04	5
Fundamental	8975	Read analyse and respond to a variety of texts	Level 4	NQF Level 04	5
Fundamental	9016	Represent analyse and calculate shape and motion in 2- and 3-dimensional space in different contexts	Level 4	NQF Level 04	4
Fundamental	7468	Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	NQF Level 04	6
Fundamental	12153	Use the writing process to compose texts required in the business environment	Level 4	NQF Level 04	5
Fundamental	8976	Write for a wide range of contexts	Level 4	NQF Level 04	5
Elective	14552	Contract service providers	Level 4	NQF Level 04	3
Elective	13952	Demonstrate basic understanding of the Primary labour legislation that impacts on a business unit	Level 4	NQF Level 04	8
Elective	13945	Describe and apply the management of stock and fixed assets in a business unit	Level 4	NQF Level 04	2
Elective	110003	Develop administrative procedures in a selected organisation	Level 4	NQF Level 04	8
Elective	7791	Display cultural awareness in dealing with customers and colleagues	Level 4	NQF Level 04	4
Elective	8561	Function in a Team	Level 4	NQF Level 04	4
Elective	10388	Interpret basic financial statements	Level 4	NQF Level 04	3
Elective	109999	Manage service providers in a selected organisation	Level 4	NQF Level 04	5
Elective	13947	Motivate a team	Level 4	NQF Level 04	6
Elective	114597	Practice effective team work in a venture	Level 4	NQF Level 04	4

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION:

When qualifications are replaced, some of their learning programmes are moved to being recorded against the replacement qualifications. If a learning programme appears to be missing from here, please check the replacement.

NONE

Appendix 5: List of Publications Emanating from this Research

Academic Journals

Lindsay, N.J., Lindsay, W.A., **Jordaan, A**., and Mapunda, G. (2007). Indigenous nascent entrepreneur self- efficacy and perceived personal success. International Journal of Entrepreneurship and Small Business, Vol. 4, No. 5, pp. 605-619.

Lindsay, N.J., Lindsay, W.A., **Jordaan, A**., and Hindle, K. (2006). Opportunity recognition attitudes of nascent Indigenous entrepreneurs. *International Journal of Entrepreneurship and Small Business*, Vol. 3, No. 1:56-75.

Conference Papers

Lindsay,Noel, Lindsay Wendy, **Jordaan, Anton**, Xia, Zhiqiang. (2013). What Motivates Nascent Entrepreneurs to Establish Tourism Ventures? *2013 ACERE Conference*, Brisbane, Australia, 5-8 February.

Lindsay, W.A., Lindsay, N.J., **Jordaan, A**., and Kropp, F. (2011). Gender differences in family and non-family business nascent necessity entrepreneurs, *Babson College Entrepreneurship Research Conference 2011*, Syracuse, New York, USA, June.

Lindsay, N.J., Lindsay, W.A., Kropp, F., and **Jordaan, A**. (2010). Do what nascent entrepreneurs think others think influence business start-up intentions and behavior: A longitudinal study, *Babson College Entrepreneurship Research Conference 2010*, IMD, Lausanne, Switzerland, June, 2010.

Lindsay, N.J., Lindsay, W.A., and **Jordaan, A.** (2010). Identifying nascent entrepreneurs who follow through, Abstract, *7th AGSE International Entrepreneurship Research Exchange 2010,* Coolum, University of the Sunshine Coast, February.

Lindsay, N.J., Lindsay, W.A., Kropp, F., and **Jordaan, A**. (2009). Entrepreneurial empowerment and wellbeing in Indigenous nascent entrepreneurs and non-entrepreneurs, Abstract, *6th AGSE International Entrepreneurship Research Exchange 2009,* Adelaide, The University of Adelaide.

Lindsay, W.A., Lindsay, N.J., **Jordaan, A**., and Dottore, A. (2008). Values, entrepreneurial attitudes, and start-up intentions of Indigenous South African nascent entrepreneurs. *Proceedings of the 5th AGSE International Entrepreneurship Research Exchange 2008, Melbourne, Swinburne University of Technology, Australia, February.*

Lindsay,W.A., Lindsay, N.J., **Jordaan, A**., and Hancock, G. (2007). Exploring the Values - Entrepreneurial Attitude Relationships of Necessity-Based Nascent Entrepreneurs. *The 13th Academy of Marketing Science World Marketing Congress*, Verona, Italy, 11-14 July, 2007.

Lindsay, N.J., **Jordaan, A**., and Lindsay, W.A. (2005) Values and entrepreneurial attitudes of nascent entrepreneurs. *Proceedings of the 50th International Council for Small Business Conference*, Washington DC, USA, June.

Lindsay, N.J., Lindsay, W.A., **Jordaan, A**., and Hindle, K. (2005). Toward an holistic and inclusive theory of opportunity recognition behavior: Do nascent Indigenous entrepreneurs perceive opportunities differently? *Regional Frontiers of Entrepreneurship Research 2005*, Vol. 2:278-298.

Lindsay, N.J., **Jordaan, A**., and Lindsay, W.A. (2004). Entrepreneurship as the way of the future for South Africa: Toward a theory of entrepreneurial attitude orientation of nascent Indigenous entrepreneurs. *Proceedings of the 2004 SEAANZ Conference*, QUT, Brisbane, Australia, September. (Nominated as a best paper candidate)