Identifying Skills Required for Senior Managers in Vocational Education Training - An Australian Perspective.

By

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Advance Dip Business Management, Graduate Certificate Tertiary Education,
Masters Business Administration

This thesis is presented in fulfillment for the requirements of the degree of
Doctorate of Business Administration

College of Business
Victoria University
Melbourne, Australia

2016

Abstract

Senior managers in Australian vocational education training (VET) are an integral part of the success of sector that contributes to Australia's economic growth and business productivity with the delivery of training to almost four million students annually.

Senior managers are often promoted from teacher to manager on the basis of practical vocational and teaching experience, rather than their management and leadership skills and are often inadequately trained or prepared for the role of leadership. Therefore, it is important to examine whether senior managers are equipped with the required leadership skills for effective leadership in VET.

This thesis utilises a new online survey of 100 senior managers employed in VET in Australia in order to identify the leadership skills required for senior managers by testing the Leadership Skills Strataplex Model (LSSM). The model highlights the importance of four broad leadership skills of cognitive, interpersonal, business and strategic skills. The study also explores the interaction of the skills required for current role, promotion and training provider type. The study conducts an exploratory and confirmatory factor analysis to identify broad and specific skills that are perceived as important. The new evidence indicates that (a) the strataplex model is not supported by the data (b) cognitive skills are perceived to be utilised the most, followed by strategic, interpersonal and business skills (c) business skills, problem solving/managing teams skills and strategic skills are identified as the most important skills required for senior managers and (d) skill importance does not seem to depend on training provider type.

Australian vocational education is increasingly complex and competitive and training providers need to recognise that the sector requires higher levels of leadership skills. Although cognitive skill requirements are high, senior managers also need higher levels of business, problem solving/managing teams and strategic skills.

Key words: Leadership; leaders; skills; vocational education training

Declaration

I, Moira Rose Kairys declare that this Doctorate thesis entitled, 'Identifying the skills required for senior managers in vocational education from an Australian perspective' is no more than 65,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

…… ……

Signature Date

Acknowledgements

This thesis would not have been possible without the support and encouragement from family, friends and the staff at Victoria University. Therefore, I would like to take this opportunity to acknowledge those whose contribution was significant in the development of this thesis. I would like to thank my Principal Supervisor Dr. George Messinis, Senior Research Fellow, Victoria Institute of Strategic Economic Studies and co-supervisor Associate Professor Theo Papadopoulos. Their support, advice and patience during this thesis provided valuable guidance. I would also like to thank Peter Symons for professional editing services provided in the final stages of this thesis. I would also like to thank Victoria University research administration team for their support throughout the process. Furthermore, I would like to thank my fellow students who with their encouragement and moral support provided motivation and focus throughout the journey. Finally I would like to dedicate my thesis to both my daughters Sara and Annabelle with the knowledge that with confidence anything is possible.

Table of Contents

List of Tables

List of Figures

Appendices

List of Abbreviations

AARE	The Australian Association for Research in Education
ABS	Australian Bureau of Statistics
A**MOS**	Analysis of Moment Structures
AQF	Australian Qualification Framework
ASQA	Australian Skills Quality Authority
AVETRA	Australian Vocational and Education Training Research Association
B	Business Skills
C	Cognitive Skills
CEO	Chief Executive Officer
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CMIN	Chi Square Test
COAG	Council of Australian Governments
CSHISC	Community Services Health Industry Service Committee
DV	Dependent variable
EBA	Enterprise Bargaining Agreement
EFA	Exploratory Factor Analysis
EFT	Employee full time
FA	Factor Analysis
H1	Hypothesis 1
H2	Hypothesis 2
H3	Hypothesis 3
H4	Hypothesis 4
HE	Higher Education
I	Interpersonal Skills
IT	Internet Technology
IV	Independent variable
KMO	Kaiser-Meyer-Olkin
KTSI	Koori/Torres Strait Islander
LSSM	Leadership Skills Strataplex Model

MAR	Missing at random
MCAR	Missing completely at random
MYEFO	Mid-Year Economic and Fiscal Outlook
N	Number
NCVER	National Centre for Vocational Education Research
NFI	Normed Fit Index
NZARE	New Zealand Association for Research in Education
OECD	Organisation for Economic Cooperation and Development
PCA	Principal Component Analysis
r	Correlation
RMSEA	Root Mean Square Error of Approximation
RTO	Registered Training Organisation
S	Strategic Skills
SD	Standard Deviation
SEM	Structural Equation Model
SPSS	Statistical Package for the Social Sciences
SST	Stratified System Theory
TAE40110	Certificate IV in Training and Assessment
TAFE	Technical and Further Education
VET	Vocational Education Training
VU	Victoria University

CHAPTER 1 INTRODUCTION

1.1 Chapter Introduction

The Australian vocational education training (VET) is a competitive sector experiencing increased volatility with training providers having to manage ongoing policy changes and reforms. The sector has been subjected to 50 key government reports and reforms since 1990 with the aim to improve the quality of Australian VET. Australian VET reforms include the introduction of a national training system regulated by National Quality Standards, increased competition between public and private training providers and the provision of consumer choice for training options. Although the sector has experienced numerous reforms the Department of Education and Training (2016) states that students, industry and training providers still view the sector as complex and fragmented. This view has a severe impact on the sustainability of the sector both nationally and internationally. Senior managers employed in VET play a significant role in the success of the sector. Therefore, senior managers require outstanding leadership skills as they respond to government expectations, increased compliance requirements, policy and funding changes and commercial competitiveness (Bhindi & Duignan 1997; Callan et al. 2007; McCallum & O'Connell 2009).

Leadership is often described as visionary and commitment to influence achievement of organisational goals with a culture of innovation and clear strategy (Hubbard 2004; McCallum & O'Connell 2009; Alloi 2012). The role of leader is to clarify an organisation's purpose and values, set direction, build community, manage change, share values to develop trust, provide supervision of subordinates with the ability to persuade, inspire and motivate (Fukuyama 1995; Hay & Hodgkinson 2006; Alloi 2013). Although the literature revealed various leadership theories that provide insight into leaders' behaviours and traits there is limited research focused on leadership skills. According to Kalargyrou, Pescosolido & Kalargiros (2012) behaviour and

trait theories describe who leaders are, however, leadership skills describe what leaders actually do. Although the literature reveals that leadership has been studied extensively within various contexts and theoretical frameworks, it is often described as complex, contradictory, confusing and lacking in cohesion (Allio 2013; Hay & Hodgkinson 2006). Many leadership studies in education have focused predominately on classroom teachers or school principals with limited research on leadership skills and less within the context of VET (Coates et al. 2013; Mehrabani & Mohamad 2015).

Therefore, this thesis will examine for the first time leadership skills in the specific context of senior managers in Australian VET using the theoretical framework of Stratified System Theory (SST), (Jacob & Jaques 1987, 1990) and the Leadership Skills Strataplex Model (LSSM), (Mumford, Campion & Morgeson 2007). The aim of this thesis is to identify leadership skills for senior managers in VET to enable effective leadership within the sector. Using the SST provides an understanding of how task complexity is relevant to organisation level and the variation in performance demands of managers (Densten 2003). The LSSM provides an understanding of performance demands of managers relevant to organisation level and leadership skill requirements to meet the performance demands (Kalargyrou, Pescosolido & Kalargiros 2012). The LSSM considers leadership skills in four broad leadership skills of cognitive, interpersonal, business and strategic skills. Therefore, this thesis will examine the four broad leadership skills, then to further identify leadership skills the skill attributes or sub-skills of each skill will be examined to define leadership skill requirements.

This thesis will use a quantitative research methodology approach to collect data via an online survey sent to senior managers employed in Australian VET. The data collected will be analysed in a variety of statistical techniques based on Mumford, Campion & Morgeson (2007) study in order to address the principal research question. The principal research question will be addressed from the perspective of senior managers employed in VET and not that of employers or the sector.

Chapter 1 will provide the background to the Australian VET sector and introduce the principal research question of 'What leadership skills are required for senior managers in Australian VET?' Based on the evidence presented in this thesis the implications to leadership policies and practices are summarised and a contribution to academic knowledge is made. Finally an outline of the thesis structure is provided that includes Chapter 1 Introduction, Chapter 2 Literature Review, Chapter 3 Methodology, Chapter 4 Data Analysis and Chapter 5 Conclusions and Implications of the thesis.

1.2 Australian Vocational Education Training

According to TAFE Directors Australia (2016) the VET sector is central to Australia's economic growth and business productivity in order to develop a flexible, highly skilled workforce to meet technological changes, industry and global demands. The sector is responsible for delivering workplace specific skills and knowledge across a wide range of careers and industries that brings together students, registered training organisations (RTOs), governments, employers and industry bodies. The Department of Education and Training formerly the Department of Education and Early Childhood Development (DEECD) (2012), outline that VET is responsible for trades training, training to semi-skilled and para-professional workers, educating technical specialists in key industries, providing pathway to higher education from school based and entry level qualifications and enables secondary school students to study units towards a recognised VET qualification while completing a secondary school certificate qualification. Furthermore, VET contributes to the Australian economy at the pre-employment stage by preparing people to enter the labour force, facilitates entry into the labour market through work study programs, provides opportunities for continuing skill development and increases employee capabilities (Maglen & Hopkin 1999).

VET in Australia is delivered by Registered Training Organisations (RTO's) that are regulated by the Standards for Registered Training Organisations as endorsed by the Council of Australian Governments Industry Skills Council (Australian Skills

Quality Authority 2016). The standards are regulated by the Australian Skills Quality Authority (ASQA). However, Victoria and Western Australian have their own regulatory bodies for registered training organisations that deliver state only registered courses. All regulatory bodies adopt a rigorous risk audit regime that is subjected to all RTO's on their initial registration, extension to scope and continuation of registration. The aim of the rigorous audit regime is to ensure the quality and reputation of Australian VET is maintained at global standards. Although, the rigorous regulatory requirements have been in place, within the last five years the number of registered VET providers have remained stable with fewer providers entering the sector. However, there has been an increase in provider registration cancelations by the regulators (Korbel & Misko 2016). Nevertheless the sector has been subjected to criticism as unscrupulous training providers continue to operate.

According to Australian Government (2015) as of January, 2015 there were approximately 4,600 RTOs in Australia with 3,400 private providers and as of June, 2015 there were 76 endorsed training packages, (which contain 1,672 qualifications, 1,147 skill sets and 18,101 units of competency) and 1,145 accredited courses (Australian Skills Quality Authority 2015). The market driven sector has experienced rapid growth in the number of providers delivering VET. The rapid increase in providers has affected the quality of training, student outcomes and the Australian VET reputation nationally and globally.

RTO's in Australia are diverse in their ownership, organisational, structure, staffing arrangements, student enrolment numbers, revenue generation, training scope and course delivery mode (Coates et al. 2013). RTO's are classified into two categories of training providers: public (government funded), Technical and Further Education (TAFE) and non-government often referred to as private provider or private RTO's. TAFE are government funded large institutions who employ thousands of staff and enrol thousands of students and generate revenue in excess of $150 million per annum across a diverse training scope and course delivery modes. All TAFE's have the authority to determine their training scope that is based on its strengths and the training needs of students and industry within their region. The TAFE sector is the largest education and training sector in Australia and comprises of more than 1,000 campuses

located in regional, urban, remote locations and throughout the Asia-Pacific and other offshore regions (Parliament of Australia, 2014). Some TAFEs operate in the dual sector, delivering vocational education and higher education courses and provide learning experience for students that include libraries, counseling services and cafeterias (Coates et al. 2013). TAFE is publicly owned, operated and funded and have semi-independent statutory authority with governing boards or business units and staff enterprise bargaining agreements (EBA) (Coates et al 2013). TAFEs are subjected to high overhead costs, an EBA, and are expected to manage an extensive training scope offering non-profitable courses and provide quality training in meeting the community and industry needs in an increasingly competitive environment. In contrast, the non-government sector or the private training providers can be subsidiaries of dual sector education and training companies, publicly listed, privately owned or managed by community and not for profit organisations (Coates et al. 2013). Private providers vary in size from small organisations that employ minimal staff and enrol only a few hundred students and generate only several thousands of dollars to large multinational organisations (Coates et al. 2013). In addition they do not have to contend with an EBA and are able to have flexible staff employment arrangements including short term contracts and negotiated wages. Furthermore, they are under no obligation to offer courses to meet community or industry expectations. Therefore, this enables them to have the ability to pick low cost high profit courses or alternatively not offer courses if there is no demand. However, regardless of the training provider type, all providers have the responsibility to meet societies' expectations to generate knowledge, provide effective teaching and student learning, as is expected of all academic organisations (Kalargyrou, Pescosolido & Kalargiros 2012).

The sector has experienced ongoing policy changes and reforms with fifty key reports on VET since 1990. In 2009, the Council of Australian Government (COAG), VET reforms aimed at improving and aligning labour force skills to meet changes and demands in the labour market. The reforms through the National Agreement for Skills and Workforce Development have set two targets for 2020 which are to (1) halve the proportion of Australians without qualifications at Certificate III level or above by 2020, (from 47.1% of 20 to 64 years olds to 23.6%) and (2) to double the number of high level (Diploma and Advanced Diploma) qualification completions by 2020 (Australian Government, 2016). The aim of these targets is to improve the

quality of post-secondary education of VET to meet the demands of the labour market (Oganisation for Economic Cooperation and Development 2014). The Productivity Commission, recurrent funding for the VET sector by Commonwealth, state and territory governments totalled $5.2 billion in 2014, which is 12% less than 2013 (TAFE Directors Australia 2016). In 2014, $2.4 billion or 46.4% of government VET funding was allocated on a competitive basis. This change in VET funding resulted in funding for private providers since 2005 to 2015 to grown to 222%. The private providers' funding continues to grow at an annual average rate of 13.9% (TAFE Directors Australia 2016). The increase of private providers and changes to student funding have resulted in TAFE being severely affected with reduced enrolments. In 2015 private providers gained 59% of government subsidised enrolments (Cook 2015). Therefore, as a result of the skew towards government funding being awarded to private providers, in 2015 the government initiated a major reform focused on the VET fee-help loan scheme. The aim of the reform was to raise the quality of training and training providers, ensure job prospects for VET students were achievable and to raise the profile of VET sector to students, employers, industry and the community (Department of Education and Training 2016). In June 2016, a draft paper prepared by the Minister for Vocational Education and Skills was submitted to COAG with recommendations that funding and management arrangements of VET become the responsibility of the Commonwealth, that the deregulation of student fees be introduced and that government owned providers (TAFEs) receive funding on the same basis as private providers. However, regardless of recommendations and ongoing reforms, Australian Vocational and Education Training Research Association (AVETRA) state that all training providers are in the market to make a profit. Therefore, the focus on profit requires both public and private training providers to compete for the same funding. However, competing for the same funding may not provide the best outcomes for students, employers and the sector (Parliament Australia 2015).

Economic factors and labour market conditions affect student enrolments in VET with a strong negative correlation between unemployment and VET enrolments (Smith et al. 2001). VET student enrolments are higher in regional Australia and have a significant over representation of low socio-economic status students (Foley 2007). Students

enrolled in VET are a diverse group of learners and range from having minimal levels of formal education and workplace competence to learners engaged in seeking to enter occupations requiring high levels of knowledge and technical competence (Coates et al. 2013). Future population trends will significantly impact student enrolments as the 18 to 22 age cohort is declining and the predicted population growth over the next ten years driven by birth rates and immigration policy (Coates et al. 2013). The VET sector continues to be subjected to additional threats that undermine the stability of the sector. The pending deregulation to the Australian higher education sector proposes that Commonwealth funding contribution towards new students' course fees be reduced by 20% (Dawkins 2014). It is predicted that deregulation of the higher education sector would result in higher education providers setting their own fees and the higher education sector expanding into the top end of the vocational education market and offering Diploma and Advanced Diplomas. These qualifications will provide direct pathways and credits into the undergraduate programs, which is more attractive to students and provide a financial income for the higher education providers. These changes will shape the VET sector as student choices and increased competiveness continue (Dawkins 2014). Australian VET sector has developed into a demand driven sector with increased commercial pressures and market competition between pubic and private providers (Callan et al. 2007). However, regardless of the demand driven sector, training providers have the responsibility to assist students in completing a qualification, to gain employment and provide pathways for further study. Therefore, the increased interplay of competing priorities and internal and external influences require the constant attention of training providers and their managers to effectively operate in a competitive market (Mulcahy 2003). These recent changes, in the VET sector, have significant consequences on how training providers operate. Training providers are now required to operate within a business and service orientation rather than the more traditional education focus (Clayton, Harris & Simons 2005).

Further challenges affecting the sector is the recruitment and sustainment of talent to ensure there are experienced people to take on senior management roles. Senior managers in VET are often promoted from teachers to managers based on their practical vocational and teaching experience, rather than their management or leadership skills. This culture of promotion from teacher to manager often results in managers being inadequately prepared for the role of leadership (Boateng 2012;

Cardno 2014). VET teachers can enter the sector with a minimum qualification of TAE40110 Certificate IV in Training and Assessment (Australian Qualification Framework (AQF) Level 4) provided they have the ability to demonstrate vocational competencies at least to the level in which they are delivering and assessing (for example Certificate III to Advanced Diploma AQF Level 1-6) (National Skills Standards Council 2014). In contrast, the minimum qualification required to teach in early childhood education is a four year undergraduate childhood qualification (for example Bachelor of Early Childhood Education AQF Level 8). In primary and secondary education there is a minimum four year tertiary education course that includes an approved course of teacher training, (for example Bachelor of Education AQF Level 8). Higher education requires teachers to have a qualification in a relevant discipline and at least one level higher than is awarded (for example Masters Degree AQF Level 9), (Education and Training 2015). Thus, it could be argued that the minimal teacher qualification of a Certificate IV as an entry qualification to the sector seriously compromises the teaching and leadership quality of VET. Therefore, as teachers and managers are promoted to the role of senior manager they require ongoing professional development and support.

In order to identify the skills required for senior managers it is important to understand the role of leadership. The literature indicates that leadership is essential for the success of all organisations (Bhindi & Duignan 1997). Leadership is a visionary activity and requires passion, commitment as well as being in touch with the internal and external environment (Hubbard 2004). Although the research on leadership is vast, often contradictory, confusing and lacks cohesion, leadership research has typically been defined as traits and behaviours (Falk 2003; Hay & Hodgkinson 2006). Predominately leadership research has focused on what leaders do and do not do in order to be more effective in different situations. There has been limited research on leadership skills for effective leadership (Katz & Kahn 1974; Mumford et al. 2000a).

Although there have been numerous leadership studies, the notion of leadership continues to evolve and leadership skills have received inadequate attention (Mumford, Campion & Morgeson 2007). Mumford et al. (2000a) examined the relationship of skills and key leadership behaviours, Zaccaro & Klimoski (2001), assessed problem solving solution construction and social judgment skills. Mumford et al. (2000) states that leadership skills can be understood in terms of knowledge, problem solving, solution construction and social judgment needed to solve organisational problems (Mumford 2000b). Burke & Collins (2005) highlight that the acquisition of skills is often through on the job training and that organisations should invest in leadership skills development to ensure leaders have the necessary skills to provide efficient organisations. Mumford, Campion & Morgeson (2007) study revealed that leadership skills are defined into four broad skills of cognitive, interpersonal, business and strategic skills. They suggest that leadership skill requirements are dependent on management level. Huusko (2006) contends that management level and leadership skills influence teams therefore identifying the required leadership skills will enable effective leadership. Although there are many studies that examine leadership, there is not one set of studies that can examine all capabilities contributing to a complex phenomenon of leadership. Furthermore, there has been limited studies focused on leadership skills within VET and according to Mumford et al. (2000a) it is impossible to identify all studies focused on leadership.

Although the Australian VET sector has been subjected to numerous reforms and changes the sector remains complex and fragmented. Therefore, senior managers require leadership skills to manage the competing dimensions of their role and to guarantee both the current and future success of the sector (Callan et al 2007). These competing dimensions often result in increased workload, role ambiguity and tension, resulting in managers trying to be good at everything with the inability to focus (Cardno 2014). Falk (2003) and Roger (2012) argue that effective leadership in VET is dependent on skills, knowledge, interpersonal expertise and the ability to manage ongoing change and market forces.

1.3 Research Question

The principal research question for this thesis is 'What leadership skills are required for senior managers in Australian VET?' The principal research question will be answered from the perspective of senior managers' leadership skill requirements. Therefore, this thesis will not necessarily reflect the employers or the sectors perspective on leadership skill requirements for senior managers. In order to answer the principal research question four hypotheses have been developed from the literature and will be tested via analysis process (Creswell 2009; Terrell 2012). Where possible the data analysis process will replicate Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) studies to test the LSSM. The four hypotheses are:

H1: Category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills.

H2: Leadership skill requirement will differ by skill category with cognitive skills required the most, followed by interpersonal, business and strategic skills.

H3: Cognitive, interpersonal, business and strategic skills requirements are related to management level

H4: Leadership skills requirements will differ with public and private training providers.

1.4 Justification for the Research

The VET sector is central to Australia's economic growth and business productivity with the aim to develop a flexible, highly skilled workforce to meet technological changes, industry and global demands (Department of Education and Training

2016a). The motivation for this research is based on the outcomes of the literature review which revealed the complexity of Australian VET sector and the urgent need to develop leadership skills of senior managers to guarantee both the current and future success of the sector. Within the emergence of a more competitive training market senior managers required leadership skills to manage the often competing dimensions of their role (Callan et al 2007). Hence, leaders with the correct leadership skills will provide efficiencies within the sector. Leadership efficiencies will therefore increase the profile and quality of Australian VET for students, employers, industry and the community.

Although, education leadership studies have focused predominately on classroom teachers as leaders of their students, or school principals as leaders of their school research in leadership skills within education is limited. Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) have studied leadership skills in government agencies, the military and higher education environments using the LSSM. However, the literature did not reveal studies conducted in Australian VET to identify leadership skills for senior managers (Mehrabani & Mohamad 2015; Coates et al. 2013). Furthermore, the literature review revealed that leadership has been researched extensively within various contexts and theoretical frameworks, however it is often described as complex, contradictory, confusing and lacking in cohesion (Allio 2013; Hay & Hodgkinson 2006).

1.4.1 Practical and Academic Contribution

Although this thesis has limitations, these limitations do not detract from the practical and theoretical contributions made by the findings of this thesis. The thesis provides valuable insights into leadership skills required for effective leadership in VET. The insights together with the findings of this thesis will influence human resource policies and practice in VET to specifically focus on leadership skills for the recruitment, succession planning and professional development of senior managers. Senior managers are often recruited from teaching staff that are not equipped with the

necessary leadership skills. In addition, succession planning in VET has been subjected to an unsustainable turnover of senior managers. This is demonstrated with a shortfall of adequately prepared candidates, an increased number of senior managers approaching retirement age and a reduction in funding resulting in positions being contracted or casualised. Therefore, the succession planning in VET has been subjected to low morale, reduction of retention rates and new talent not being attracted to these positions. Although the sector continues to invest in professional development for managers, Mehrabani & Mohamad (2015) argue that currently professional development programs are predominately focused on leadership behaviour, attributes and competencies with limited focus on leadership skills. Hence, based on the findings of this thesis human resource policies and practice in relation to the recruitment, succession planning and professional development of senior managers should focus specifically on leadership skills of business, problem solving/managing teams and strategic skills. Business skills consist of the capacity to make decisions regarding the procuring and allocating of equipment, ability to be responsible for the financial resources of a program or unit delivery and the ability to read, understand and apply written information and instructions. Problem solving/managing team skills consist of skills that include the capacity to problem solve complex issues, ability to handle conflict, capacity to manage staff and material resources, capacity to develop and motivate individuals in their work, ensure services are provided at a high standard to meet regulatory requirements, use persuasion skills to influence others to achieve organisational goals, apply negotiation skills to reconcile differences between team members and respond to other team member's needs**.** Strategic skills consist of the ability to plan and prioritise workload, identify and manage risk, identify internal capabilities and external threats to achieve strategic goals, involve other team members when making decisions and the ability to apply a systematic perspective to influence planning and implementation

This thesis will make a distinct contribution to academic knowledge in the explicit themes of leaders, skills and leadership skills and add new depth to the phenomenon of leadership. The findings will provide a foundation to rethink leadership with a focus on skills and offers a richer conception of skills. Furthermore, this thesis expands on the concept of the LSSM and highlights that examining leadership skills

within a specific context provides an explicit understanding that leadership skills required in one context may not be relevant in a different context (Kalargyrou, Pescosolido & Kalargiros 2012).

1.5 Thesis Structure

This thesis structure is guided by Perry (2012) and consists of five chapters, Chapter 1 Introduction, Chapter 2 Literature Review, Chapter 3 Methodology, Chapter 4 Data Analysis and Chapter 5 Conclusions and Implications. Each chapter was guided by the body of knowledge in the area of leadership, skills, leadership skills and VET through the ongoing review of the literature.

1.5.1 Chapter 1 Introduction

Chapter 1 provides the introduction to this thesis and the context in which this research is conducted. The aim of this thesis is to investigate the skills of senior manager in VET using the theoretical framework of Stratified System Theory (SST), (Jacob & Jaques 1987, 1992) and the Leadership Skills Strataplex Model (LSSM), (Mumford, Campion & Morgeson 2007). This thesis draws on studies from Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) who examined leadership skills across levels of an organisation. The studies determined that leadership is stratified and that as managers move through an organisations' hierarchy a significant level of leadership skills are required. The LSSM categorised leadership skills into the four broad skills of cognitive, interpersonal, business and strategic skills. Previous studies using the LSSM theory were conducted in the government, military (Mumford, Campion & Morgeson 2007) and higher education

(Kalargyrou, Pescosolido & Kalargiros 2012). However, on review of the literature there is no evidence that the LSSM has been applied to identify leadership skills for senior managers within the context of Australian VET sector. Therefore, this thesis will be the first time that LSSM will be applied to identify leadership skills for senior managers in the Australian VET sector. Chapter 1 also provides the background to this thesis with an introduction to the Australian VET sector, leadership and leadership skills. The principal research question and the associated hypotheses are introduced and the justification for the research is made in light of the current status of the Australia VET sector. The quantitative research methodology and justification for this research methodology have been made based on previous research conducted by Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012). The chosen research methodology will test the LSSM using the data collected via the online survey by replicating the statistical analysis conducted by Mumford, Campion & Morgeson (2007). Furthermore, the limitations to this thesis have been identified, in particular with reference to the restrictions of research scope for the Doctorate of Business Administration. Finally, Chapter 1 presents practical contributions that will impact VET leadership practices and policies. Academic contributions to the body of knowledge of skills, leadership and VET are also made. Chapter 1 provides the foundation to guide the literature review as presented in Chapter 2.

1.5.2 Chapter 2 Literature Review

Chapter 2 presents the literature review for the development of the theoretical foundation for this thesis. The literature review presents the body of knowledge to be examined in the literature and identifies the relationship between the theories of SST, (Jacob & Jaques 1987 & 1992), LSSM, (Mumford, Campion & Morgeson 2007) and the five broad theoretical areas of leadership. The five broad theoretical areas of leadership include traits, behaviours, contingency, transformational and enabling leadership (Falk 2003). The literature review was conducted from July 2014 to June

2015 and revealed that leadership skills have been studied with the SST and LSSM approach. However, the literature did not reveal any studies conducted in the context of Australian VET using the SST and LSSM theory to identify leadership skills for senior managers. Therefore, the literature gap identified for this thesis is that no studies have focused on leadership skills for senior managers in VET using the SST and LSSM. The literature review also guided the suitable research methodology to collect and analyse the data to answer the principal research question and is presented in Chapter 3. Chapter 4 will provide the outcomes of the data analysis that tested the hypotheses to answer the principal research question. Chapter 5 will discuss the outcomes of the data analysis, conclusions and implications of these findings to leadership practice and policy within the VET sector. In addition, the findings will contribute to academic knowledge in the area of leaders, leadership, skills and VET.

1.5.3 Chapter 3 Methodology

Chapter 3 Methodology outlines the methodology of the data collection and analysis to test the hypotheses in order to answer the principal research question. A positivist research paradigm with a quantitative methodology approach was applied. Therefore, through a process of reducing the principal research question into four non-directional hypotheses the principal research question was answered.

In order to justify the use of a quantitative research methodology approach for this thesis with an online survey as the data collection tool, a review of previous studies that investigated leadership skills was conducted. Mumford (2000a), Kalargyrou, Pescosolido & Kalargiros (2012) and (Mehrabani & Mohamad 2015) conducted previous studies using a quantitative research methodology using a survey method. The aim of these studies was to identify leadership skills based on skill requirements relevant to position level within an organisation. Therefore, based on these previous studies the quantitative research methodology produced results that tested the LSSM theory (Thomas 2004). The structure and content of the online survey was guided by

the literature. The questions were guided by the LSSM theory and the four broad leadership skills of cognitive, interpersonal, business and strategic skills and their associated skill attributes or sub-skills. The online survey was developed, administered and the data collect using Qualtrics Online Survey software. This process ensured the ethical management of the online survey and the integrity and the safe storage of the data collected as required by Victoria University. Pilot testing of the online survey was conducted prior to the distribution to the sample population of senior managers employed in VET and ensured that the programming administered by Qualtrics Online Survey software worked effectively to collect reliable and valid data (Hunter 2010).

In order to identify participants to complete the online survey and gain a statistical significant sample size of the population of senior managers employed in VET a sample selection framework was developed. The sample selection framework guided the process to identify senior managers employed in Australian VET to complete the online survey. Furthermore, to ensure the success of the online survey the administration strategy of the survey included the management of the emails, pre-testing of survey hyperlink to ensure the link was active, testing the instructions on how to complete the survey and developing response process and follow up procedures. The data file was developed using the data collected from online survey using Qualtrics Online Survey Software, which automatically collected and stored the data. On receipt of 100 responses of the online survey the data from Qualtrics Online Survey Software was downloaded in to Statistical Package for the Social Sciences (SPSS) version 22 to create a data file for statistical analysis. With the intention of testing the hypotheses a variety of technical analysis procedures were justified and the statistical measurements to test the significance of each analysis provided. The statistical techniques used to test the variables and the hypotheses included means test, Pearson's correlation test, independent t-test, Factor Analysis (FA) using an Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) approach. The limitations of the research methodology are described with recommendations to future research. The research paradigm and methodology provided in Chapter 3 guided the data analysis process of Chapter 4.

1.5.4 Chapter 4 Data Analysis

Chapter 4 reports the data analysis using the applied methodology to answer the principal research question and the associated hypotheses. The data was checked for normality prior to statistical analysis and was conducted as outlined in Chapter 3. The data check included the identification of missing data, the testing for the reliability of scaled questions to ensure the scales were free from error. The data resulted in data normality, including distribution, reliability and validity of scales. The online survey collected data from twenty six questions. However, only data that addressed the principal research question and tested the associated hypotheses was analysed.

The testing of the hypotheses used a range of statistical techniques. In order to test hypothesis 1 a FA was conducted with an EFA and CFA approach. The aim of the CFA was to evaluate the factorial validity of the EFA. In addition the CFA was used to test leadership theory and determine if the data collected from the online survey would support the four broad leadership skills of cognitive, interpersonal, business and strategic skills as presented in the LSSM. In order to test hypothesis 2 and 3, correlation tests, means tests and independent t-tests were conducted. Finally to test hypothesis 4, correlation tests, means tests, independent t-tests, EFA and CFA were conducted. The data analysis results presented in Chapter 4 guided Chapter 5 to determine the conclusions of the thesis and provide the practical and academic contributions to the body of knowledge of leadership, leadership skills and VET.

1.5.5 Chapter 5 Conclusions and Implications

Chapter 5 provides the conclusions of this thesis and identifies implications that will impact on VET practices and policies. The findings presented in the conclusion will also make significant contributions to academic knowledge. This chapter also provides a summary of each chapter and reveals how Chapters 1, 2 and 3 contributed to the development of the hypotheses to answer the principal research question, Chapter 4 presents the data analysis to support the conclusion and implications reported in Chapter 5. In order to support the conclusion and implications, the findings of the

literature review conducted post June 2015 revealed that research in the area of leadership, skills and VET continues to be conducted. Nevertheless, there is still limited research focused on leadership skills required for senior managers in VET.

Chapter 5 presented the conclusions of this thesis and revealed four major findings: (1) That 'business', 'problem solving/managing teams' and 'strategic' skills are empirically distinguishable leadership skills required for senior managers employed in VET; (2) That 'cognitive' skills are required the most followed by 'strategic', 'interpersonal' and 'business' skills; (3) That skill requirement is relevant to management level with skills required for current role of senior manager ranked in order of importance are 'interpersonal', 'cognitive', 'strategic' and 'business' skills and for promotion are 'strategic', 'interpersonal', 'business' and 'cognitive' skills and (4) That the broad category leadership skills required for senior managers do not differ depending on training provider type. However, on further investigation the EFA and CFA confirmed there were some differences of leadership skill requirements with senior managers employed with public training providers requiring leadership skills of 'strategic', 'business' and 'problem solving' skills and senior managers employed with private training providers requiring leadership skills of 'business', 'managing teams' and 'strategic' skills.

Theses findings will impact on VET human resource policies and practice for the recruitment, succession planning and professional development of senior managers with a specific focus on leadership skills. The leadership skills require a particular focus on 'business skills', 'problem solving/managing teams skills' and 'strategic skills'. Furthermore, the findings make a distinct contribution to academic knowledge in the explicit themes of leaders, skills, leadership skills and VET. The added new depth to leadership theory provide a foundation to rethink leadership with a focus on skills. In addition, the findings expand on the LSSM and highlight that leadership skills examined within the specific context of VET provide an explicit understanding of skill requirement for senior managers. Chapter 5 also presents the limitations of the thesis with consideration to the thesis scope, timing of the research and the research methodology. Recommendations for future research to test the results of this thesis are also made.

1.6 Delimitations of the Thesis Scope

Delimitations of the scope of this thesis were those items that were deemed outside the control of the researcher that affected the results of the thesis. These items included the inability to represent the entire Australian VET senior manager population, to review all leadership theories in relation to leadership skills and to collect data from the employers' perspective.

The inability to represent the entire Australian VET senior manager population was due to the diversity and complexity of training providers including their geographical location, organisational structure, training scope and senior management role classification. Although every attempt was made to obtain a large sample size and an even distribution of senior managers employed in public and private Australian VET providers, this was not possible due to the research methodology and the scope of this thesis. In addition, the review of the literature identified two major limitations that affected this thesis. Firstly, that the roles or title classifications of senior manager employed in Australian VET are not consistent. Second, the numerous leadership studies make it impossible to review all leadership skills theories (Mumford et al. 2000a).

1.7 Future Research

Notwithstanding, the limitations of this thesis future research should be conducted to determine the generalisation of the results as presented in this thesis. Future research should include replicating this research using a larger sample size, conducting the research from the employers' perspective and undertaking a longitudinal study of senior managers skill requirements. Conducting future research with a larger sample size would improve the power of group differences to determine skill requirements based on training provider type and further test skill requirement related to management level. Conducting research from an employers' perspective would test

the evidence as presented in this thesis and provide further insight into leadership skills requirements. A longitudinal study on senior managers would enable the collection of data over a long period of time to identify patterns of change to establish the direction and magnitude of causal relationships of skill requirements (Menard 2002). Unfortunately due to the time limitations of the Doctorate of Business Administration, a longitudinal study and collecting data from the employers' perspective was not conducted. Therefore, future study may determine if the findings of this thesis could be replicated.

1.8 Chapter Summary

This chapter provides the foundation for this thesis to answer the principal research question of, 'What leadership skills are required for senior managers in Australian VET?' Four non-directional hypotheses have been developed and were tested to answer the principal research question from the senior managers' perspective. The quantitative research methodology tested the hypotheses with a variety of statistical techniques. The four non-directional hypotheses are:

H1: Category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills.

H2: Leadership skill requirement will differ by skill category with cognitive skills required the most, followed by interpersonal, business and strategic skills.

H3: Cognitive, interpersonal, business and strategic skills requirements are related to management level.

H4: Leadership skills requirements will differ with public and private training providers.

Justification to use a quantitative research methodology approach for this thesis was

based on previous studies conducted by Mumford (2000a), Kalargyrou, Pescosolido & Kalargiros (2012) and (Mehrabani & Mohamad 2015) that tested the LSSM. Replicating the statistical analysis as identified in these studies enabled the testing of the LSSM within the VET context to identify the leadership skill requirements for senior managers. The results of the statistical analysis provided practical contribution to the VET sector to guide human resources policies and practices for the recruitment, succession planning and professional development programs of senior managers.

CHAPTER 2 LITERATURE REVIEW

2.1 Chapter introduction

Chapter 1 provided the introduction and the context of this thesis. This chapter presents the literature review that was conducted from July 2013 to June 2015. The literature review revealed that the Leadership Skills Strataplex Model (LSSM) has been used in previous studies in government agencies, military (Mumford, Campion & Morgeson 2007) and higher education (Kalargyrou, Pescosolido & Kalargiros 2012) to identify leadership skills requirements. However, it did not reveal previous studies using the LSSM within the context of Australian VET to identify leadership skill requirements for senior managers. The literature review was guided by the literature review framework and is presented in Figure 2.1. The literature review framework focused on three major theoretical concepts that included Stratified System Theory (SST) (Densten 2003), Leadership Skills Strataplex Model (LSSM) (Mumford, Campion & Morgeson, 2007) and five broad theoretical areas of leadership. SST explores 'task complexity across levels within an organisation to explain the variation in performance demands for managers' (Densten 2003, p. 401). The LSSM suggests that the level of leadership skill requirement is dependent on management level within an organisation (Mumford, Campion & Morgeson 2007). The LSSM indicates that leadership skills can be categorised into four distinct skills. These skills are cognitive, interpersonal, business and strategic skills and each skill has associated skill attributes or sub-skills. In order to explore leadership theory and leadership skills five broad theoretical areas of leadership were reviewed. The five leadership theoretical areas included traits, behaviours, contingency, transformational and enabling leadership (Falk 2003).

In order to further understand skills the literature review also investigated skill development and acquisition. Mumford et al. (2000) state that understanding skill development provides practical and theoretical benefits for leadership skills acquisition. Furthermore, an understanding of skill development assisted in the identification of interventions that can contribute to leadership skill acquisition and

promote an increase in skills.

The literature also revealed that there is a strong recognition that skill development and acquisition are gained through practice rather than from formal instructions and takes place over time and increase with experience (Katz & Kahn 1978; Mumford et al. 2000). A review of the literature also confirmed that the five broad theoretical areas of leadership have been studied extensively within various contexts and theoretical frameworks. However, the leadership literature is complex, vast, contradictory, confusing and lacking in cohesion (Hay & Hodgkinson 2006). The review highlighted that leadership theories are predominately focused on leaders' behaviours and traits with limited focus on leadership skills.

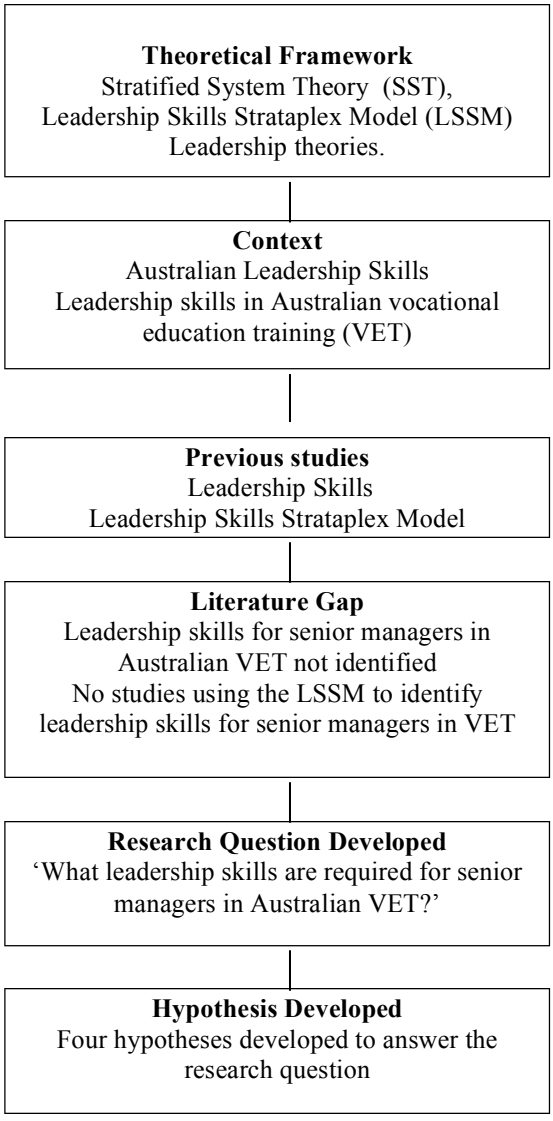
The literature review further investigated the conceptualisation of the four broad leadership skills as presented in the LSSM and their associated skill attributes or sub-skills. Although the review was by no means comprehensive it confirmed that the four broad skills share common skill attributes. In order to further understand leadership skills the literature review also investigated the effect of leadership skills on Australian productivity. Finally, the review investigated leadership skills for senior managers in the context Australian VET. The findings in the literature review guided the development of the principal research question and research methodology. The research methodology will be presented in Chapter 3 and will guide the data analysis as presented in Chapter 4. Chapter 5 will provide the conclusions and implications of the data analysis.

2.2 Literature Review Framework

The literature review framework guided the literature review. The aim of the literature review was to identify the literature gap within the body of knowledge in the area of leadership, leadership skills and vocational education. Identifying the literature gap guided the development of the principal research question in order to identify the leadership skills requirements for senior managers in VET. Figure 2.1 presents the literature review framework for this thesis. Stage one, identifies the

theoretical framework that forms the basis of this thesis. The theoretical framework consists of three major theories, SST, LSSM and the five broad theoretical areas of leadership theory of traits, behavioural, contingency, transformational and enabling leadership. Stage two identified the context of this thesis and confirms that the thesis will focus on identifying leadership skill requirements for senior managers employed in Australian VET. Stage three, explored previous leadership skills studies and in particular those studies that utilised the LSSM to identify leadership skills. Stage four, identified the gap within the literature. Stage five, the principal research question was developed and stage six the hypotheses were developed.

Figure 2.1 Literature Review Framework

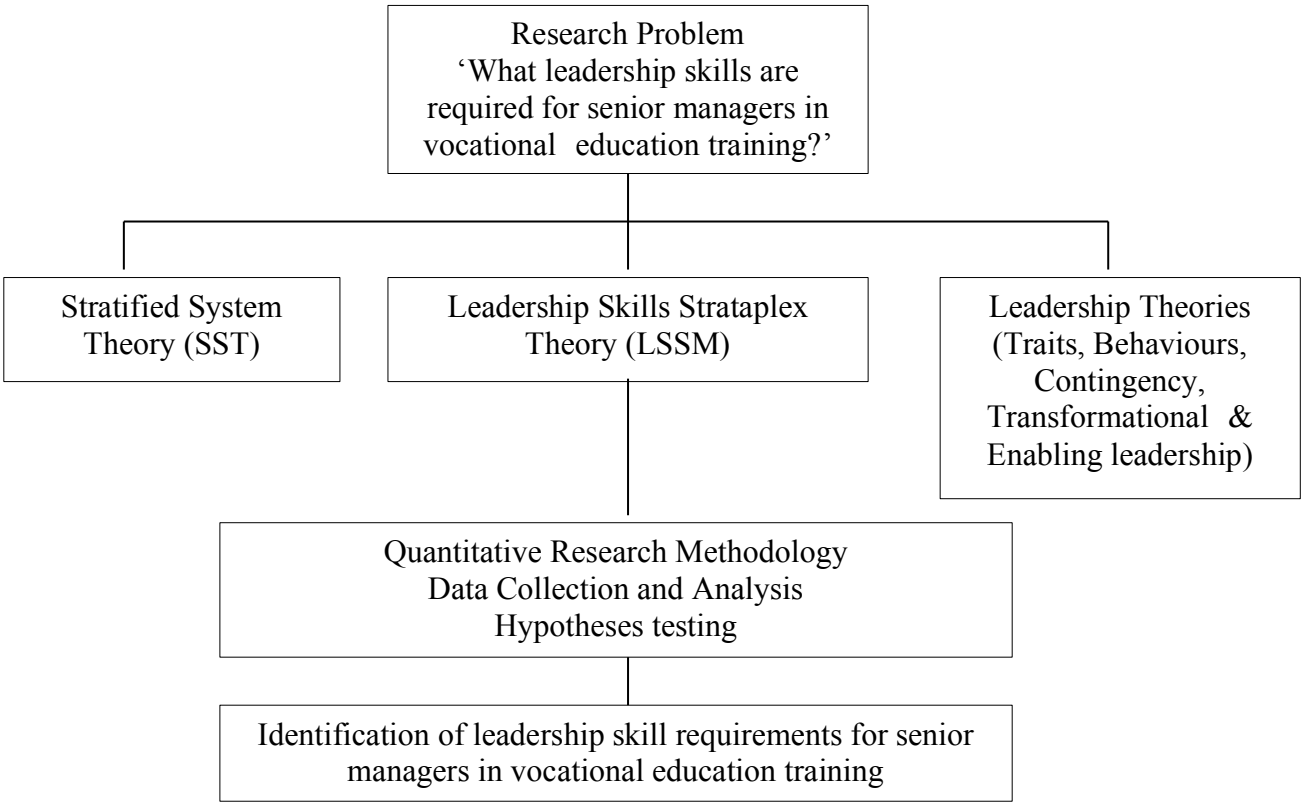


Source: Adapted from Perry (2012)

2.3 Conceptual Framework

Based on the literature review the conceptual framework for this thesis has been developed and is presented in Figure 2.2. The conceptual framework consists of three leadership theories. The theories include the Stratified System Theory (SST), Leadership Skills Strataplex Model (LSSM) and the five broad theoretical areas of leadership that include traits, behaviours, contingency, transformational and enabling leadership. These theories form the foundation of this thesis that will guide the development of the hypotheses to answer the principal research question, the research methodology, data collection and analysis. Furthermore, the conceptual framework will guide the effects of leadership skills relevant to management level and training provider type. The conceptual framework may present unexpected findings that will question or validate the theories. These findings may discover new or expand on existing leadership skills theoretical frameworks. Although, Kalargyrou, Pescosolido & Kalargiros (2012, p. 41) suggest that 'skills of an effective manager are technical, conceptual and interpersonal skills' and Mumford Campion & Morgeson (2007) suggest that leadership skills are categorised into four broad skills of cognitive, interpersonal, business and strategic skills, there continues to be multiple attempts to categorise the skills or behaviours needed to be an effective leader (Boyatzis, 1982; Mintzberg, 1973; Peterson & Van Fleet, 2004). The conceptual framework for this thesis is presented in Figure 2.2.

Figure 2.2 Conceptual Framework



Source: Adapted from Perry (2012)

As guided by Perry (2012) Figure 2.2 illustrates the conceptual framework for this thesis. The conceptual framework has been developed through the literature review. The literature review constructed the principal research question of 'What leadership skills are required for senior managers in Australian VET? The theories of SST, LSSM and five broad leadership theories guided the quantitative research methodology for the data collection and analysis to test the hypotheses.

2.4 Stratified System Theory

According to Densten (2003) Stratified System Theory (SST) provides an understanding of how task complexity is relevant to organisation level and the variation in performance demands for managers. Densten (2003, p. 401) also suggests that and that the 'fundamental purpose of leadership remains the same across all levels of an organisations, however the task complexity varies across levels'. Mumford, Campion & Morgeson (2007) support Jacob & Jaques (1987, 1990) SST and concur that leadership skill requirements are stratified by organisation level. Although registered training providers (RTO) range in organisational size and structure it could be argued that providers would present with senior management roles relevant to organisation level. This is demonstrated with smaller RTO's having one or two levels and larger organisation such as TAFE's having multiple levels. Therefore, it could be argued that leadership skill requirements for senior managers in VET are stratified by organisation level. Previous leadership studies have applied the SST approach to examine organisational structure, complexity of decision making for managers and the effectiveness of leadership skills. For example, Genty et al. (2008) study identified that managerial skills are important at different levels and across different functions of an organisation. Mumford, Campion & Morgeson (2007) study categorised leadership skill requirements based on organisational levels and identified five levels. Level one refers to front line supervisors who are required to understand, articulate and carry out the work to be completed. Level two is the departmental manager who must be able to both carry out current tasks and prepare for likely change. Level three features the general manager or senior manager who must have the ability to make comparisons among multiple systems and choose effectively. Level four, features those managers who operate within small organisation and undertake tasks that require additional cognitive complexity to make strategic recommendations, whilst at level five senior managers must be able to deal with ambiguities and complexities in the environment in which they operate by establishing priorities and managing external relationships (Mumford, Campion & Morgeson 2007). Huusko (2006) study suggests that skill priorities at different levels of management are related to the differing role requirements at each level of the organisation. Therefore, based on Mumford, Campion & Morgeson (2007) five

organisation level theory, senior managers in VET would sit predominately in level four and five.

According to Coates et al. (2013) the Australian VET sector is complex and vast therefore, senior managers require a particular unique set of leadership skills. The unique set of leadership skills enable senior managers to be more responsive to government expectations, manage increased compliance and fluctuating requirements of industry, community and individuals. Furthermore, senior managers at different levels of the organisation regardless of organisation type are expected to be highly effective in their respective leadership role. Callan et al. (2007) concur that due to the complexity of the sector, workload and job roles for managers have changed substantially, with a significant increase in administrative responsibilities. Therefore, as managerial levels affect the relevance of leadership skills, managers require a combination of new and existing skills in order to ascend the career ladder and be effective within their role.

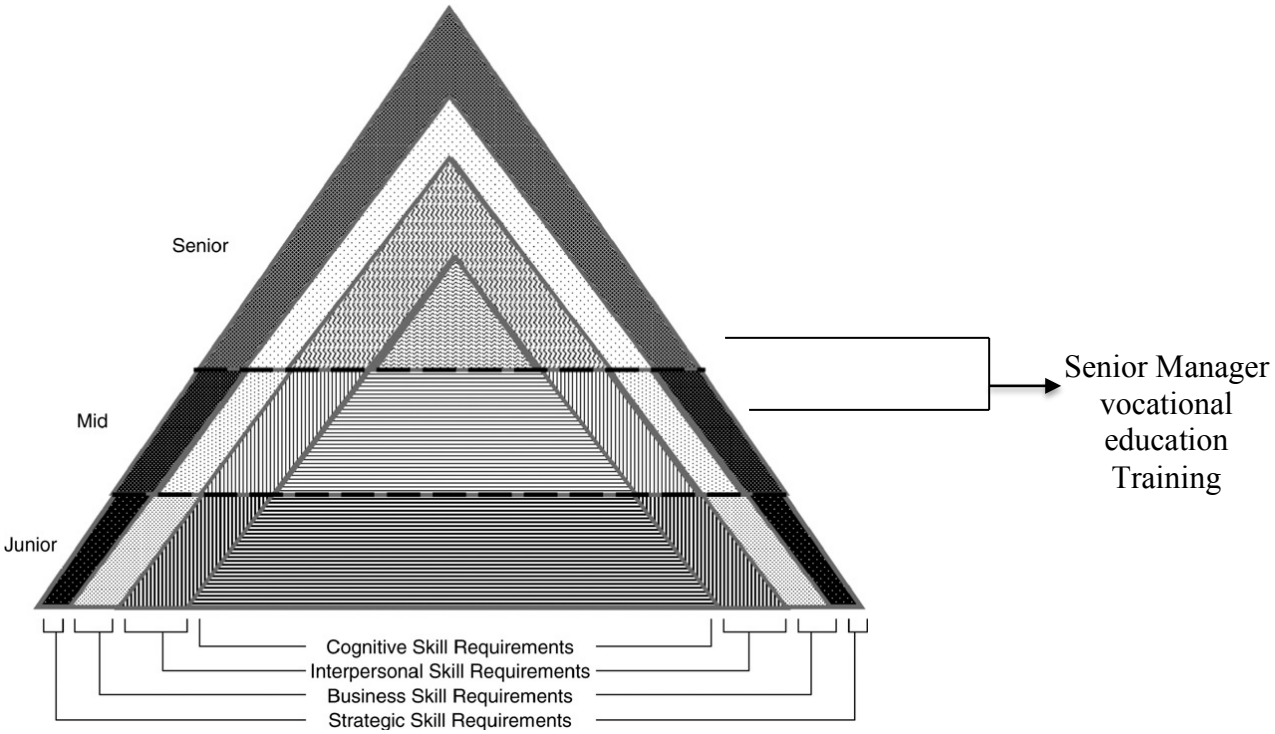
SST provides insight into the differences of management levels within an organisation and the effect of management level on task complexity and leadership skill requirements. The SST will extend on the theory of LSSM theory that suggests that leaders at different levels of the organisation require multiple complex categories of leadership skills (Mumford, Campion & Morgeson 2007).

2.5 The Leadership Skills Strataplex Model

The second theory of the conceptual framework is the Leadership Skills Strataplex Model (LSSM) (Mumford, Campion & Morgeson 2007). The review of the literature revealed that previous studies in the military (Mumford, Campion & Morgeson 2007) and higher education (Kalargyrou, Pescosolido & Kalargiros 2012) have applied the model to identify leadership skills. Mumford, Campion & Morgeson (2007) state that the term strataplex is derived from the term ‘strata’, having layers or levels in an organised system, with ‘plex’ from the word complex meaning divided into a specified number of parts similar to that of an organisation. The LSSM consists of

four broad leadership skills of cognitive, interpersonal, business and strategic skills (Mumford, Campion & Morgeson 2007). The LSSM also suggests that as managers move through the hierarchy of the organisation leadership skill requirements are relevant to management level. The Leadership Skills Strataplex Model is presented in Figure 2.3.

Figure 2.3 The Leadership Skills Strataplex Model



Source: Mumford, Campion & Morgeson (2007).

Figure 2.4 presents the LSSM and the four triangles represent the four categories of leadership skills of cognitive, interpersonal, business and strategic skills with the dotted horizontal lines stratify the requirements for management roles within organisational levels. The levels in the figure (that is junior, mid and senior levels) could be applied effectively to the hierarchical levels in vocational education, trainer/teacher, head teacher, program manager, department manager or director. The area subsumed in each successive triangle, stratum, or triangle–stratum segment

represents the hypothesised amount of that particular leadership skill that would be required for that particular job level. Mumford, Campion & Morgeson (2007) argues that leadership skill requirements are stratified by organisational level and a complex multiple categories of leadership skills are required. Middle and senior management roles in VET organisations sit predominately in the middle sphere, as demonstrated in the LSSM and may overlap into non-academic management roles of executive or direct educational and administrative roles in the top third of the sphere. The responsibilities of senior managers vary dependent on training provider type. The role may encompass both academic and non-academic requirements as well as being a member of the executive team (Callan et al. 2007).

The model refers to four broad leadership skills of cognitive, interpersonal, business and strategic skills. 'Cognitive skills' refer to thinking, conceptual and communication skills such as gathering and processing information, speaking and listening skills and adaptability to new environments, information and technologies. 'Interpersonal skills' are centred on interacting with and influencing people through social awareness and interpersonal understanding. 'Business skills' are related to specific functional skills for an individual's position and includes the management of personnel, material and financial resources in order to successfully accomplish critical business goals. Finally, 'strategic skills' are described as high level conceptual skills focused on managing complexity, ambiguity and change within the organisation. The LSSM suggests that as senior managers are promoted within the organisational hierarchy, the acquisition of strategic and business skills are more critical than the acquisition of interpersonal and cognitive skills.

The LSSM has been used in previous studies to identify leadership skills within the military, government and higher education sectors (Mumford, Campion & Morgeson 2007; Kalargyrou, Pescosolido & Kalargiros 2012) however, the literature did not revealed any studies where the model has been applied to the context of senior managers employed in Australian VET. Therefore, the LSSM provides insight into leadership skill requirement of senior managers based on management level within an organisation.

2.5.1 Conceptualisation of Leadership Skills

Gentry et al (2006) highlighted that numerous studies have been conducted to investigate the roles, tasks and activities of managers. However, there are limited studies that specifically examined leadership skills. The conceptualisation of leadership skills as presented in the LSSM adds to McCallum & O'Connell (2009) study. The study identified ten skills and abilities that are important for leaders, the skills and abilities included 'cognitive ability, strategic thinking skills, analytical ability, decision making ability, communication skills, influence and persuasive, ability to manage in a context of diversity, ability to delegate and manage risk, ability to develop talent and personal adaptability' (McCallum & O'Connell 2009, p. 6) McCallum & O'Connell (2009) reviewed global leadership studies conducted in 2002 which provided an insight into the characteristics considered most important for successful leadership. The characteristics of leadership competencies and skills were devised from views obtained from training managers and executives within private and public organisations. The leadership skills supported previous studies that consistently highlighted that cognitive, interpersonal, business and strategic skills and their subsequent skill attributes or sub-skills are consistent with the leadership skills presented in the LSSM.

The review of the literature extends on Mumford, Campion & Morgeson (2007) conceptualisation of leadership skills and suggests that leadership skills continue to be categorised into the four broad skills of cognitive, interpersonal, business and strategic skills. Table 2.1 presents the leadership skills studies in chronological order that have identified skill attributes of cognitive, interpersonal, business and strategic skills. Although this review is not comprehensive due to the scope of this thesis, the review confirms that skill attributes may be associated with more than one skill. For example cognitive complexity is associated with cognitive skills and strategic skills (Hooijber, Hunt & Dodge 1997). Due to the limitations of this thesis not all leadership skills studies were reviewed.

Table 2.1 Conceptualisation of Leadership Skills

Conceptualisation of Leadership Skills				
Previous Research	**Skill**			
Author	**Cognitive**	**Interpersonal**	**Business**	**Strategic**
Mahoney et al. (1965)	Investigating	Supervisory Negotiating	Co-ordination Staffing	Planning Evaluating
Mintzberg (1973)	Monitor Disseminator	Leader Negotiator Disturbance handler	Resource allocator	Spokes person Liaison
Katz & Kahn (1978) Lau & Pavett (1980)	Information gathering and dissemination	Human relations Supervision	Technical know how Allocating resources	System perspective Decision Making Problem solving
Kanungo & Misra (1992)		People orientated		Intellectual competencies
Hooijberg, Hunt & Dodge (1997)		Social Complexity		Cognitive complexity
Connelly et al. (2000)	General cognitive capacities	Social Judgment		Problem solving skills
Connelly et al. (2000)		Social Judgment		Problem solving
Zaccaro & Klimoski (2001)	Basic cognitive capacities	Social capacities	Functional expertise	Higher cognitive capacities
Daniels (2009)	Cognitive capacities			Higher cognitive capacities
Burke & Collins (2005)		Social Capacities	Functional expertise	Problem solving
Callan et al. (2007) Gleeson (2008)	Capabilities		Functional expertise	
Mumford, Campion & Morgeson (2007)	Cognitive	Interpersonal	Business	Strategic
Billot (2011) Guangrong, Tang & De Muse (2011)		Social Judgment	Functional expertise	Problem solving
Kalargyrou, Pescosolido & Kalargiros (2012)	Cognitive	Social judgment	Functional expertise	Problem solving
Dunigan (2014)	Cognitive			Problem Solving
Mehrabani & Mohamad (2015)	Cognitive			Problem Solving

Source: Adapted from Mumford Campion & Morgeson (2007)

Table 2.1 presents a chronological review of the literature of leadership skills research that focused on cognitive, interpersonal, business and strategic skills. The research was undertaken across a variety of industry sectors including, military, government and higher education. The review highlights that cognitive, interpersonal, business and strategic skills and the associated skill attributes or sub-skills as demonstrated in

the LSSM continue to attract research attention.

2.6 Category Skills and Associated Sub- skills

The review of the literature confirms that the conceptualisation of leadership skills can be categorised into cognitive, interpersonal, business and strategic skills as presented in the LSSM (Mumford, Campion & Morgeson, 2007). Furthermore, each skill has associated skill attributes or sub-skills which are elements associated with the skill. The review of the literature revealed that skill attributes may be associated with more than one skill. For example, the skill attribute of oral and written communication are associated with cognitive and interpersonal skills (Bambaccas 2009; Paraham 2015), cognitive capacity and cognitive complexity are associated with cognitive and strategic skills (Ambrosini, Jenkins & Collier 2007; Marx 2015), negotiation skills are associated with interpersonal and business skills and trustworthy associated with interpersonal and business skills (Huusko 2006). Appendix 1 presents the review of the literature that identifies studies conducted in leadership to develop the conceptualisation of the four broad category leadership skills of cognitive, interpersonal, business and strategic skills and their associated skill attributes or sub-skills. A further review of the literature presented a detailed definition of the four broad leadership skills and their associated skill attributes or sub-skills. This review further extends the knowledge on leadership skills.

2.6.1 Cognitive Skills

Mumford, Campion & Morgeson, (2007) highlight that cognitive skills are required for effective leadership. These skills include analytical ability, logical thinking, concept formation, inductive and deductive reasoning (Huusko 2006). Cognitive skills can be categorised into four distinct areas that include information gathering, communication, cognitive thinking and ability to learn and adapt. Paraham et al. (2015) states that information gathering is the procedure of collecting, processing, monitoring and disseminating information. This procedure is a daily occurrence across all levels of management within VET. The success of this process is dependent

on the communication strategy of the organisation and leaders who undertake the task. Mumford, Campion & Morgeson (2007), Bambaccas & Patrickson (2009) and Paraham et al. (2015) highlight communication as the sharing of information between two or more individuals or groups to reach a common understanding. Communication skills include oral, written, active listening and non-verbal skills which are provided at a consistent standard to effectively convey information such as what needs to be accomplished and why it needs to be done (Mumford, Campion & Morgeson 2007). Communication skills become more critical as managers move from controlling to facilitating that requires an assertive communication style (Bambaccas & Patrickson 2009). Communicating with internal and external stakeholders requires a high level of communication skills. Furthermore, Bedwell Fiore & Salas (2014) describe oral communication skills as the ability to send verbal messages constructively, to express clearly and to communicate emotions. The skills include speaking and listening and are the foundations of literacy. The ability to explain and present ideas to a diverse audience and to effectively tailor the delivery to the situation, to exchange information and ideas, to ask questions, give directions, coordinate work tasks and to inspire others into action are components of oral communication (Barrett 2006).

Bambaccas & Patrickson (2009) highlight the importance of written skills that can be developed through practice. Senior managers in VET are expected to have formal business writing skills. These skills include the ability to structure and write effectively for simple and complex correspondence and documentation that can be read and comprehended with a minimal amount of effort (Smith & Kleiner, 1995). Written communication involves any type of interaction that makes use of the written word and is the most frequent form of business communication used. It is an essential skill for managers in the Information Age, as they are required to write rapidly with the written word representing both the organisation and the writer. Furthermore, organisations recognise the negative impact that poor or ineffective writing has on the organisation and stakeholders who read, interpret and implement action as indicated from the text. Bedwell, Fiore, & Salas (2014) note that communication also includes active listening. Active listening is the ability to pay attention to what is being said. It also involves asking the other party to provide explicit meaning to their answer and

the opportunity for all parties to participate. Full concentration from the listener through a neutral and non-judgmental perspective rather than just passively hearing the message of the speaker is also required. More importantly active listening requires the listener to use verbal and non-verbal messaging such as eye contact and positive body language. Active listening is the skill in any rhetorical situation and requires greater attention to hearing what others say and not simply hearing what we think we hear them say (Barrett 2006). A high level of listening skills will help senior managers to effectively make decisions.

Parham et al. (2015) describe assertiveness as the ability to express opinions, thoughts and wishes in a clear and rational way, even under circumstances of fear of failure or rejection and is also referred to as dominance. According to Hayes (2013) assertive communication skills can be categorised into three skill areas: content skills, non-verbal skills and social interaction skills. Content skills are the ability to provide brief and direct statements that are respectful to the other persons. Non-verbal skills include voice volume, firmness and tone, controlled body language, facial expression and eye contact. Social interaction is the ability to control escalation, enforce persistence and manage defensive reactions. In addition, Parham et al. (2015), state that an understanding of assertiveness, while taking account of gender, culture and ethnicity will increase the effectiveness of communication. Hayes (2013) describes non-verbal communication as a replacement for the verbal message, as it can elaborate or modify a verbal message, emphasise or accentuate part of the spoken message in a particular context. The substitute of the spoken word through the use of gestures, facial expressions, eye contact, posture and tone of voice can be used to communicate the emotional state and interpersonal attitudes within the communication and offers rich data to the overall communication process. Effective communication requires the ability to identify the recognition of a non-verbal elements that have the potential to add to the message value and the pattern recognition within the communication process whereby elements are sorted into meaningful patterns (Hayes 2013). In addition, Hayes (2013) outlines that non-verbal communication is closely linked to active listening and should not be considered in isolation as collectively they both provide clues to what the speaker is feeling. Hayes (2013) also argues that it is important to listen to verbal and non-verbal signals as they may overlap or send

contradicting messages as words are used for communicating factual information and non-verbal signals are used for communicating emotion. Therefore, the skill of active listening to non-verbal messages is to be able to recognise behaviours that communicate and enhance verbal communication.

Tucker, Edmondson & Spear (2002), state that cognitive thinking requires the capacity and complexity to apply critical thinking and adaptability for problem solving. In order to problem solve managers need to recognise what a problem is. According to Tucker, Edmondson & Spear (2002, p. 2). 'A problem is defined as an undesirable gap between an expected and observed state that hinders an ability to complete a task'. It could be argued that frequently occurring problems in organisations are evident indications of faulty procedures or processes and may be a reflection of leadership. Therefore, managers are required to take action to problem solve (Giroux 2009). Problem solving requires the use of emotions, self-efficacy and deamination, intuition, coincidence and luck. Subsequently, Bedell-Avers, Hunter & Mumford (2008) suggest that a manager's recognition of a problem and the differences in leaders' success in solving the problem often defines leadership skills. Furthermore, organisational structure may affect the ability to problem solve. For example, in small organisations leaders are continually changing functions on any given day and there is more reliance on informal communication process than in larger organisations, therefore resulting in more flexibility to problem solve (Giroux 2009). Core management skills for leaders include the ability to identify, analyse and solve organisational problems as they arise. Managers with effective problem solving skills enable the organisation to operate effectively (Giroux 2009). In addition, critical thinking forms part of problem solving skills (Mumford, Campion & Morgeson 2007). Hence, senior managers require cognitive skills to be able to adapt behaviours and strategies to deal with non-routine and dynamic components within their role.

2.6.2 Interpersonal Skills

Interpersonal skills are people orientated skills. The skills include the ability to manage self awareness, social skills and interact and influence others (Mumford, Campion & Morgeson 2007). Interpersonal skills also include knowledge about human behaviour and group processes. This knowledge is the ability to 'understand the feelings, attitudes and motives of others and to communicate clearly and persuasively' (Huusko 2006, p.11). Mumford, Campion & Morgeson (2007), state that interpersonal skills are a key requirement for effective leadership. In addition, (Kalargyrou, Pescosolido & Kalargiros 2012), describes interpersonal skills as the ability to assist in interacting and influencing others through flexibility, persuasiveness and listening to others (Lau & Pavett 1980) as well as supervisory and negotiation skills. Bedwell, Fiore & Salas (2014) defined interpersonal skills as communication, co-operation, coordination, trust, intercultural sensitivity and service orientation. Empathy, social insight, charm, tact and diplomacy, persuasiveness and oral communication are essential to develop and maintain co-operative relationships with subordinates, superiors, peers and outsiders and are also identified as interpersonal skills. In addition life skills used every day to communicate and interact with other people both individually and in groups or teams are integral to the provision of communicating supportively, gaining power, managing conflict and motivating employees. Communication skills include oral and written communication and are also skill attributes of cognitive and interpersonal skills (Paraham 2015; Bambaccas 2009; Mumford, Campion & Morgeson 2007). Finally, Bedwell, Fiore & Salas (2014) remind us that interpersonal skills are relevant to other outcomes such as job commitment, individual differences, agreeableness, conscientiousness and self efficacy and can be a key factor as to whether managers are successful. Therefore, interpersonal skills are essential for senior managers in VET sector to enable leaders to identify what is known, what is wanted and what needs to be done, to achieve organisational objectives (Hayes 2013).

2.6.3 Business Skills

Mumford, Campion & Morgeson (2007) describe business skills as staffing coordination, resource allocation, technical know how and functional expertise. Business skills involve the management of resources including staff, finance and tangible resources of goods and equipment at a high standard within an allocated time frame. Within business skills there are additional skills and competencies such as an understanding of human resource management, budgeting, information technology, marketing, finance and an extensive knowledge of the internal and external environment. Palakshappa & Gordon (2007) state that the successful business skills include the ability to build relationships and an awareness of one's own and other's needs through interpersonal competencies. These skills help to build collaborative relationships for the organisation with internal and external stakeholders and assist managers to acquire new skills to achieve specific organisational objectives. Furthermore, collaborative relationships may include strategic alliances, joint ventures and business to business relationships to assist with resource constraints, accelerating technological advancement and heightened levels of competition. Collaborative relationships provide a mechanism for skill and resource enhancement and tangible and intangible benefits (Palakshappa & Gordon 2007). Managers that base relationship skills on a foundation of trust will ensure success and collaborating with both internal and external stakeholders (Palakshappa & Gordon 2007). Finally, Mumford, Campion & Morgeson (2007), highlight that business skill functions should be conducted ethically with intent and transparency.

2.6.4 Strategic Skills

Although the literature highlights that strategy is a people oriented process and requires leaders to have specific skills to communicate, inspire, motivate, empower and reward people across all levels of the organisation, Marx (2015) outlines that organisations often select leaders with skills that are compatible to the organisations business strategy and leadership functions. Strategy is the task of planning for the future, identifying what needs to be accomplish by who, when and how within an allocated timeframe. The concepts of strategy are the 'mission (the why), vision (the

where), objectives and goals, (the when) and strategy the (how)' (Stumpf & Mullen 1991, p. 43). Strategy is also referred to as a blue print, a design of how to build and make something happen which requires managerial effectiveness and strategic skills to analysis specific business situations in order to make decisions using the strategic skills of thinking and acting (Stumpf & Mullen 1991). Formulating strategy is an analytical market driven process conducted by senior leaders whose experience, intuition and motivations affect strategy design. The literature is still dominated by top down conceptualisation of strategy with an emphasis on the role of top managers and their decision making processes influencing strategy (Ambrosini, Jenkins & Collier 2007). The literature indicates that strategic skills include leadership, planning and intellectual competency and are required for the development and implementation of strategy. Stumpf & Mullen (1991) argue that strategic skills involve the ability for managers to know their business and markets, to manage rivalry whilst identifying and overcoming internal and external threats, to be entrepreneurial whilst accommodating diversity to ensure that all stakeholders stay on the strategy. Strategic management skills also include the ability to develop complex thinking, analysing and applying information, know the business and the markets and the ability to stimulate others to expand their thinking. Therefore, the implementation of strategy requires leaders to make the right choices and undertake the right actions.

'Leadership plays a significant role in strategy design' (Marx(2014, p. 111). Strategy effects the functions, skills, behaviour and style of leaders who are in charge of implementing the strategy. Leadership is the skill of continually communicating the strategy to all stakeholders, provide commitment, passion, drive and belief that the strategy will achieve the objectives of the organisation and requires managers to have the ability to lead with direction. The primary responsibility of leadership is formatting and implementing the organisation's strategy which is not something an organisation *has* but something that managers and leaders *do* as they shape the construction of practice through who they are and what resources they draw upon (Ambrosini, Jenkins & Collier 2007). Furthermore, leaders need to be the spokesperson or champion of strategy, to communicate the vision, whilst bringing and managing change. Leadership requires intellectual competency to contend with external and internal forces and the ability to recognise opportunities or threats. To identify opportunities requires planning to achieve those opportunities, design,

implement, monitor, evaluate and or take corrective action to achieve the organisation's objectives. Finally leaders need to be able to evaluate the strategy to objectively see if it will achieve the organisation's vision and to liaise with internal and external stakeholders to enable further decisions. Furthermore, strategy and leadership should be inseparable and leaders must undertake different functions develop the necessary skills and change their behaviour and leadership styles to effectively implement alternative strategies. Formulating and implementing strategy is the responsibility of the leaders. However, others such as middle managers are also important in the strategic process. More importantly, all members of the management team regardless of what level they are have the ability to shape strategy even though they may not have a direct strategic role. Therefore, where strategic plans need to be reviewed quickly due to the volatile market, VET training providers require leaders with specific skills to successfully develop and implement strategy (Speculand 2014). Furthermore, Speculand (2014) argues that the failure of many strategic plans is often the result of leadership skills where leaders have an understanding of the strategic theory but not the implementation of strategy.

In summary the review of the four broad leadership skills as presented in the LSSM and their associated skill attributes or sub-skills provides insight into the construction of each skill. The review also confirmed that skill attributes could have an association with more than one skill. Thus, an understanding of the four skills extends on the knowledge of leadership skills.

2.7 Skills

In order to identify leadership skills required for senior managers in VET knowledge of what constitutes skills, skill development and acquisition is required. According to Mumford et al. (2000); Gentry et. al (2008) there is a strong recognition in the literature that skills are gained through practice rather than from formal instructions and takes place over time and with experience Kalargyrou, Pescosolido & Kalargiros (2012, p. 40) note that 'skills are abilities which are developed and are not necessarily

innate or manifested into performance or a potential'. Chell (2013) considers that skills are not the same as abilities, which are aligned to more general traits, as skills once learnt cannot be discounted or undervalued. Quintana, Ruiz & Vila (2014, p. 530) highlight that employability is relevant to competencies that consist of knowledge, skills abilities and attitudes. 'Competencies for leadership behaviour include: ability to negotiate effectively, identify new opportunities, assert authority, mobilise the capacities of others, question ideas, identify ideas and solutions, coordinate activities and ability to make directions clear to others'.

According to Dreyfus (2004) there are five stages of adult skill acquisition. The stages range from novice, advanced beginner, competent, proficient and expert. The acquisition of skills is dependent on the context of the learner and the situation, the perspective of the learner to recognises components of the skill required to complete the task, using analytical or intuitive decision making to act based on experience and the commitment to immerse into the learning situation. The acquisition of skills can be through formal on the job training and are accumulated through job experience and job mobility with skilfulness being demonstrated by effective action under various circumstances (Dreyfus 2004). The acquisition of skills acquired in the work place provides practical knowledge that becomes transferrable, therefore 'managers ascending the career ladder require the steady acquisition of skills' (Quintana, Ruiz & Vila, 2014, p. 530). Subsequently, without the right skills, individuals are kept at the margins of society and business and countries are unable to complete in an increasingly complex globally connected world (Organization for Economic Cooperation and Development 2014). Mumford et al. (2000), highlight that an understanding of skill development provides practical and theoretical benefits for leadership skills acquisition that will assist in the identification of interventions and contribute to leadership skill development and promote skill increase. Therefore, employer organisations that fund work place learning to develop skills, will achieve a return on their investment, if management development and learning is well constructed. In addition, the ability for managers to learn, contextualise actions and critically reflect is critical to an organisation's success. Finally, organisations that provide professional development for managers with learning focused on 'real world' issues and contextualised and embedded in the manager's work environment will provide a means of successfully developing the manager's ability to learn.

2.8 Leadership

In order to identify leadership skills required for senior managers in VET knowledge of what constitutes leadership and leadership skills is required. According to Allio (2012) leadership is a much debated topic in the literature and reveals that there are predominately two views regarding leadership: 1) leaders are born or 2) leaders are developed. Although, leadership has been studied extensively, the literature is vast, often contradictory, confusing and lacking in cohesion (Hay & Hodgkinson 2006). Alloi (2012) suggests that leaders are required to clarify an organisation's purpose and values, set direction, build community and manage change. In addition, Fukuyama (1995), noted that the role of leadership is one of negotiation, exhibiting shared values to develop trust, supervision of subordinates with the ability to persuade, inspire and motivate to achieve the organisation's goals and vision (Hay & Hodgkinson 2006). According to Bhindi & Duignan (1997), leadership is a visionary activity, which requires passion, commitment with actions. Hubbard (2004) notes that leadership requires leaders to be in touch with what is happening internally and externally. McCallum & O'Connell (2009) highlight that leadership is used to influence and encourage participation in achieving set goals. Furthermore, Mumford et al. (2000b) states that leadership is understood in terms of knowledge and skills with the application of judgment to solve organisational issues and provide solutions. In addition, Falk (2003) states that effective leadership is related to events or interventions and attributes of leaders are necessary, however attributes alone are not sufficient for effective leadership. Mumford et al. (2006b) further suggest that outstanding leadership is where leaders construe or think about the situation that gives rise to the opportunity for outstanding leadership. Alloi (2012) also recommends that good leadership can increase an organisation's value by exhibiting clear strategy to enable objectives to be achieved in a culture of innovation. An understanding of what defines leadership provides the foundations to develop and guide leadership skills.

2.9 Leadership Theory

In order to evaluate the development of leadership skills a review of the leadership theories extends on the knowledge of leadership skills. Leadership theory is presented in various theoretical models that have developed over time. According to Falk (2003) there are five broad theoretical areas of leadership, which include traits, behaviours, contingency, transformational and enabling leadership. Bryman (2013) states that traits leadership theories have sought to establish the personal features of leaders that distinguish them from non-leaders or followers. According to Falk (2003) behavioural leadership theory is job centred with a focus on completing the task with close supervision and specific procedures with a reliance on coercion, reward and reasonable power to influence behaviour and performance. Contingency leadership theory focuses on the leader's behaviour within a situation and their ability to adjust their leadership style according to the situation (Falk 2003). Transformational leadership theories include transactional, charismatic and situational leadership (Falk, 2003). According to Hay & Hodgkinson (2006), Transformational Leadership theory is focused on the articulation of vision whilst encouraging subordinates to change their motives beliefs, values and capabilities so that the subordinates own interest and personal goals become consistent with the goals of the organisation. Enabling leadership theory is based on the leadership process, rather than the individual leader's traits and attributes and is focused on enhancing network relationships and collective action (Falk, 2003). Enabling leadership theories include path goal leadership, value based leadership and authentic leadership.

Although leadership theories are defined by traits, qualities and behaviours there is limited focus on what leaders do and leadership skills required to provide effective leadership (Katz, D & Kahn 1978; Mumford et al. 2000). A review of the five broad theoretical areas of leadership support that there is limited focus on leadership skills within leadership theories.

2.9.1 Traits Leadership Theory

Bryman (2013) states that traits leadership theory has sought to establish the personal features of leaders that distinguish them from non-leaders or followers. Kalargyrou, Pescosolido & Kalargiros (2012, p. 40) suggest that 'traits theories describe who leaders are'. According to Bryman (2013), traits theories identify personal traits associated with leadership including physical characteristics, social background, intelligence and ability, personality, task related characteristics and social characteristics. Bartol et al. (2005), expands on Bryman (2013) description of trait theories and suggests that traits are described as internal qualities or characteristics. They include physical appearance of height and weight, personality traits of dominance or extroversion, skills and abilities of intellectual knowledge, technical competencies and social factors of interpersonal skills and sociability. However, Bartol et al. (2005) highlight that traits are not easily identified and traits alone cannot predict leadership performance.

2.9.2 Behavioural Leadership Theory

According to Falk (2003) behavioural leadership theory is job centred with a focus on completing the task with close supervision and specific procedures with a reliance on coercion, reward and reasonable power to influence behaviour and performance. The leader is employee centred with a focus on employees doing the work through delegation of decision making to enhance subordinates advancement, growth and achievements. In addition, the leader creates structure to organise and define group relationships and establishes defined channels of communication with consideration to mutual trust and rapport between the leader and the team. Furthermore, behavioural theories focus on the belief that leaders are made and not born and that people can learn to become leaders through teaching and observation.

2.9.3 Contingency Leadership Theory

Contingency leadership theory focuses on the leader's behaviour within a situation and their ability to adjust their leadership style according to the situation (Falk 2003). The situation includes the leader and member relationship, the task structure and the leader's power, including their formal position of leadership and the power to reward or punish subordinates to gain compliance (Miller, Butler & Cosentino 2004). Contingency leadership theory focuses on the ability of leaders to be flexible in their leadership style and to alter their behaviour according to the situational factors and readiness of subordinates (Bartol et al. 2005). The leader's personality, power, attitude and the perception of their own and subordinates behaviour within the situation influences the ability for leaders to be flexible to alter their leadership style (Hersey 2009). Therefore, contingency leadership theory portrays that leaders need to be conscious of their leadership style to influence factors, subordinates and the situation and adapt their leadership style appropriately for effective leadership (Bartol et al. 2005).

2.9.4 Transformational Leadership Theory

Transformational leadership theories include transactional, charismatic and situational leadership (Falk, 2003). According to Hay & Hodgkinson (2006), Transformational Leadership theory is focused on the articulation of vision whilst encouraging subordinates to change their motives beliefs, values and capabilities so that the subordinates own interest and personal goals become consistent with the goals of the organisation. Gleeson (2008) says that Transformational Leadership is also associated with democratically developed principles of shared responsibility and team based, people oriented management. The role of the leader in this theory is to motivate individuals to perform beyond normal expectations by inspiring subordinates to focus on the broader goals and to have confidence in their abilities to achieve their goals. Transformational Leadership explores the notion that leadership characteristics such as inspiration, intellect and empathy contribute to securing the respect and gain the support of subordinates to become followers. According to Adams & Gamage (2008) Transformational Leadership is the most effective leadership style for VET.

This may be reflective of the Australian VET sector that needs to move from the traditional education focus to business and services in order to meet the demands of the competitive environment. However, Charismatic Leadership cannot be ignored, as it is closely aligned to the theory of Transformational Leadership (Bartol et al. 2005). Charismatic Leadership is a leadership style that articulates an inspirational vision with behaviours that support an extraordinary mission (Falk 2003). (Bedell-Avers, Hunter & Mumford 2008) state that charismatic leaders are typically positive, future goal orientated and encourage subordinates to act on goal attainment. They also demonstrate effective communication to influence goal attainment whilst maintaining frequent contact with followers.

2.9.5 Enabling Leadership Theory

Enabling leadership theory is based on the leadership process, rather than the individual leader's traits and attributes and is focused on enhancing network relationships and collective action (Falk, 2003). Enabling leadership theories include path goal leadership, value based leadership and authentic leadership. Path Goal leadership theory is where the leader supports subordinates to achieve their goals by providing a clear path for them to follow (Silverthorne 2001). Bartol et al. (2005) states that Path Goal theory enables leaders to focus on how they can influence followers' perceptions of work goals, self development goals and paths to goal attainment whilst having a positive impact on followers through motivation and satisfaction. The theory is based on how leadership behaviour can positively influence the motivation and job satisfaction of subordinates, with the use of directive, supportive, participative and achievement leadership styles (Bartol et al. 2005). Path Goal theory also suggests that leaders adjust their own behaviours to adapt to contingencies and find the most suitable leadership style for any particular situation (Silverthorne 2001). The theory proposes that a leader will know where and when to adapt instrumental or directive, supportive, participative and achievement oriented leadership styles to be effective depending on the nature of the subordinate and the task. Finally, Silverthorne (2001) outlines that the behaviour of the leader is viewed as acceptable and motivational to subordinates as the leader provides support through coaching, guidance and rewards for their effective performance. Value based

leadership theory, as outlined by Dunigan (1993), requires leadership to connect organisational goals to employees personal values with leaders telling members how to behave in order to fulfil the organisation's mission. Leaders lead by example, focus on core organisational values and enduring principles to capture the organisations strength and character that are sustainable in the changing market place.

The theory of Authentic Leadership is based on ideals of honour, self-respect, inquisitiveness, compassion, courage, excellence and service whilst being ethical in action. Bhindi & Duignan (1997), states that Authentic Leadership is based on personal integrity and credibility, trusting relationships and a commitment to ethical and moral values in shaping the organisations structure, process and practices. Authentic Leadership is often viewed as the soft approach whilst rejecting a culture of dominance, compliance, aggressive ambition and win at all cost leadership (Duignan 2014). Authentic Leadership also assumes the role of stewardship and service to inspire and empower others whilst encourage sharing and partnerships based on mutual recognition and interdependence in relationships to transform the good will and good intentions to the organisations vision of the future (Bhindi & Duignan 1997). Furthermore, Bhindi & Duignan (1997) state that authentic leaders who pursue their mission with passion and commitment can create sustainable value for customers, employees and stakeholders to create an organisational culture that values professional collaboration, collective responsibility and high quality outcomes. Authentic Leadership encourages a shared vision providing organisational members with a focus on the big picture and help them to understand and appreciate their role in achieving the vision (Bhindi & Duignan 1997).

In summary, the review of the five broad leadership theories of traits, behavioural, contingency, transformational and enabling leadership highlight that leadership theories are predominately focused on leadership traits and behaviours with limited reference to actual leadership skills. This review does not diminish the importance of leadership traits and behaviours. Furthermore, Kalargyrou, Pescosolido & Kalargiros (2012) highlight that skills interact with traits, behaviours and experience to develop leadership capabilities. These leadership capabilities have a direct and immediate

impact on leadership performance. Therefore, the importance of leadership skills cannot be ignored and further research into leadership skills will extend on the current body of knowledge in leadership theory.

2.10 Leadership Skills

Although, the notion of leadership continues to evolve within the literature leadership skills have received inadequate attention (Mumford, Campion & Morgeson 2007). Kalargyrou, Pescosolido & Kalargiros (2012, p. 42) suggest that 'Leaders in academic institutions require a particular unique set of skills as opposed to those leaders in business, military or government settings' Mumford et al. (2000b) described leadership as a definable set of skills that can be learned and developed over a period of time. McCullum & O'Connell (2009) study identified ten skills and abilities important for leaders. The skills and abilities identified are cognitive ability, strategic thinking skills, analytical ability, decision making ability, communication skills, influence and persuasion, ability to manage in a context of diversity, ability to delegate and manage risk, ability to develop talent and personal adaptability. Gentry et al. (2008) state that skills and abilities necessary for successful leadership are cognitive, strategic, analytical, communication and technical skills, the ability to influence, manage a diverse environment, delegate and the ability to identify attract, develop and retain talent. Guangrong, Tang & De Muse (2011), note that leadership competencies are defined as knowledge and skills and include problem solving and analytical thinking.

The literature revealed that studies in leadership have predominately been conducted within the context of business, military and government. The leadership studies conducted within the context of education have predominately focused on teachers or principals as leaders (Kalargyrou, Pescosolido & Kalargiros 2012) with limited reference to leadership skills. Therefore, additional research in leadership skills, focused on senior managers in VET, will provide an understanding of specific skill requirements.

2.11 Leadership Skills from an Australian Perspective

A review of Australian leadership skills provides further insight into leadership skills within the VET sector and guides leadership skill requirements for senior managers. Significant reports that have reviewed Australian leadership include the Karpin Report 1995 (Karpin, 1995) and the Global Competitiveness Report 2013-2014 (Scwab 2014). The Karpin Report (Karpin 1995) provided a comprehensive insight into the way in which Australia prepared its managers for work and leadership. The report was a result of three years of consultation, research study missions and analysis. It highlighted the need for improvement in the performance of Australia's managers to complement the government's micro economic reform and workforce training initiatives (Karpin 1995). The report emphasised that management skills, underpin economic growth and workplace reforms and that leadership is the linkage between management skills and economic growth to full employment (Karpin 1995). Karpin (1995) argues that managers who are educated and trained with the right skills will increase the speed of innovation and secure significant economic benefit through work place restructuring and improved business processes and therefore, increase the productivity of Australia's human and capital resources.

The Global Competitiveness Report 2013-2014 (Schwab 2014), assessed the competitiveness landscape of 148 economies, Australia was ranked 21st. The report provided an insight into the drivers of productivity, prosperity and competitiveness that determine and drive productivity and competitiveness (Schwab, 2014). The aspects of competitiveness considered included institutional environment, infrastructure, microenvironment, health and primary education, higher education and training; goods market efficiencies, financial market development, technological readiness, market size, business sophistication and innovation. Australia was one of the Organization for Economic Cooperation and Development (OECD) leaders in productivity growth in the 1990s, however in early 2000s it began to lag. The Review of the National Innovation System noted that 'Australian productivity went from

growing substantially faster to growing substantially slower' (Hall, Agarwal & Grenn, 2013, p. 3).

Australian Government, Department of Education and Training (2012b) state that the leadership skills and management capabilities are key to the national economic prosperity. Therefore, the globalised economy requires well educated and skilled employees who are able to perform complex tasks and adapt rapidly to the changing environment (Schwab 2014). Without appropriately skilled managers who can adapt their organisation to change it will continue to be difficult for Australian businesses to maintain their competitiveness (Karpin 1995). Therefore, for the VET sector to remain competitive appropriately skilled managers are required. In order to ensure managers are appropriately skilled the sector needs to support strategies to improve human resource related policies and practices for the recruitment, retainment and promotion of best talent. In addition, ongoing investment in professional development to improve management practices is required. These strategies will provide leaders with the opportunity to develop and acquire leadership and management skills.

2.11.1 Leadership Skills for Senior Managers in Australian VET

Leadership skills for senior managers in Australian VET are often affected by work overload and lack of training in specific management and leadership skills. The lack of training often reflects that leaders are not adequately prepared for the role (Cardno 2014). Furthermore, the work overload and lack of leadership skills inhibit the ability for senior managers to adjust their leadership approach as they try to be good at everything, struggle with ambiguity and tensions and are unable to focus. Therefore, to guarantee the future success of VET, training providers need to invest in developing leadership skills for senior managers that incorporate both interpersonal and intra personal dimensions as they operate at different levels within the organisation (Callan et al. 2007; Mehrabani & Mohamad 2015).

The Australian VET sector requires leaders who have skills and competencies that will enable them to operate in a volatile sector (McCallum & O'Connell 2009) and to manage ongoing changes affecting personnel, policies and practices (Bhindi & Duignan 1997). VET leadership is important to Australian and worldwide economic activity. VET is affected by the increasing significance and centrality of skills to meet the demands of global economies, economic trends of internationalisation of education and emergence of global labour markets and demographic trends of ageing populations and workforces (Crossman & Cameron 2014). Furthermore, VET and managers within the sector play an important role for the development and acquisition of skills and theoretical knowledge for the Australian workforce. The VET sector is responsible for producing employees who have practical skills to function in the workplace and be 'job ready' (Australian Government, Department of Education and Training 2012). Senior managers in Australian VET have a significant role in the Australian economy to ensure Australia remains competitive in the global market whilst addressing skills and workforce development objectives and the skill shortage of the Australian workforce. The role of senior manager includes the development of the VET system to influence industry and student outcomes, which will have a considerable effect on the Australian workforce development and economy. Although, Adams & Gamage (2008) state that leadership within education should be shared across all levels from the most senior manager to the frontline staff, leadership skills for senior managers are paramount for the success of the sector. Duignan (2014) states that the role of the senior managers in VET consists of balancing financial return and quality; responding to current and emerging issues; being efficient while running a humanistic organisation and prioritising actions that are managerial and those that are educational. Furthermore, VET organisations are complex and have multiple stakeholders and senior managers are required to manage the stakeholder relationships. The sector complexity and stakeholder relations may amplify or constrain their leadership influence (Dunigan 2014). Therefore, the economic success of the VET sector is dependant on the leadership skills of its senior managers (Crossman & Cameron 2014).

Leadership skills acquired and required and for senior managers in VET are influenced by their organisation and are reflective of the organisation's culture, values, strategic goals and organisational life cycle (Bartol et al. 2006). Due to these influences senior managers in VET have the responsibility to adapt their leadership styles and skills to influence leadership practice, human resource policy, students and their organisation. This is particularly relevant at a time when federal and state governments are under pressure to meet the public expectations for the performance outcomes of students within the vocational education sector (Duignan, 2014a). Therefore, leaders in VET require a unique set of skills, as opposed to the skills required by business, the military or government leaders. Hence, to support and develop leadership skills VET training providers need to reinforce professional development training for senior managers. Professional development training for senior managers should focus on developing core leadership competencies and skills to increase organisational capacity (Connelly 2000; Cardno 2014). Core leadership competencies are correlated with job performance and include organisational strategy, resources management, communication, collaboration, advocacy and professionalism (Crossman & Cameron 2014). According to Quintana, Ruiz & Vila (2014, p. 530) competencies are a combination of 'knowledge, skills abilities and attributes'. Table 2.2 presents professional development training, as recommended by Crossman & Cameron (2014) to develop leadership competencies and leadership skills of cognitive, interpersonal, business and strategic skills.

Table 2.2 Professional Development Training - Leadership Competencies and Skills

Professional Development Training - Leadership Competencies and Skills		
Professional Development Training	**Leadership Competency**	**Leadership Skills**
Progressive and challenging job responsibilities	Organisational strategy Resource management Collaboration	Strategic Business Interpersonal Cognitive
Feedback and challenging job assignments	Communication	Interpersonal Cognitive
Networking, mentoring, coaching and workshops	Advocacy	Interpersonal Cognitive
Mentoring/coaching and postgraduate courses	Professionalism	Cognitive

Source: Adapted from Crossman & Cameron 2014

Table 2.2 presents leadership professional development training to develop leadership competencies and leadership skills as recommended Crossman & Cameron (2014). Professional development activities focused on challenging job responsibilities, feedback and challenging job assignments, networking, mentoring, coaching and post-graduate courses will develop leadership competencies and skills. Crossman & Cameron (2014) recommend that professional development training can be informal or formal. The leadership competencies include organisational strategy, resource management, communication, collaboration, advocacy and professionalism. Guangrong, Tang & De Muse (2011) indicate that leadership competencies are defined as knowledge and skills and include problem solving and analytical thinking. The development of leadership competencies as demonstrated in Table 2.2 will develop the four broad leadership skills of cognitive, interpersonal, business and strategic skills as reflected in the LSSM.

2.12 Chapter Summary

In summary Chapter 2 provided the finding of the literature review conducted from June 2013 to June 2015. Through explicit research of the literature it was confirmed that no previous studies have been conducted using the LSSM to identify leadership skills for senior managers in Australian VET. The literature review, guided by the conceptual framework, explored in depth the theory of SST, LSSM and trait, behaviour, contingency, transformational and enabling leadership which form the five broad theoretical areas of leadership (Falk 2003). The review revealed that there is a growing body of literature on leadership and skills, with a diversity of leadership theoretical perspectives however, research into leadership skills is limited. Leadership research has typically been conducted in business with a secondary emphasis on the military and government agencies with limited focus in education. This is perhaps 'because educational leaders have not been as receptive to studies about what they do and there are many more non-educational organisations in which to study' (Kalargyrou, Pescosolido & Kalargiros 2012, p. 42). Many of the studies conducted on leadership within the educational setting have predominately focused on either

teachers as leaders of their students or on primary school principals as leaders within their school with relatively few studies focused on senior managers as leaders within vocational education. Although the literature revealed that research into leadership within vocational education is numerous, (Coates 2007; Callan et al. 2007; Mehrabani & Mohamad 2015) there has been limited research into leadership skills and none using the LSSM framework to identify leadership skills. Studies in VET leadership have predominately focused on leadership traits and attributes (Falk 2003), leadership for teachers (Buli & Yeshuf 2015; McVicar & Tabasso 2015; Horn 2016) and leadership for curriculum and student development (Albashiry, Vogt & Peiters 2015; Bacca et al. 2015; Cattaneo, Nguyen & Aprea 2016; Hodge 2016). Research has generated new theories and knowledge in the area of leadership in education, such as the traits, behaviours and attributes of individual leaders, which are necessary but not sufficient to achieve effective leadership (Falk 2003). The volatility of the Australian VET sector continues to focus research in VET on funding, governance, quality, regulations, student outcomes and industry and community expectations. The focus of the current VET research indicates that research into leadership skills is not a key priority within the sector.

According to the Australian Government Department of Education and Training (2012b) leadership skills and management capacities are key to the national economic prosperity. Therefore, businesses need to provide policies and practices for leaders to develop and acquire leadership skills. Mulcahy (2003) study revealed that the role of senior manager in VET is evolving into substantially more of an administrative role than an educational role and therefore, specific skills are required. This study concurs with Kalargyrou, Pescosolido & Kalargiros (2012) study that highlights leaders within the education environment require a unique set of skills as opposed to leaders in business, military or government organisations. Although the review has identified that the Australian VET sector continues to be volatile and that the role of manager within the sector has changed from an educational to an administrative role, research within the sector continues with limited focus on leadership and less within the specific area of leadership skills for senior managers. Therefore, the literature review as presented in this chapter has identified a gap within the literature and guided the principal research question and methodology in order to develop the associated hypotheses in order to answer the principal research question.

The research methodology is presented in Chapter 3. Chapter 4 will present the data analyses using the research methodology to test the hypotheses to answer the principal research question. Chapter 5 will present the conclusion and implications to practice, policy and academic knowledge as derived from the data analyses.

CHAPTER 3 METHODOLOGY

3.1 Chapter Introduction

Chapter 2 provided an empirical approach to the review of the literature within the body of knowledge of skills, leadership, leadership skills and vocational education. The literature revealed previous research relevant to leadership skills associated to management level in an organisation with the application of the Stratified System Theory (SST) and the Leadership Skill Strataplex Model (LSSM). The SST refers to task complexity across levels of organisations to explain the variation in performance requirements of managers at any point of the organisational structure (Densten 2003). Mumford, Campion & Morgeson (2007) LSSM categorised leadership skills into four broad skills of cognitive, interpersonal, business and strategic skills and applied a stratified approach to determine that leadership skill requirements are relevant to management level within an organisation. The literature review guided the conceptual framework to develop the principal research question, the hypotheses and the research methodology to collect and analysis data to test the hypotheses to answer the principal research question. The aim of the methodology was to test the LSSM and determine leadership skill requirements based on the four broad category leadership skills of cognitive, interpersonal, business and strategic skills and their associated skill attributes or sub-skills.

Based on previous studies conducted by Kalargyrou, Pescosolido & Kalargiros (2012) and Mumford, Campion & Morgeson (2007) that used the LSSM framework with a quantitative research methodology to identify leadership skills this chapter outlines the research methodology of this thesis. This thesis applied a positivist research paradigm and quantitative methodology approach to test the LSSM framework to answer the principal research question through a process of reducing the principal research question into four hypotheses. The four non-directional hypotheses aimed to test the broad category leadership skills and their associated skill

attributes or sub-skills. This process aimed to further identify specific skill requirements. The hypotheses were Hypothesis 1: Cognitive, interpersonal, business and strategic skills are empirically distinguishable leadership skills. Hypothesis 2: Leadership skill requirement will vary by skill category with cognitive skills required the most, followed by interpersonal, business and strategic skills. Hypothesis 3: Cognitive, interpersonal, business and strategic skills requirement will be related to management level in an organisation and Hypothesis 4: Leadership skill requirements will differ with public and private training providers.

In order to test the LSSM and replicate the results of Kalargyrou, Pescosolido & Kalargiros (2012) and Mumford, Campion & Morgeson (2007) studies an online survey method was used to collect data. Using the online survey enabled the gathering of data on leadership skill requirements from the perspective of senior managers employed in VET (Thomas 2004). The literature review and the theoretical framework of the LSSM guided the structure of the online survey and questions. The LSSM presented that leadership skills are categorised into four broad category skills of cognitive, interpersonal, business and strategic skills and their associated skill attributes or sub-skills. The online survey was developed, administered, distributed with data collected and stored using Qualtrics Online Survey software, as recommended by Victoria University research data management guidelines (Victoria University 2015). Pilot testing of the online survey was conducted prior to distribution to the selected sample of senior manager employed in VET to ensure that the programming administered by Qualtrics Online Survey software worked effectively to collect reliable and valid data (Hunter 2010). The data file was developed from the data collected via the online survey and automatically stored in Qualtrics Online Survey software. The data was then downloaded into Statistical Package for the Social Sciences (SPSS) version 22 as a compatible file for data analysis. Prior to conducting the statistical analysis the data file was checked for missing or incomplete data and outlining data. Outlining data refers to data collected that indicates extremes compared to the rest of the data. Once the normality of the data had been confirmed the data was managed for data scoring and data pre and post coding.

The population of the senior managers employed in the Australian VET sector is not defined and the scope of this thesis did not enable the testing of the whole population. Therefore, a sample of senior managers was selected guided by a sample selection process and framework. The final sample was identified with consideration to the scope of this thesis and the sample size required to achieve a suitable statistical power of number of respondents. The administration of the online survey was developed with reference to how issues related to the distribution of the email, the hyperlink to the online survey, instructions on how to complete the survey, the duration of the survey, the response and the follow up procedures was managed.

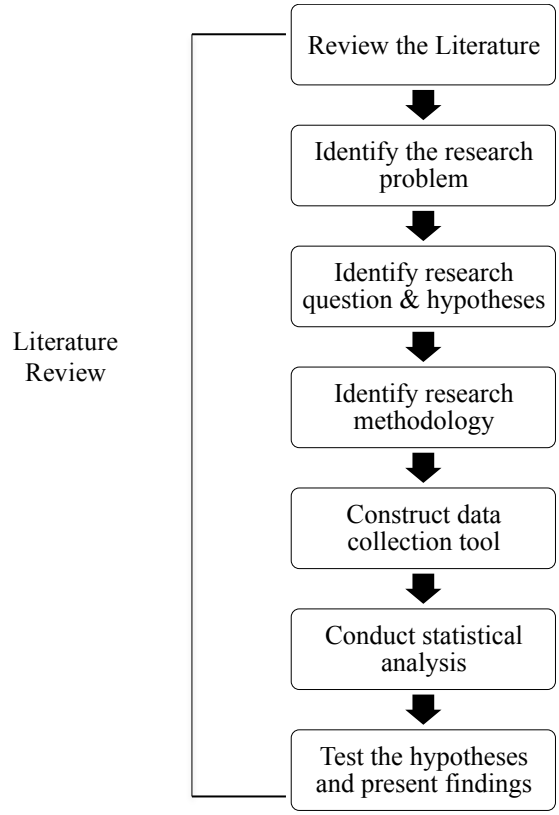
The testing of the hypotheses was conducted with a variety of statistical techniques and results measured ensured the findings were statistically significant. The statistical techniques used to test the descriptive variables and the hypotheses included frequency tests, Pearson's correlation test, independent t-test, factor analysis using an exploratory factor analysis and a confirmatory factor analysis approach with structural equation modelling. The limitations of the research methodology for this thesis are described and recommendations for continuous improvements for future research paradigms and methodology are provided in Chapter 5. In summary, the research paradigm and methodology presented in Chapter 3 guided the data analysis process of Chapter 4 to test the identified four non-directional hypotheses to answer the principal research question. Chapter 5 discussed the findings, as presented in Chapter 4 and identified the conclusions drawn from the data analysis. The conclusions drawn from the evidence presented in this thesis provides practical implications to the VET sector to guide leadership policy and practice. In addition the conclusions and evidence contributed to academic knowledge in the area of leaders, leadership, skills, leadership skills and academic management.

3.2 Overview of the Research Design and Approach

This thesis employed an empirical research approach that was guided by the literature review. This approach developed a suitable research methodology to answer the principal research question of 'What leadership skills are required for senior managers in Australian VET?' The principal research question was answered from the

perspective of senior managers employed in Australian VET. Therefore, the results presented in this thesis do not reflect the views of employers or the sector. The research conceptual framework was guided by previous studies that tested the LSSM as conducted by Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012). The research design and methodology was guided by Lau & Blythe (2013), Tuckerman (2012), Creswell (2009), Sue & Ritter (2007), Thomas (2004), Veal (2005) and Roberts (1999). The selection of a suitable research paradigm and methodology was relevant to the thesis scope with consideration to available resources, time frame and budget. Furthermore, the selection of the research design and methodology ensured that the results of the data analysis were generalised across the study population and that the online survey construct was reliable and valid (Hakim 2012). The identification of the methodology is presented in Figure 3.1.

Figure 3.1 Methodology Approach



Source: Adapted from Tuckerman (2012)

Figure 3.1 presents the methodology approach applied to this thesis. A review of the literature was undertaken and revealed previous studies that tested leadership skills using the LSSM (Mumford, Campion & Morgeson 2007; Kalargyrou, Pescosolido & Kalargiros 2012). The SST suggested that task complexity across levels of an organisation explain the variation in performance demands at any point of the organisational structure. The LSSM indicated that leadership skills are categorised into four broad skills of cognitive, interpersonal, business and strategic skills and the level of skills required were dependent on the management level within an organisation. These studies were conducted in the military, business and higher education sectors. Therefore, this thesis was the first time that the LSSM has been used to identify leadership skills within the Australian VET sector. The literature revealed that there was limited research on leadership skills and less within the context of senior managers leadership skill requirements in VET. Therefore, the research problem that was investigated in this thesis was to identify skills required for senior manager employed in Australian VET. The principal research question was answered from the perspective of senior managers employed in VET and did not necessarily reflect the skill requirements of senior managers from the perspective of employers or the sector. The research question and the associated hypotheses were developed from examining the literature as recommended by Creswell (2009). A quantitative research methodology approach was applied while the research question and associated hypotheses were answered through data analysis to determine the relationship and comparison among variables and groups based on data collected, tested and evaluated from the sample. The data was collected by an online survey and was deemed the most suitable methodology to collect the data based on previous research, the scope of this thesis, budget, resources and time frame (Sue & Ritter 2007) The literature also guided the statistical analysis to test the hypotheses and presented the findings based on data collected from the online survey.

3.3 Research Question

The development of the principal research question for this thesis was guided by the literature review as detailed in Chapter 2. The literature review identified that there was limited research in the area of leadership skills and less within VET focused on leadership skills required for senior managers. Therefore, this thesis aimed to answer the principal research question of:

'What leadership skills are required for senior managers in Australian VET?'

Drawing on the conceptual framework as presented in Chapter 2 that included the theoretical foundations of SST, LSSM and Falk (2003) five broad theoretical areas of leadership, this thesis aimed to identify the leadership skills required for senior managers in VET. The principal research question was answered from the employees' perspective, as data was collected from senior managers employed in Australian VET. Therefore, the findings do not reflect the perspectives of skills required for senior managers from the employers or sectors point of view.

3.4 Hypotheses Development

The hypotheses were developed from the examination of the literature and were consistent with hypotheses of prior studies conducted by Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) to test the LSSM. The data analysis techniques were consistent with Mumford, Campion & Morgeson (2007) data analysis techniques to test the hypotheses in order to replicate the results as presented in the LSSM. The four hypotheses stated clearly and concisely what was to be tested (Terrell 2012). The data analysis determined the relationship between variables and compared variables and groups based on data collected, tested and evaluated from the sample (Tuckman 2012). This process confirmed specific predictions and the direction of relationships that exists with variables to answer the principal research question (Tuckman 2012). Chapter 4 presents the results of the data analysis. The four hypotheses were as follows.

3.4.1 H1: Category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills.

Hypothesis 1: Category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills. The LSSM suggests that cognitive, interpersonal, business and strategic skills are empirically distinguishable. However, hypothesis 1 tested if the skills were empirically distinguishable in the context of skills required for senior managers in Australian VET. The literature revealed that cognitive skills include analytical ability, logical thinking, concept formation, inductive reasoning and deductive reasoning (Huusko 2006) and can be categorised into four distinctive areas: information gathering, communication, cognitive thinking and the ability to learn and adapt (Mumford, Campion & Morgeson 2007). Interpersonal skills include empathy, social insight, charm, tact and diplomacy, persuasiveness and oral communication ability are the skills often identified as interpersonal skills. These skills are often identified as 'interpersonal skills' and are essential for the development and maintenance of cooperative relationships with subordinates, superiors, peers and stakeholders. According to Huusko (2006, p. 11), interpersonal skills include 'knowledge about human behaviour and group processes, ability to understand the feelings, attitudes and motives of others and the ability to communicate clearly and persuasively'. Bedwell (2014), argues that interpersonal skills include communication skills, co-operation with others, trust and intercultural sensitivity. Mumford, Campion & Morgeson (2007), state that interpersonal skills are people orientated skills, self awareness, managing stress and solving problems creatively and involve social skills relating to interacting and influencing others within the team, organisation or external stakeholders. Interpersonal skills are also life skills used daily to communicate and interact with other people both individually and in groups and are integral to the provision of communicating supportively, gaining power, managing conflict and motivating employees (Bedwell, 2014). According to Mumford, Campion & Morgeson (2007, p. 157) 'business skills involve skills related to function areas that create context in which most leaders work'. Business skills include the management of resources including staff, finances, technology, goods and equipment at a high standard within an allocated time frame and require management that is transparent and ethical (Palakshappa & Gordon 2007). Within each of these business skills there are

additional skill attributes and competencies which include understanding human resource management, budgeting, information technology, marketing, finance and an extensive knowledge of the environment in which they operate (Ambrosini, Jenkins & Collier 2007). Strategic skills include leadership, planning and intellectual competency with the ability to continually communicate the strategy to all stakeholders. Strategic skills include commitment, passion, drive and belief that the strategy will achieve the objectives of the organisation and managers are required to lead decisively (Stumpf & Mullen 1991).

3.4.2 H2: Leadership skill requirements will differ by skill category with cognitive skills required the most followed by interpersonal, business and strategic skills.

Hypothesis 2 proposed that leadership skill requirements will differ by skill category with cognitive skills required the most, followed by interpersonal, business and strategic skills. Mumford, Campion & Morgeson (2007) studies confirmed that senior managers require cognitive skills the most based on the assumption that cognitive skills are the foundation of leadership skills and represent the majority of skills utilised daily. This is consistent with cognitive skill attributes of oral and written communication. Interpersonal skills require a significant amount of time as leadership positions include the interaction, persuasion and co-ordination of others. Business skill requirements are greater than strategic skills as business skills are fundamentally function activities. Mumford, Campion & Morgeson (2007) do not suggest that strategic skills are less important than the other category skills but they are required less due to the essential requirement of cognitive, interpersonal and business skills.

3.4.3 H3: Cognitive, interpersonal, business and strategic skills requirements are related to management level.

Hypothesis 3 proposed that cognitive, interpersonal, business and strategic skills requirements are related to management level. Mumford, Campion & Morgeson (2007) suggests that leadership presents in different ways at different levels in the organisation and the SST indicates that positions in organisations are structured into

three or five levels (Densten 2003). Level one is the frontline supervisor who is responsible for conducting the work, second level is the middle manager who conducts the work and prepares for future changes, third level is the general manager or senior manager who is required to have the ability to make comparison and choose effectively in an often complex environment. Fourth level refers to senior managers in smaller organisations and the fifth level refers to managers in large complex organisations. Therefore, applying Densten (2003) analysis of SST supports that senior management roles in VET would be consistent with level three through to five in the organisation level. Densten (2003) theory is consistent with Mumford, Campion & Morgeson (2007) LSSM theory that suggests that managers in higher level positions possess more sophisticated leadership skills and that more senior leadership positions require higher levels of skill. Furthermore, Densten (2003) and Mumford, Campion & Morgeson (2007) concur that there is a relationship between organisational level and leadership skill requirement. Hence, Mumford, Campion & Morgeson (2007) argue that strategic skill requirements are more strongly related to organisational level than cognitive, interpersonal and business skills.

3.4.4 H4: Leadership skills requirement will differ with public and private training providers.

Hypotheses 4 proposed that leadership skill requirements would differ for public and private training provider. As registered training organisations (RTO's) in Australia are classified into two categories of training provider types 1) public, or referred often as government owned, Technical and Further Education (TAFE) and 2) non-government owned, private registered training organisations (RTO's). Hypothesis 4 was tested to compare leadership skill requirements for senior managers based on training provider type of public; government owned TAFE and private; non-government owned.

The four non-directional hypotheses were developed to answer the principal research question and are presented in Table 3.1.

Table 3.1 Non-directional Hypotheses

Non Directional Hypotheses	
No	**Hypothesis**
$H1_0$	Category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills
$H2_0$	Leadership skill requirement will differ by skill category with cognitive skills required the most followed by interpersonal, business and strategic skills
$H3_0$	Cognitive, interpersonal, business and strategic skills requirements are related to management level
$H4_0$	Leadership skill requirements will differ with public and private training providers

Source: Adapted from Mumford Campion & Morgeson (2007).

3.5 Research Paradigm

According to Creswell (2009), the research paradigm guides and influences the choice of the research methodology. A positivist research approach and quantitative methodology was applied to this thesis that identified the leadership skills for senior managers in VET. Although the positivist approach provided quantifiable results, the role of the researcher in positivism research was limited to data collection and data analysis. Therefore, the testing of the hypotheses was based purely on the facts and considered the world to be external and objective. The research approach together with an empirical review of the literature evaluated and validated the theory of LSSM based on the theory predictions (Creswell 2009). The quantitative methodology approach, based on previous studies to test the LSSM, was used to measure and classify the data variables and defined distances between scale values to determine reliability and validity of the data collection tool (Sing 2007). The statistical analysis determined the statistical significance of results to test the LSSM theory and the hypotheses.

According to Vogt, Gardner & Haeffele (2012) quantitative research methodology approach provides the ability for research findings to be generalised to the population, job role or organisation. The survey instrument can be assessed to validate the findings and the standardised approach applied in quantitative methodology enables the research to be replicated. However, quantitative methodology is not free from

criticism as not all information can be collected through a structured self administered survey. Access to certain demographics may be limited, administration of the online survey may isolate respondents and the online survey data collection tool cannot be modified once the survey has commenced. Therefore, the quantitative methodology may result in low response rates and affect the results (Vogt, Gardner & Haeffele 2012).

3.6 Data Collection Methodology

According to Roberts (1999) research in the area of social science and human experiences has commonly used the survey method to collect data. This thesis focused on human experience to identify leadership skills for senior managers employed in Australian VET. The collection of data through the survey method facilitated the examination of characteristics and interrelations of sociological and psychological variables and provided a systematic measurement of the variables that identified patterns in the data collected. The attributes of the online survey method were based on previous research that utilised the survey method to collect data to investigate leadership skills (Mehrabani & Mohamad 2015; Kalargyrou, Pescosolido & Kalargiros 2012; Mumford, Campion & Morgeson 2007; Mumford et al. 2000a). Therefore, based on these attributes the online survey was deemed the most suitable data collection tool to meet the requirements of this thesis scope of budget, resource allocation and time frame restrictions. Furthermore, the online survey enabled the collection of a large amount of evidence at a relatively low cost directly from the respondents, through respondents answering brief and structured questions. The direct collection of data assisted in ensuring that the response rates were adequate and reliable (Vogt, Gardner & Haeffele 2012) and also enabled the collection of large quantities of descriptive and generalisable data within the Australian geographical reach whilst avoiding researcher bias (Lauer, Mcleod & Blythe 2013). The data collection method provided participants with real time access to the survey with the ability to start, pause or end the survey at any time. Furthermore, the rapid deployment of the survey and return times of completed surveys using the online survey could not have been achieved with alternative data collection methodologies (Sue & Ritter 2007). Finally, the online survey approach provided the collection of

participant's data to be automatically entered and digitally stored, enabling the data analysis to be streamlined and available immediately.

As highlighted by Sue & Ritter (2007), the online survey research methodology is not free from criticism and the disadvantages to this methodology were taken into consideration. The disadvantages of the online survey methodology included the difficulty of achieving a suitable statistical sample size, relying on participants access to the internet with a suitable internet connection and IT filters not classifying the invitation to participate email as spam. The sample size may have been influenced by the respondents' motivation and availability to respond to the online survey due to competing online distractions, email message overloaded and other messages being more attractive or important than completing the online survey (Sue & Ritter 2007). The respondents' access to a suitable internet connection may have also influence the sample size. However, the major disadvantage was that the invitation email being classified as spam due to bulk email delivery or email filters commonly used in government organisations such as TAFE. The administration of the online survey would aim to mitigate the identified disadvantages of the online survey methodology. The survey design would take into consideration how participants would interact with questions, the data produced as well as the metadata collected. The online survey methodology aimed to provide dynamic and layered data collection whilst ensuring a statistical significant participation and completion rate (Lauer, Mcleod & Blythe 2013). Finally, the online survey methodology provided a comparison of Kalargyrou, Pescosolido & Kalargiros (2012) and Mumford Campion & Morgeson (2007) research results that tested the LSSM, as the data was collected, analysed and hypotheses tested in a similar fashion (Veal 2005).

3.6.1 Online Survey

The development of the online survey followed the guidelines of Thomas (2004) and Lauer, Mcleod & Blythe (2013). According to Thomas (2004) survey research using an online survey is an appropriate method of data collection when existing information is not available to answer the research question. Although, previous studies in Australian VET leadership have been conducted no previous studies have

applied the LSSM to identify leadership skills for senior managers. Therefore no existing data was available to test the LSSM and the hypotheses. The online survey method gathered a range of viewpoints through the data collection and produced data that was analysed to test the LSSM theory (Thomas 2004). In order to achieve success of the online survey a project plan as guided by Thomas (2004) was developed and implemented. The project plan identified and engaged the stakeholders to gain support in all phases of the online survey with consideration to the final audience that would view the results. The stakeholders included academic and non-academic senior managers employed in VET, their employers, VET policy practitioners, VET membership bodies, industry and students.

The online survey design was guided by Thomas (2004) and Sue & Ritter (2007). These guidelines ensured that the design would not encourage premature termination or abandonment of the survey by the participants. Survey fatigue is well documented and is often identified as a problem in the survey literature (Lauer, Mcleod & Blythe 2013). Therefore, as recommended by Sue & Ritter (2007) the contents of the online survey were structured and logically presented with clear wording for each question. Pre-coded questions incorporated simple interpretation of the questions and clear process to answer each question. The questions were short, unambiguous and meaningful to the respondent, to eliminate 'survey fatigue'. Where compulsory questions were to be answered there was multiple choice answers with only one answer per question as this process eliminated errors and increased response rates (Sue & Ritter 2007)

The graphic design of the online survey was customised with consistent font style, size and colours. A progress bar, page numbers, backwards, forwards and submit buttons were included in the design of the survey, to reduce participant frustration (Lauer, Mcleod & Blythe 2013). In addition, the survey design employed flexible programming for complex questions and integrated skip patterns with contingency questions, therefore automatically guiding respondents to be directed to a new set of questions on the basis of their responses. The programming flexibility increased response times and eliminated survey fatigue. Technical issues relating to the online

survey were also taken into consideration with different operating systems, screen configuration and IT devices (Sue & Ritter 2007). Qualtrics Online Survey software provided options for the survey to be viewed on mobile and desktop devices including computers, mobile phones and electronic tablets with screen size and resolution adjusted accordingly.

The invitation to participate in the survey was guided by Sue & Ritter (2007) and sent via email to participants. To ensure the email was not filtered as spam, trigger spam words or phrases, capitalised punctuation was eliminated with only sentence case used in the email title. In addition, there were no images with embedded hyperlinks or attachments included in the invitation email. Although this anti-spam strategy was initiated there was no guarantee that the invitation email would not be categorised as spam. The invitation email included a hyperlink to the online survey that opened into the welcome screen of the online survey. The welcome screen reiterated the objectives of the survey including how the respondents were selected and the provision of anonymity and confidentiality for participants, the purpose of the survey and the contact details of the researcher. Instructions on how to complete the survey, the approximate time required to complete the survey and survey progress bar were also provided. Participants indicated their acceptance to the terms and conditions of the online survey by selecting a tick box and confirming age status as 18 years and over. To ensure that there was no survey fatigue the survey completion time was no more than 20 minutes as guided by Lauer, Mcleod & Blythe (2013).

3.6.2 Online Survey Questions

The online survey questions were constructed with like items placed together and clear directions provided for each question (Thomas 2004). The questions were explanatory or confirmatory and based on the four broad leadership skills of cognitive, interpersonal, business and strategic skills and their associated skill attributes with the objective to test the hypotheses (Vogt, Gardner & Haeffele 2012).

The questions were developed from the review of the literature that identified Mumford, Campion & Morgeson (2007) LSSM four broad leadership skills of

cognitive, interpersonal, business and strategic skills and their associated skill attributes or sub-skills. Appendix 1 presents the review of the literature that identified studies conducted in leadership to develop the conceptualisation of the four broad category leadership skills of cognitive, interpersonal, business and strategic skills and their associated skill attributes or sub-skills. In addition, Table 3.2 presents a comprehensive analysis of Appendix 1 of the category skill attributes or sub-skills. The literature identified that several skill attributes or sub-skills were associated with more than one category skill. For example, oral communication was identified as a skill attribute for both cognitive and interpersonal skills (Mumford, Campion & Morgeson 2007; Bedwell 2014; Paraham 2015) and cognitive complexity identified for both cognitive and strategic skills (Ambrosini, Jenkins & Collier 2007; Marx 2015). Therefore, the questions for the online survey were guided by the category skill and their associated sub-skill and reflected that sub-skills can be associated with more than one category skill.

Table 3.2 Category Skills and Skill Attributes

Category Skills and Skill Attributes				
Skill Attributes	**Cognitive Skills**	**Interpersonal Skills**	**Business Skills**	**Strategic Skills**
Collecting	✓			
Processing	✓			
Monitoring	✓			
Information gathering	✓			
Information dissemination	✓			
Learning	✓			
Critical Thinking	✓			
Oral Communication	✓	✓		
Written communication	✓	✓		
Adaptability	✓			
Problem solving	✓			
Investigating	✓			
Cognitive capacity	✓			✓
Cognitive complexity	✓			✓
Interacting		✓		
Influencing		✓		
Supervisory		✓		
Negotiating		✓	✓	
People orientation		✓		
Caring		✓		
Empathetic		✓		
Forgiving		✓		
Hospitable		✓		
Patient		✓		
Trustworthy		✓	✓	

Human Relations		✓		
Leader		✓		
Flexible		✓		
Persuasive		✓		
Listening		✓		
Empowering			✓	
Authority			✓	
Staffing			✓	
High standards			✓	
Time management			✓	
Transparency			✓	
Co-ordination			✓	
Technical			✓	
Financial resource allocator			✓	
Budgeting			✓	
Resource allocator			✓	
Strategic planning				✓
Evaluating				✓
Figure head				✓
Spokesperson				✓
Liaison				✓
System perspective				✓
Decision making				✓
Intellectual competency				✓
Provide direction				✓
Communicate the vision				✓
Recognise opportunities				✓
Bring change				✓
Manage change				✓

Source: Adapted from Mumford, Campion & Morgeson (2007)

Table 3.2 presents the skill attributes of cognitive, interpersonal, business and strategic skills as presented in the literature review. Due to the scope of this thesis the literature review did not explore all studies relevant to the category skills. Although the list presented in Table 3.2 is comprehensive it could be argued that there are similarities in some of the skill attributes. For example bring change/manage change, figure head/spokesperson and cognitive capacity/cognitive complexity. However, these similarities do not drawn from the interpretation of the skill attributes.

The online survey format consisted of 26 questions and were categorised into 8 sections. Data was collected from all questions. Section One included twelve questions, questions 1 to 12. Question 1 requested respondents to indicate that they were over the age of 18 and agreed to participate in the online survey by indicating the yes or no button. If respondents selected the no button the online survey was terminated. Question 1 also included a tick box for respondents to register their

interest in phase 2 of the research. Phase 2 involved individual interviews with respondents who indicated that they would like an analysis of their leadership skills. However, due to the scope and the limitations of this thesis, phase 2 would be completed outside this thesis scope and participants were advised accordingly. Questions 2 to 12 explored the demographic profile of the sample and collected data regarding gender, age, Koori or Torres Strait Islander status, organisation type and size, employment type, duration employed in current position, with current organisation and in vocational education with a comparison of public and private providers. According to Sue & Ritter (2007), respondents are likely to abandon the online survey early in the survey, therefore, to mitigate this risk of abandonment section one of the online survey used a short question format, with responses indicated through the application of radio buttons, check boxes and drop down lists. The format enabled the collection of demographic information to describe the characteristics of respondents, enable the disaggregation of data into subgroups and filter respondents (Thomas 2004).

Section Two, consisted of two questions, questions 13 and 22 that used a Likert scale of 1 to 3 ranging from 1 not important to 3 highly important. The 3 point Likert scale was adopted to ensure that the questions were not ambiguous or unclear and that the response category was meaningful to the respondents as well as eliminate mid-point confusion and measurement error (Vogt, Gardner & Haeffele 2012). Question 13 requested respondents to rank in order of importance cognitive, interpersonal, business and strategic skills for their current role. Question 22 requested respondents to rank in order of importance cognitive, interpersonal, business and strategic skills required for promotion within their organisation.

Section Three, consisted of four questions. Questions 14 to 17 used a 10 point Likert scale ranging from 1, ‘not important’ to 10, ‘highly important’. The 10 point Likert scale was used to eliminate possible misinterpretation of midpoint and ensured that respondents were more discerning and thoughtful with their responses (Vogt, Gardner & Haeffele 2012). Question 14 requested respondents to rank the importance of six statements relevant to cognitive skills. The six statements were derived from cognitive skill attributes and consisted of: capacity to problem solve complex issues,

capacity to problem solve complex issues which effect the strategic direction of the organisation, capacity to read understand and apply written information and instructions, ability to make decisions based on clear, rational and informed evidence, ability to learn and adapt new technology to undertake your role and ability to identify and manage risk. Question 15 requested respondents to rank the importance of six statements relevant to interpersonal skills. The six statements were derived from interpersonal skill attributes and consisted of: ability to involve other team members when making decisions, able to apply negotiation skills to reconcile differences between team members/employees, use persuasion skills to influence others to achieve organisational goals, ability to handle conflict and respond to other team members needs and self care. Question 16 requested respondents to rank the importance of six statements relevant to business skills. The statements were derived from business skill attributes and consisted of: capacity to manage staff and material resources, capacity to make decisions regarding the procuring and allocating of equipment, capacity to develop and motivate individuals in their work, ability to be responsible for financial resources of a program or unit delivery, respond to other team members needs and ensure services are provided at a high standard to meet regulatory requirements. Question 17 requested respondents to rank the importance of five statements relevant to strategic skills. The statements were derived from strategic skills attributes and consisted of: capacity to plan and priorities workload, capacity to make decisions regarding the procurement and allocation of equipment, able to apply a systematic perspective to influence planning and implementation, ability to use appropriate problem solving skills to identify alternative actions or solutions and identify internal capabilities and external threats to achieve strategic goals.

Section Four consisted of one question. Question 18 used a Likert scale of 1 to 3 that was anchored from 1 not important to 3 highly important. The 3 point Likert scale was adopted to ensure the questions were not ambiguous or unclear and that the response category was meaningful to the respondents as well as eliminating mid-point confusion and measurement error (Vogt, Gardner & Haeffele 2012). Question 18 requested respondents to consider the skills required for their current role and rank in order of importance the statements of: my organisation supports me in the allocation of resources, my team members expect me to negotiate with internal and external

stakeholders, my problem solving skills enable me to achieve organisational objectives, my ability to identify external threats provides the opportunity for continuous improvements, when making decisions I use data and research evidence, I am required to regularly delegate tasks to other team members, managing staff is a priority in my role and when planning the organisational objectives are clearly considered. The statements were derived from cognitive, interpersonal, business and strategic skill attributes.

Section Five consisted of one question. Question 19 used a free text box and requested respondents to respond to statements to indicate a percentage out of 100% of their daily use of cognitive, interpersonal, business and strategic skills. The statements were derived from cognitive, interpersonal, business and strategic skill attributes and included cognitive skills: problem solving, interpersonal skills: staff supervision, business skills: allocating resources and strategic skills: planning. Section Six consisted of three questions. Question 20, 21 and 25, question 20 requested respondents to provide a free text response to indicate what skills they required additional training in or skills required to better perform their role. Question 21 requested respondents to indicate from a drop down list what skills their organisation thought were important for promotion. The drop down list consisted of cognitive, interpersonal, business and strategic skills attributes and included: budgeting and finance, staff management, strategic planning, communication and all of the above. Question 25 requested respondents to indicate what skills they thought were important for promotion from a drop down list. The drop down list consisted of cognitive, interpersonal, business and strategic skills attributes and included: budgeting and finance, staff management, strategic planning, communication and all of the above.

Section Seven included two questions, question 23 and 24. Question 23 requested respondents to indicate what skills enabled them to undertake their role effectively and to select their response with a tick box. The twelve skills were derived from cognitive, interpersonal, business and strategic skill attributes. The skill attributes included: critical thinking, oral and written communication, problem solving, negotiation, people skills, leadership, managing staff, budgeting, technical skills, strategic planning, managing change and communicate the vision. Question 24 requested respondents to indicate what skills disenabled them to undertake their role

effectively and to select their response with a tick box. The twelve skills were derived from cognitive, interpersonal, business and strategic skill attributes. The skill attributes included: critical thinking, oral and written communication, problem solving, negotiation, people skills, leadership, managing staff, budgeting, technical skills, strategic planning, managing change and communicate the vision. Questions 23 and 24 did not provide provision of ranking of enabling and disenabling skills therefore, data collected from questions 23 and 24 was not utilised to answer the principal research question of this thesis. Section eight consisted of one question. Question 26 requested respondents to indicate their interest in an individual leadership skill analysis. This was confirmed with indicating 'yes' or 'no' and if 'yes' respondents were asked to provide their email address for contact details. The researcher then followed up each individual respondent.

3.6.3 Metadata Collection

The online survey was administered by Qualtrics Online Survey software and enabled the collection of data and metadata concurrently. Although, the online survey collected metadata, the metadata was not used to answer the principal research question. However, the metadata provided information on how participants interacted with the online survey including their start and finish times, where they abandoned the survey and their geographic location (Lauer, Mcleod & Blythe, 2013). The collection of metadata via Qualtrics Online Survey software also enabled the automatic sending of pre-notification e-mails, follow-up reminders sent to non-respondents and thankyou emails to thank participants for their participation. These emails were sent out within the nominated time frame as programmed into Qualtrics online survey software. The metadata collection ensured that only one response per email was provided, therefore, avoided the skewing of data with multiple replies from one user (Lauer, Mcleod & Blythe, 2013).

3.7 Pilot Testing Online Survey

Prior to disseminating the online survey pilot testing was conducted. Pilot testing ensured that the programming administered by Qualtrics Online Survey software would work properly and effectively to collect the correct data (Hunter 2010). Pilot testing of the online survey was undertaken to improve the reliability and validity of the data collected, evaluate individual questions and the entire online survey (Roberts 1999). The process was undertaken to ascertain the value of the questions and ensured that the questions elicited the right information to answer the research question. Furthermore, the pilot test established the appropriate length of the survey and ensured that the respondents remained focused and that the questions were not answered incorrectly due to carelessness or premeditated answers (Bethlehem & Biffignandi 2012).

The pilot testing process involved three steps during the online survey development stage as outlined by Sue & Ritter (2007). Step One: discussions with individuals and groups of academic and non-academic managers employed within the VET sector to receive feedback on the online survey were conducted. Discussions focused on the instructions on how to complete the online survey, survey format, order of questions, wording of questions, response selections, completion time frame and survey layout and design (Roberts 1999). The feedback was reviewed and where applicable the online survey was rectified. Step Two: ten senior managers in vocational education were selected from the researcher's personal networks and contacted via telephone or personally by the researcher to test the pilot online survey. When the nominated senior managers confirmed their participation to review the online survey a draft email invitation with a link to the draft online survey was sent. Step Three: each nominated senior manager who agreed to participate in the review of the online survey was then contacted by telephone or email to provide feedback on the pilot survey. This feedback influenced changes to the online survey and included comments of re-wording of questions to provide more clarity, the order of the questions and further clarification on instructions. Once again, the feedback was reviewed and where necessary the online survey was rectified. This process ensured

that the final survey would elicit the right information to answer the research question (Sue & Ritter 2007).

3.8 The Population and Sample Selection

In order to test the hypothesis for this thesis the population of senior managers employed in VET and the selection of a sample of participants were identified. The complexity of the VET sector together with the inability to gain direct access to individual senior managers details presented challenges in determining the exact population of senior managers employed in Australian VET. Although, the Department of Employment (2016) projects that in 2019 approximately 31,000 vocational education teachers will be employed in Australia, there are no projections to confirm the number of senior managers or the percentage of teachers who will be promoted into senior management roles. The projections indicated that the main employing industries for vocational education teachers would be education and training 84.5%, public administration and safety 2.9%, health care and social assistance 2.4% and professional, scientific and technical services 2.2%. Based on this information and the scope of this thesis, it was not feasible or practical to collect data from the entire population of senior managers employed in the Australian VET sector. Therefore, a sample of senior managers was identified to partake in the online survey. As stated by Veal (2005) a sample is more manageable than the whole population. The size of the sample was determined by the statistical techniques to be conducted to test the hypotheses, the administration requirements of the survey and the research scope (Veal 2005).

3.8.1 Sample Selection and Framework

As outlined by Sue & Ritter (2007), to create a sample selection to participate in the research a sample framework is required. For this thesis a non-probability purposive sample selection was deemed the most suitable sample method as it involved the selection of specific unique participants to collect relevant data to discover, understand and gain insight into what leadership skills are required by senior managers in VET to enable effective leadership within the sector (Merriam 2014). A

purposive sample is a selective or subjective sampling process with the aim to gain a representative sample of a particular group (Cresswell 2009). Although, Roberts (1999) and Vogt, Gardner & Haeffele (2012) recommend that a probability sampling is more likely to produce a sample that represents the population, the purposive sampling method is cost effective and less time consuming than other sampling methods. The sample framework for this thesis was guided by the literature and considered variables of gender, age, training provider type, Koori or Torres Strait Islander status, current position title, employment status and type, duration in current position, in current organisation and in VET and position title. Questions 1 to 12 of the online survey collected the demographic data information. Question 6 was guided by senior manager position titles as developed by (Coates et al. 2013). Respondents indicated their position title from a drop down menu selection and for titles not listed in the drop down menu a free text box was provided. According to Coates et al. (2013), the role of senior manager is categorised into Academic Manager and Non-Academic Manager. The role of academic manager includes planning, organising, directing, controlling and coordinating educational policy and providing advice and educational and administrative support to staff and students in educational institutions. The role of non-academic manager includes the management of tangible and intangible resources with limited input in to direct academic management. However, Harris & Simons (2012) argue that leadership roles in VET are shaped by the size of the organisation and that managers employed in smaller training provider organisations are engaged across most functions of the business. These functions may include developing curriculum, teaching, managing compliance requirements, recruitment and retention of staff and business development. Therefore, in some organisations the role of academic and non-academic manager may be overlapping (Harris & Simons 2012). Table 3.3 presents the indicative position titles for academic and non-academic managers in the Australian VET sector as determined by Coates et al. (2013). The management level within the organisation is dependent on the organisation structure.

Table 3.3 Vocational Education Training Senior Manager Position Title

Vocational Education Training Senior Manager Position Title		
Level	**Role**	**Indicative Position Title**
Senior Manager	Academic Manager	Director of Education, Director of Academic Services, Director of Course Development, Director of Studies, Director of Teaching and Learning, Educational Manager, Head of Department, Head of School, Learning Portfolio Manager, Learning Programs Manager, Manager Educational Programs, Program Coordinator, Program Manager, Head Teacher Senior Education, Course Manager
Senior Manager	Non-Academic Manager	Training Manager Company Director CEO Other

Adapted from Coates et al. (2013)

Table 3.3 presents the indicative position titles for senior managers employed in VET, however the indicative position titles do not represent all titles of senior manager in the sector.

The participants chosen to complete the online survey were managed by obtaining VET senior manager contact details from www.training.gov.au, TAFE and private training provider websites, vocational education membership networks, social media sites and the researchers personal networks. The invitation to participate in the survey was also promoted at the joint conference between the Australian Association for Research in Education and New Zealand Association for Research in Education 2014 (AARE-NZARE). Although 375 email invitations were sent, legislation such as the Privacy and Data Protection Act 2014 (Vic) restricted gaining access to contact details of senior managers employed in the Victorian VET. Therefore, the strategy for this thesis to gain a perfect sample to represent the VET senior manager population was by chance alone and provided differences between the sample and population (Roberts 1999).

3.8.2 Sample Size

In research projects, the sample size is determined on the basis of the relationship of the size to the population (Veal 2005). Creswell (2009) states that the sample size varies according to the type of research being undertaken and the availability of time and resources. Therefore the sample size for this thesis was determined by the number of senior managers that could be contacted via the means available in this thesis scope. The response rate would determine the final number of useable responses, the statistical power and the manageability of the administration of the survey (Roberts 1999). Although, a larger sample size would have improved the statistical analysis, the limited resources to administer and fund the online survey restricted the sample size. Veal (2005) also states that the determinant for the research sample size includes the required level of precision in the results and the level of detail in the proposed analysis. Therefore, the sample of 375 VET senior managers invited to participate in the online survey represented an equal probability of managers employed with public or private training providers (Creswell 2009). Of the sample 100 of the 375 completed the online survey therefore, according to Flick (2009) the number of completions was deemed sufficient to provide the data to address the research question**.** The online survey completions are presented in Table 3.4.

Table 3.4 Online Survey Completions

Online Survey Completions				
Training Provider Type	**Surveys Sent Number (n)**	**Survey Sent (%)**	**Completions (N)**	**Completion Percentage (%)**
Public Provider	210	56	48	22.8
Private Provider	165	44	52	31.5
Total	**375**	**100**	**100**	**27%**

Source: Qualtrics Online Survey Software.

Table 3.4 presents the number of email invitations sent to senior managers employed in Australian VET sector to participate in the online survey. A total of 375 email invitations were sent, 210 (56%) were employed with public providers and 165 (44%) were employed with private providers. 56 % of the public providers 48 (n) and 44% of the private providers 52 (n) completed the online survey resulting in 23% of public training providers and 31.5% of the private training providers completing the survey.

Therefore, the overall completion rate of the online survey was 27%.

3.8.3 Statistical Power for Number of Respondents

Statistical power for number of respondents is the ability to detect the effects of a specific size, given the particular variance and sample size of a study (Sue & Ritter 2007). Roberts (1999) argues that the number of respondents is sufficient if the minimum desired statistical power of 0.80 is achieved, provided that the effect size is a minimum of 0.08, that is a co-efficient of determination (R2) or approximately 0.07. According to Capuano (2008) several factors influence the statistical power of a study and consequently the required sample size. These factors include the hypotheses to be tested, the probability model to test the hypotheses, the significance level, the variance and effect size; and the expected difference between groups (Capuano 2008). Although a larger number of completed surveys would have improved the statistical power, 100 responses of the sample size provided a 27% response rate. The response rate, the statistical power, the manageability of the administration of the survey and the resources available provided a sufficient number of completions to undertake the statistical analysis to answer the principal research question of this thesis.

3.9 Administration of the Online Survey

According to Vogt, Gardner & Haeffele (2012), administration of the survey can be conducted face to face, by telephone or self-administered by paper or electronically. The self administered online survey provided certainty that all respondents would answer the same questions, easy access can be made to respondents in remote and hard to access geographical regions, the time required answering each question is minimal and there is no financial cost to respondents. Criticisms of the self administered online survey include the inability for respondents to participate if there is no access to electronic devices or internet, limited ability to interact with the survey administrator to further explain question and the certainty of the respondents' identity. However, as the participants were employed in senior roles in VET it was assumed that managers at this level would have access to electronic devices and the internet

and therefore the identified criticisms presented as a low risk to the success of data collection. Administration of the online survey was conducted according to the guidelines of Sue & Ritter (2007). The guidelines included how to address issues related to the email distribution including the email invitation to participate, the hyperlink to the online survey, instructions on how to complete the survey, the duration of the survey, the response process and the follow up procedures. The online survey was emailed to participants that included a direct hyperlink to the survey. The online survey was conducted in Qualtrics Online Survey software www.qualtrics.com and hosted on Victoria University website www.vu.edu.au. This process met the ethical requirements Victoria University research data storage.

In order to ensure the email invitation was not deleted the email subject line was concise, intriguing and short (Sue & Ritter 2007). Furthermore, to encourage participants to complete the survey an incentive of an individual leadership skills analysis was provided. According to Sue & Ritter (2007), incentives provided for participation in online surveys can increase completion rate by 19%. The management of the metadata identified respondents' interaction with the email invitation including, viewed, opened, started and/or completed and enabled the automatic administration to follow up non-completed or incompletions of the survey and thank you emails. Each respondent was provided with seven days to complete the survey, if the survey was not completed within the seven day period, a follow up email was sent at seven day intervals until completion or expiration of the online survey. The reminder email highlighted that if the survey had been completed, to please disregard the email. The invitation and thank you emails were personally customised to each individual and distributed automatically via Qualtrics Online Survey software. This process according to Sue & Ritter (2007) was optimal and provided the opportunity to increase response rates.

3.9.1 Online Survey Activation

The online survey was activated on the 1st July 2015 and concluded on 30th November 2015. The duration of activation provided sufficient time for the administration of the survey, response time for participants and data collection and data analysis within the scope of this thesis.

3.10 Final Sample of Responses

According to Sue & Ritter (2007), there is a wide range of response rates that are considered acceptable for online surveys with a range of 20% to 76%. Therefore, according to Malhotra et al. (2004). a response rate of 27% is acceptable as presented in Table 3.5. The final response sample is presented in Table 3.5

Table 3.5 Survey Responses

Survey Responses	
Survey Status	
Number of Surveys Sent	375 (n)
Non Responses	274 (n)
Emails Bounced Back	14 (n)
Surveys Commenced	103 (n)
Surveys Completed	100 (n)
Surveys started and completed	97%

Source: Qualtrics Online Survey Software

3.10.1 Sampling Error

Sampling errors can occur with population specification error, sample framework error, selection error and non-responses. The research methodology aimed to reduce the sampling error as outlined by Sue & Ritter (2007) increasing the sample size, choosing a suitable sample frame, ensuring the online survey design engaged participants and maintaining a robust survey administration process. The management of non-response rates for email surveys has received limited research within the literature and is not as well developed as for mail and telephone surveys with low motivation, technical difficulties and data confidentially as major factors contributing to non-response rates (Sue & Ritter 2007). The test for non-response bias used the characteristics of organisational type, size and location. The response rate was

calculated as the percentage of the number of completed surveys and the number of invitations sent to participate in the survey. Therefore, it can be concluded that there was no significant difference between the characteristics of the respondents and the non-respondents. The bounced emails 14 (n), 3.7%, contributed to the non-response rate and were reviewed for validity and where rectification was required the email was resent. Due to the limitations of the scope of this thesis not all participants were personally contacted to introduce the online survey, this may have contributed to the non-response rate.

3.11 Data File Development

The development of the data file to complete the data analysis for this thesis was designed based on the data collected, the research question and the associated hypotheses to be tested to answer the research question. The data was collected via an online survey process using Qualtrics Online Survey software, which automatically electronically collected and stored the data. However, Qualtrics Online Survey software did not have the data analysis capacity required for this thesis, therefore the data was exported from Qualtrics Online Survey software into Statistical Package for the Social Sciences (SPSS) version 22 format to create a suitable data file. Prior to conducting the statistical analyses to test the hypotheses, the data file was reviewed to ensure that the analysis would provide accurate results. This process included screening and cleaning the data file by editing the data to define the codes, checking the data file for errors and rectifying the errors where necessary. The process also included reviewing missing data, non-responses, invalid or out of range responses and the review of responses to ensure they were not contradictory (Lavrakas 2008; Pallant 2010). The data collection through Qualtrics Online Survey software provided real time data editing hence, the validity of data was evaluated as data was collected.

3.11.1 Missing Data

In order to identify missing data the data analysis strategy used all available information to investigate the missing data patterns. According to Lavrakas (2008), missing data can result from respondents not entirely answering all the questions. To

identify missing data values in relation to number of missing values against the number of non-missing values, a frequency analysis was conducted for each variable using SPSS. Missing data patterns were categorised into missing completely at random (MCAR) data or missing at random (MAR). The missing data option of 'pairwise' was applied to all analyses conducted in SPSS. Pairwise enabled the analyses to only excluded responses if they were missing the data required for the specific analyse and retrospectively, included in any analyses for which they had the necessary information (Pallant 2010).

3.11.2 Data Scoring

Data scoring was guided by Tuckman, (2012) and consisted of four scoring procedures. First, scale scoring, which was undertaken where the online survey required respondents to respond to items represented on a scale, each point on the scale was then assigned a score. After adjusting for reversal in phrasing, a respondent's score was added onto the item within a total scale to obtain the over all score. Second, where the online survey provided ranking scores, respondents were required to rank an item on a list and then the average ranks across all respondents was calculated for each item in the list. Third, categorical or nominal responses were obtained on a scale and the numbers of agreeing responses were calculated, which provided a total score on the scale for all respondents. Finally, respondent counting was obtained with the online survey eliciting categorical or nominal responses on single items, scoring then counted the number of respondents who provided a particular response to an item. Respondent counting enabled the development of a contingency table to employ a chi–square (x_2) analysis.

3.11.3 Data Pre and Post-coding

Where possible, pre-coding of the variables was adapted prior to the data collection to ensure relevant information was obtained. This process eliminated coding as a separate step in the data reduction and also provided an easy format for data collection and greater efficiency and coder reliability than post-coding (Tuckman 2012). Data from questions 1 to 12 were recoded and the variables were renamed to

enable easier analysis and are presented in Table 3.6.

Table 3.6 Data Original Coding and Recoding

Data Original Coding and Recoding				
	Original Coding		**Recoding**	
Question No	**Variable**	**Code**	**Label**	**Code**
3	Gender • Male • Female	 1 2	 Male Female	 0 1
4	Age (Years) • 20 - 30 • 31 - 40 • 41 - 50 • 51-60 • 61 plus	 1 2 3 4 5	< 40 years > 40 years	0 1
5	Organisation Type • TAFE • Private RTO • Enterprise RTO • Other • All	 1 2 3 4 5	Private Public	0 1
7	Current Position • Academic Manager/Director of Education or Academic Services • Director of studies/Teaching • Educational Manager/Head of School • Program/Training Manager • Business Development Manager • Course Manager/Head Teacher/Senior Education • Other	 1 2 3 4 5 6	Academic Manager Non-academic manager	0 1
8	Organisation Size • Under 10 EFT • 20 - 49 EFT • 50 - 99 EFT • 100 - 199 EFT • 200 - 400 EFT • Over 400 EFT	 1 2 3 4 5 6	< 100EFT > 100EFT	0 1
9	Employment Type • Fulltime - Ongoing • Full time - Contract • Part time - Contract • Casual • Sessional • Other	 1 2 3 4 5 6	Full time Part Time	0 1
10	Duration employed in current position • Under 1 Year • 2 years • 3 - 5 years • 6 - 10 years	 1 2 3 4	< 5 years > 5 years	0 1

	• 11 years plus	5		
11	Duration with current organisation • Under 1 Year • 2 years • 3 - 5 years • 6 - 10 years • 11 years plus	 1 2 3 4 5	< 5 years > 5 years	0 1
12	Duration employed in vocational education • Under 1 Year • 2 years • 3 - 5 years • 6 - 10 years • 11 years plus	 1 2 3 4 5	 < 5 years > 5 years	 0 1

Source: SPSS OutPut

3.12 Hypotheses Testing

To answer the principal research question each hypothesis was tested with the appropriate data analysis technique. The factors influencing the choice of data analysis technique was determined by the research question, the number of dependent and independent variables, the relationship between variables or group differences, data collection methodology and the scale of measurement used to measure the variables. Four hypotheses were developed to answer the principal research question based on the conceptual framework of this thesis and Mumford, Champion & Morgeson (2007) study to test the LSSM. The data analyses techniques to test the hypotheses were guided by Kerr (2002) and are presented in Table 3.7.

Table 3.7 Hypotheses Testing Data Analysis

Hypotheses Testing Data Analysis					
Hypothesis Number	**Research Question**	**Number of dependent variables (DVs)**	**Number of independent variables (IVs)**	**Analytical Technique**	**Goal of Analysis**
H1	Degree of relationship among variables	Multiple	Multiple	Factor Analysis: Exploratory Factor Analysis & Confirmatory Factor Analysis	Create a linear combination of IVs to predict DV optimally
H2	Degree of relationship among variables	Multiple	Multiple	Frequency Test: Means Test & Independent t-test	Create a linear combination of IVs to predict DV optimally
H3	Degree of relationship among	Multiple	Multiple	Frequency Test: Correlation, Means Test &	Create a linear combination of IVs to predict

	variables			Independent t-test	DV optimally
H4	Significance of group differences Degree if relationship among variables	Multiple	Multiple	Factor Analysis: Exploratory Factor Analysis & Confirmatory Factor Analysis Independent T-Test	Create a linear combination of DVs to maximise group differences Create a linear combination of IVs to predict DV optimally

Notes: IV – Independent variable DV – Dependent variable. Source: Adapted from Kerr (2002)

3.12.1 H1: Cognitive, interpersonal, business and strategic skills are empirically distinguishable leadership skills.

Hypothesis 1 proposed that cognitive, interpersonal, business and strategic skills would be empirically distinguishable. In order to test hypothesis 1 to determine if cognitive, interpersonal, business and strategic skills are empirically distinguishable a Factor Analysis (FA) was conducted with an Exploratory Factor Analysis (EFA) approach. The goal of the EFA was to determine the number of latent constructs underlying the items and to provide a means of explaining variation amongst them to enable the labelling of the factors. The EFA provided a variable reduction technique to identify the number of latent constructs and the underlying factor structure of the variables and estimate factors that influenced responses on observed variables to identify the number of factors. Second, a Confirmatory Factor Analysis (CFA) was conducted to statistically test the outcomes of the EFA and further test the LSSM. The CFA enabled the evaluation of the factorial validity of the EFA and to statistical test the hypotheses and the LSSM theory. Data was collected from questions 14 to 17.

3.12.2 H2: Leadership skill requirement will vary by skill category with cognitive skills required the most, followed by interpersonal, business and strategic skills.

Hypothesis 2 proposed that leadership skill requirement will vary by skill category and that cognitive skills will be required the most followed by interpersonal, business and strategic skills. In order to test if leadership skill requirement will vary by skill

category and that cognitive skills would be required the most followed by interpersonal, business and strategic skills respectively frequency tests including a means test and independent t-test on data collected from question 19 was conducted.

3.12.3 H3: Cognitive, interpersonal, business and strategic skills requirement will be related to management level in an organisation.

Hypothesis 3 proposed that cognitive, interpersonal, business and strategic skills requirements are related to management level in an organisation. In order to test hypothesis 3 to determine if cognitive, interpersonal, business and strategic skills requirements are related to management level in an organisation, frequency test including means and independent t-test and a correlation test was conducted from data collected from questions 13 and 22.

3.12.4 H4: Leadership skill requirements will differ with public and private training providers

Hypothesis 4 proposed that leadership skills requirements would differ with training provider types. In order to test hypothesis 4 three distinct statistical analyses were conducted. First an independent t-test was conducted on the category skills to determine leadership skill requirements based on the two distinct group categories of public and private provider. Second, in order to further define leadership skill requirements of the two groups an EFA was conducted on the skill attributes or sub-skills of the category skills. The aim of the EFA was to determine factorial validity of data collected from questions 14 to 17. Third a CFA was conducted from the results of the EFA to test the validity of the EFA and the LSSM theory.

3.13 Data Analysis

The data analysis process involved five stages as recommended by Pallant (2010). Stage One included the development of the data codes. Stage Two, the creation of a data file and data structure. Stage three, the screening of the data file for errors. Stage

Four, the exploration of data using descriptive statistics and finally Stage Five, modifying variables to explore relationships and to compare groups between variables. Creating the data file required the checking and modifying the data where necessary once exported from Qualtrics Online Survey software to SPSS. The structure of the data file was determined by defining the variables and ensuring that the values obtained from each response matched each variable (Pallant 2010). This process required the screening and cleaning of the data as guided by Pallant (2010). The process required checking for errors to ensure that the variables for the scores were not outside the identified range and finding and correcting the errors in the data file which required the correction and the deletion of values where necessary. Preliminary analysis of the data required the inspection of the data file to identify variables to ensure that statistical techniques could be conducted in order to test the hypotheses to answer the principal research question (Pallant 2010). This process required the checking of categorical and continuous variables and in particular the distribution of variables with regards to normality and outliers using scree plot graphs and data manipulation. Furthermore, violations and assumptions of the data were also checked prior to statistical analysis.

3.13.1 Testing Data Distribution

Prior to conducting data analysis the testing of data distribution was conducted, this process involved the testing for normality for the distribution of data and to identify outliers by determining the Skewness, Kurtosis and Kolmogorov-Simirov value of the data. The skewness value provided an indication of the symmetry of the distribution of data, a positive skewness value indicated a positive skew and a negative skewness value indicated a negative skew. Kurtosis values below 0.0 indicated a flat distribution. Therefore, to analyse the data further, a histogram was undertaken to determine the shape and distribution of the data to test for normal distribution (Pallant 2010). In addition the Kolmogorov-Simirov analysis was applied and a significance value of 0.05 indicated a non-significant result therefore, suggesting normal distribution of the data (Pallant 2010).

3.13.2 Statistical Measurements

Statistical measurements to determine the significance of the results of the data analysis were used and were dependent on the statistical technique and assumptions. The data was categorised into nominal (categorical), ordinal (ranked) scale and interval and ratio (continuous) data (Pallant 2010). Statistical measurements included means and standard deviation and the *p*-value, to determine the significance of results, Cronbach's measurement of scale for reliability and validity of scales, Pearson's correlation measurement to determine the correlation values, the effect size measurement to quantify the difference between two groups and emphasises the size of the difference and the confirmatory factor analysis model fit indices.

The means provided the centre of the distribution and the standard deviation (SD) measured the width of the distribution. Frequency analysis provided the means and standard deviation value. The *p*-value determined the significance of the statistical results when testing the validity of a claim or a null hypothesis. The test results were reported as recommended by Pallant (2010) based on the *p*-value level as presented in Table 3.8. All probabilities reported were based on two-tailed tests as each comparison had two possible directions.

Table 3.8 *p*-Value Significance of Results

***p*-Value Significance of Results**	
***p*-Value**	**Rating**
$0.05 > p < 0.01$	Significant
$0.01 > p < 0.001$	Highly significant
$0.001 > p$	Very highly significant

Source: Adapted from Pallant (2010)

Table 3.8 presents the p-value significance of results. The *p*-value significance of results with measurements greater than 0.05 and less than 0.01 presents a significant result, greater than 0.01 and less than 0.001 is a highly significant result and greater than 0.001 is a very highly significant result. Thus, the lower the *p*-value the stronger the evidence against the claim or the null hypothesis tested. Put differently, a *p*-value lower than 0.05 indicates significant support for the rejection of the null hypothesis.

Measurement for data reliability and validity was paramount in the design of the online survey to eliminate poor data quality, as poor data quality would have a profound effect on the data analysis (Roberts 1999). Measures of error of the data included reliability and validity. Reliability is the degree to which the assessment tool produces stable and consistent results and validity refers to how well the test measured what it is purported to measure (Sue & Ritter 2007). As recommended by Pallant (2010) measurement and reliability of scales were conducted to ensure the internal scales were consistent and refers to the degree of each item that make up the scale hang together. Questions 13 to 17 and 22 used a scale measurement of a Likert scale. The Likert scale was used to gauge the respondents' view of on leadership skills and to identify responses to questions on a scale (Vogt, Gardner & Haeffele 2012). In addition, the Likert scale enabled respondents to rate their degree of agreement or disagreement to the questions on interval properties, which produced data that was interval scaled (Wilson 2014). Questions 13 and 22 used a Likert scale of 1 to 3 that was anchored from 1 not important to 3 highly important. The 3 point Likert scale was adopted to ensure the questions were not ambiguous or unclear and that the response category was meaningful to the respondents as well as eliminating mid-point confusion and measurement error (Vogt, Gardner & Haeffele 2012). Questions 14 to 17 used a 10 point Likert scale that was anchored from 1, not important to 10, highly important. The 10 point Likert scale was used to eliminate possible misinterpretation of midpoint to ensure that respondents were more discerning and thoughtful with their response (Vogt, Gardner & Haeffele 2012). The scales were measured using the Cronbach's coefficient alpha and the validity of the scale construct was tested against theoretically derived hypotheses concerning the nature of the underlying variable or construct. The measurement of scale is presented in Table 3.9.

Table 3.9 Measurement of Scale

Measurement of Scale	
Cronbach's Alpha	**Rating**
< 0.5	Poor
0.7	Good
> 0.8	Excellent

Source: Pallant (2010)

Table 3.9 presents the measure of scale Cronbach's Alpha rating. The measurement of scale Cronbach's Alpha rating indicates a scale rating of less than 0.5 as poor, 0.7 good and greater than 0.8 excellent.

Pearson's correlation measurement was used to identify the correlation between variables in the data collected from questions 13 and 22. Correlation can present with a positive or negative correlation value of -1 to +1. The size of the value provides an indication of the strength of the relationship between variables with 1 or -1 being a perfect correlation (Pallant 2010). The Pearson correlation measurement values are presented in Table 3.10.

Table 3.10 Pearson Correlation Measurements

Pearson Correlation Measurements	
Correlation	**Strength**
0.10 to 0.29	Small
0.30 to 0.49	Strong
0.50 to 1.0	Very strong

Source: Adapted from Pallant (2010)

Table 3.10 presents the Pearson correlation measurements. The Pearson Correlation measurements indicate that a correlation measurement of 0.10 to 0.29 the correlation strength is small, 0.30 to 0.40 strong and 0.50 to 1.0 very strong.

The effect size quantifies the difference between two groups and emphasises the size of the difference, rather than the size of the sample. The effect size is also referred to as the 'strength of association which indicates the relative magnitude of the differences between means, or the amount of the total variance in the dependent variable that is predictable from knowledge of the levels of the independent variable (Pallant 2010, p. 210). In order to access the statistical results and to determine the effect size the Eta squared and Cohen's d were applied. Table 3.11 presents the effect size measurements.

Table 3.11 Effect Size Measurements

Effect Size Measurements		
Size	**Eta Squared (% of variance explained)**	**Cohen's d (standard deviation units)**
Small	0.01 or 1%	0.2
Medium	0.06 or 6%	0.5
Large	0.138 or 13.8%	0.8

Source: Pallant (2010)

Table 3.11 present the effective size measurements. The effect size measurement presents the small effect size as Eta squared (percentage of the variance explained) at 0.01 or 1% and determines the Cohen's d (standard deviation units) of 0.2, medium 0.06 or 6% and Cohen's d (standard deviation) 0.5 and large 0.138 or 13.8% Cohen's d (standard deviation) 0.8.

Confirmatory Factor Analysis (CFA) is 'used to test a hypothesis developed in line with a theory' (Khine 2013, p. 158). In order to conduct the CFA the pattern matrix data generated from the exploratory factor analysis (EFA) agnostic extraction method and a four factor extraction was used to determine a model fit of the four leadership skills as presented in the LSSM of cognitive, interpersonal, business and strategic skills. According to Khine (2013) there are disagreements over what constitutes acceptable values for model fit indices and therefore recommends that various fit indices be reported. Therefore, this thesis applied the model fit indices used by Mumford, Champion & Morgeson (2007) LSSM four factor model to determine if cognitive, interpersonal, business and strategic skills would be empirically distinct. The model fit indices were the Normed Fit Index (NFI), Comparative Fit Index (CFI), Root mean square error of approximation (RMSEA) and the Chi-Square (CMIN). The NFI is used to compare a proposed model to the null model and measures the discrepancy between the chi-square value of the hypothesised model and the chi-square of the null model and a result of > 0.90 indicates a good model fit. The CFI indicates the relative lack of fit of a specified model versus the baseline model and is used because of its strengths and insensitivity to model complexity > 0.90 indicates a good model fit. The RMSEA corrects the tendency of the chi-square to reject the model particularly with a large sample size or number of variables and a value of <0.05 indicates a good model fit. The chi-square tests for the extent of

misspecification of the model and 'using the chi-square test is useful in determining the relative fit of the model' (Mumford, Champion & Morgeson 2007, p. 161) and is a good model fit based on the *p*-value. The model fit indices are presented in Table 3.12.

Table 3.12 Model Fit Indices

Model Fit Indices		
Model Fit Indices	**Abbreviation**	**Goodness of Fit Model Measurement**
Normed Fit Index	NFI	> 0 .90
Comparative Fit Index	CFI	> 0.90
Root mean square error of approximation	RMSEA	< 0.05
Chi Square	CMIN	*p*-value

Source: Khine (2013)

Table 3.12 presents the model fit indices to determine the goodness of fit model measurements. The model fit indices of NFI and CFI greater than 0.90 and a RMSEA less than 0.05 presents a goodness of fit model. The CMIN is measured by the p-value.

3.14 Statistical Techniques

A variety of statistical techniques were used to test the hypotheses to answer the principal research question. Descriptive statistics were conducted to determine the characteristics of the sample. In order to determine the required leadership skills an examination of category skills was conducted with a range of statistical analysis. These analyses included a correlation, means and independent t-test. Correlation tests were conducted to determine the strength of correlation of the broad category skills required for the current role of senior manager and skills required for promotion. The means test was conducted to determine the mean of the sample group for skills required for current role and for promotion. The independent t-test was conducted to compare between the two groups e.g. public provider and private providers in relation to skills required for current role and for promotion. In order to further test the category skills an analysis was conducted on the category sub-skills. The analysis included a Factor Analysis (FA) using an Exploratory Factor Analysis (EFA) and a Confirmatory Factor Analysis (CFA) approach to test the validity of the EFA and the LSSM theory.

3.14.1 Descriptive Statistics

Descriptive statistics can explain the characteristics of the sample, identify any violation of assumptions of the statistical techniques applied and answer the principal research question (Pallant 2010). Descriptive statistics are also used to summarise the data to enable statistics to be represented in a unique combination of specific values and identify the relationships between the variables (Sing 2007). The descriptive statistics included frequencies, mean and standard deviation range of scores, skewness and kurtosis. The skewness value provides an indication of the symmetry of the distribution of data, a positive skewness value indicated a positive skew and a negative skewness value indicated a negative skew. Kurtosis values below 0 indicated a flat distribution. Therefore, to analysis the data further a histogram was conducted to determine the shape and distribution of the data (Pallant, 2010). In order to further check the range of normality of distribution a Kolmogorov-Simirov analysis was conducted, a significance value of 0.05 indicated a non-significant result suggesting a normal distribution of scores (Pallant 2010). Although the descriptive statistics described and summarised the characteristics of the sample and provided useful information of the data set they do not test the hypotheses (Comrey & Lee 2003).

3.14.2 Correlation Test

According to Pallant (2010) the correlation test is used to determine the strengths and direction of linear relationship between two variables. Pearson's correlation coefficients presents values from -1 to +1 indicating a positive correlation for example as one variable increases, so too does the other, or a negative correlation as one increases the other decreases. The size of the correlation indicates the strength of the relationship between the two variables. However, correlation tests are not free from criticism and the effect of non-linear relationships, outliers, restriction of range, correlation versus causality and statistical verse practical significance impact on the results. The correlation test was used to determine the strength and direction of correlations of the broad category skills required for current role for promotion. The

correlations also provided a comparison of the results presented for public and private providers.

3.14.3 Means Test

In order to determine the normal distribution of data a frequency analysis was conducted to present the means and standard deviation. The mean in this thesis referred to the sample mean that provided an estimate of the population mean. The sample mean is more manageable as the population mean is difficult to calculate.

3.14.4 Independent t-Test

The independent t-test is used to compare the means scores of two different groups and to test hypotheses (Pallant 2010). Prior to conducting the independent t-test a process to confirm six assumptions to ensure the validity of data was conducted. These assumptions included the verification that the dependent variable could be measured on a continuous scale, the independent variable were categorised into two independent groups (e.g. public and private provider), independence of observation to ensure there was no relationship between the observations in each group or between the groups and there were no significant outliers (that is extreme values compared to the rest of the data), the dependent variable was approximately normally distributed for each group of the independent variables and there was a homogeneity of variances. However, there are factors that can influence the results of the independent t-test, these factors include the sample size, the effect size which is referred to as the difference between the groups and the *p*-value used to evaluate the results of the statistical analysis e.g. 0.05/0.01. According to Pallant (2010) when the sample size is large e.g. 100 or more participants per group the *p*-value is not an issue. However, when the sample size is small as demonstrated in this thesis e.g. less than 50 per group the non-significant results may be due to the insufficient power of the sample size. Therefore, the t-test was used to test hypothesis 4 to determine if leadership skills required for public and private providers differed. The mean presented in the t-test represented the sample mean that provided an estimate of the population mean. The sample mean was used as it is more manageable as the population mean is

difficult to calculate (μ pub = μ pri). Thus, the t-test was used to test the validity of the claim that, on average, the importance of a particular broad category skill is the same in public providers as in private providers. In this case, the formal t-test tested whether the mean score or, say, cognitive skills are statistically the same in the two provider types after allowing for some variation within each group. Hence, in testing H_4, for example, the t-test was used to examine if the null or no mean differences was valid. If the null was rejected due to a significant *p*-value then there was support for H_4.

3.14.5 Factor Analysis

According to Pallant (2010), Factor Analysis (FA) is used to reduce a large number of related variables to a more manageable number. The two main approaches of factor analysis are Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) and were used in this thesis. Although there are conflicting recommendations in the literature regarding the range of sample size necessary to obtain factor solutions that are adequately stable and correspond closely to the population factor, Comrey & Lee (2013) state that a sample of 100 as demonstrated in the sample for this thesis is acceptable and will provide a correlation matrix to enable factors to be extracted. Pallant, (2010) concurs that the sample size is not important however, the ratio of participants to items for example 10 to 1 ratio or 5 to 1 is important to provide statistical analysis. Therefore, the data collected from questions 14 to 17 from the 100 respondents was sufficient to conduct the EFA and CFA.

The EFA is used in the early stages of the research to gather information and to explore the interrelationships amongst the variables and the CFA, which is more complex and used later in the research process (Pallant 2010). The aim of the CFA was to 'test a hypothesis developed in line with a theory' (Khine 2013, p. 158) and is used after the EFA to determine if a clear delineated model can be confirmed by the data. Furthermore, CFA is a multivariate statistical procedure that is used to measure variables in order to test the constructs of the four leadership skills of the LSSM.
The EFA was used to determine the factor structure and CFA and to verify the factor

structure. In addition, the aim of the EFA was to reduce the number of variables, examine the structure and relationship between variables and estimate factors and extracted factors representing category sub-skills (independent variables). The maximum likelihood extraction method with direct oblimin rotation was applied, as this method is widely understood and conforms to the factor analytic model in which common variance is analysed with the unique and error variance removed. The assessment for the suitability of the data was dependent on the sample size and strength of the inter-correlation between variables. Correlation is the value of one variable enabling the accurate prediction of the values of a second value. According to Comrey & Lee (2013) the value of the variable factor correlation is used to judge the potential factor interpretation as demonstrated in scale of variable factor correlation as presented in Table 3.13. An EPA was conducted on data collected from questions 14 to 17 to test hypotheses 1 and 4. Questions 14 to 17 provide data in relation to the skill attributes or sub-skills of the four broad leadership skills of cognitive, interpersonal, business and strategic skills.

Table 3.13 Scale of Variable Factor Correlation

Scale of Variable Factor Correlation		
Oblique rotation (Direct oblimin with Kaiser Normalisation) Factor Loading	Percentage of Variance	Rating
0.71	50%	Excellent
0.63	40%	Very Good
0.55	30%	Good
0.45	20%	Fair
0.30	10%	Poor

Source: Adapted from Comrey & Lee (2013)

Table 3.13 presents the scale of variable factor correlation with the application of oblique rotation (Direct oblimin with Kaiser Normalisation) to determine factor loadings, percentage of variance and factor rating. Oblique rotation factor loading of 0.71 with a 50% variance presents an excellent rating, 0.63 with 40% variance very good rating, 0.55 with a 30% variance good rating, 0.45 with 20% variance fair rating and 0.30 with 10% variance presents with a poor rating.

The factor analysis process was guided by Comrey & Lee (2013) and included the assessment of the suitability of the data for EFA, selection of the variables, computing the matrix of correlations among the variables, extracting the un-rotated factors, rotating the factors and interpreting the rotated factor matrix. Prior to conducting the EFA four testing of assumptions were confirmed. First, the ordinal variables scales of reliability were measured, second a linear relationship between all variables and the identification of significant outliers using a scatterplot was conducted, third to determine if the sampling was adequate it was measured using Kaiser-Meyer-Olkin (KMO) and finally the data was reviewed to be suitable for data reduction with the application of the Bartlett's test of sphericity test (Pallant 2010).

The number of factors retained were guided by the eigenvalue rule where only factors with an eigenvalue of 1.0 or more were retained for the purpose of investigation, 'the eigenvalue of a factor represents the amount of the total variance explained by the factor' (Pallant, 2010, p. 184). Factor rotation of direct oblimin was applied as the oblique rotation methods assume that the factors are correlated. Factor rotation was applied to interpret the factors according to Comrey & Lee (2013) un-rotated factors do not represent useful factor constructs. The rotation provided a 'simple structure, which represented that each variable loaded on one component only and each component was represented by a number of strongly loading variables' (Pallant 2010, p.185). Furthermore, Comrey & Lee (2013) recommend a ratio of six variables per factor with a minimum of 3.0 as a small number of variables per factor with communalities value less than 0.50 are considered high overdetermination and factors with fewer than three variables are generally consider weak, the overdetermination of the factor, is the number of variables per factor. Communalities were viewed to ascertain the variance in each of the original variables by the extracted factors and communalities variable less than 0.4 were excluded from the analysis as the factor solution contained less than half of the variance in the original variable (Comrey & Lee 2013). Due to the small sample size all factors with a communalities variable greater than 0.4 were included however, this resulted in factors with less than three variables.

The EFA process first requested an agnostic factor extraction approach using the selection criterion of a factor eigenvalue being greater than 1. Second, a four factor extraction was requested using the same selection criterion of eigenvalues being greater than 1. In order to assess the suitability of the EFA output the correlation matrix required correlations with a value of 0.4 or greater, the Barlett's test of sphericity to be statistically significant required a p value of $p < 0.05$ and the Kaiser-Meyer-Olkin value of 0.6 or greater (Pallant 2010). Although, Pallant (2010) suggests that the EFA has limitations and criticises the number of factors and rotational scheme as they are based on practical rather than theoretical considerations, the EFA is suitable in the first stages of the data analysis. The EFA analysis generated a pattern matrix that represented the regression equation where the standardised observed variables were expressed as a function of the factors. The loadings were the regression coefficients. The structure matrix holds the correlations between the variables and the factors. The data from the EFA pattern matrix was used to conduct a CFA to further test the LSSM theory and hypotheses 1 and 4.

3.14.6 Confirmatory Factor Analysis

The CFA approach was used to test LSSM theory and hypothesis 1 and 4. Hypothesis 1 was tested to determine if cognitive, interpersonal, business and strategic skills are distinguishable leadership skills. Hypothesis 4 was tested to determine if leadership skill requirements differ by training provider type. The CFA approach to data analysis provided an explicit estimate of error variance parameters, which other techniques cannot provide; in addition it incorporated unobserved and observed variables and was capable of modelling multivariate relations and estimating direct and indirect effects of variables. The aim of the CFA was to examine the interrelationships among various constructs to measure a set of observed variables and develop a structural equation model (SEM). The SEM assumes that there are no specific directional relationships between the constructs as they are correlated with each other. The success of SEM is dependent on the sample size as the sample size determines the model specification and the extent to which the hypothesised model illustrates specification error or lack of relevant variables in the model (Khine 2013). Analysis of Moment Structures (AMOS) version 22 software was used to conduct the

CFA.

The CFA model fit were assessed by four indices: the Comparative Fit Index (CFI), the Normed Fit Index (NFI), the Root Mean Square Error of Approximation (RMSEA) and the chi-square test (CMIN). The CFI measures the model fit by examining the discrepancy between the data and the hypothesised model with a value greater than 0.90 indicating a good model fit. The NFI measures the differences between the chi-square value of the hypothesised model and the chi-square value of the null model with a value of 0.95 or greater indicating a good model fit and the RMSEA measures the differences between the sample covariance matrix and the model covariance matrix with a value of 0.08 or less indicated an acceptable model fit. The chi-square test (CMIN) indicates the differences between the observed and expected covariance matrix and a p-value of 0.0 indicates a good model fit (Khine 2013).

3.15 Limitations of Quantitative Research Methodology

Previous studies testing the LSSM have applied a quantitative methodology approach (Mumford, Campion & Morgeson 2007; Kalargyrou, Pescosolido & Kalargiros 2012). Therefore, based on previous research and the scope of this thesis, the quantitative research methodology was deemed the most suitable research methodology. However, quantitative methodology is not without criticism or limitations for this thesis. The major limitation of the quantitative methodology applied to this thesis was the online survey as the data collection tool. The online survey as the data collection tool may have had an impact on the final sample size. The sample size may have been affected due to participants' level of IT skills and access to electronic hardware and internet. Participants were not contacted by the researcher prior to conducting the online survey due to the limitations of the thesis scope and may have effected participants' motivation to participate. Furthermore, they may not have been fully aware of the objectives of the survey prior to receiving the invitation to participate. In addition, email filters may have classified the email as spam or junk mail and therefore, deleted the email. The questions of the online survey were structured and limited to collecting data on the category and sub-skills of the

LSSM. Therefore, respondents were unable to provide qualitative data in their responses. Finally, once the online survey had been distributed no further changes could be made to the online survey by the administrator to amend format or questions on the basis of survey drop out or response rates. For example, once the online survey had been distributed it was identified that question 26, identifying enabling skills and question 27, identifying disabling skills, were measured with a tick box rather than a scale range, therefore data collected from questions 26 and 27 could not be statistically measured. The limitations of the research methodology may have contributed to the response rate and affected the statistical significance of the findings.

3.16 Research Ethics

This thesis focused on people's lives and therefore, ethical considerations were important. Ethical considerations included the confidentiality of the data collection process and data storage (Merriam 2014). Confidentiality and anonymity of the participants was of a high priority therefore, participants were assured that their personal identification would be removed or changed from the written data and presentation of the analysis (Flick 2013). This thesis involved the collection of anonymous and non-sensitive data via the online survey and posed no foreseeable risks or discomfort to participants. Therefore, any foreseeable risk was considered no more than an inconvenience. The thesis was assigned to the Low Risk Human Research Ethics Committee at Victoria University and was rated at low risk. This Australian based thesis was not a pilot study or formed part of a larger study and did not focus on Australian Indigenous population or involve children under the age of 18 years. Access to the data collected will be available to the researcher, principal supervisor and co-supervisor and no individuals or organisations external to the research team will have access to the data collected. Risk assessment, confidentiality, informed consent, data access and ownership advice on data collection as well as an explanation and purpose of the thesis and the rationale for the applied methodology and ethical and legal consideration was completed. Informed consent to participate in the online survey was implied by the agreement of participants to the terms and conditions of the online survey. Ethics approval was granted on 10th July 2015, by

Victoria University, Human Research Ethics Committee.

3.17 Chapter Summary

This chapter provided the methodology for the collection of data and data analysis procedures for this thesis. The data was analysed as presented in Chapter 4, to test the hypotheses with the aim to answer the principal research question. A positivist research paradigm and quantitative methodology approach was adopted. The quantitative methodology used a process to reduce the principal research question into four hypotheses. Hypothesis 1: Cognitive, interpersonal, business and strategic skills are empirically distinguishable leadership skills. Hypothesis 2: Leadership skill requirement will vary by skill category with cognitive skills required the most, followed by interpersonal, business and strategic skills. Hypothesis 3: Cognitive, interpersonal, business and strategic skill requirements will be related to management level in an organisation and Hypothesis 4: Leadership skill requirements will differ with public and private training providers.

For this thesis the online survey method was deemed the most appropriate tool for the collection of data to test the hypotheses based on previous studies conducted by Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012). The literature review and the conceptual framework of this thesis guided the structure, contents and questions of the online survey. The online survey was developed using Qualtrics Online Survey software and included the management of the survey questions, structure, graphic design, format and technical aspects for the collection of data. Pilot testing of the online survey was conducted to validate the survey software programming and to ensure that the data collected was correct, reliable and valid. The feedback from the pilot testing was reviewed and implemented into the final draft of the online survey prior to distribution.

The population of senior managers employed in VET was not analysed due to practicability and the scope of this thesis therefore, a sample of senior managers was selected from the population guided by a sample selection process and framework. Qualtrics Online Survey software was used to host and distribute the online survey

and store the data collected. This process assisted in the administration of the online survey including the distribution and management of responses and non-responses. On the expiration date of the survey the response numbers were reviewed and 100 completed responses received were deemed sufficient to conduct the data analysis. The data file from Qualtrics Online Survey software was then downloaded into a compatible SPSS file format for further statistical analysis using SPSS version 22 and AMOS version 22.

Statistical techniques included frequency analyses with means and independent t-tests, Pearson's correlation test, to test correlations and factor analysis (FA). The FA included an Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The EFA was used in the early stages of the data analysis to gather information to explore the interrelationships amongst the variables. The aim of the CFA, which is more complex than the EFA, was to examine the interrelationships among various constructs to measure a set of observed variables and develop a structural equation model (SEM). The CFA was conducted to test the LSSM theory and hypotheses 1 and 4. Although, quantitative research methodology was used for this thesis, the online survey as the data collection tool was identified as major limitation to the methodology.

Chapter 3 was guided by Chapter 2 and outlined the methodology for the data collection and analysis. The results of the data analysis will be presented in Chapter 4. Chapter 5 will provide the conclusions of the data analysis and identify practical and academic implications of the findings.

CHAPTER 4 DATA ANALYSIS

4.1 Chapter Introduction

Chapter 3 presented the guidelines for data analysis methodology for this thesis to answer the principal research question. The online survey as presented in Appendix 2, collected data from 26 questions, however only data collected from questions 2 to 17 and 22 were used to test the hypotheses in order to answer the principal research question. The data collected from the remaining questions provided further insight into leadership skills for senior managers in VET and although the data was not relevant to answer the research question it can be used in future research. Descriptive statistics were presented from data collected from questions 2 to 12, question 13 collected data relevant to the importance of category skills for respondents' current role. Questions 14 to 17 collected data relevant to the importance cognitive, interpersonal, business and strategic skills and their associated skill attributes or sub-skills. Question 19 collected data regarding the daily utilisation of each category leadership skill and question 22 collected data relevant to the importance of category skills required for promotion. Chapter 4 reports the data analysis findings using the methodology as presented in Chapter 3 and Chapter 5 presents the conclusions of the data analysis findings and impacts on the Australian VET sector.

Chapter 4 also provides an overview of the data editing process that implemented SPSS to ensure that the data met the requirements and assumptions for the statistical techniques as presented in Chapter 3. The data editing process enabled the detection of normal distribution of the data, the management of missing data and the testing of the scale questions to ensure that the data collected from the scale questions was reliable and valid. In order to determine if the data distribution was normal histograms were conducted and frequency tests presented the percentage of values missing for each variable. The testing of scales were measured using the Cronbach's coefficient alpha to ensure that the scales were free from error and the items in the scale were measuring the same underlying attributes.

In order to provide descriptive statistics of the sample, frequency tests were conducted on the categorical demographic variables of data collected from questions 2 to 12. Furthermore to test hypothesis 1 that proposed cognitive, interpersonal, business and strategic skills are empirically distinguishable leadership skills, a variety of statistical analyses were conducted. The statistical analyses used data from questions 14 to 17 and included frequency tests of a means and independent t-test, factor analysis using an exploratory factor analysis (EFA) approach and confirmatory factor analysis (CFA). In order to test hypothesis 2 that proposed leadership skill requirements would differ by skill category with cognitive skills required the most, followed by interpersonal, business and strategic skills. The statistical analysis used data from question 19 the statistical analysis included frequency test of a means and independent t-test. In addition, to test hypothesis 3 that proposed that cognitive, interpersonal, business and strategic skill requirements are related to management level. The statistical analysis used data from questions 13 and 22. A correlation test was a conducted to obtain a Pearson's correlation coefficient. The Pearson's correlation measured the strength and direction of the linear relationships between each of the category skills for current role and each of the category skills for promotion. Finally, hypothesis 4 proposed that leadership skills requirements would differ with training provider types. In order to test hypothesis 4 three distinct statistical analyses were conducted. First an independent t-test was conducted on the category skills to determine leadership skill requirements based on the two distinct group categories of public and private provider. Second, in order to further define leadership skill requirements of the two groups an EFA was conducted on the skill attributes or sub-skills of the category skills. The aim of the EFA was to determine factorial validity of data collected from questions 14 to 17. Third a CFA was conducted from the results of the EFA to test the validity of the EFA and the LSSM theory.

Results from the data analysis are presented in this chapter and will guide Chapter 5 to provide the conclusions and implications from the findings. The findings will present the implications to VET leadership practices and policies and contribute to academic knowledge in the areas of leadership, leadership skills and vocational education.

4.2 Data Editing

The data editing process enabled the detection and correcting of errors in the raw data including the identification of missing data, invalid or not completed responses and out of range responses which were contradictory to the normal range data. Therefore, in order to identify missing data a frequency analysis was conducted using SPSS to determine the percentage of values missing for each variable. Missing data patterns were categorised into missing completely at random (MCAR) data or missing at random (MAR). When conducting statistical analysis in SPSS, missing data was managed using the exclude cases pairwise option. The exclude cases pairwise option only excludes the response if the response is missing the data required for the specific analysis and retrospectively includes the response in the analysis for which there is the necessary data (Pallant 2010). The data editing procedure also included the testing of the reliability and validity of scale items of the online survey to ensure the scales were free from error and that the items in the scale measured the same underlying attributes. The scales were measured using the Cronbach's coefficient alpha and this process revealed that the questions in the online survey were valid and all scale questions achieved a Cronbach's alpha value greater than 0.70.

4.3 Descriptive Statistics

In order to provide an understanding of the sample, a descriptive analysis was conducted on the demographic variables on data collected from questions 2 to 12 of the online survey. These items explored the demographic profile of the sample and provided data regarding gender, age, Koori or Torres Strait Islander status, organisation type and size, employment type, duration employed in current position, with current organisation and in VET. Table 4.1 presents the descriptive analysis for all providers and a comparison of public and private providers.

Table 4.1 Descriptive Statistics

Descriptive Statistics				
Variable	**Item**	**All**	**Public**	**Private**
Gender	Male	45.5%	45%	46%
Age	> 40 years	83.5%	83%	84%
Organisation Type	Public		48%	52%
Koori /Torres Strait Islander status (KTSI)	KTSI	6%	6%	6%
Position Title	Academic Manager	60.5%	50%	71%
Organisation Size	> 100 (EFT)	66%	94%	38%
Employment Type	Full time	78%	87%	69%
Duration employed with current organisation	> 5 years	54%	73%	35%
Duration employed in vocational education	> 5 years	87%	85%	89%

Source: SPSS Output

Table 4.1 summarises key variables for the 100 respondents, of which 54 were male and 46 female. All respondents indicated that they held the position of senior manager in vocational education and were over the age of 18 years. The gender distribution was the same across all provider types. The age identification revealed that the vast majority of senior managers were over 40 years of age and was consistent across all provider types. There was a slightly higher number employed with private training providers 52% and 48% employed in public training providers. The organisation size varied across provider type with 94% of respondents employed in public training providers indicating their organisations employed more than 100 staff employed full time (EFT) compared to only 38% of those employed with private training providers. This is contributed to TAFEs' who have a larger training scope and enrol hundreds of students and therefore require more staff in comparison to private providers who have a vast variation in training scope and student enrolments. The Koori or Torres Strait Islander status was low across all training provider types, with 6% in public and 6% in private training providers. The formal title of senior manager was varied across public and private training provider types and was categories into Academic Manager or Non-Academic Manager. Those employed as Academic Managers were those managers responsible for the direct delivery of education programs and Non-Academic Managers were those responsible for non-education programs and held more operational roles. Of the responses 60.5% indicated their role as Academic Manager. Of the public training providers, 50% indicated their role as Academic Manager, which is significantly lower than private providers of 71%. This may be contributed to the fact that Academic Managers employed with private providers are conducting both academic and non-academic

tasks within their role.

Those employed full time represented 78% of respondents, with public training providers 87% and 69% for private training providers. Fifty four per cent of senior managers have been employed with their current organisation for more than 5 years with public training providers having 73% and private training providers 35%. Examining careers over the longer term we presented that 87% were employed in VET for more than 5 years, with public training providers on 85% and private training providers on 89%.

In summary, the descriptive analysis indicates that the gender distribution of senior managers was equally distributed for both public and private training providers. However, the age distribution of 84% being more than 40 years is expected, as most managers would be in this age group and is represented in both public and private training providers. The organisation size is distinctly varied with 62% of private organisations employing less than 100 EFT staff. The senior manager role titled varied across training provider type with private training providers having a larger number of Academic Managers. In addition, there is a significant bias to full time employment for both public and private providers. Examining careers over the longer term there is a higher number employed more than 5 years within VET indicating that senior managers tend to stay employed within the VET sector.

4.4 Category Skills Analysis

In order to determine if the four broad leadership skills of cognitive, interpersonal, business and strategic skills as presented in the LSSM would be empirically distinct for senior managers employed in VET, data was collected from questions 13 and 22. Both these questions used a Likert scale of 1 to 3 and ranged from 1 not important to 3 highly important. The 3 point Likert scale was adopted to ensure the questions were not ambiguous or unclear and that the response category was meaningful to the respondents as well as eliminating mid-point confusion and measurement error (Vogt, Gardner & Haeffele 2012). Question 13 requested respondents to rank in order of importance cognitive, interpersonal, business and strategic skills for their current role.

In contrast, question 22 requested respondents to rank in order of importance cognitive, interpersonal, business and strategic skills required for promotion within their organisation. The data from questions 13 and 22 was correlated and measured with a Pearson's correlation coefficient to determine the strength and direction of the linear relationships between the cognitive, interpersonal, business and strategic skills required for current role and for promotion of senior managers. Second, a means test was conducted on data collected from question 19, which requested respondents to identify the utilisation of skills on a daily basis of category skills from a percentage range of 0 to 100%.

4.4.1 Category Skills Correlation

A Pearson's correlation coefficient was obtained from data collected from questions 13 and 22 to identify the strength and direction of a potential linear association between the category skills. These coefficients were significant at the 0.01** and 0.05* level (2-tailed) and ranged from 0.01 to 1 with 1 indicating a perfect positive correlation and 0.0 indicating no correlation. The level of significance (2-tailed test) is the *p*-value associated with the correlation. Table 4.2 presents category skills correlation coefficients related to the current role and promotion for all training providers, Table 4.3 presents the equivalent coefficients and significance levels current role and promotion for public training providers and Table 4.4 for private training providers. The strongest correlation of skills required for current role and for promotion are highlighted in bold.

Table 4.2 Category Skills Correlation by Current Role and Promotion–All Training Providers

Category Skills Correlation by Current Role and Promotion – All Training Providers								
Current Role					**For Promotion**			
Skill	1	2	3	4	1	2	3	4
1. Cognitive	1	**0.648**	0.318	0.622		0.491	0.495	0.**535**
2.Interpersonal		1	0.585	0.586		1	0.387	0.514
3.Business			1	0.459			1	0.506
4.Strategic				1				1

Note: **Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed) Pallant (2010) Source: SPSS Output

Table 4.2 presents category skills correlation coefficients related to the current role and promotion of senior manager for all training providers. The correlation coefficients for current role ranged from 0.318 to 1, with the strongest correlation between cognitive and interpersonal skills 0.648. The correlation coefficients for promotion ranged from 0.387 to 1 with the strongest correlation between cognitive and strategic skills 0.535. Although Table 4.2 demonstrated the correlation of leadership skills for current role and for promotion for all providers, no correlation of skills were presented as significant as all correlations were greater than 0.01 and 0.05.

Table 4.3 Category Skills Correlation by Current Role and Promotion – Public Training Providers

Category Skills Correlation for Current Role and Promotion – Public Training Providers								
Skill	**Current**				**Promotion**			
	Cognitive	**Interpersonal**	**Business**	**Strategic**	**Cognitive**	**Interpersonal**	**Business**	**Strategic**
Cognitive	1	0.562	0.348	0.545	1	0.557	0.427	0.561
Interpersonal		1	0. 548	0.515		1	0.408	0.**717**
Business			1	0.337			1	0.516
Strategic				1				1

Notes: **Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed) Pallant (2010) Source: SPSS Output

Table 4.3 presents category skills correlation coefficients related to the current role and promotion of senior manager for public training providers. The correlation coefficients for current role ranged from 0.337 to 1, with the strongest correlation between cognitive and interpersonal skills 0.562. The correlation coefficients for promotion ranged from 0.408 to 1 with the strongest correlation between interpersonal and strategic skills 0.717. Although Table 4.3 demonstrated the correlation of leadership skills for current role and for promotion for public providers, no correlation of skills were presented as significant as all correlations were greater than 0.01 and 0.05.

Table 4.4 Category Skills Correlation by Current Role and Promotion – Private Training Provider.

Category Skills Correlation by Current Role and Promotion – Private Training Provider								
Skill	**Current**				**Promotion**			
	1	2	3	4	1	2	3	4
1. Cognitive	1	0.702	0.296	**0.718**	1	0.535	**0.737**	0.705
2. Interpersonal		1	0.604	0.646		1	0.524	0.637
3. Business			1	0.531			1	0.494
4. Strategic				1				**1**

Notes: **Correlation is significant at the 0.01 level (2 tailed). * Correlation is significant at the 0.05 level (2-tailed) Pallant (2010) Source: SPSS output

Table 4.4 presents category skills correlation coefficients related to the current role and promotion of senior manager for private training providers. The correlation coefficients for current role ranged from 0.296 to 1, with the strongest correlation between cognitive and strategic skills 0.718. The correlation coefficients for promotion ranged from 0.524 to 1 with the strongest correlation between cognitive and business skills 0.737. Although Table 4.4 demonstrated the correlation of leadership skills for current role and for promotion for private providers, no correlation of skills were presented as significant as all correlations were greater than 0.01 and 0.05.

In summary the strongest correlation of skills required for current senior manager role for all and public training providers was between cognitive and interpersonal skills and for private training providers, cognitive and strategic skills. In contrast the strongest correlation of skills required for the role of senior manager and for promotion for all training providers was between cognitive and strategic skills, public training providers interpersonal and strategic skills and for private training providers cognitive and business skills. Table 4.5 presents a summary of category skills correlation for current manager role and for promotion.

Table 4.5 Summary Category Skills Correlation for Current Role and Promotion

Summary Category Skills Correlation for Current Role and Promotion		
Provider Type	**Current Role**	**Promotion**
All providers	Cognitive and Interpersonal	Cognitive and strategic
Public	Cognitive and interpersonal	Interpersonal and strategic
Private	Cognitive and strategic	Cognitive and business

Source: SPSS output

Table 4.5 presents cognitive skills are correlated the strongest with interpersonal, business and strategic skills for all providers for current role and for promotion. However, none of the correlations are significant as all correlations were greater than 0.01 and 0.05. These findings support Mumford, Campion & Morgeson (2007) studies that suggest cognitive skills are the foundation of the leadership skill requirements and that cognitive skills are required the most.

4.4.2 Utilisation of Category Skills

In order to determine the typically use of category skills, data was collected from question 19 of the online survey, which requested respondents to indicate by percentage the utilisation of category sub-skills. The category sub-skills included cognitive skills: problem solving, interpersonal skills: staff supervision, business skills: allocating resources and strategic skills: planning. The category sub-skills were anchored from 0 to 100% on a Likert scale of 1 to 10. Table 4.6 presents the utilisation of category skills by all training providers and a comparison of public and private training providers.

Table 4.6 Utilisation of Category Skills

Utilisation of Category Skills				
Provider Type	**Cognitive**	**Interpersonal**	**Business**	**Strategic**
All	38%	17%	16%	29%
Public	37%	18%	15%	30%
Private	40%	16%	14%	30%

Source: SPSS Output

Table 4.6 shows that there was limited variance of the utilisation of category skills based on training provider type. However there was a larger variance between each skill. Cognitive skills for all training providers presented at 38% with a slightly lower number for public training providers at 37% and slightly higher for private training providers at 40%. Strategic skills used presented at 29% for all training providers and subsequently 30% for both public and private training providers. Interpersonal skills used for all training providers presented at 17%, slightly higher for public training providers at 18% and lower for private training providers at 16% and business skills presented at 16% for all training providers, slightly higher for public training providers at 15% and lower for private training providers at 14%. Therefore, in

summary the most utilised skills were cognitive skills followed by strategic skills and least utilised skills were interpersonal skills followed by business skills. The findings support that leadership skill requirements do vary by skill category and that cognitive skills are required the most as demonstrated in Mumford,, Campion & Morgeson (2007) study of the LSSM. However, the order of subsequent skill requirements differs from interpersonal, business and strategic skills respectively.

4.4.3 Category Skills by Current Role and Promotion

In order to report on the level of importance of the category skills necessary for senior managers respondents were requested to rank by level of importance for current role and for promotion. Data was collected from questions 13 and 22. Questions 13 and 22 used a Likert scale of 1 to 3 that was anchored from 1 not important to 3 highly important. The 3 point Likert scale was adopted to ensure the questions were not ambiguous or unclear and that the response category was meaningful to the respondents as well as eliminating mid-point confusion and measurement error (Vogt, Gardner & Haeffele 2012). These items demonstrated a good reliability of scale for the importance of skills for current position (coefficient alphas of 0.678) and excellent reliability for importance of skills for promotion (coefficient alpha of 0.809). In order to rank the importance of category skills for current role of senior manager and category skills required for promotion, a means test was conducted for all training provider type as presented in Table 4.7. An independent t-test was conducted to examine possible differences between the two groups of public and private training providers. The highest means ratings are highlighted.

Table 4.7 Skills Required for Current Role and Promotion-All Training Providers

Skills Required for Current Role and Promotion – All Training Providers							
Current role				**Promotion**			
Rank	**Skill**	**Mean**	**SD**	**Rank**	**Skill**	**Mean**	**SD**
1	Interpersonal	**2.83**	0.567	1	Strategic	**2.66**	0.703
2	Cognitive	2.69	0.697	2	Interpersonal	2.60	0.790
3	Strategic	2.61	0.755	3	Business	2.60	0.703
4	Business	2.54	0.656	4	Cognitive	2.51	0.703

Notes: *0.05 > p < 0.01 significant, **0.01 > p < 0.001 highly significant and ***0.001 > p very highly significant. Means range = 1-3 SD = Standard Deviation. Source: SPSS Output

Table 4.7 presents an overview of the mean range for the importance of skills by current role and the importance of skills for promotion for all training provider types. The normal mean range is 1 to 3 and is aligned to the 3 point Likert scale. Skills required for current role mean ranged from 2.54 to 2.83 with a standard deviation from 0.567 to 0.755 and skills for promotion ranged from 2.51 to 2.66 with a standard deviation ranged from 0.703 to 0.790. The means variance between each skill for current role and for promotion is limited and based on the mean score all training providers indicated that the order of importance of category skills for current role are interpersonal, cognitive, strategic and business skills and for promotion strategic, interpersonal, business and cognitive. Furthermore, the standard deviation range for current role and for promotion for also leadership skills are also limited and present that the standard deviation range is not significant.

In order to determine if skills for senior managers employed with public and private training providers differed an independent t-test on skills required for current role and for promotion was conducted. The results of the independent t-test are presented in Table 4.8.

Table 4.8 Category Skills for Current Role & Promotion – Public and Private Training Providers

Category Skills for Current Role & Promotion – Public and Private Training Providers									
Current Role					**For Promotion**				
Rank	Skill	Public (Mean)	Private (Mean)	*p* Value	Rank	Skill	Public (Mean)	Private (Mean	*p* Value
1	Interpersonal	2.85	2.80	0.715	1	Strategic	2.76	2.56	0.165
2	Cognitive	2.71	2.67	0.764	2	Interpersonal	2.76	2.43	0.048**
3	Strategic	2.61	2.61	1.0	3	Business	2.67	2.52	0.337
4	Business	2.59	2.50	0.514	4	Cognitive	2.67	2.36	0.037**

Notes: N = Public (47) Private (45) *Significant P = 0.05 > p < 0.01, **Highly significant 0.01 > p < 0.001, ***Very highly significant 0.001 > p. Source: SPSS Output

Table 4.8 presents the ranking of category skills from important to not important for current role and for promotion on a means range from 1 to 3. Skills required for current role for public providers presented with a means range from 2.59 to 2.85 and for private providers 2.50 to 2.80. Skills required for promotion presented with a means range for public providers from 2.67 to 2.76 and for private providers 2.36 to 2.56. The mean range for skills required for current role and for promotion for public and private providers was minimal and presented with the same ranking. Skills ranked in order of importance for public and private providers were interpersonal, cognitive, strategic and business skills and for promotion strategic, interpersonal, business and cognitive skills. Table 4.8 also presents means difference between public and private for each broad skill category by current role and for promotion. The *p*-value for skills for current role ranged from 0.514 to 0.715 and for skills for promotion ranged from 0.037 to 0.165. However, interpersonal skills (*p*-value = 0.048) and cognitive skills (*p*-value = 0.037) presented with a p-value less than 0.05 and are therefore significant. These results suggest that there are no statistically significant differences in the mean score for the four skills categories on the basis of provider type for the role of senior manager. For promotion purposes, however, only for strategic and business skills the null hypothesis of no differences cannot be rejected but there seems to be significant differences by provider type for interpersonal and cognitive skills. Although these differences are confined to promotion purposes, the pervasive lack of mean differences (i.e., lack of support for H_4) may be due to the sample size of the two provider groups. Furthermore, the results support Mumford, Campion & Morgeson (2007) study that suggests that cognitive skills form the basis of leadership skills and that cognitive and interpersonal

skills share similar skill attributes.

Figure. 4.1 illustrates that the four broad leadership category skills of strategic, business, interpersonal and cognitive skills are required for promotion and for the current position of senior manager in VET.

Figure 4.1 Category Skills – For Promotion and for Current Position

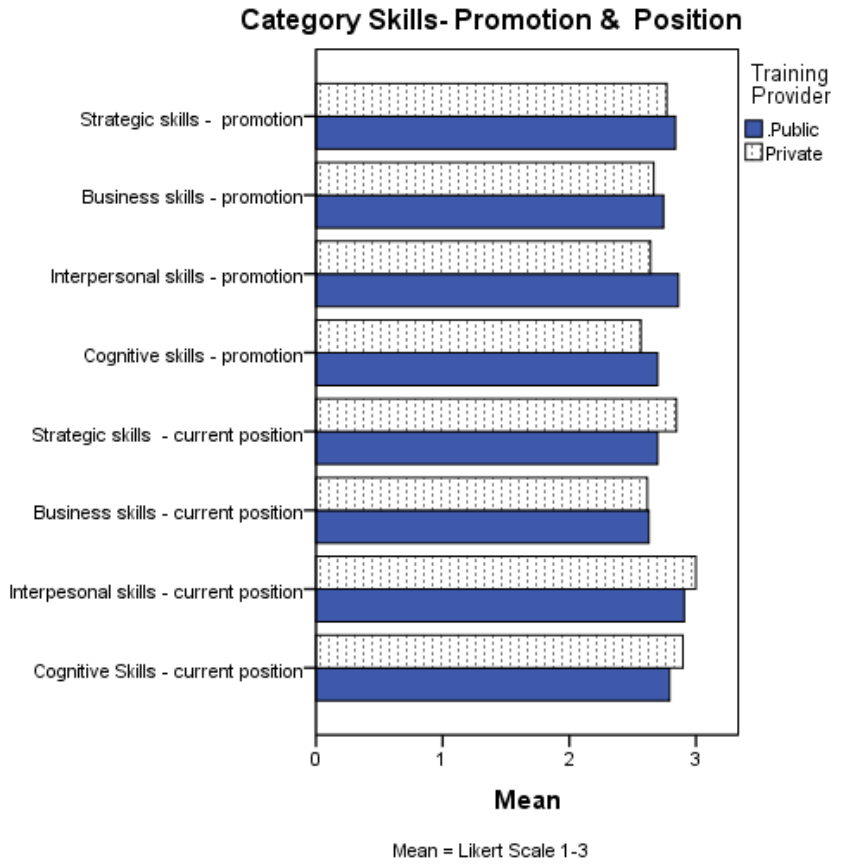


Figure 4.1 shows that there is limited difference between public and private training provider skill requirement for current role of senior manager and skill required for promotion of senior manager.

The leadership skills required for the role of senior manager across all providers ranked in order of importance are interpersonal, cognitive, strategic and business skills and for promotion of senior managers the skills required are strategic, interpersonal, business and cognitive skills as presented in Table 4.9.

Table 4.9 Summary Category Skill by Current Role and Promotion

Summary Category Skills by Current Role and Promotion								
Current Role – Skills					**Promotion- Skills**			
Rank	1	2	3	4	1	2	3	4
All	Interpersonal	Cognitive	Strategic	Business	Strategic	Interpersonal	Business	Cognitive
Public	Interpersonal	Cognitive	Strategic	Business	Strategic	Interpersonal	Business	Cognitive
Private	Interpersonal	Cognitive	Strategic	Business	Strategic	Interpersonal	Business	Cognitive

Source: SPSS output

Table 4.9 presents that cognitive skills are the most important leadership skill for the role of senior manager and strategic skills are the most important leadership skill for promotion. Mumford, Campion & Morgeson (2007) suggest that as managers are promoted through the organisational hierarchy the acquisition of strategic and business skills are more critical than the acquisition of interpersonal and cognitive skills. However, the findings suggest that strategic and interpersonal skills are more critical than business and cognitive skills. Furthermore, Mumford, Campion & Morgeson (2007) suggest that strategic and business skills are required at a greater rate with organisational level than cognitive and interpersonal skills, however the findings indicate that strategic and interpersonal skills are required at a greater rate with organisation level than business and cognitive skills. Therefore, the findings indicate that the promotional criteria for senior managers should be linked to the demonstrated proficiency of skills in their current role and tied to the demonstration of skills that are needed at the next level (Mumford, Campion & Morgeson 2007).

4.4.4 Category Skills Analysis Summary

In summary, the category skills analysis demonstrates that cognitive and interpersonal skills have the strongest correlation of skills required for current role and cognitive and strategic skills for promotion. Cognitive skills are utilised the most followed by strategic, interpersonal and business skills. However, skills ranked in order of importance for the current role of senior manager are interpersonal, cognitive, strategic and business skills and for promotion are strategic, interpersonal, business and cognitive skills. Therefore, these findings support Mumford, Campion & Morgeson (2007) study that roles at higher levels of the organisation require significant leadership skills with cognitive skills required the most and that strategic skills are critical for managers for promotion. The findings did not support Mumford,

Campion & Morgeson (2007) findings that interpersonal skills are required more than business and strategic skills and that business skills are more important than interpersonal skills for promotion.

4.5 Category Sub-skills Analysis.

In order to determine if the four category leadership skills of cognitive, interpersonal, business and strategic skills were empirically distinct for senior managers employed in VET a further analysis was conducted on the category skill attributes or sub-skills. The analysis further defined the leadership skills by identifying the skill attributes of the four broad leadership skills in order to determine the skills required for senior managers to in VET to enable effective leadership. Respondents were requested to rank their response to statements which reflected the level of importance of the category sub-skills for their role from 'not important' to 'highly important' as presented in questions 14 to 17. Questions 14 to 17 used a 10 point Likert scale that was anchored from 1, 'not important' to 10, 'highly important'. A 10 point Likert scale was used to eliminate possible misinterpretation of the mid- point and to ensure that respondents were more discerning and thoughtful with their responses (Vogt, Gardner & Haeffele 2012). The statements were derived from cognitive skill attributes and consisted of: capacity to problem solve complex issues, capacity to problem solve complex issues which effect the strategic direction of the organisation, capacity to read understand and apply written information and instructions, make decisions based on clear, rational and informed evidence, learn about and adapt new technology to undertake your role and identify and manage risk. Question 15 requested respondents to rank the importance of six statements relevant to interpersonal skills. The statements were derived from interpersonal skill attributes and consisted of: involving other team members when making decisions, apply negotiation skills to reconcile differences between team members/employees, use persuasion skills to influence others to achieve organisational goals, handle conflict, respond to other team members needs and self care. Question 16 requested respondents to rank the importance of six statements relevant to business skills. The statements were

derived from business skill attributes and consisted of: capacity to manage staff and material resources, capacity to make decisions regarding the procuring and allocating of equipment, capacity to develop and motivate individuals in their work, responsibility for financial resources of a program or unit delivery, respond to other team members needs and ensure services are provided at a high standard to meet regulatory requirements. Question 17 requested respondents to rank the importance five statements relevant to strategic skills. The statements were derived from strategic skills attributes and consisted of: capacity to plan and prioritise workload, capacity to make decisions regarding the procuring and allocating of equipment, able to apply a systematic perspective to influence planning and implementation, able to use appropriate problem solving skills to identify alternative actions or solutions and identify internal capabilities and external threats to achieve strategic goals. In total there were 23 statements however, 'capacity to make decisions regarding the procuring and allocating of equipment' was duplicated in business skills and strategic skills and 'respond to other team member needs' was duplicated in interpersonal and business skills. Therefore, only 21 statements were used in the analysis.

The 23 statements included in questions 14 to 17 presented an excellent reliability scale for each of the statements associated with interpersonal, cognitive, business and strategic skills (coefficient alphas ranged from good 0.75 to excellent 0.80, 0.82 and 0.85). The reliability scale confirmed that the data collected from the online survey was valid and reliable. Therefore, the data meet the assumptions of normality and a frequency analysis of a means and independent t-test was conducted on the 23 statements. The analysis was conducted to determine the importance of the four category leadership skills for all training providers and a comparison of skills for public and private training providers.

The results of the means test analysis, for all providers, are presented in Table 4.10 and rank the skills by mean value. Table 4.11 presents a comparison of skill ranking for public and private providers. Each sub-skill is identified to the associated category skills as C: cognitive, I: interpersonal, B: business and S: strategic.

Table 4.10 Category Sub-Skills - All Providers

Category Sub-Skills – All Providers		
Sub-Skill	**Mean**	**SD**
C: Capacity to problem solve complex issues	8.75	1.93
S: Make decisions based on clear rational and informed evidence	8.63	2.06
S: Capacity to plan and prioritise workload	8.61	1.86
B: Ensure services are provided at a high standard to meet regulatory requirements	8.55	2.42
C: Able to use problem solving skills to identify alternative actions or solutions	8.47	2.11
S: Capacity to problem solve complex issues which effect the strategic direction of the organisation	8.37	2.45
B: Capacity to read, understand and apply written information and instructions	8.28	2.51
C: Identify and manage risk	8.21	2.43
S: Able to apply a systematic perspective to influence planning and implementation	8.10	2.25
I: Apply negotiation skills to reconcile differences between team members	8.05	2.22
S: Identify internal capabilities and external threats to achieve strategic goals	8.02	2.55
I: Use persuasion skills to influence others to achieve organisational goals	7.94	1.97
B: Capacity to manage staff and material resources	7.89	2.41
B: Capacity to develop and motivate individuals to do their work	7.88	2.59
I: Self Care	7.80	2.57
I: Respond to other team members needs	7.78	2.48
I: Involve other team members when making decisions	7.74	1.89
I: Handle conflict	7.38	2.65
B: Learn about and adapt new technology	7.20	2.28
B: Responsible for financial resources of a program or unit delivery	7.13	2.88
B: Capacity to make decisions regarding the procuring and allocating of equipment	6.56	2.85

Notes: C: Cognitive, I: Interpersonal, B: Business, S: Strategic skills. Mean range = 1-10
SD = standard deviation. Source: SPSS Output

Table 4.10 presents the means range from 6.56 to 8.75 and a standard deviation range from 1.93 to 2.88 for the category sub-skills. There was a limited mean range between each of the 21 sub-skills, however there was a significant variance in the mean range between the most important skill; capacity to problem solve complex issues 8.75, sd 1.93 associated sub-skill of cognitive skills and the least important; capacity to make decisions regarding the procuring and allocating of equipment 6.56, sd 2.85 associated sub-skill of business skills.

Table 4.11 presents the category sub-skills ranked in mean order to determine the order of importance of the category sub-skills and provides a comparison of public and private providers. The sub-skills ranked as the most important are highlighted in bold.

Table 4.11 Category Sub-Skills – Public and Private Training Provider

Category Sub-Skills – Public and Private Training Provider		
Sub Skill	**Public (Mean)**	**Private (Mean)**
B: Ensure services are provided at a high standard to meet regulatory requirements	**8.95**	8.17
C: Make decisions based on clear rational and informed evidence	8.76	8.52
C: Capacity to problem solve complex issues	8.76	**8.73**
S: Capacity to plan and prioritise workload	8.65	8.58
S: Capacity to problem solve complex issues which effect the strategic direction of the organisation	8.41	8.33
B: Capacity to read, understand and apply written information and instructions	8.39	8.17
B: Able to use problem solving skills to identify alternative actions or solutions	8.32	8.60
I: Apply negotiation skills to reconcile differences between team members	8.11	8.00
I: Self Care	8.09	7.53
S: Able to apply a systematic perspective to influence planning and implementation	8.04	8.15
I: Use persuasion skills to influence others to achieve organisational goals	8.00	7.88
I: Involve other team members when making decisions	7.88	7.60
B: Capacity to develop and motivate individuals to do their work	7.85	7.91
B: Capacity to manage staff and material resources	7.82	7.95
C: Identify and manage risk	7.80	8.58
I: Respond to other team members needs	7.76	7.80
S: Identify internal capabilities and external threats to achieve strategic goals	7.74	8.28
I: Handle conflict	7.57	7.21
B: Responsible for financial resources of a program or unit delivery	7.42	6.86
B: Learn about and adapt new technology	7.14	7.26
S: Capacity to make decisions regarding the procuring and allocating of equipment	6.50	6.63

Notes: N = Public (43) Private (46). C= cognitive, I: Interpersonal, B: Business and S: Strategic skills. Mean range: 1-10. Source: SPSS Output

Table 4.11 presents the means range between each sub-skill was minimal between public and private providers. The highest sub-skill mean range for both public and private providers was 'ensure services are provided at a high standard to meet regulatory requirements', 8.95 and 8.17, which is associated with business skills. The lowest sub-skill mean range for public and private providers was: 'capacity to make decisions regarding the procuring and allocating of equipment' 6.50 and 6.63 associated with business skills.

4.5.1 Summary of Category Sub-skills

In summary, the analysis of the four broad category skills of cognitive, interpersonal, business and strategic skills and the category sub-skills support the LSSM that suggests that that cognitive skills are the most important skill (Mumford, Campion & Morgeson 2007). Table 4.12 presents the summary of category sub-skills in order of

importance for all training providers and a comparison of public and private training providers.

Table 4.12 Summary of Category Sub-skills in Order of Importance

Summary of Category Sub-Skills in Order of Importance		
Training Provider Type	**Category Skill**	**Category Sub-Skill**
All	Cognitive	Capacity to problem solve complex issues
Public	Business	Ensure services are provided at a high standard to meet regulatory requirements
Private	Cognitive	Capacity to problem solve complex issues

Source: SPSS output.

Table 4.12 presents that the most important category sub-skill for all training providers is 'capacity to problem solve complex issues' which is a sub-skill associated with cognitive skills, public training providers, 'ensure services are provided a high standard to meet regulatory requirements' associated with business skills and private training providers 'capacity to problem solve complex issues' associated with cognitive skills.

4.6 Factor Analysis of Category Sub-skills

According to Pallant (2010), Factor Analysis (FA) is used to reduce a large number of related variables to a more manageable number. 'Exploratory Factor Analysis (EFA) is used in the early stages of the research to gather information to explore the interrelationships amongst a set of variables' (Pallant 2010, p. 181). Therefore, to determine if the four leadership skills of cognitive, interpersonal, business and strategic skills are empirically distinct for senior managers employed across all training provider types and provide a comparison for public and private training providers an EFA was conducted from data collected from questions 14 to 17. Data collected from questions 14 to 17 was associated with the skill attributes or sub skills of the four broad leadership skills. The investigation of the skill attributes or sub-skills provided further insight into the four broad leadership skills. Respondents were required to rank the statements in questions 14 to 17 using a 10-point Likert scale that was anchored from 1, 'not important' to 10, 'highly important'. Questions 14 to 17

were referenced to the category skills of cognitive, interpersonal, business and strategic and their associated skill attributes or sub-skills. Question 14 was referenced to cognitive skills, question 15 interpersonal skills, question 16 business skills and question 17 strategic skills. For the purpose of the presentation each category skill attribute or sub-skill is indicated as C: cognitive, I: interpersonal, B: business and S: strategic.

The aim of the EFA was to determine the number of latent constructs underlying the items and to provide a means of explaining variation amongst them to enable the labeling of the factors (Pallant 2010). The EFA provides a variable reduction technique to identify the number of latent constructs and the underlying factor structure of the variables and estimate factors that influenced responses on observed variables to identify the number of factors. Prior to conducting the EFA the data was tested to ensure that the four data assumptions were confirmed. First, the ordinal variables scales of reliability were measured, second, a linear relationship between all variables and the identification of significant outliers using a scatterplot was applied, third, the sampling was adequate and was measured using Kaiser-Meyer-Olkin (KMO) and finally the data was reviewed to be suitable for data reduction with the application of the Bartlett's test of sphericity test (Pallant 2010). The EFA extracted factors representing the category skill attributes or sub-skills (independent variables). The maximum likelihood extraction method with direct oblimin rotation was applied. This extraction method is widely understood and conforms to the factor analytic model in which common variance is analysed with the unique and error variance removed. The EFA was conducted in two stages. Stage one an agnostic factor extraction was requested and stage two four factor extraction was requested. The agnostic approach to factor extraction requested eignenvalues over 1 and a factor coefficient absolute value greater than 0.4, this extraction extracted 5 reliable factors. The four factor extraction, aligned to the four leadership skills as presented in the LSSM. Eignenvalues over 1 and a factor coefficient absolute value greater than 0.4 was requested, this extraction extracted 3 reliable factors. Finally, a CFA was conducted in order to examine the interrelationships among various constructs to measure the set of observed variables to develop a Structural Equation Model. The aim of the model was to test the validity of the EFA results and theory of the LSSM using the good model fit indices as guided by Mumford, Campion & Morgeson

(2007).

Prior to conducting the EFA consideration was given to the sample size of 100 for this thesis. As there are conflicting recommendations in the literature regarding the range of sample size necessary to obtain factor solutions that are adequately stable and correspond closely to the population, Pallant (2010) suggests that the sample size is not important and the ration of participants to items for example 10 to 1 ratio or 5 to 1 is sufficient to provide statistical analysis. Comrey & Lewis (2013) concur that a sample of 100 is good and will provide a correlation matrix to enable factors to be extracted. However, the sample size may affect the communality of variables and the degree of over-determination of the factor and size of factor loadings. The over-determination of the factor is the number variables per factor. Comrey & Lewis (2013) recommend a ratio of six variables per factor, with a minimum of 3 as a small number of variables per factor with commonalities less than 0.50 are considered high over-determination of the factor and factors with fewer than three variables are generally consider weak. However, due to the small sample size presented in this thesis, all factors loadings greater than 0.4 presented in the EFA analysis were retained.

4.6.1 Exploratory Factor Analysis an Agnostic Approach

An EFA was conducted with an agnostic approach. The EFA extracted factors representing category sub-skills (independent variables) and the maximum likelihood extraction method with direct oblimin rotation was applied. This extraction method is widely understood and conforms to the factor analytic model in which common variance is analysis with the unique and error variance removed. First, factor extraction with factors based on an eigenvalue greater than 1 with agnostic approach to factor extraction and factor coefficient absolute value greater than 0.4 were requested. This process extracted 5 reliable factors and are presented in Table 4.13.

Table 4.13 EFA 5 Factor Pattern Matrix – All Training Providers

Exploratory Factor Analysis- 5 Factor Pattern Matrix - All Training Providers					
Sub-skill	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
B: Capacity to make decisions regarding the procuring and allocating of equipment	0.961				
B: Capacity to manage staff and material resources	0.428				
S: Identify internal capabilities and external threats to achieve strategic goals		0.897			
S: Able to use appropriate problem solving skills to identify alternative actions or solutions		0.729			
C: Identify and manage risk		0.487			
S: Able to apply a systematic perspective to influence planning and implementation		0.421			
I: Apply negotiation skills to reconcile differences between team members		0.409			
C: Capacity to read, understand and apply written information and instructions			0.639		
I: Involve other team members when making decisions			0.635		
S: Capacity to plan and priorities workload			0.548		
C: Make decisions based on clear, rational and informed evidence			0.514		
I: Handle conflict				- 0.613	
C: Capacity to problem solve complex issues which effect the strategic direction of the organisations				- 0.702	
B: Capacity to develop and motivate individuals in their work					0.631
B: Respond to other team members needs					0.543
C: Learn about and adapt new technology					0.520
B: Responsible for financial resources of a program or unit delivery					0.513

Notes: C: Cognitive, I: Interpersonal, B: Business, S: Strategic. Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 17 iterations
Source: SPSS Output

The EFA for all providers demonstrates that the agnostic approach to factor extraction resulted in 5 factors, which presented with consistent themes of 'business skills', 'problem solving skills' and 'managing teams skills'.

Factor 1 consisted of two items with factor loadings ranging from 0.428 to 0.961. The variance was 42%. The items were: B: Capacity to make decisions regarding the procuring and allocating of equipment and B: Capacity to manage staff and material resources. Both sub-skills presented with a consistent theme of 'business skills'.

Factor 2 consisted of 5 items with factor loading ranging from 0.409 to 0.897. The variance was 51%. The items were: S: Identify internal capabilities and external threats to achieve strategic goals, S: Able to use appropriate problem solving skills to identify alternative actions or solutions, C: Identify and manage risk, S: Able to apply a systematic perspective to influence planning and implementation and I: Apply negotiation skills to reconcile differences between team members. The items were sub-skills of strategic and cognitive skills and presented with a consistent theme of 'problem solving skills'.

Factor 3 consisted of 4 items with factor loading ranging from 0.514 to 0.639. The variance was 57%. The items were: C: Capacity to read, understand and apply written information and instructions, I: Involve other team members when making decisions, S: Capacity to plan and prioritise workload and C: Make decisions based on clear, rational and informed evidence. The sub-skills were associated with cognitive, interpersonal and strategic skills and presented with a consistent theme of 'managing team members skills'.

Factor 4 consisted of 2 items with factor loading ranging from -0.716 to -0.702. The variance was 62%. The items were: I: Handle conflict and C: Capacity to problem solve complex issues. The sub-skills were associated with interpersonal and cognitive skills and presented with a consistent theme of 'problem solving skills'.

Factor 5 consisted of 4 factors with factor loadings ranging from 0.513 to 0.631. The variance was 67%. The items were: B: Capacity to develop and motivate individuals in their work, B: Respond to other team member's needs, C: Learn about and adapt new technology and B: Responsible for financial resources of a program or unit delivery. The sub-skills were associated with business and cognitive skills and presented with a consistent theme of 'business skills'.

Table 4.14 EFA 5 Factor Pattern Matrix - Public Training Providers

Exploratory Factor Analysis- 5 Factor Pattern Matrix for Public Training Providers					
Sub-skill	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
B: Respond to other team member needs	1.017				
B: Capacity to develop and motivate individuals	0.629				
S: Capacity to plan and prioritise workload		0.939			
S: Ability to apply a systematic perspective to influence planning and implementation		0.726			
C: Make decisions based on clear, rational and informed evidence		0.592			
C: Identify and manage risk		0.542			
B: Ensure services are provided at a high standard		0.511			
I: Involve other team members when making decisions		0.502			
B: Capacity to manage staff and material resources		0.459			
S: Able to use appropriate problem solving skills to identify alternative actions or solutions			0.644		
S: Identify internal capabilities and external threats to achieve strategic goals			0.503		
I: Apply negotiation skills to reconcile differences between team members			0.550		
C: Learn about and adapt new technology				0.406	
B: Capacity to make decisions regarding the procuring and allocating of equipment				0.893	
B: Responsible for financial resources of a program or unit delivery				0.530	
C: Capacity to problem solve complex issues which effect the strategic direction of the organisation					0.713
I: Handle conflict					0.699
I: Use persuasion skills to influence others					0.626
I: Self Care					0.623

Notes: C: Cognitive, I: Interpersonal, B: Business, S: Strategic. Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 17 iterations
Source: SPSS Output

The EFA agnostic approach to factor extraction for public training providers presented that the 5 factors with consistent themes of business skills, strategic skills and problem solving skills were extracted.

Factor 1 consisted of 2 items with factor loadings ranging from 0.629 to 1.017. The variance was 44%. The items were: B: Respond to other team member needs and B: Capacity to develop and motivate individuals. Both sub-skills presented with a theme of 'business skills'.

Factor 2 consisted of 7 items with factor loadings ranging from 0.459 to 0.939. The variance was 54%. The items were: S: Capacity to plan and prioritise workload, S: Ability to apply a systematic perspective to influence planning and implementation, C: Make decisions based on clear, rational and informed evidence, C: Identify and manage risk, B: Ensure services are provided at a high standard, I: Involve other team members when making decisions and B: Capacity to manage staff and material resources. The sub-skills were associated with strategic, cognitive and business skills and presented with a consistent theme of 'strategic skills'.

Factor 3 consisted of 3 items with factor loadings ranging from 0.503 to 0.664. The variance was 62%. The items were: S: Able to use appropriate problem solving skills to identify alternative actions or solutions, S: Identify internal capabilities and external threats to achieve strategic goals and I: Apply negotiation skills to reconcile differences between team members. The sub-skills were associated with strategic and interpersonal skills and presented with a consistent theme of 'strategic skills'.

Factor 4 consisted of 4 items with factor loadings ranging from 0.406 to 0.893. The variance was 69%. The items were: C: Learn about and adapt new technology, B: Capacity to make decisions regarding the procuring and allocating of equipment and B: Responsible for financial resources of a program or unit delivery. The sub-skills were associated with cognitive and business skills and presented with a consistent theme of 'business skills'.

Factor 5 consisted of 4 items with factor loadings ranging from 0.626 to 0.713. The variance was 74%. The items were: C: Capacity to problem solve complex issues which effect the strategic direction of the organisation, I: Handle conflict, I: Use persuasion skills to influence others and I: Self Care. The sub-skills were associated with cognitive and interpersonal skills and presented with a consistent theme of 'problem solving skills'.

Table 4.15 EFA 5 Factor Pattern Matrix for Private Training Providers

Exploratory Factor Analysis – 5 Factor Pattern Matrix for Private Training Providers					
Sub-skill	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
S: Identify internal capabilities and external threats to achieve strategic goals	0.999				
I: Apply negotiation skills to reconcile differences between team members	0.699				
B: Ensure services are provided at a high standard	0.656				
S: Able to use appropriate problem solving skills to identify alternative actions or solutions	0.605				
C: Identify and manage risk	0.596				
S: Ability to apply a systematic perspective to influence planning and implementation	0.527				
B: Capacity to develop and motivate individuals	0.511				
C: Capacity to problem solve complex issues which effect the strategic direction of the organisation	0.469				
S: Capacity to plan and prioritise workload	0.426				
C: Make decisions based on clear, rational and informed evidence		0.796			
B: Respond to other team member needs		0.589			
I: Handle conflict		0.559			
C: Learn about and adapt new technology		0.551			
C: Capacity to problem solve complex issues		0.499			
I: Involve other team members when making decisions		0.485			
I: Use persuasion skills to influence others		0.425			
B: Capacity to make decisions regarding the procuring and allocating of equipment			0.693		
B: Responsible for financial resources of a program or unit delivery			0.490		
B: Capacity to manage staff and material resources				0.605	
I: Self Care					-0.421

Notes: C: Cognitive, I: Interpersonal, B: Business, S Strategic. Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 17 iterations
Source: SPSS Output

The EFA with an agnostic extraction for private training providers demonstrates that the 5 factors were extracted with consistent themes of planning, problem solving skills, managing teams skills, business skills and interpersonal skills.

Factor 1 consisted of 9 items with factor loadings ranging from 0.469 to 0.999. The variance was 44%. The items were: S: Identify internal capabilities and external threats to achieve strategic goals, I: Apply negotiation skills to reconcile differences between team members, B: Ensure services are provided at a high standard, S: Able to use appropriate problem solving skills to identify alternative actions or solutions, C: Identify and manage risk, S: Ability to apply a systematic perspective to influence

planning and implementation, B: Capacity to develop and motivate individuals, C: Capacity to problem solve complex issues which effect the strategic direction of the organisation, S: Capacity to plan and prioritise workload, C: Make decisions based on clear, rational and informed evidence, B: Respond to other team member needs, I: Handle conflict, C: Learn about and adapt new technology, C: Capacity to problem solve complex issues, I: Involve other team members when making decisions and I: Use persuasion skills to influence others. The sub-skills are associated with strategic, interpersonal, business and cognitive skills and presented with a consistent theme of 'planning, problem solving and manage teams skills'.

Factor 2 consisted of 7 items with factor loadings ranging from 0.425 to 0.796. The variance was 54%. The items were: C: Make decisions based on clear, rational and informed evidence, B: Respond to other team member needs I: Handle conflict, C: Learn about and adapt new technology, C: Capacity to problem solve complex issues, I-Involve other team members when making decisions and I: Use persuasion skills to influence others. The sub-skills are associated with cognitive, business and interpersonal skills and presented with a consistent theme of 'problem solving and managing teams skills'.

Factor 3 consisted of 2 items with factor loadings ranging from 0.490 to 0.693. The variance was 62%. The items were: B: Capacity to make decisions regarding the procuring and allocating of equipment and B: responsible for financial resources of a program or unit delivery. The sub-skills presented with a consistent theme of 'business skills'.

Factor 4 consisted of 1 item with a factor loading of 0.605. The variance was 69%. The item was: B: Capacity to manage staff and material resources. The sub-skill presented with a consistent theme of 'business skills'.

Factor 5 consisted of 1 item with factor range loading of -0.421. The variance was 74%. The item was: I: Self Care. The sub-skill presented with a consistent theme of 'interpersonal skills'.

In summary the EFA, with an agnostic extraction approach resulted in 5 factors for all provider types with consistent themes repeating for each factor. All training providers presented with factor themes of 'business skills', 'problem solving skills' and 'managing teams skills', public providers, 'business skills', 'strategic skills' and 'problem solving skills' and private training providers, 'planning, problem solving and managing teams skills', 'business skills' and 'interpersonal skills' as presented in Table 4.16.

Table 4.16 Summary EFA Agnostic Approach 5 Factor Extraction – All Providers

Summary EFA Agnostic Approach 5 Factor Extraction – All Providers					
Training Provider Type	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
All	Business skills	Problem solving skills	Managing teams skills	Problem solving skills	Business skills
Public	Business skills	Strategic skills	Strategic skills	Business skills	Problem Solving skills
Private	Planning, problem solving, managing teams skills	Problem solving managing teams skills	Business skills	Business skills	Interpersonal skills

Source: SPSS Output

4.6.2 Exploratory Factor Analysis - 4 Factor Extraction

Further to the EFA agnostic factor extraction, a four factor extraction was applied to determine if the four broad leaderships skills of cognitive, interpersonal, business and strategic skills as presented in the LSSM would be empirically distinguishable leadership skills for senior managers employed in VET. The EFA extracted factors representing the category sub-skills (independent variables) and the maximum likelihood extraction method with direct oblimin rotation was applied. This extraction method is widely understood and conforms to the factor analytic model in which common variance is analysis with the unique and error variance removed. First, factors based on an eigenvalue greater than 1.0 with and fixed number of four factors to be extracted and factor coefficient absolute value greater than 0.4 was requested. This extraction method resulted in three factors being extracted with the results presented in Table 4.17 All Training Providers, Table 4.18 Public Training Providers and Table 4.19 Private Training Providers.

Table 4.17 EFA - 3 Factor Extraction Pattern Matrix - All Training Providers

EFA – 3 Factor Extraction Pattern Matrix – All Training Providers			
Sub-skills	**Factor 1**	**Factor 2**	**Factor 3**
B: Capacity to make decisions regarding the procuring and allocating of equipment	0.891		
B: Responsible for financial resources of a program or unit delivery	0.586		
C: Capacity to problem solve complex issues		0.750	
I: Handle conflict		0.715	
B: Capacity to manage staff and material resources		0.536	
B: Capacity to develop and motivate individuals in their work		0.468	
B: Ensure services are provided at a high standard to meet regulatory requirements		0.421	
I: Use persuasion skills to influence others to achieve organisational goals		0.407	
S: Capacity to plan and prioritise workload			0.853
C: Identify and manage risk			0.759
S: Identify internal capabilities and external threats to achieve strategic goals			0.686
I: Involve other team members when making decisions			0.509
I: Apply negotiation skills to reconcile differences between team members			0.560
S: Able to apply a systematic perspective to influence planning and implementation			0.551
I: Respond to other team members needs			0.514
C: Capacity to read, understand and apply written information and instructions			0.427

Notes: C: Cognitive, I: Interpersonal, B: Business, S: Strategic. Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 12 iterations
Source: SPSS Output

The EFA four factor extraction resulted in three factors being extracted for all providers with the consistent themes of 'business skills', 'problem solving, managing teams skills' and 'strategic skills'.

Factor 1 consisted of two items with factor loadings ranging from 0.586 to 0.891. The variance was 43.2%. The items were: B: Capacity to make decisions regarding the procuring and allocating of equipment and B: Responsible for financial resources of a program or unit delivery. The sub-skills presented with a consistent theme of 'business skills'.

Factor 2 consisted of six items with factor loadings ranging from 0.407 to 0.750. The variance was 52%. The items were: C: Capacity to problem solve complex issues, I: Handle conflict, B: Capacity to manage staff and material resources, B: Capacity to develop and motivate individuals in their work, B: Ensure services are provided at a

high standard to meet regulatory requirements and I: Use persuasion skills to influence others to achieve organisational goals. These sub-skills were associated with cognitive, interpersonal and business skills and presented with a consistent theme of 'problem solving and managing teams' skills.

Factor 3 consisted of 8 items with factor loadings ranging from 0.427 to 0.853 and the variance was 64%. The items were: S: Capacity to plan and prioritise workload, C: Identify and manage risk, S: Identify internal capabilities and external threats to achieve strategic goals, I: Involve other team members when making decisions, I: Apply negotiation skills to reconcile differences between team members, I: Respond to other team member's needs, S: Able to apply a systematic perspective to influence planning and implementation and C: Capacity to read, understand and apply written information and instructions. These sub-skills were associated with strategic, interpersonal and cognitive skills and presented with a consistent theme of 'strategic skills'.

Table 4.18 EFA - 4 Factor Extraction Pattern Matrix - Public Training Providers

EFA - 4 Factor Extraction Pattern Matrix - Public Training Providers			
Sub-skills	**Factor 1**	**Factor 2**	**Factor 3**
S: Capacity to plan and prioritise workload	0.912		
S: Able to apply a systematic perspective to influence planning an implementation	0.696		
C: Make decisions based on clear, rational and informed evidence	0.601		
C: Identify and manage risk	0.524		
I: Involve other team members when making decisions	0.505		
B: Ensure services are provided at a high standard to meet regulatory requirements	0.450		
B: Capacity to make decisions regarding procuring and allocating of equipment		0.862	
B: Responsible for financial resources of a program or delivery unit		0.499	
S: Capacity to make decisions regarding the procuring and allocating of equipment		0.467	
B: Capacity to manage staff and material resources		0.439	
C: Capacity to solve complex issues which effect the strategic direction of the organisation			0.788
C: Capacity to solve complex issues			0.712
I: Handle conflict			0.640
I: Self care			0.594
I- Use persuasion skills to influence others to achieve organisational goals			0.548

Notes: C: Cognitive, I: Interpersonal, B: Business, S: Strategic. Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 24 iterations
Source: SPSS Output

The EFA four factor extraction resulted in three factors being extracted for public providers with the consistent themes of 'strategic skills', 'business skills' and 'problem solving skills'.

Factor 1 consisted of 6 items with factor loadings ranging from 0.450 to 0.912 and the variance was 44%. The items were: S: Capacity to plan and prioritise workload, S: Able to apply a systematic perspective to influence planning and implementation, C: Make decisions based on clear, rational and informed evidence, C: Identify and manage risk, I: Involve other team members when making decisions, B: Ensure services are provided at a high standard to meet regulatory requirements. The sub-skills associated with strategic, cognitive, business and interpersonal skills and presented with a consistent theme of 'strategic skills'.

Factor 2 consisted of 4 items with factor loadings ranging from 0.439 to 0.862 and the variance was 62.5%. The items were: B: Capacity to make decisions regarding procuring and allocating of equipment, B: Responsible for financial resource of a program or delivery unit, S: Capacity to make decisions regarding the procuring and allocating of equipment and B: Capacity to manage staff and material resources. The sub-skills were associated with strategic, business and cognitive skills with a consistent theme of 'business skills'.

Factor 3 consisted of 5 items with factor loadings ranging from 0.548 to 0.788 and the variance was 69%. The items were: C: Capacity to solve complex issues which effect the strategic direction of the organisation, C: Capacity to solve complex issues, I: Handle conflict, I: Use persuasion skills to influence others to achieve organisational goals and I: Self-care. The sub-skills were associated with cognitive and interpersonal skills and presented with a consistent theme of 'problem solving skills'.

Table 4.19 EFA - 3 Factor Pattern Matrix - Private Training Providers

EFA - 3 Factor Extraction Pattern Matrix Private Training Providers			
Sub-skills	**Factor 1**	**Factor 2**	**Factor 3**
S: Capacity to make decisions regarding the procuring and allocating of equipment	0.983		
B: Capacity to make decisions regarding procuring and allocating of equipment	0.822		
B: Responsible for financial resources of a program or unit delivery	0.498		
C: Make decisions based on clear, rational and informed evidence		1.025	
B: Capacity to develop and motivate others		0.667	
C: Learn about and adapt new technology		0.629	
C: Identify and manage risk		0.586	
B: Respond to other team members needs		0.467	
B: Ensure services are provided at a high standard to meet regulatory requirements			0.777
I: Use persuasion skills to influence others to achieve organisational goals			0.639
I: Respond to other team members needs			0.636
B: Capacity to manage staff and material resources			0.608
C: Capacity to problem solve complex issues which effect the strategic direction of the organisations			0.599
S: Able to apply a systematic perspective to influence planning and implementation			0.598
S: Identify internal capabilities and external threats to achieve strategic goals			0.590
I: Apply negotiation skills to reconcile differences between team members/employees			0.590
S: Capacity to plan and prioritise workload			0.556
C: Capacity to problem solve complex issues			0.573
I: Handle conflict		.	0.492
S: Use problem solving skills to identify alternative actions or solutions			0.452
I: Involve other team members when making decisions			0.407

Notes: C: Cognitive, I: Interpersonal, B: Business, S: Strategic. Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 24 iterations
Source: SPSS Output

The EFA four factor extraction resulted in three factors being extracted for private training providers with the consistent themes of 'business skills', 'managing teams skills' and 'strategic skills'.

Factor 1 consisted of three factors with factor loadings ranging from 0.498 to 0.983 and the variance was 42%. The items were: S: Capacity to make decisions regarding the procuring and allocating of equipment, B: Capacity to make decisions regarding procuring and allocating of equipment and B: Responsible for financial resources of a program or unit delivery. The sub-skills were associated with business and strategic skills and presented with a consistent theme of 'business skills'.

Factor 2 consisted of 5 items with factor loadings ranging from 0.467 to 1.025 and the variance was 52%. The items were: C: Make decisions based on clear, rational and informed evidence, B: Capacity to develop and motivate others, C: Learn about and adapt new technology, C: Identify and manage risk and B: Respond to other team member's needs. The sub-skills were associated with cognitive and business and presented with a consistent theme of 'managing teams skills'.

Factor 3 consisted of 13 items with factor loadings ranging from 0.407 to 0.777 and the variance was 60%. The items were: B: Ensure services are provided at a high standard to meet regulatory requirements, I: Use persuasion skills to influence others to achieve organisational goals, I: Respond to other team member's needs, B: Capacity to manage staff and material resources, C: Capacity to problem solve complex issues which effect the strategic direction of the organisations, S: Able to apply a systematic perspective to influence planning and implementation, S: Identify internal capabilities and external threats to achieve strategic goals, I: Apply negotiation skills to reconcile differences between team members/employees, S: Capacity to plan and prioritise workload, C: Capacity to problem solve complex issues, I: Handle conflict, S: Use problem solving skills to identify alternative actions or solutions and I: Involve other team members when making decisions. The sub-skills were associated with business, strategic and interpersonal skills and presented with a consistent theme of 'strategic skills'.

In summary the EFA four factor extraction aligned to the LSSM four leadership skills resulted in three factors being extracted. The three factors presented with themes for all training providers as 'business skills', 'problem solving/managing teams skills' and 'strategic skills', for public training providers 'strategic skills', 'business skills' and 'problem solving skills' and for private training providers 'business skills', 'managing teams skills' and 'strategic skills' as presented in Table 4.20.

Table 4.20. EFA – 4 Factor Extraction

EFA - 4 Factor Extraction			
Training Provider Type	**Factor 1**	**Factor 2**	**Factor 3**
All	Business skills	Problem Solving/ Managing teams skills	Strategic skills
Public	Strategic skills	Business skills	Problem Solving skills
Private	Business skills	Managing Teams skills	Strategic skills

Source: SPSS output

Table 4.20 presents the EFA four factor extraction which resulted in three factors being extracted. Although strategic and business skills were consistent skills required for senior managers. Problem solving presented with public providers and managing teams presented with private providers. This may be contributed to the variation in role requirements of managers employed with public providers and private providers

4.6.3 Summary of Exploratory Factor Analysis

A summary of the exploratory factor analysis for the agnostic extraction approach resulted in 5 factor extraction themes for all providers, public and private providers. To further define the factor themes a four factor extraction approach was conducted to determine if cognitive, interpersonal, business and strategic skills would be empirically distinguishable leaderships skills, as identified in the LSSM, for senior managers employed in VET. The EFA revealed that the four factor extraction resulted in three factors being extracted for all training provider types. Across all training provider types the factors presented with a consisted theme of 'business', 'problem solving/managing teams' and 'strategic skills'. Table 4.21 presents a summary of the EFA agnostic approach that resulted in five factors being extracted and the EFA four factor extraction approach, aligned to the four leadership skills in the LSSM, that resulted in three factors being extracted.

Table 4.21 Summary Exploratory Factor Analysis

Summary Exploratory Factor Analysis					
Summary EFA –Agnostic Factor Extraction					
Provider Type	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
All	Business skills	Problem solving skills	Managing teams skills	Problem solving skills	Business skills
Public	Business skills	Strategic skills	Strategic skills	Business skills	Problem Solving skills
Private	Planning, problem solving, managing teams skills	Problem solving/ managing teams skills	Business skills	Business skills	Interpersonal skills
Summary EFA - 4 Factor Extraction					
Provider Type	**Factor 1**	**Factor 2**	**Factor 3**		
All	Business skills	Problem Solving/ Managing teams skills	Strategic skills		
Public	Strategic skills	Business skills	Problem Solving skills		
Private	Business skills	Managing teams skills	Strategic skills		

Sources: SPSS

Table 4.21 presents that EFA agnostic approach that resulted in five factors being extracted and the four factor extraction that resulted in three factors being extracted. The consistent theme for all providers is 'business', 'problem solving/managing teams' and 'strategic skills', however public providers did not present with 'managing teams skills' as a theme and private providers did not present with 'problem solving' as a theme.

4.7 Confirmatory Factor Analysis

According to Pallant (2010), Factor Analysis (FA) is used to reduce a large number of related variables to a more manageable number with the two main approaches to factor analysis being exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). 'EFA is used in the early stage of the research to gather information to explore the interrelationships amongst a set of variables and CFA is more complex and used later in the research process to test or confirm hypotheses or theories' (Pallant 2010, p. 181). The CFA enabled the evaluation of the factorial validity of the EFA and to test hypotheses 1 and 4. Therefore, the LSSM four factor model of leadership skill requirements was compared with the agnostic EFA approach that

presented with five factors and the four factor extraction EFA that presented a three factor model. The CFA was conducted using AMOS with the aim to test both of the four and three factor nested models to determine if the model fits were statistically significant.

The models were assessed by four indices based on Mumford, Campion & Morgeson (2007) study of the LSSM and guided by Khine (2013). The four indices included the normed fit index (NFI), comparative fit index (CFI), the root mean square error of approximation (RMSEA) and the chi square test (CMIN). The NFI is used to compare a proposed model to the null model and measures the discrepancy between the chi-square value of the hypothesised model and the chi-square of the null model and a result more than 0.90 indicates a good model fit. The CFI indicates the relative lack of fit of a specified model versus the baseline model and is used because of its strengths and insensitivity to model complexity and a result more than 0.90 indicates a good model fit. The RMSEA corrects the tendency of the chi-square to reject the model particularly with a large sample size or number of variables and the Chi-square tests for the extent of misspecification of the model and 'using the chi-square test is useful in determining the relative fit of the model' and is measured with the *p*-value (Mumford, Champion & Morgeson 2007, p. 161).

The CFA did not result in a model fit for agnostic EFA approach of the five factor extraction. However, a model fit for the EFA four factor extraction that presented three factors did result in a statistical model. Therefore, the three factor model presented that the skills required for senior managers employed across all training providers types are 'business skills', 'problem solving/managing teams skills' and 'strategic skills'. For public providers, 'strategic skills', 'business skills' and 'problem solving skills' are required and for private providers, 'business skills', 'managing teams skills' and 'strategic skills'.

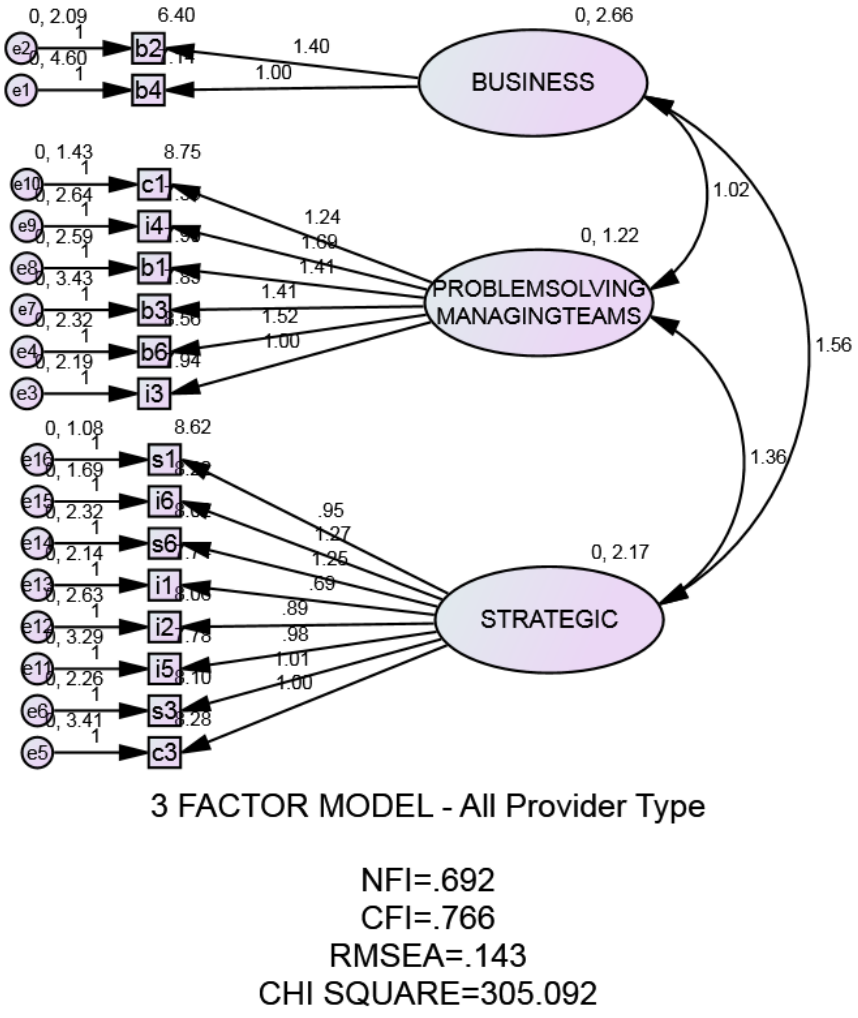
The three factor model are presented Figure 4.2 All Training Providers, Figure 4.3 Public Training Providers and Figure 4.4 Private Training Providers. According to Khine (2013) there are disagreements over what constitutes acceptable values for model fit indices and therefore, recommends a variety of fit indices be reported.

Appendix 3 presents the CFA model fit summary for all providers, public and private providers. The model fit summary provides additional model fit indices that are not presented in Figures 4.2, 4.3 and 4.4. The additional model fit indices include the Root square mean residual (RMR), Goodness of Fit Index (GFI), the Baseline Comparison Fit, Parismony-Adjustment Measures, Measures based on population discrepancy (NCP), FMIN and information theoretic measures of Akaike Information Criteria (AIC)**,** ECVI and HOTELTER.

4.7.1 CFA 3 Factor Model – All Training Providers

Figure 4.2 presents the CFA – 3 Factor model for all training provider types

Figure 4.2 CFA – 3 Factor Model - All Training Providers



3 FACTOR MODEL - All Provider Type

NFI=.692
CFI=.766
RMSEA=.143
CHI SQUARE=305.092

Table 4.22 Figure 3 Factor Model – All Training Providers Legend

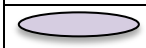
Intercept	Variable
b2	Capacity to make decisions regarding the procuring and allocating of equipment
b4	Responsible for financial resources of a program or unit delivery
c1	Capacity to problem solve complex issues
i4	Handle conflict
b1	Capacity to manage staff and material resources
b3	Capacity to develop and motivate individuals in their work
b6	Ensure services are provided at a high standard to meet regulatory requirements
i3	Use persuasion skills to influence others to achieve organisational goals
s1	Capacity to plan and prioritise workload
i6	Identify and manage risk
s6	Identify internal capabilities and external threats to achieve strategic goals
i1	Involve other team members when making decisions
i2	Apply negotiation skills to reconcile differences between team members
i5	Respond to other team members needs
s3	Able to apply a systematic perspective to influence planning and implementation
c3	Capacity to read, understand and apply written information and instructions
	Latent variable
	Observed variable
	Covariance
	Regression weights

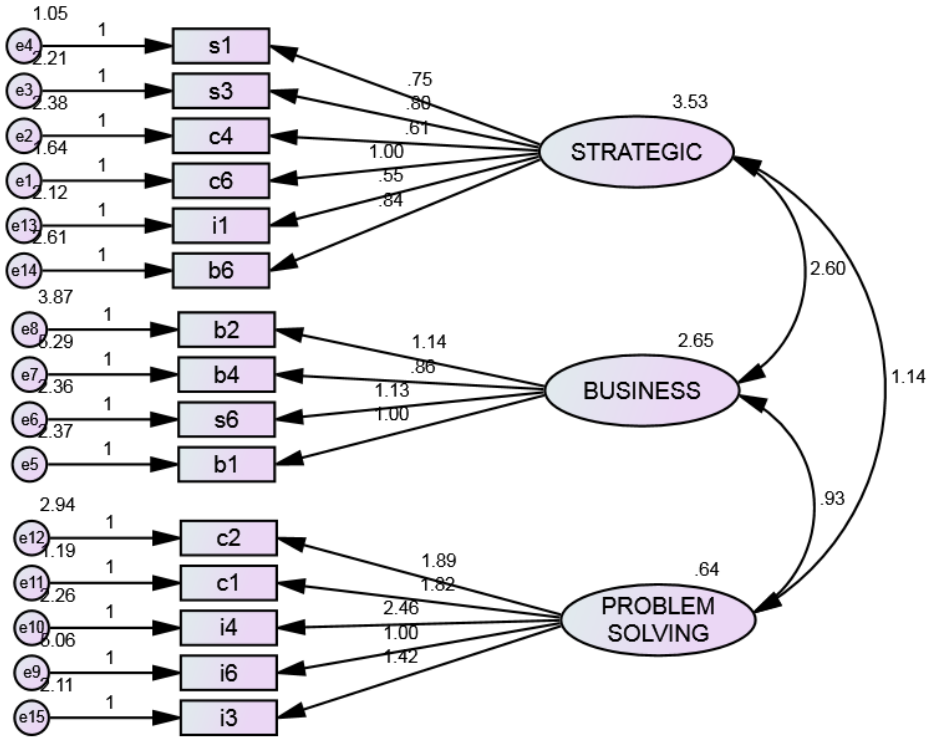
Figure 4.2 presents the analysis of the measurement model for the three Factor Model for all providers with parameters of covariance, regression weights variables, factors and intercepts. The model goodness fit was assessed by four fit indices: the CFI, NFI, RMSEA and Chi Square. The indices indicate that CFI and NFI were less than 0.90 (CFI= 0.766, NFI = 0.692) and RMSEA 0.143. Although the model did not present with a goodness of fit model, the sample size may have contributed to the results. Therefore, the skills required for senior managers employed with all training provider types are 'business', 'problem solving/managing teams' and 'strategic skills'. Business skills consist of capacity to make decisions regarding the procuring and allocating of equipment, responsible for financial resources of a program or unit delivery, capacity to read, understand and apply written information and instructions. Problem solving/managing team skills consist of capacity to problem solve complex issues, handle conflict, capacity to manage staff and material resources, capacity to develop and motivate individuals in their work, ensure services are provided at a high

standard to meet regulatory requirements, use persuasion skills to influence other to achieve organisational goals, apply negotiation skills to reconcile differences between team members and respond to other team member's needs**.** Strategic skills consist of capacity to plan and prioritise workload, identify and manage risk, identify internal capabilities and external threats to achieve strategic goals, involve other team members when making decisions and able to apply a systematic perspective to influence planning and implementation.

4.7.2 CFA 3 Factor Model - Public Training Providers

Figure 4.3 presents the CFA - 3 Factor model for public training providers.

Figure 4.3 3 Factor Model - Public Training Providers



3 FACTOR MODEL - Public Provider

NFI=.705
CFI=.780
RMSEA=.138
CHI SQUARE =251.026

Table 4.23 Figure 4.3. 3 Factor Model- Public Training Providers Legend

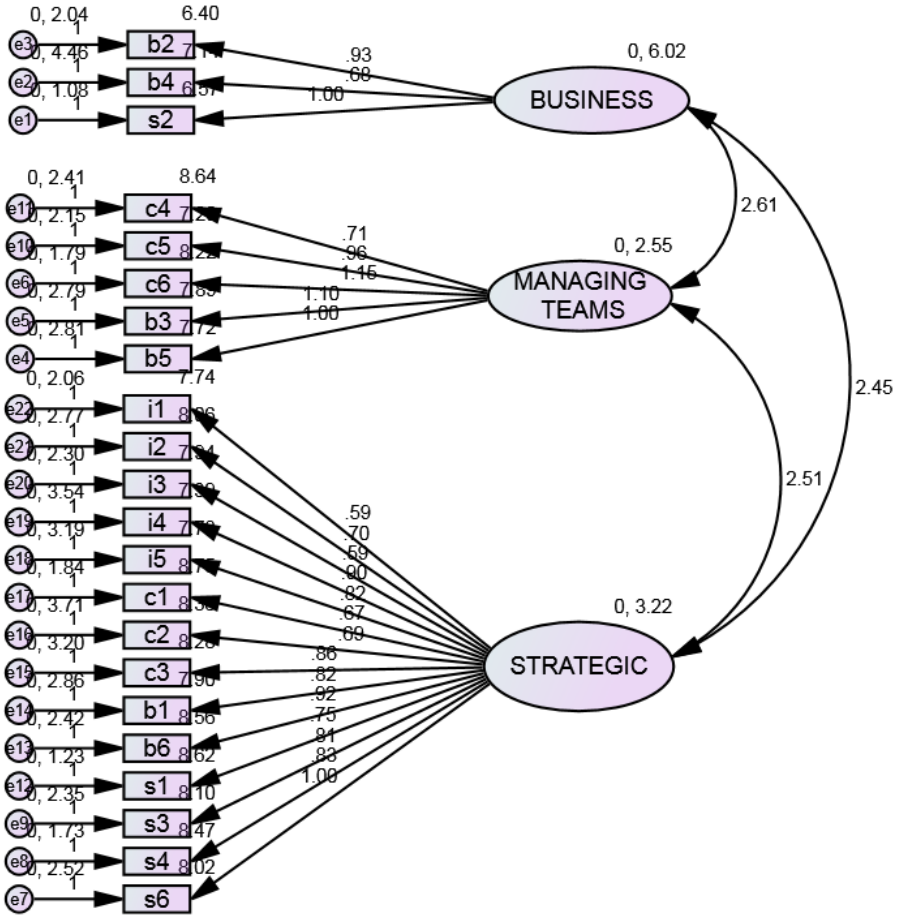
Intercept	Variable
s1	Capacity to plan and prioritise workload
s3	Able to apply a systematic perspective to influence planning and implementation
c4	Make decisions based on clear, rational and informed evidence
c6	Identify and manage risk
i1	Involve other team members when making decisions
b6	Ensure services are provided at a high standard to meet regulatory requirements
b2	Capacity to make decisions regarding procuring and allocating of equipment
b4	Responsible for financial resources of a program or delivery unit
s6	Capacity to make decisions regarding the procuring and allocating of equipment
b1	Capacity to manage staff and material resources
c2	Capacity to solve complex issues which effect the strategic direction of the organisation
c1	Capacity to solve complex issues
i4	Handle conflict
i6	Self care
i3	Use persuasion skills to influence others to achieve organisational goals
	Latent variable
	Observed variable
	Covariance
	Regression weights

Figure 4.3 presents the analysis of the measurement model for the three factor model for public providers with parameters of covariance, regression weights variables, factors and intercepts. The model goodness fit was assessed by four fit indices: the CFI, NFI, RMSEA and Chi Square. The indices indicate that CFI and NFI were less than 0.90 (CFI= 0.780, NFI = 0.705) and RMSEA 0.138. Although the model did not present with a goodness of fit model, the sample size may have contributed to the results. Therefore, the skills required for senior managers employed with public training providers are strategic, business and problem solving skills.

4.7.3 CFA 3 Factor Model - Private Training Providers

Figure 4.4 presents the CFA - 3 Factor model for private training providers.

Figure 4.4 CFA 3 Factor Model – Private Training Providers



3 FACTOR MODEL - Private Provider

NFI=.611
CFI =.693
RMSEA=.147
CHI SQUARE=644.584

Table 4.24 Figure 4.4. 3 Factor Model – Private Training Providers legend

Intercept	Variable
b2	Capacity to make decisions regarding procuring and allocating of equipment
b4	Responsible for financial resources of a program or unit delivery
s2	Capacity to make decisions regarding the procuring and allocating of equipment
c4	Make decisions based on clear, rational and informed evidence
c5	Learn about and adapt new technology
c6	Identify and manage risk
b3	Capacity to develop and motivate others
b5	Respond to other team members needs
i1	Involve other team members when making decisions
i2	Apply negotiation skills to reconcile differences between team members/employees
i3	Use persuasion skills to influence others to achieve organisational goals
i4	Handle conflict
i5	Respond to other team members needs
c1	Capacity to problem solve complex issues
c2	Capacity to problem solve complex issues which effect the strategic direction of the organisations
c3	Capacity to read, understand and apply written information and instructions
b1	Capacity to manage staff and material resources
b6	Ensure services are provided at a high standard to meet regulatory requirements
s1	Capacity to plan and priorities workload
s3	Able to apply a systematic perspective to influence planning and implementation
s4	Able to us appropriate problem solving skills to identify alternative actions or solutions
s6	Identify internal capabilities and external threats to achieve strategic goals
	Latent variable
	Observed variable
	Covariance
	Regression weights

Figure 4.4 presents the analysis of the measurement model for the three Factor Model for private training providers with parameters of covariance, regression weights variables, factors and intercepts. The model goodness fit was assessed by four fit indices: the CFI, NFI, RMSEA and Chi Square. The indices indicate that CFI and NFI were less than 0.90 (CFI= 0.693, NFI = 0.611) and RMSEA 0.47. Although the model did not present with a goodness of fit model, the sample size may have contributed to the results. Therefore, the skills required for senior managers employed with private providers are: business, managing teams and strategic skills.

4.7.4 CFA Summary

In summary the CFA results in the fit indices three factor model for all providers (CMIN = 305.092, CFI = 0.766, NFI = 0.692, RMSEA = 0.143) suggests that 'business', 'problem solving/managing teams' and 'strategic skills' are distinguishable skills for senior managers employed in VET, for senior managers employed with public providers 'strategic', 'business' and 'problem solving skills' are distinguishable skills (CMIN = 251.026, CFI = 0.780, NFI = 0.705, RMSEA= 0.138) and senior managers employed with private providers 'business', 'managing teams' and strategic skills' are distinguishable skills (CMIN = 644.584, CFI = 0.693, NFI = 0.611, RMSEA= 0.147). The three factor model indices are presented in Table 4.25

Table 4.25 3 Factor Model Fit Indices

3 Factor Model Fit Indices						
Training Provider Type	**Leadership Skills**	**CFI**	**NFI**	**RMSEA**	**CMIN**	**p-Value**
All	Business, problem solving/managing teams and strategic skills	0.766	0.692	0.143	305.092	0.000
Public	Strategic, business and problem solving skills	0.780	0.705	0.138	251.026	0.000
Private	Business, managing teams and strategic skills	0.693	0.611	0.147	644.584	0.000

Source: AMOS Output

Table 4.25 presents the results of the three factor model indices for all training provider types. Although the models were not statistically significant the results indicate that the sub-skills were able to present with a construct model for the three factors. However, the sample size may have contributed to the model results and therefore, further testing of the models with a larger sample size is recommended.

4.8 Hypotheses Testing Results

The data analysis tested the four hypotheses to answer the principal research question to determine the required leadership skills for senior managers in VET.

4.8.1 H1: Category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills.

Hypothesis 1 proposed that category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills. The results of the EFA and the CFA suggest that cognitive, interpersonal, business and strategic skills are *not* distinguishable leadership skills for senior managers employed in VET. However, the distinguishable leadership skills for senior managers employed in VET are 'business', 'problem solving/managing teams' and 'strategic skills' as presented in the CFA (CMIN = 305.092, CFI = 0.766, NFI = 0.692, RMSEA= 0.143). For senior managers employed with public providers 'strategic', 'business' and 'problem solving skills' are identified as distinguishable and are supported with the model fit indices (CMIN = 251.026, CFI = 0.780, NFI = 0.705, RMSEA= 0.138). Private providers, 'business', 'managing teams' and 'strategic' and are supported with the model fit indices (CMIN = 644.584, CFI = 0.693, NFI = 0.611, RMSEA = 0.147). Therefore, hypothesis 1 is not supported

4.8.2 H2: Leadership skill requirement will differ by skill category with cognitive skills required the most, followed by interpersonal, business and strategic.

Hypothesis 2 proposed that leadership skill requirements will differ by skill category and that cognitive skills are required the most followed by interpersonal, business and strategic skills respectively. The results of the frequency analysis of a means and independent t-test presented that cognitive skills are required the most based on the daily utilisation of cognitive, interpersonal, business and strategic skills. Cognitive skills daily utilisation for all training providers is 38% with a slightly lower number for public at 37% and slightly higher number for private at 40%. Strategic skills presented at 29% for all providers and subsequently at 30% for senior managers employed with public and private training providers. For interpersonal skills all providers presented at 17% and slightly higher for public at 18% and lower for private 16% and business skills presented at 16% for all providers, slightly higher for public at 15% and lower for private at 14%. In summary, cognitive skills are

required the most followed by strategic, interpersonal and business skills. Therefore, hypothesis 2 is partially supported, as leadership skill requirements do differ by skill category with cognitive skills required the most however, they are not followed by interpersonal, business and strategic skills.

4.8.3 H3 Cognitive, interpersonal, business and strategic skills requirements are related to management level.

Hypothesis 3 proposed that cognitive, interpersonal, business and strategic skill requirements are related to management level. In order to test hypothesis 3 a correlation test was conducted to ascertain the level of skills required for the role of senior manager and for promotion. The results presented that there is a correlation of the leadership skills required for the role of senior manager and for the promotion of senior managers. Cognitive and interpersonal skills presented with strongest correlation (0.648) of leadership skills required for the role of senior manager. Interpersonal and strategic skills presented with the strongest correlation (0.535) of skills required for promotion of senior managers Although there is a correlation of skills required for current role of senior manager and for promotion of senior managers to further test hypothesis 3 a means and independent t-test was conducted on the four broad leadership skills of cognitive, interpersonal, business and strategic skills to determined that leadership skills ranked in order of importance for current role of senior manager and skills required for promotion of senior managers. The most important skill required for current role as senior manager are interpersonal (m = 2.83), cognitive (m = 2.69), strategic (m = 2.61) and business skills (m = 2.54). The most important skill required for promotion of senior managers is strategic (m = 2.66), interpersonal and business (m = 2.60) and cognitive skills (m = 2.51). Therefore, hypothesis 3 is supported as cognitive, interpersonal, business and strategic skills requirements are related to management level.

4.8.4 H4: Leadership skills requirements will differ with public and private training providers.

Hypothesis 4 proposed that leadership skills requirements will differ with public and private training providers. In order to test hypothesis 4 statistical analysis were conducted to compare the two distinct groups of public provider and private provider. The two distinct groups were compared on the criteria of the broad leadership skills and skill attributes or sub skills. The statistical analysis conducted on the broad skills included the Pearson's correlation test and independent t-tests and on the skill attributes a means test, EFA and CFA.

In order to determine the correlation of the broad leaderships skills required for current role and for promotion a Pearson's correlation tests was conducted. Correlation of category skills required for current role presented with public providers with a correlation variance of 0.337 to 1, with the strongest correlation of skills being *cognitive* and *interpersonal skills* (0.562). Private providers presented with a correlation variance of 0.296 to 1, with the strongest correlation between *cognitive* and *strategic skills* (0.718). Correlation of category skills required for promotion presented with public providers with a correlation variance of 0.408 to 1 with the strongest category skills correlation being for *interpersonal* and *strategic skills* (0.717). Private providers presented with correlation variance of 0.524 to 1 with the strongest correlation between *cognitive* and *business skills* (0.737). Although the correlation test identified skills correlation for current role and for promotion no correlations were presented as significant as all correlations were greater than 0.01 and 0.05.

Furthermore, in order to determine if broad leadership skills required for current role and for promotion differed between public and private providers an independent t-test was conducted. Skills required for current role for public providers presented with a means range from 2.59 to 2.85 and private providers 2.50 to 2.80. Skills required for promotion presented with means range for public providers from 2.67 to 2.76 and for private providers 2.36 to 2.56. The means range for skills required for current role and for promotion of public and private providers was minimal and presented with the same ranking in order of skill requirements. However, the *p*-value

for skills required for promotion indicated that interpersonal skills (p-value = 0.048) and cognitive skills (p-value = 0.037) were significant for both groups. Therefore, the results indicated that skills required for public and private providers for promotion did not differ.

In order to determine if there was a difference between the two groups of the broad leadership skills required the most an analysis was conducted on the daily utilisation of skills. Daily utilisation of cognitive skills for public was 37% and slightly higher for private at 40%, strategic skills at 30% for both public and private training providers, interpersonal skills public providers presented at 18% and lower for private training providers at 16% and business skills presented slightly higher for public providers at 15% and for private providers at 14%. Although there was difference between each skill requirement there was minimal difference between public and private providers with both presenting that cognitive skills required the most. Therefore, there was not difference between the two groups for the utilisation of skills.

In order to determine if specific skill attributes of sub-skills differed between the two distinct groups of public and private providers a means test was conducted. The means range from 6.50 to 8.96 for public providers and from 6.63 to 8.17 for private providers and demonstrated there was minimal differences between the two groups. However, the highest mean arrange for public providers was 8.95 for sub-skill 'ensure services are provided at a high standard to meet regulatory requirements' associated with cognitive skills and for private providers 8.73 'capacity to problem solve complex issues, associated with cognitive skills. The results presented that although there is minimal variance between each sub-skill the highest mean range for both public and private providers presented with cognitive skills. Therefore, there is no difference between the two groups.

In order to further test the sub-skills an EFA and CFA was conducted. The EFA confirmed the sub-skills required are associated with 'strategic', 'business' and 'problem solving skills' for public providers and business skills', 'managing teams skills' and 'strategic skills' for private providers. Furthermore, in order to test the

results of the EFA to the theory of the LSSM a CFA was conducted. The results of the CFA that revealed a three factor model for skills required for public providers as 'strategic', 'business' and 'problem solving skills' (CMIN = 251.026, CFI = 0.780, NFI = 0.705, RMSEA = 0.138). Private providers 'business skills', 'managing teams skills' and 'strategic skills' (CMIN = 644.584, CFI = 0.693, NFI = 0.611, RMSEA= 0.147). Although the EFA and CFA presented that there are some difference in sub-skills required, caution should be taken when interpreting these results due to the small sample size of each of the groups. Therefore, hypothesis 4 is not supported.

4.8.5 Hypotheses Summary

Hypothesis 1 proposed that the category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills. The results of the EFA and CFA do not support that leadership category skills of cognitive, interpersonal, business and strategic skills are empirically distinguishable. However, the results indicate that the empirically distinguishable leadership skills are 'business skills', 'problem solving/managing teams skills' and 'strategic skills'. Therefore, hypothesis 1 is not supported.

Hypothesis 2 proposed that the leadership skill requirements will differ by skill category and that cognitive skills are required the most followed by interpersonal, business and strategic skills. The results of the means and independent t-test revealed that cognitive skills are required the most followed by strategic, interpersonal and business skills. Therefore, hypothesis 2 is partially supported.

Hypothesis 3 proposed that cognitive, interpersonal, business and strategic skill requirements are related to management level. The results of the correlation, means and independent-test supported that cognitive, interpersonal, business and strategic skill requirements are related to management level. The most important skills required for current role for senior manager ranked in order of importance are interpersonal, cognitive, strategic and business skills and the most important skills required for promotion of senior managers are strategic, interpersonal, business and cognitive skills. The LSSM suggest that strategic and business skills are required at a greater

rate with organisational level than cognitive and interpersonal skills, however the findings indicate that strategic and interpersonal skills are required at a greater rate with organisation level than business and cognitive skills. Therefore, hypothesis 3 is supported.

Hypothesis 4 proposed that the leadership skill requirements would differ with public and private training providers. In order to test hypothesis 4 statistical analyses were conducted to compare the two distinct groups of public training providers and private training providers. The two distinct groups were compared on the criteria of the broad leadership skills and skill attributes or sub skills. The statistical analyses conducted on the broad skills included the Pearson's correlation test and independent t-tests and on the skill attributes a means test, EFA and CFA. The tests demonstrated that there was no difference in the broad category skills for current role, for promotion and for utilisation of skills. However the results did point out some difference in the cognitive and interpersonal skills for promotion and in the sub-categories of skills. The results of the EFA and CFA presented that skills required ranked in order of importance for public providers are 'strategic skills', 'business skills' and 'problem solving' skills and for private training providers skills required are 'business skills', 'managing teams skills' and 'strategic skills'. Although the results do present that there is some differences in leadership skill requirements caution should be taken in interpreting these results due to the small sample size of the two groups.

4.9 Chapter Summary

This chapter presented the outcomes of the data analysis to test the four hypotheses to answer the principal research question of 'What leadership skills are required for senior managers in Australian VET?' Prior to the data analysis the data was tested for normality and no assumptions of data were violated. Therefore, a range of statistical analysis were conducted including a descriptive statistics analysis, frequency tests of a means and independent t-test, Pearson's correlation test, FA with an EFA approach and a CFA.

Hypothesis 1 proposed that the category skills of cognitive, interpersonal, business

and strategic skills would be empirically distinguishable leadership skills. The results of the EFA and CFA do not support that leadership category skills of cognitive, interpersonal, business and strategic skills are empirically distinguishable. However, the results presented that the empirically distinguishable leadership skills are 'business skills', 'problem solving/managing teams skills' and 'strategic skills'. Therefore, hypothesis 1 is not supported. Hypothesis 2 proposed that the leadership skill requirements will differ by skill category and that cognitive skills are required the most followed by interpersonal, business and strategic skills. The results of the means and independent t-test revealed that cognitive skills are required the most followed by strategic, interpersonal and business skills. Therefore, hypothesis 2 is partially supported. Hypothesis 3 proposed that cognitive, interpersonal, business and strategic skill requirements are related to management level. The results of the Pearson's correlation test, means and independent t-test supported that cognitive, interpersonal, business and strategic skills requirements are related to management level. The most important skills required for current role for senior manager ranked in order of importance are interpersonal, cognitive, strategic and business skills and the most important skills required for promotion of senior managers are strategic, interpersonal, business and cognitive skills. Therefore, hypothesis 3 is supported. Hypothesis 4 proposed that the leadership skill requirements would differ with public and private training providers. The tests demonstrated that there was no difference in the broad category skills for current role, for skills required for promotion and for utilisation of skills. However the results did present some differences in two broad skill categories for promotion and in sub-skills. The results of the EFA and CFA presented that skills required ranked in order of importance for public training providers are 'strategic skills', 'business skills' and 'problem solving' skills and for private providers skills required are 'business skills', 'managing teams skills' and 'strategic skills'. Although the results of the EFA and CFA present that there are differences in some of the broad categories for promotion and in leadership sub-skills the evidence should be interpreted with caution as the sample size may have prevented the comprehensive testing of group differences in broad skill requirements.

CHAPTER 5 CONCLUSION AND IMPLICATIONS

5.1 Chapter Introduction

The Australian VET sector is a competitive market experiencing increased volatility as training providers have to manage ongoing policy changes and reforms. Therefore, for the sector to be sustainable VET training providers need senior managers with outstanding leadership skills to respond to government expectations, increased compliance and administration requirements, policy and funding changes and commercial competitiveness (Bhindi & Duignan 1997; Callan et al. 2007; McCallum & O'Connell 2009). This thesis presented the first time that leadership skills have been researched in the context of Australian VET sector using the Leadership Skills Strataplex Model (LSSM) as the theoretical framework to identify the skills required for senior managers. The LSSM applied a stratified approach to skill requirement with skill level requirement being dependent on the management level within an organisation (Kalargyrou, Pescosolido & Kalargiros 2012). Although, this thesis presents leadership skill requirements from the perspective of senior managers employed in VET, it does not necessary reflect the perspective of employers or the sectors.

Chapter 5 presents a summary of each chapter, a review of the literature post 2015 and the practical implications and academic contributions derived from the findings of this thesis. This chapter will also identify the limitations of this thesis and how the limitations may have impacted on the findings. Future research into leadership skill requirements for senior managers in VET is recommended, as future research will provide validation and generalisation of the findings presented in this thesis. The conclusions of this thesis will provide recommendations to influence practice and policy within the Australian VET sector.

5.1 Chapters Summary

Chapter 1 was the foundation of this five chapter structured thesis and presented an overview of the Australian VET sector. This overview identified the on going volatility of the Australian VET sector and the need for senior managers to be equipped with leadership skills to enable effective leadership within the sector. Furthermore, this chapter motivated this thesis as the findings will impact Australian VET sector leadership practices and policies and contribute to the body of knowledge on leadership, leadership skills and VET.

Chapter 2 presented the literature review that commenced July 2013 and concluded June 2015. The literature review revealed that leadership research continues to be focused on traits and attributes of individual leaders, with limited research focused on leadership skills (Falk 2003). Furthermore, the review identified that the role of senior manager in VET continues to move from an education focus to an administrative focus (Coates et al. 2013) and senior managers in the Australian VET require specific leadership skills compared to leaders in business, military or government sectors (Mulcahy 2003). Although the literature revealed that leadership research within the context of VET is vast (Coates et al. 2013; Callan et al. 2007 & Mehrabani & Mohamad 2015), there continues to be limited research into leadership skills. Therefore, the review guided the conceptual framework for this thesis using the Stratified System Theory (SST), the Leadership Skills Strataplex Model (LSSM) and five broad theoretical areas of leadership that include traits, behaviours, contingency, transformational and enabling leadership (Falk 2003). The literature revealed previous studies using the LSSM to identify leadership skills (Mumford, Campion & Morgeson, 2007; Kalargyrou, Pescosolido & Kalargiros 2012). However, it did not reveal any studies using the LSSM to identify leadership skills for senior managers within the context of Australian VET. The review also guided the research methodology for this thesis and based on the scope of this thesis and previous studies, a quantitative research methodology using an online survey to collect the data was deemed the most appropriate research methodology. The research methodology was presented in Chapter 3.

Chapter 3 presented the quantitative research methodology for the collection of data and data analysis to test the four hypotheses and subsequently answer the principal research question: 'What leadership skills are required for senior manager in Australian VET?' Chapter 2 guided the research methodology based on the research of Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) that utilised the LSSM to identify leadership skill requirements within the context of management level within an organisation. The principal question was answered from the perspective of senior managers employed in VET with data collected from the online survey. Four hypotheses were tested to answer the question. Hypothesis 1: Category skills of cognitive, interpersonal, business and strategic skills are empirically distinguishable leadership skills. Hypothesis 2: Leadership skill requirement will differ by skill category with cognitive skills required the most followed by interpersonal, business and strategic skills. Hypothesis 3: Cognitive, interpersonal, business and strategic skill requirements are related to management level. Hypothesis 4: Leadership skill requirements will differ between public and private training providers.

In order to test the LSSM the research methodology for this thesis the statistical techniques as conducted Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) were replicated. The statistical techniques were conducted using SPSS version 22 and AMOS version 22. The statistical techniques included means tests, correlation tests, independent t-tests, factor analysis using an exploratory factor analysis and a confirmatory factor analysis approach. The research methodology presented in Chapter 3 guided the data analysis techniques as presented in Chapter 4.

Chapter 4 reported the results of the data analyses that were used to test the hypotheses to answer the principal research question. Prior to conducting the data analysis, as presented in Chapter 3, the data was checked for statistical normality, reliability and validity. The data analysis included a range of statistical techniques including descriptive analysis, means and independent t-tests, correlation tests, FA with an EFA and CFA approach. Descriptive analysis provided statistics to explain

the characteristics of the sample and identified violation of assumptions of the statistical techniques (Pallant 2010). In summary the descriptive analysis indicated that the gender distribution of senior managers was equally distributed for both public and private training providers. However, the age distribution of 84% being more than 40 years was expected, as most managers would be in this age group and is represented in both public and private training providers. The organisation size was distinctly varied with 62% of private providers employing less than 100 EFT staff. The senior manager title varied across training provider type with private training providers having a larger number of Academic Managers. In addition there was significant bias to full time employment in both public and private training providers. Examining careers over the longer term there was a higher number employed more than five years within VET indicating that senior managers tend to stay employed within the sector.

This chapter also provided the results of the testing of the hypotheses. Hypothesis 1 proposed that the category skills of cognitive, interpersonal, business and strategic skills would be empirically distinguishable leadership skills. The results of the EFA and CFA did not support that leadership category skills of cognitive, interpersonal, business and strategic skills were empirically distinguishable. The results presented that the empirically distinguishable leadership skills required for senior managers are 'business', 'problem solving/managing teams' and 'strategic skills'. Therefore, hypothesis 1 was not supported. Hypothesis 2 proposed that the leadership skill requirements would differ by skill category and that cognitive skills would be required the most followed by interpersonal, business and strategic skills. The results of the means and independent t-tests revealed that cognitive skills were required the most followed by strategic, interpersonal and business skills. Therefore, hypothesis 2 was only partially supported. Hypothesis 3 proposed that cognitive, interpersonal, business and strategic skill requirements were related to management level. The results supported that leadership skills are related to management level and that skills required for current role ranked in order of importance are interpersonal, cognitive, strategic and business skills and for promotion are strategic, interpersonal, business and cognitive skills. Therefore, hypothesis 3 is supported. Hypothesis 4 proposed that the leadership skill requirements would differ with public and private training providers. The tests demonstrated that there was no difference in the broad category

skills for current role, for promotion and for utilisation of skills. However the results EFA and CFA suggest that there are some differences in leadership skill requirements for public and private training providers. Public training providers presented with leadership skill requirements as 'strategic skills', 'business skills' and 'problem solving' skills and for private providers presented with 'business skills', 'managing teams skills' and 'strategic skills'. Although the results do present that there is some differences between public and private training providers on leadership skill requirements caution should be noted due to the small sample size.

Chapter 4 presented the data analysis results and guided the conclusions and implications of this thesis. Chapter 5, the final chapter, presents the conclusion and recommendations of this thesis and provides a summary of each chapter. Furthermore, the review of the literature post June 2015 to May 2016 built on literature findings discussed in Chapter 2. This additional review provided further insight into recent research conducted in leadership, leadership skills and the Australian VET sector. The review was valuable in revealing that there continues to be a growing body of knowledge in leadership, theoretical perspectives and leadership methodologies. Furthermore, it revealed that research in the area of leadership continues to be conducted, however, there is limited research focused on leadership skills and less within the context of leadership skills for senior managers in VET.

In conclusion this thesis has revealed four major findings: (1) That 'business', 'problem solving/managing teams' and 'strategic' skills are empirically distinguishable leadership skills required for senior managers employed in VET; (2) That 'cognitive' skills are required the most followed by 'strategic', 'interpersonal' and 'business' skills; (3) That skill requirement is relevant to management level with skills required for current role of senior manager ranked in order of importance are 'interpersonal', 'cognitive', 'strategic' and 'business' skills and for promotion are 'strategic', 'interpersonal', 'business' and 'cognitive' skills and (4) That the broad category leadership skills required for senior managers do not differ depending on training provider type. However, on further investigation the EFA and CFA confirmed there were some differences of leadership skill requirements with senior managers employed with public training providers requiring leadership skills of 'strategic', 'business' and 'problem solving' skills and senior managers employed

with private training providers requiring leadership skills of 'business', 'managing teams' and 'strategic' skills. However, the results of the EFA and the CFA do suggest some differences. Senior managers employed with public training providers require leadership skills of 'strategic skills', 'business skills' and 'problem solving skills' and senior managers employed with private training providers require leadership skills of 'business skills', 'managing teams skills' and 'strategic skills'.

These findings will impact on VET human resource policies and practice for the recruitment, succession planning and professional development of senior managers should specifically focus on leadership skills. These leadership skills require a particular focus on 'business skills', 'problem solving/managing teams skills' and 'strategic skills'. Furthermore, the findings made a distinct contribution to academic knowledge in the explicit themes of leaders, skills, leadership skills and VET. The added new depth to leadership theory provided a foundation to rethink leadership with a focus on skills. In addition, the findings expanded on the LSSM and highlighted that leadership skills examined within the specific context of VET provided an explicit understanding of skill requirement for senior managers. Chapter 5 also presented the limitations of the thesis with consideration to the thesis scope, timing of the research and the research methodology. Recommendations for future research to test the results of this thesis were also made.

5.2 Literature Review Post June 2015

A review of the literature post June 2015 revealed that research continued to be conducted in the area of leadership, skills and VET. Research in the area of VET continued to be focused on teaching strategies (Buli & Yeshuf 2015; McVicar & Tabasso 2015; Horn 2016) and curriculum development (Albashiry, Vogt & Peiters 2015; Bacca et al. 2015; Cattaneo, Nguyen & Aprea 2016; Hodge 2016). Education leadership research continued to be focused on leadership practices for school principals (Salo, Nylund & Stjernstrom 2015; Warwas 2015; Sinnema, Ludlow & Robinson 2016), leadership for teachers (Oude Groote Beverborg, Sleegers & van Veen 2015) and leadership within higher education (Savage et al. 2015; Raimonda & Modesa 2016; Arar 2016). Although Coates et al. (2013) argued that leadership in VET needs to be researched to provide an understanding of the complexity of the

sector, there continues to be limited research in this area.

5.3 Practical implications and Academic Contributions

The findings of this thesis will impact on the VET sector and therefore influence practice and policy. In addition, academic contributions have been made and extend on the theory of leadership, skills and leadership skills.

5.3.1 Practical Implications

Although this thesis had limitations, as summarised below, these limitations do not detract from the overall contribution made by this thesis. The findings of this thesis will impact on leadership practices and policies to the Australian VET sector. As outlined by Boateng (2012) & Cardno (2014) senior managers in VET are usually promoted through the ranks of teacher to manager on the basis of their practical vocational and teaching experience, rather than their management or leadership skills and are often inadequately prepared for the role of leadership. Therefore the findings of this thesis are of particular importance to employers, senior managers and the VET sector. In particular the focus on leadership skills can guide the recruitment criteria, succession planning and professional development of senior managers. The literature indicated that succession planning in VET has been subjected to an unsustainable turnover of senior managers, with a shortfall of adequately prepared candidates and an increasing number of senior managers approaching retirement age. A reduction of funding has resulted in management and teaching positions being contracted or casualised which has reduced morale and talent attraction. In response to these crises, Mehrabani & Mohamad (2015) highlight that professional development programs for managers in VET have continued, however the programs are predominately focused on leadership behaviour, attributes and competencies with limited importance on leadership skills. The findings of this thesis have provided practical contribution to human resource policies and practice for the recruitment, professional development and succession planning of senior managers in VET. Therefore, government, training

providers and senior managers should not ignore the importance of leadership skills.

5.3.2 Academic Contribution

This thesis has made a contribution to academic knowledge that extends the theory of leadership. The distinct academic contributions to knowledge within the explicit themes of leaders, skills and leadership skills have added new depth to the phenomenon of leadership. The findings of this thesis have provided a foundation to rethink leadership with a focus on skills and offered a richer conception of skills. Furthermore, this thesis expands on the concept of the LSSM and highlights that examining leadership skills within a specific context provides an explicit understanding that leadership skill requirements in one context may not necessary be relevant in another context (Kalargyrou, Pescosolido & Kalargiros 2012).

5.4 Limitations

As in all research, this thesis presented with limitations that may have impacted on the findings. The major limitations to this thesis included the thesis scope, the timing of the research and the research methodology. The thesis scope was guided by the Doctorate of Business Administration requirements and presented restrictions on the timeframe, resources and budget. The timing of the research did not allow a longitudinal study or a comparison of skills requirement from the employers of sectors perspective to be conducted. The decision to use quantitative research methodology was based on previous research conducted by Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012). Furthermore, the research methodology was deemed the most time and cost effective methodology. However, the limitations of the methodology may have impacted on the findings. For example, the quantitative approach used a purposive sampling framework and an online survey as the data collection tool and therefore restricted the ability to collect qualitative data. Qualitative data may have confirmed or provided more insight to the findings of this thesis. Furthermore, the use of the online survey as the data collection

tool required participants to have a level of IT skills, access to electronic hardware and the internet as well as the reliance of email filters to effectively deliver the email also presented as limitations to this thesis. Finally the sample size of respondents has limited the power of group difference tests in relation to H_3 and H_4.

Although, the limitations of this thesis may have impacted on the definitive assessment of these hypotheses, the research conducted here is ground breaking in terms of practical and academic contributions in this important VET sector.

5.5 Future Research

Notwithstanding, the limitations of this thesis, future research should be conducted in order to determine the generalisation of the results as presented in this thesis. Future research recommendations include conducting the research with a larger sample size, from the employers' perspective and a longitudinal study. A larger sample size will improve the power of group differences and determine leaderships skill requirements based on training provider type and skill requirements related to management level. Examining leadership skill requirements from an employers' perspective will determine if the results of this thesis can be replicated and a longitudinal study will collect data over a long period of time to identify patterns or changes in leadership skill requirements (Menard 2002).

5.6 Conclusions

The conclusions for this thesis are discussed in the context of previous research conducted by Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) and the findings of this thesis. Previous research conducted by Mumford, Campion & Morgeson (2007), examined the skill requirement dependent on management level within an organisation. The sample consisted of professional employees working in a government agency who held the position of junior, mid level and senior manager. Mumford, Campion & Morgeson (2007) applied a stratified approach in identifying leadership skills using the LSSM four factor model of cognitive, interpersonal, business and strategic skills. The LSSM four factor model

proposed that leadership skills are four distinct skills of cognitive, interpersonal, business and strategic skills and that skills requirement are relevant to management level. Furthermore, Mumford, Campion & Morgeson (2007) confirmed that cognitive skills are required the most, followed by interpersonal, business and strategic skills. Kalargyrou, Pescosolido & Kalargiros (2012) examined the expectations of leadership from the perspective of the followers of leaders in the faculty of hospitality within a large university setting using the LSSM. The aim of their research was to test the LSSM and identify leadership skills within the context of senior managers in high education. Kalargyrou, Pescosolido & Kalargiros (2012) ranked business skills as the most important set of leadership skills, followed by cognitive, interpersonal, and strategic. These findings were different from the study conducted by Mumford, Campion, and Morgeson (2007) that concluded that cognitive skills would be needed the most, followed by interpersonal, business, and finally, strategic skills. Although, the LSSM provided a framework to identify leadership skills, the findings of this thesis differed from Mumford, Campion, and Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) studies. The LSSM presented as a four leadership skills model of cognitive, interpersonal, business and strategic skills. However, on further examination of these skills the skill attributes are of importance within the context Australian VET sector. Leadership skills required are a three factor leadership skill model. Therefore, the three factor leadership skill model answered the principal research question to indicate that the skills required for senior manager in the context of Australian VET are 'business skills', 'problem solving/managing teams skills' and 'strategic skills'. Furthermore, the findings of this thesis concluded that:

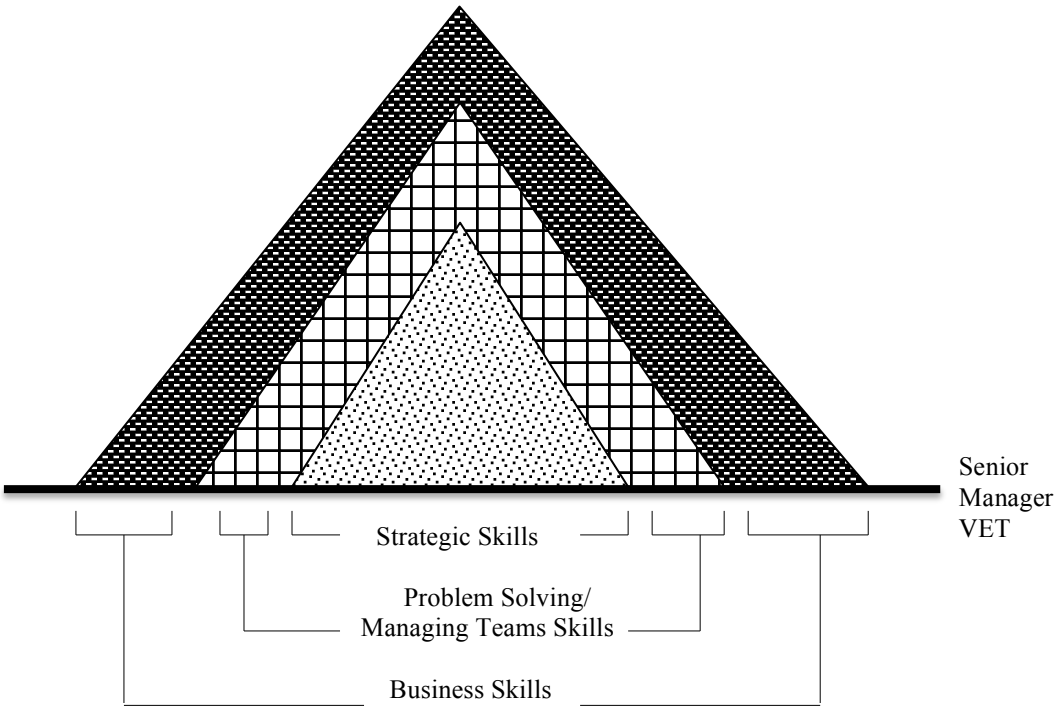
1. The LSSM leadership skills of cognitive, interpersonal, business and strategic skills are distinctive. However, within the context VET, leadership skills for senior manager do not conclusively fit within the LSSM. The skills required for senior managers in VET are 'business skills ', 'problem solving/managing teams skills' and 'strategic skills'. Business skills consist of the capacity to make decisions regarding the procuring and allocating of equipment, ability to be responsible for the financial resources of a program or unit delivery, capacity to read, understand and apply written information and instructions. Problem solving/managing team skills consist of capacity to problem solve complex issues,

ability to handle conflict, manage staff and material resources, capacity to develop and motivate individuals in their work, ensure services are provided at a high standard to meet regulatory requirements, use persuasion skills to influence others to achieve organisational goals, apply negotiation skills to reconcile differences between team members and respond to other team members needs. Strategic skills consist of capacity to plan and prioritise workload, identify and manage risk, identify internal capabilities and external threats to achieve strategic goals, involve other team members when making decisions and the ability to apply a systematic perspective to influence planning and implementation.

2. Senior managers in VET do utilise cognitive skills the most followed by strategic, interpersonal and business skills.

3. Leadership skill requirements are related to management level within an organisation and senior managers require business skills, problem solving/managing teams skills and strategic skills. The LSSM presented in Figure 2.4 of this thesis illustrates the four category leadership skills of cognitive, interpersonal, business and strategic skills in relation to organisation level. Figure 5.1 illustrates the Leadership Skills Strataplex Model – VET Senior Managers as presented from the findings of this thesis. The horizontal line presents the management role as associated with organisation levels. The three categories of leadership skills are business skills, problem solving/managing teams skills and strategic skills. The area subsumed in each successive triangle, represents the hypothesised amount of that particular leadership skill that would be required for that particular job level. Mumford, Campion & Morgeson (2007) LSSM refers to cognitive skills being required the most, followed by interpersonal, business and strategic skills. However, LSSM for senior managers in VET suggests that as managers are promoted into senior management roles the acquisition of business skills and problem solving/managing teams skills are more critical than strategic skills.

Figure 5.1 Leadership Skills Strataplex Model - VET Senior Managers



Source: Adapted from Leadership Skills Strataplex Model. Mumford, Campion & Morgeson (2007)

4. The broad leadership skills required for senior managers do not seem to differ by training provider type. However, the results of the EFA and CFA suggest some differences in leadership skill requirements based on the analysis of the broad skills for promotion and more specific categories of leadership skills. Senior managers employed with public training providers require leadership skills of 'strategic skills', 'business skills' and 'problem solving skills' and those employed in private training providers require leadership skills of 'business skills', 'managing teams skills' and 'strategic skills'.

Therefore, the evidence presented in this thesis does differ from Mumford, Campion & Morgeson (2007) and Kalargyrou, Pescosolido & Kalargiros (2012) testing of the LSSM. The evidence also supports an explicit understanding that leadership skills required in one context may not be relevant in a different context (Kalargyrou, Pescosolido & Kalargiros 2012). Furthermore, the identification of the skills required

for senior managers of 'business skills', 'problem solving/managing teams skills' and 'strategic skills' indicate that senior managers are predominately focused on day to day operations and team management rather than on the strategic planning of the organisation. These findings provide further insight into the sector and suggest that senior managers are focused inward rather than undertaking action and activities to implement strategy (Hubbard 2004) and is reflective of the volatility of the Australian VET sector.

5.7 Recommendations

This thesis has generated evidence to support that senior managers in VET require specific leadership skills for effective leadership. The specific leadership skills are 'business', 'problem solving/managing teams' and 'strategic skills'. Business skills consist of capacity to make decisions regarding the procuring and allocating of equipment, ability to be responsible for financial resources of a program or unit delivery, capacity to read, understand and apply written information and instructions. Problem solving/managing team skills consist of capacity to problem solve complex issues, ability to handle conflict, capacity to manage staff and material resources, ability to develop and motivate individuals in their work, ensure services are provided at a high standard to meet regulatory requirements, use persuasion skills to influence others to achieve organisational goals, apply negotiation skills to reconcile differences between team members and the ability to respond to other team member's needs**.** Strategic skills consist of capacity to plan and prioritise workload, identify and manage risk, identify internal capabilities and external threats to achieve strategic goals, involve other team members when making decisions and able to apply a systematic perspective to influence planning and implementation. Based on this evidence it is recommended that the VET human resource policies of recruitment criteria, professional development and succession planning for senior managers focus on leadership skills with a specific focus on 'business', 'problem solving/managing teams' and 'strategic skills'. Additional recommendations include future research to determine the generalisation of the results of this thesis in order to further extend the body of knowledge on leadership, leadership skills and VET.

5.8 Chapter Summary

Chapter 5 presented a summary of each chapter and provided the conclusions of the thesis. The evidence of this thesis presented that leadership skills required for senior managers in VET are a three factor leadership skills model of 'business', 'problem solving/managing teams' and 'strategic skills' Business skills consist of capacity to make decisions regarding the procuring and allocating of equipment, responsible for financial resources of a program or unit delivery, capacity to read, understand and apply written information and instructions. Problem solving/managing team skills consist of capacity to problem solve complex issues, handle conflict, capacity to manage staff and material resources, capacity to develop and motivate individuals in their work, ensure services are provided at a high standard to meet regulatory requirements, use persuasion skills to influence other to achieve organisational goals, apply negotiation skills to reconcile differences between team members and respond to other team member's needs**.** Strategic skills consist of capacity to plan and prioritise workload, identify and manage risk, identify internal capabilities and external threats to achieve strategic goals, involve other team members when making decisions and able to apply a systematic perspective to influence planning and implementation

In addition, the findings of this thesis provided practical contribution to the VET sector to guide leadership professional development programs to focus on leadership skills and influence human resource strategies and policies in the area of recruitment and succession planning for senior managers in VET. This thesis also provided a distinct contribution to academic knowledge in the explicit themes of leaders, skills and leadership skills and added a new depth to the knowledge of leadership. Future research includes examining VET senior manager leadership skill requirements from the employers' perspective and a longitudinal study of senior managers to determine the generalisation of the results as presented in this thesis. Finally, recommendations include the VET sector to encourage leadership skills of senior managers to be assessed using valid and reliable instruments to ensure they are equipped with the

required skills of business, problem solving/managing teams and strategic skills. For managers in VET the findings should encourage managers to develop their leadership skills of business, problem solving/managing teams and strategic skills through practical and theoretical avenues to enable effective leadership.

Finally, further research is required to more comprehensively test the hypotheses that suggest that skill requirements may differ by management level and training provider type.

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APPENDICIES

Appendix 1 Conceptualisation of Category Skills and Skill Attributes

Conceptualisation of category skills and associated sub skills.					
Reference	**Skill Attribute**	**Cognitive Skills**	**Interpersonal Skills**	**Business Skills**	**Strategic Skills**
Mumford, Campion & Morgeson (2007)	Collecting	✓			
Mumford, Campion & Morgeson (2007)	Processing	✓			
Mumford, Campion & Morgeson (2007)	Monitoring	✓			
Paraham (2015) Mumford et al (2007)	Information gathering	✓			
Nambaccas (2009)	Information Dissemination	✓			
Mumford, Campion & Morgeson (2007)	Learning	✓			
Tucker (2002) Giroux (2009)	Critical Thinking	✓			
Paraham (2015) Mumford, Campion & Morgeson (2007) Bambaccas (2009) Bedwell (2014)	Oral Communication	✓	✓		
Mumford, Campion & Morgeson (2007) Bambaccas (2009)	Written communication	✓	✓		
Mumford, Campion & Morgeson (2007)	Adaptability	✓			
Bedwell (2014) Giroux (2009)	Problem Solving	✓			
Mumford, Campion & Morgeson (2007)	Investigating	✓			
Mumford, Campion & Morgeson (2007)	Cognitive capacity	✓			✓
Ambrosini, Jenkins & Collier (2007) Marx (2015)	Cognitive complexity	✓			✓
Bedwell (2014)	Interacting		✓		
Mumford, Campion & Morgeson (2007) Bedwell (2014)	Influencing		✓		
Mumford, Campion & Morgeson (2007)	Supervisory		✓		
Mumford, Campion & Morgeson (2007)	Negotiating		✓	✓	
Bedwell (2014)	People orientation		✓		
Huusko (2006)	Caring		✓		
Huusko (2006)	Empathetic		✓		

Mumford, Campion & Morgeson (2007)	Forgiving		✓		
Mumford, Campion & Morgeson (2007)	Hospitable		✓		
Mumford, Campion & Morgeson (2007)	Patient		✓		
Huusko (2006)	Trustworthy		✓	✓	
Huusko (2006) Palakshappa (2007)	Human Relations		✓		
Huusko (2006) Palakshappa (2007)	Leader		✓		
Kalargyrou Pescosolido & Kalargiros (2012)	Flexible		✓		
Kalargyrou Pescosolido & Kalargiros (2012)	Persuasive		✓		
Lau & Pavett (1980) Bedwell (2014)	Listening		✓		
Coates et al (2013)	Empowering			✓	
Mumford, Campion & Morgeson (2007)	Authority			✓	
Mumford, Campion & Morgeson (2007)	Staffing			✓	
Mumford, Campion & Morgeson (2007)	High Standards			✓	
Giroux (2009)	Time management			✓	
Mumford et al (2007)	Transparency			✓	
Coates et al (2013)	Co-ordination			✓	
Coates et al (2013) Palakshappa (2007)	Technical			✓	
Coates et al (2013)	Financial resource allocator			✓	
Mumford et al (2007)	Budgeting			✓	
Mumford, Campion & Morgeson (2007) Ambrosini, Jenkins & Collier (2007)	Resource allocator			✓	
Stumpf (1991)	Strategic Planning				✓
Ambrosini, Jenkins & Collier (2007)	Evaluating				✓
Ambrosini, Jenkins & Collier (2007)	Figure head				✓
Marx (2015)	Spokesperson				✓
Ambrosini, Jenkins & Collier (2007)	Liaison				✓
Ambrosini, Jenkins & Collier (2007) Mumford, Campion & Morgeson (2007)	System perspective				✓
Ambrosini, Jenkins & Collier (2007) Marx (2015) Mumford, Campion & Morgeson (2007)	Decision making				✓

Ambrosini, Jenkins & Collier (2007) Mumford, Campion & Morgeson (2007)	Intellectual competency				✓
Barrett (2006) Mumford, Campion & Morgeson (2007)	Provide direction				✓
Stumpf (1991) Marx (2015) Mumford, Campion & Morgeson (2007)	Communicate the Vision				✓
Stumpf (1991) Marx (2015) Mumford, Campion & Morgeson (2007)	Recognise Opportunities				✓
Stumpf (1991) Mumford, Campion & Morgeson (2007)	Bring Change				✓
Giroux (2009) Mumford, Campion & Morgeson (2007)	Manage Change				✓

Appendix 2 Online Survey

Default Question Block

WELCOME

The aim of this survey is to identifying the required skills for senior managers of vocational education in Australia.

You are invited to participate in this survey which is to identify the skills required for effective leadership in vocational education from the perspective of senior managers using the "Leadership skills requirement strataplex model" (Mumford, 2007). The model highlights that as managers move through the organisation a different set of skills are required at different levels.

In a competitive environment that demands managers to have a holistic perspective of educational outcomes and organisational objectives it is anticipated that the data collected from this survey will benefit organisations and individuals to identify the skills gaps of senior managers in vocational education.

The skills gap identification will assist organisations in developing professional training to up skill existing staff, recruitment of senior managers and succession planning. For individuals it may identify skills gap that inhibit promotion and enable focus on required skills development.

This survey forms the basis a Doctorate of Business Administration undertaken by Moira Kairys at Victoria University and the information you provide will be maintained in the strictest confidence as per the University's guidelines for data security and disposal. It will be used for statistical analysis as part of the research project.

Phase 2 of the research will involve individual interviews to reconfirm the data collected from the survey. Those who wish to participate in the phase 2 will have their individual results made available. Please indicate if you wish to participate in Phase 2.

It should be noted that this survey is limited to leadership skills and does not intend to test leadership models, competencies or attributes.

If you have any queries or complaints about the way this survey has been conducted please contact Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email Researchethics@vu.edu.au or phone (03) 9919 4781 or 4461.Moira Kairys
Mobile: 0432588961 Email: moirakairys@gmail.com

Please indicate that you are over the age of 18 and wish to participate in this survey.

- ◯ Yes
- ◯ No
- ◯ I would like to participate in Phase 2

What is your name (Optional) .

What is your gender?

- ◯ Male
- ◯ Female

How old are you?

- ◯ 20-30 years
- ◯ 31-40 years
- ◯ 41-50 years
- ◯ 51-60
- ◯ 61 plus

What type of organisations are you currently employed in?

TAFE Technical and Further Education
Private RTO
Enterprise RTO
Other
All

Are you Koorie or Torres Strait Islander?

- ◯ Yes
- ◯ No

What is your current position?

- ◯ Education Manager/Director of Education/Director of Academic Services
- ◯ Director of Studies/ Teaching
- ◯ Educational Manager/ Head of School
- ◯ Program Manager/Training Manager
- ◯ Business Development Manager
- ◯ Course Manager/Head teacher/Senior Education
- ◯ Other

What is the size of your organisation?

- ◯ Under 10 EFT

- 20-49 EFT
- 50-99 EFT
- 100-199 EFT
- 200-400EFT
- Over 400 EFT

What is your employment type?

How long have you been employed in your current position?

How long have you been employed in your current organisation?

How long have you been employed in the vocational education sector?

Thinking of your current role rank the following skills in order of not important to highly important required for this position

	Not Important	Some what Important	Highly Important
Cognitive Skills			
Interpersonal Skills			
Business Skills			
Strategic Skills			

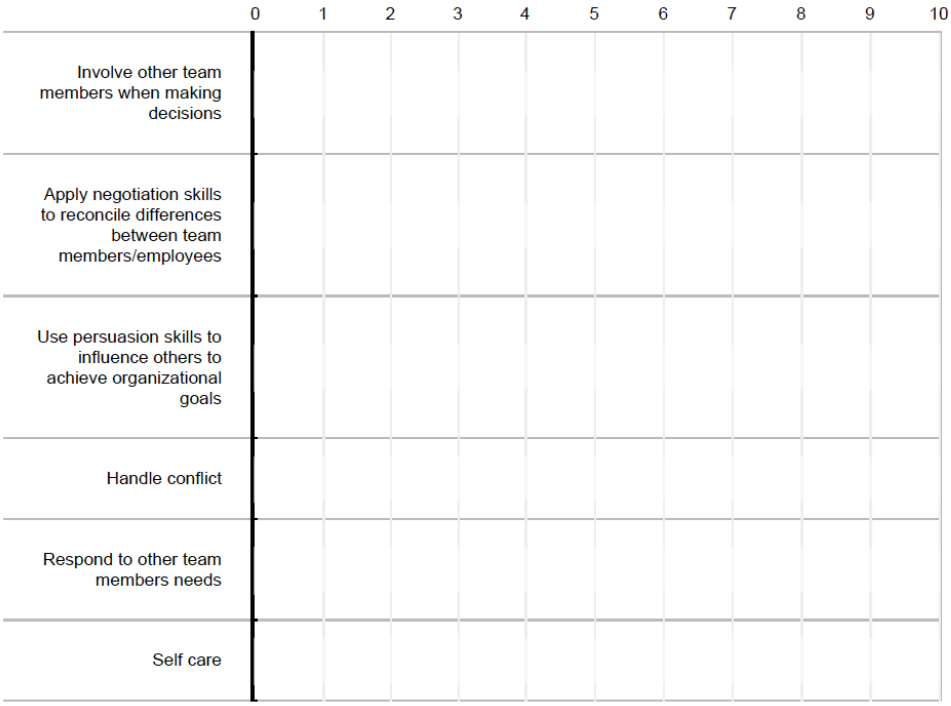
Thinking of your current role rank the follwoing skills in order of not important to highly important required to gain promotion within your organisation

	Not Important	Some what Important	Highly Important
Cognitive Skills			
Interpersonal Skills			
Business Skills			
Strategic Skills			

Thinking of your current role for each of the following statements slide the slider from 0-10 to indicate the importance to your role

0 = Skill not necessary for this position
10 = Skill absolutely critical for adequate performance in this position

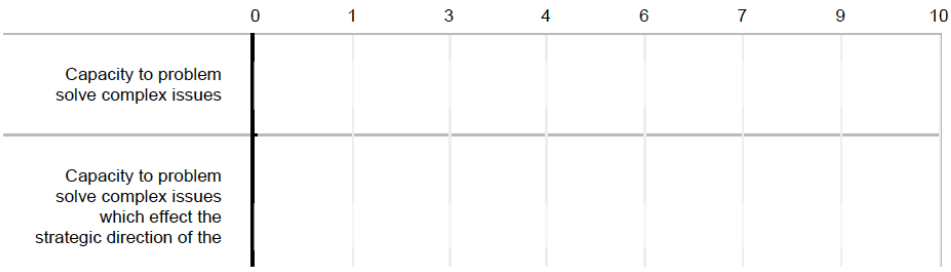
SKILL: Interpersonal Skills



Thinking of your current role for each of the following statements slide the slider from 0-10 to indicate the importance to your role

0 = Skill not necessary for this position
10 = Skill absolutely critical for adequate performance in this position

SKILL: Cognitive



organisation	
Capacity to read, understand and apply written information and instructions	
Make decisions based on clear, rational and informed evidence	
Learn about and adapt new technology to undertake your role	
Identify and manage risk	

Thinking of your current role for each of the following statements slide the slider from 0-10 to indicate the importance to your role

0 = Skill not necessary for this position
10 = Skill absolutely critical for adequate performance in this position

SKILL: Business

	0	1	2	3	4	5	6	7	8	9	10
Capacity to manage staff and material resources											
Capacity to make decisions regarding the procuring and allocating of equipment											
Capacity to develop and motivate individuals in their work											
Responsibility for financial resources of a program or unit delivery											
Respond to other team members needs											
Ensure services are provided at a high standard to meet regulatory requirements											

Thinking of your current role for each of the following statements slide the slider from 0-10 to indicate the importance to your role

0 = Skill not necessary for this position
10 = Skill absolutely critical for adequate performance in this position

SKILL: Strategic Skills

	0	1	2	3	4	5	6	7	8	9	10
Capacity to plan/priorities workload											
Capacity to make decisions regarding the procuring and allocating of equipment											
Able to apply a systematic perspective to influence planing and implementation											
Able to use appropriate problem solving skills to identify alternative actions or solutions											
Use appropriate problem solving skills to identify alternative actions or solutions											
Identify internal capabilities and external threats to achieve strategic goals											

When considering the skills required in your current role place in order of priority the following statements ranked from extremely important to not important.

Items	Extremely important
My organisation supports me in the allocation of resources	
My team members expect me to negotiate with internal and external stakeholders	
My problem solving skills enable me to achieve organizational objectives	
My ability to identify external	

threats provides the opportunity for continuous improvement	**Moderately important**
When making decisions need to use data and research evidence	
I am required to regularly delegate tasks to other team members	
Managing staff is a priority in my role	
When planning the organizational objectives are clearly considered	**Not Important**

Thinking of your current role indicate what skills you have that enable you to undertake your role effectively.

- [ ] Critical Thinking
- [ ] Oral and Written communication
- [ ] Problem solving
- [ ] Negotiating
- [ ] People Skills
- [ ] Leadership
- [ ] Managing Staff
- [ ] Budgeting
- [ ] Technical skills
- [ ] Strategic Planning
- [ ] Managing Change
- [ ] Communicate the vision

Thinking of your current role indicate what skills you lack that inhibit you to undertake your role effectively.

- [ ] Critical Thinking
- [ ] Oral and Written communication
- [ ] Problem solving
- [ ] Negotiating
- [ ] People Skills
- [ ] Leadership
- [ ] Managing Staff
- [ ] Budgeting
- [ ] Technical skills
- [ ] Strategic Planning
- [ ] Managing Change

☐ Communicate the vision

Out of 100% thinking of your current role what percentage of time do the following tasks take on a daily basis?

0 Planning 0 Allocating resources 0 Staff Supervision 0 Problem solving

---

Thinking about your current role what skills do you think you require additional training in to better perform?

What skills does your organisation think are important for promotion?

Budgeting and Finance
Staff Management
Strategic Planning
Communication
All

What skills do you think are important for promotion?

- ○ Budgeting and Finance
- ○ Staff Management
- ○ Strategic planning
- ○ Communication
- ○ All

Please indicate if you would like an analysis of your leadership skills

- ○ Yes
- ○ No
- ○ If yes please provide your email address

End of Survey.
Thank you for your participation

Appendix 3 Model Fit Summary

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	51	305.092	101	.000	3.021
Saturated model	152	.000	0		
Independence model	32	991.765	120	.000	8.265

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.692	.635	.771	.722	.766
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.842	.583	.645
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	204.092	155.369	260.445
Saturated model	.000	.000	.000
Independence model	871.765	775.036	975.949

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	3.082	2.062	1.569	2.631
Saturated model	.000	.000	.000	.000
Independence model	10.018	8.806	7.829	9.858

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.143	.125	.161	.000
Independence model	.271	.255	.287	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	407.092	428.238		
Saturated model	304.000	367.024		

Independence model 1055.765 1069.033

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	4.112	3.620	4.681	4.326
Saturated model	3.071	3.071	3.071	3.707
Independence model	10.664	9.687	11.717	10.798

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	41	45
Independence model	15	16

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	33	251.026	87	.000	2.885
Saturated model	120	.000	0		
Independence model	15	851.119	105	.000	8.106

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.423	.767	.679	.556
Saturated model	.000	1.000		
Independence model	1.861	.296	.196	.259

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.705	.644	.785	.735	.780
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.829	.584	.646
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	164.026	120.405	215.290
Saturated model	.000	.000	.000
Independence model	746.119	656.845	842.855

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	2.536	1.657	1.216	2.175
Saturated model	.000	.000	.000	.000
Independence model	8.597	7.537	6.635	8.514

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.138	.118	.158	.000

Independence model	.268	.251	.285	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	317.026	329.749	402.996	435.996
Saturated model	240.000	286.265	552.620	672.620
Independence model	881.119	886.903	920.197	935.197

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	3.202	2.762	3.720	3.331
Saturated model	2.424	2.424	2.424	2.892
Independence model	8.900	7.998	9.877	8.959

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	44	48
Independence model	16	17

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	69	644.584	206	.000	3.129
Saturated model	275	.000	0		
Independence model	44	1658.925	231	.000	7.181

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.611	.564	.698	.656	.693
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.892	.545	.618
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	438.584	365.797	518.986
Saturated model	.000	.000	.000
Independence model	1427.925	1302.367	1560.930

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	6.511	4.430	3.695	5.242
Saturated model	.000	.000	.000	.000
Independence model	16.757	14.423	13.155	15.767

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.147	.134	.160	.000
Independence model	.250	.239	.261	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	782.584	824.347		
Saturated model	550.000	716.447		

Independence model 1746.925 1773.557

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	7.905	7.170	8.717	8.327
Saturated model	5.556	5.556	5.556	7.237
Independence model	17.646	16.377	18.989	17.915

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	37	40
Independence model	16	17