AN INVESTIGATION INTO THE RELATIONSHIP BETWEEN TALENT MANAGEMENT PROCESSES AND KNOWLEDGE MANAGEMENT PROCESSES: A CASE OF THE HIGHER EDUCATION SECTOR IN QUEENSLAND, AUSTRALIA

A Thesis submitted by

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ABSTRACT

In Australia, the higher education industry has become one of the key foundations of a progressive knowledge-based economy. Talent management studies and knowledge management frameworks have been used to assist organisations to meet demands related to increased competitiveness through investing in their human capital to develop their talent capabilities. There are pragmatic advantages for organisations that focus on talent and knowledge. A focus on talent and knowledge can provide many advantages to educational organisations, as both talent and knowledge can assist in increasing the rankings and profits of higher education organisations. However, few studies have empirically examined the interaction between talent management processes and knowledge management processes. Therefore, this study aimed to: (1) comprehend the best processes that are currently used in managing talent and knowledge in Australian higher education; and (2) investigate the relationship between talent management processes and knowledge management processes in Australian universities.

To achieve these two objectives and fill gaps in the literature, this research adopted a sequential exploratory strategy as a specific mixed-methods design. The qualitative study, as a first stage, is followed by a quantitative study in the second stage. The first objective of the study was met by conducting three qualitative multi-method approaches that are commonly used in empirical studies, namely brainstorming, focus group discussions, and individual interviews. The second objective of the study was achieved by conducting survey questionnaires, which are universally used in practical quantitative research. The sample involved six participants for brainstorming, eleven in the focus group session, six individual interviews, and 286 individuals for the quantitative survey questionnaire, all conducted in the public and private universities within the Australian higher education industry in Queensland.

The core conclusion of the first study is that Queensland universities are significantly aware of the six key themes that are currently used in managing talent and knowledge in their divisions and faculties. Three key themes and ten sub-themes of talent management processes are: (1) talent attraction (social domain, and organisational excellence); (2) talent development (performance management, coaching talent, and leadership development); and (3) talent retention (benchmarking,

job satisfaction, non-monetary rewards, employee empowerment, and employee motivation). Similarly, three key themes and seven sub-themes of knowledge management processes are: (1) knowledge transfer (personalisation and codification); (2) knowledge creation (combination, socialisation, internalisation, and externalisation); and (3) knowledge sharing (sharing information). The primary conclusion of the second study is that there is a significant influence of talent management processes (talent development and talent retention) on knowledge transfer; of talent management processes (talent development, talent retention) on knowledge creation; and of talent management processes (talent attraction, talent development, and talent retention) on knowledge sharing. This means that talent management processes play a core role in knowledge management processes in Australian higher education, because most of the relationships between these processes are significant and positive.

Theoretical and practical contributions of the study were also outlined. Theoretically, the study offers a value-add to both talent management and knowledge management literature in the form of a conceptual model that links both of these variables in the Australian higher education sector. In terms of the practical contributions, this study has collected rich and original qualitative and quantitative data regarding talent management and knowledge management in the higher education domain. For instance, the research findings validate what had already been found but they are nevertheless significant because practical, rather than theoretical, data was gathered through a discussion with real people. This study has high quality because of the strengthening effect of the in-depth case study.

CERTIFICATION OF THESIS

This thesis is entirely the work of **Atheer Abdullah Mohammed** except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

Principal Supervisor: Professor Raj Gururajan

Associate Supervisor: Dr Abdul Hafeez-Baig

Student and supervisors signatures of endorsement are held at the University.

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DEDICATION

I dedicate this thesis to

... Almighty Allah for responding to all my prayers and making this complicated journey a success

….the hurt that always bleeds, Iraq

… my beloved parents

… my beloved brothers, Aqeel, Nabil, Haider, and Kaiser

… my beloved two sisters, Sahar and Sara

… my beloved daughter, Retaj, and

… my beloved son, Zain-Alabdeen.

LIST OF PUBLICATIONS

- **Book Chapters**

Mohammed, AA, Baig, AH & Gururajan, R 2018, 'Talent management as a core source of innovation and social development in higher education', in D Parrish (ed.), *Innovations in higher education- Cases on transforming and advancing practice*, IntechOpen, London.

- **Conference Papers:**

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- **Journal Articles:**

Mohammed, AA, Hafeez-Baig, A & Gururajan, R 2018, 'A qualitative research to explore processes that are utilised for managing talent: A case study in a Queensland Regional University', *Australian Academy of Business and Economics Review*, vol. 4, no. 3, pp. 188-200.

- **Journal Articles: Accepted**

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- **Papers Under Review**

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Mohammed, AA, Hafeez-Baig, A & Gururajan, R, 'An assessment of knowledge management processes: A case of the higher education sector in Queensland, Australia', paper submitted to the *Journal of Asia Pasific Management Review*.

Mohammed, AA, Hafeez-Baig, A & Gururajan, R, 'An examination of higher education policies regarding talent management in Australian universities', paper submitted to the *Journal of Productivity and Performance Management*.

Mohammed, AA, Hafeez-Baig, A & Gururajan, R, 'An investigation into the relationship between talent management processes and knowledge transfer: A case of Australian higher education', paper submitted to the *Academy of Management Journal.*

Mohammed, AA, Hafeez-Baig, A & Gururajan, R, 'The effect of talent management processes on knowledge creation: A case of the Australian public and private universities', paper submitted to *International Journal of Information Systems and Change Management.*

Mohammed, AA, Hafeez-Baig, A & Gururajan, R, 'An investigation the relationship between talent development and knowledge sharing: A case of Australian higher

education', paper submitted to *eKNOW 2019, The Eleventh International Conference on Information, Process, and Knowledge Management*.

Mohammed, AA, Hafeez-Baig, A & Gururajan, R, 'The emergency of knowledge management research in the higher education sector: A critical review', paper submitted to the *Journal of Online Information Review.*

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LIST OF ABBREVIATIONS

AGFI	Adjusted Goodness-of-Fit statistic
AMOS	Analysis of Moment Structures
CB-SEM	Covariance Based-Structural Equation Modeling
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
Chisq	Chi-square
Chisq/df	Chi-Square/ Degree of Freedom
ECV	Exploratory Construct Validity
EFA	Exploratory Factor Analysis
GFI	Goodness of Fit Index
HTMT	Heterotrait-Monotrait Ratio
HREC	Human Research Ethics Committee
ICC	Interclass Correlation Coefficient
IFI	Incremental Index of Fit
IT	Information Technology
KC	Knowledge Creation
KMO	Kaiser-Meyer-Olkin Measure
KS	Knowledge Sharing
KT	Knowledge Transfer
MD	Mahalanobis Distance
PCA	Principal Component Analysis
PLS-SEM	Partial Least Squares-Structural Equation Modeling
RMR	Root Mean square Residual
RMSEA	Root Mean Square Error of Approximation
SECI	Socialisation, Externalisation, Combination, and Internalisation
SEM	Structural Equation Modeling
SPSS	The Statistical Package for the Social Science
TA	Talent Attraction
TD	Talent Development
TLI	Tucker Lewis Inde
TR	Talent Retention
USQ	University of Southern Queensland

CHAPTER 1: INTRODUCTION

1.1. Chapter overview

This chapter provides an introduction to the topic of the thesis. The chapter is divided into nine sections. Section 1.1 is the overview of this chapter. The next section 1.2 introduces the research, which is then followed by a discussion of the motivation and justification for the research in 1.3. The research setting and audience are addressed in Section 1.4, and Section 1.5 discusses the study's problem statement. The scope of the study is then presented in Section 1.6. It concerns public and private universities in Queensland. Section 1.7 highlights operational definitions of the constructs developed for this study. The research objectives and research questions are addressed in Section 1.8. There are two core research objectives and nine research questions as part of this study. Finally, the last section provides a brief summary of the chapters that are involved in this thesis. Figure 1.1 shows a graphical layout of this chapter.

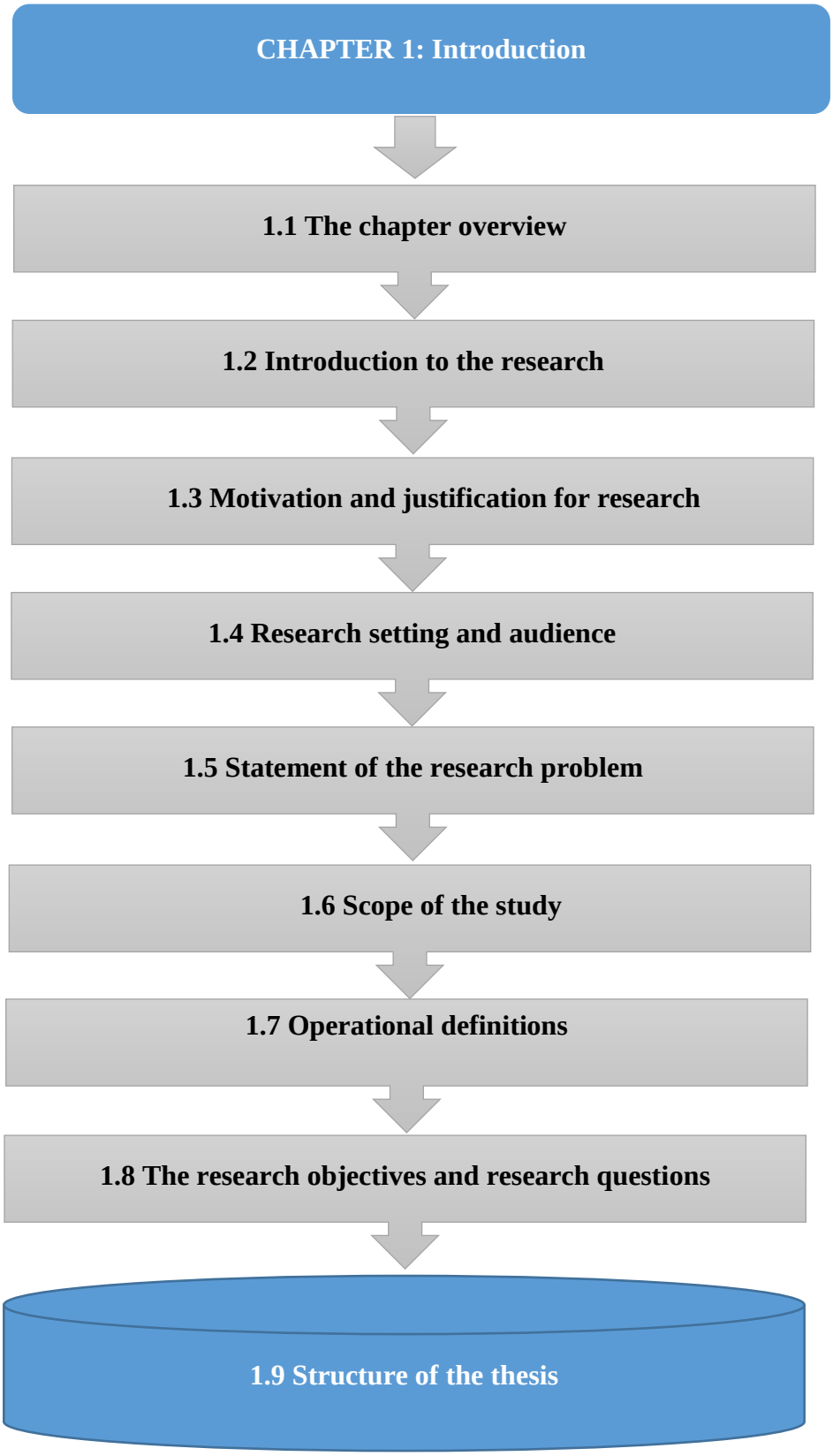


Figure 1.1: A graphical layout for Chapter 1

Source: Prepared by the researcher.

1.2. Introduction to the research

In recent years, talent management and knowledge management research have been used to assist organisations meet demands associated with increased competitiveness. (Daraei et al. 2014; Gallardo-Gallardo et al. 2015; Mohammed et al. 2017; Osigwelem 2017; Urbancová & Vnoučková 2015). This has been by capitalising on their human assets to develop their talent capabilities (Daraei et al. 2014; Gallardo-Gallardo et al. 2015; Mohammed et al. 2017; Osigwelem 2017; Urbancová & Vnoučková 2015). This is because of the pragmatic advantages for organisations that focus on talents and knowledge (Hazelkorn 2017; Jones 2008; Lynch 2015; Norhafizah 2016; Shabane 2017; Urbancová & Vnoučková 2015). For example, both talent and knowledge assist in increasing the rankings and profits of higher education organisations (Diezmann 2018; Hazelkorn 2017; Lynch 2015). The period of the talent economy is dependent upon knowledge, networks, and information (Gateau & Simon 2016; Mohammed et al. 2017).

Globally, talent management has received growing attention among various organisations (Ingram 2016; Kimathi 2015; Morley et al. 2017). Talent management has become a common term beginning with the McKinsey group who first mentioned it in their 1997 report, *The war for talent* (Cui et al. 2016; Farndale et al. 2010; Iles, Preece, et al. 2010; Martin 2015; Mohammed et al. 2017; Ozuem et al. 2016; Swailes 2016). In the higher education sector as an industry, talent management as a primary component of strategic human resources management can improve a university's performance over the long term by advancing its strategy and enact it through its talented individuals (Bradley 2016; Kamal 2017; Paisey & Paisey 2018). Thus, talent management is an essential for organisational success by making it possible for organisational systems to achieve higher goals (Andersson 2014; Calo 2008; Daneshfard et al. 2016; Sweem 2009). Consequently, it is considered a core source of innovation and social development (Bradley 2016; Mohammed et al. 2017).

In today's business world, a majority of organisations have started to rethink their procedures and policies to achieve better acquisition and retention of individual talents. It is obvious that there is strong competition between organisations in a technology-driven modern era, which has caused an increase in knowledge workers along with vast market changes (Andersson 2014; Calo 2008; Sweem 2009). Therefore,

organisations have begun to think about how to improve their performance, operations, skills, and employee knowledge in order to maintain excellence and flexible development (Andersson 2014; Calo 2008; Sweem 2009). Many scholars have paid empirical attention to retention, development and attraction of talent (Andersen 2013; Awan & Farhan 2016; Ford 2017; Gallardo-Gallardo & Thunnissen 2016; Ortlieb & Sieben 2012; Tarique & Schuler 2010; Thomas 2015). This is because talent attraction, development, and retention are of strategic importance in today's unpredictable knowledge economy, as they aid an organisation to accomplish strategic business objectives, achieve fundamental business requirements, and they form the basis for the implementation of a business strategy (Ford 2017; Hejase et al. 2016; Kim et al. 2014; Rothwell 2011; Rothwell et al. 2014; Tatoglu et al. 2016; Waheed et al. 2013). Thus, these processes are the essential to growth and success of higher education organisations as an industry over long perioud of time by employing an organisation's strategy with highly qualified individuals (Bradley 2016; Kamal 2017; Rudhumbu & Maphosa 2015; Wu et al. 2016).

Nonetheless, new research in the strategic human resources area is urgently needed and rapidly expanding, as organisations have encountered significant challenges associated with talent management (Kamal 2017; Mohammed et al. 2017; Scaringella & Malaeb 2014). These key challenges are faced by Australian higher education organisations as an industry sector, which needs high-quality assurance in terms of their technical expertise and activities (Chiou 2014; Choon Boey Lim 2009; Lim 2010; Lynch 2013; Shah & Jarzabkowski 2013) and an ability to be leading exporters of international education (Carnegie & Tuck 2010; Chiou 2014; Harmon 2015; Lynch 2013). Bradley (2016) has suggested a key solution to meet these challenges in Australian higher education could be the application of talent management programs. Such programs include processes such as attraction, development and retention of talent, which are key to growth and success of higher education organisations within their industry (Bradley 2016; Kamal 2017; Kasemsap 2017; Rudhumbu & Maphosa 2015; Wu et al. 2016).

Similarly, knowledge management is one of the most common concepts link to talent management (Gallardo-Gallardo & Thunnissen 2016; Kasemsap 2017; Powell & Ambrosini 2017; Suryawanshi 2017). For many years, knowledge management

research has been surprisingly neglected with no clear applications by researchers and authors in the higher education industry (Sunalai & Beyerlein 2015). However, more recently, there has been an increasing amount of literature considering the creation, transfer, sharing, and utilisation of knowledge in educational organisations (Hazelkorn 2017; Kasemsap 2017; Masa'deh et al. 2017; Oktavia et al. 2017; Rambe & Mbeo 2017; Shams & Belyaeva 2017; Sunalai & Beyerlein 2015; Veer Ramjeawon & Rowley 2017). As such, knowledge management in the higher education industry is considered an integrated approach that can allow organisations to meet demands associated with increased competitiveness (Hazelkorn 2017; Kasemsap 2017; Masa'deh et al. 2017; Oktavia et al. 2017; Rambe & Mbeo 2017; Shams & Belyaeva 2017; Sunalai & Beyerlein 2015; Veer Ramjeawon & Rowley 2017).

Over the past decade, many organisations in the higher education industry have realised that applying knowledge management processes can make an organisation more effective, efficient, and competitive (Kasemsap 2017; Oktavia et al. 2017; Veer Ramjeawon & Rowley 2017). Consequently, these processes perform a strategic role in the success and growth of organisations in the higher education industry (Kasemsap 2017; Rambe & Mbeo 2017; Shams & Belyaeva 2017; Veer Ramjeawon & Rowley 2017). Knowledge management processes are strategic factors in improving and developing innovative organisations (Koohang et al. 2017). Knowledge management processes can include human, technological, and methodological elements, and therefore can be very involved (García-Holgado et al. 2015). A strategic key for successful knowledge management in the higher education industry is a focus on knowledge creation, sharing, and transfer (Howell & Annansingh 2013; Veer Ramjeawon & Rowley 2017).

Relatively few studies have examined the interaction between talent management and knowledge management (Ali et al. 2017; Dries 2013; Kim et al. 2014; Mohammed et al. 2017; Scaringella & Malaeb 2014; Sparrow & Makram 2015). The dominant work reported in the existing literature on talent management has been predominantly theoretical with little focus on practical studies (Gallardo-Gallardo et al. 2015; Gallardo-Gallardo & Thunnissen 2016; Thunnissen 2016; Tomany 2012). Moreover, practical studies on talent management are either quantitative or qualitative with one fifth utilising a mixed-method approach (Gallardo-Gallardo & Thunnissen 2016;

McDonnell et al. 2017; Mohammed et al. 2017). Nevertheless, empirical research of knowledge management has focused on some aspects, 'such as the individualistic nature of research and loyalty to discipline, or on specific elements of knowledge management, such as knowledge sharing amongst academics' (Agarwal & Marouf 2017; Veer Ramjeawon & Rowley 2017, p. 1).

In summary however, little is known about the relationships between talent management processes and knowledge management processes. Researchers recommend that more studies are required to further examine the relationship between talent management processes and knowledge management processes (Ali et al. 2017; Daraei et al. 2014; Kim et al. 2014; Mohammed et al. 2017; Osigwelem 2017; Scaringella & Malaeb 2014; Shabane 2017; Sparrow & Makram 2015; Urbancová & Vnoučková 2015; Vaiman et al. 2015). The outcomes of this research will benefit Australian higher education as an industry sector. Hence, this research has applied an empirical mixed-method approach to determine any potential relationship between talent management processes and knowledge management processes in the Australian higher education sector in Queensland.

1.3. Motivation and justification for research

Knowledge and talent are two primary sources of competitive advantage for organisations (Daraei et al. 2014; Gateau & Simon 2016; Jones 2008; Lawler III 2010; Shabane 2017). As a result, there are many practical benefits for organisations that focus on talents and knowledge (Hazelkorn 2017; Jones 2008; Lynch 2015; Shabane 2017; Urbancová & Vnoučková 2015). For example, both talent and knowledge assist in increasing rankings and profits in the higher education industry (Hazelkorn 2017; Lynch 2015), because universities' rankings are aligned with the talent and knowledge of high-performing employees (Bradley 2016; Diezmann 2018; Hazelkorn 2017; Horseman 2018; Lynch 2015; Refozar et al. 2017). These talented individuals contribute significantly to a university's performance by attracting new students, conducting high-quality teaching and learning, conducting high-level research, and securing funds for further research (Bradley 2016; Diezmann 2018; Hazelkorn 2017; Horseman 2018; Lynch 2015; Refozar et al. 2017).

In terms of talent management processes, the benefits for higher education organisations include development of the talent pool, improvement of the productivity of individuals, support for effective planning, and improvement of human resources management (Kasemsap 2017; Wu et al. 2016). Furthermore, attraction, development and retention of talent are strategically the key to growth and success of the Australian higher education industry (Bradley 2016), as competitive advantage can be maintained by attracting, developing and retaining highly qualified individuals in key positions (Gateau & Simon 2016; Kasemsap 2017; Mwangi et al. 2014; Waithiegeni Kibui 2015).

Conversely, one of the key areas of knowledge management is within higher education settings, and technology has become critical in creating quality research and educational outcomes as part of knowledge management (Kasemsap 2017; Rambe & Mbeo 2017; Shams & Belyaeva 2017; Veer Ramjeawon & Rowley 2017). Thus, knowledge management practices are important for successful and expanding universities (Kasemsap 2017; Rambe & Mbeo 2017; Shams & Belyaeva 2017; Veer Ramjeawon & Rowley 2017). They provide many advantages to educational organisations, including using technology for effective teaching and learning, reducing costs of overall research, and improving evaluation as well as administrative activities (Kasemsap 2017; Veer Ramjeawon & Rowley 2017). Overall, knowledge management is one of the most prevalent frameworks for talent management (Gallardo-Gallardo & Thunnissen 2016; Kasemsap 2017; Powell & Ambrosini 2017; Rambe & Mbeo 2017; Suryawanshi 2017).

However, both talent management and knowledge management research in the higher education sector are limited (Paisey & Paisey 2018; Sunalai & Beyerlein 2015; Veer Ramjeawon & Rowley 2017). Most research in talent management concentrates on theoretical frameworks with limited emphase on empirical research (Gallardo-Gallardo et al. 2015; Gallardo-Gallardo & Thunnissen 2016; Thunnissen 2016; Tomany 2012). Furthermore, empirical research on talent management is either quantitative or qualitative with only one fifth using a mixed-method approach (Gallardo-Gallardo & Thunnissen 2016; McDonnell et al. 2017). Similarly, current empirical studies on knowledge management have concentrated on some aspects, ‘such as the individualistic nature of research and loyalty to discipline, or on specific

elements of knowledge management, such as knowledge sharing amongst academics'(Agarwal & Marouf 2017; Veer Ramjeawon & Rowley 2017, p. 1). Hence, there is much more research to be done in this space, especially in relation to talent and knowledge management using empirical methodologies.

Empirical research has applied benefits for organisations focused on improving knowledge and talent (Jones 2008; Shabane 2017; Urbancová & Vnoučková 2015). Consequently, focusing on talent and knowledge is a method for increasing an organisation's knowledge base and obtaining competitive advantage (Daraei et al. 2014; Gateau & Simon 2016; Hazelkorn 2017; Jones 2008; Kasemsap 2017; Lynch 2015). Thus, identifying and assessing organisational-level interventions can be optimised by including empirical frameworks in talent management and knowledge management studies (Gallardo-Gallardo et al. 2015). This research project is therefore motivated by the requirement to fill a gap in knowledge in terms of the relationship between talent management and knowledge management (Gateau & Simon 2016; Mohammed et al. 2017; Scaringella & Malaeb 2014; Sparrow & Makram 2015) within the context of the higher education industry (Daraei et al. 2014; Osigwelem 2017).

1.4. Research setting and audience

This thesis combines research on talent management in the field of human resources management, and knowledge management in the field of information systems. As mentioned earlier, this is promising because organisations gain benefits through both talent management and knowledge management (Hazelkorn 2017; Jones 2008; Lynch 2015; Shabane 2017; Urbancová & Vnoučková 2015). Therefore, this study provides a combined vision of talent management and knowledge management, which benefits Australian higher education organisations, practitioners, talented individuals, and researchers in the higher education industry.

1.5. Statement of the research problem

The statement of the research problem in this study started with the development and definition of a decision statement, followed by iterative refinement into precise terms of research (Baloch 2011; Zikmund et al. 2013). This is the basis for any research

(Baloch 2011; Cooper & Schindler 2011; Creswell 2014; Ellis & Levy 2008). Over the last few years, a number of researchers have published findings on talent management and knowledge management (Blackman & Kennedy 2008; Peet et al. 2010; Whelan & Carcary 2011; Whelan et al. 2010).

However, little research has investigated the interaction between talent management and knowledge management (Ali et al. 2017; Dries 2013; Kim et al. 2014; Scaringella & Malaeb 2014; Sparrow & Makram 2015). Meanwhile, the Australian higher education industry faces key challenges, such as maintaining high levels of quality assurance in terms of their technical expertise and activities (Chiou 2014; Choon Boey Lim 2009; Lim 2010; Lynch 2013; Shah & Jarzabkowski 2013) and their ability to be a leading exporter of international education (Carnegie & Tuck 2010; Chiou 2014; Harmon 2015; Lynch 2013). Therefore, Bradley (2016) has suggested that a key solution to meet these challenges in the Australian higher education industry is through the application of talent management processes. These processes are attraction, development and retention of talent, which in turn can improve a university's performance over the long term by enacting its strategy through its talented individuals (Bradley 2016; Kamal 2017; Osigwelem 2017; Paisey & Paisey 2018). Hence, Australian higher education organisations should find methods and strategies for attracting, developing and retaining talented individuals (Bradley 2016).

Conversly, there is a need for academic work that examines the combining of talent management processes with knowledge management frameworks, which may lead to novel and worthy results (Sparrow & Makram 2015). Furthermore, research needs to investigate whether worthwhile relationships can be built in the fields that make up talent management, specifically in the areas of talent attraction, development, retention, and knowledge management (Scaringella & Malaeb 2014). Attraction, development, and retention of talent are a central part of talent management in inventive organisations, which are informed by the dual fields of talent management and knowledge management (Gateau & Simon 2016). To conclude this section, further investigation of a broader sample of organisations within the university industry is needed to gain further strategic understanding into the relationship between talent management and knowledge management (Daraei et al. 2014; Osigwelem 2017).

1.6. The scope of the study

The scope of this research includes the public and private universities within the Australian higher education industry in Queensland. The Australian higher education industry refers to three types of organisations: public and private universities, and non-university providers (Training, D. o. E. a. 2015). In Australia, the higher education industry has become one of the key foundations of a progressive knowledge-based economy (Boreham & Salisbury 2016; Bradley 2016). It contributes positively to the progress and growth of Australia's economy through a number of economic benefits to both governments and individuals (Shah & Jarzabkowski 2013; Training 2016). As a result, Australia is one of the major exporters of higher education services and international entrepreneurialism (Carnegie & Tuck 2010; Deschamps & Lee 2015; Harmon 2015; Lynch 2013; Lynch 2015; Vijaya Sunder M 2016). A majority of higher education organisations have realised that talented individuals are strategic assets because they play a key role in the success and growth of the higher education industry over the long term (Bradley 2016; Hazelkorn 2017; Rudhumbu & Maphosa 2015; Wu et al. 2016). Consequently, when an organisation fails to redefine its staff value proposition it will continually have issues in attracting, developing and retaining talent (Rudhumbu & Maphosa 2015). Talented individuals are people who assist higher education organisations with cultural adaption through identifying the challenges of public perception and the development of active learning environments (Kamal 2017; Peet et al. 2010; Training 2016).

However, the Australian higher education industry faces key challenges, such as high levels of quality assurance in terms of its technical expertise and activities (Chiou 2014; Choon Boey Lim 2009; Lim 2010; Lynch 2013; Shah & Jarzabkowski 2013) and the continuity to be a leading exporter of international education (Carnegie & Tuck 2010; Chiou 2014; Harmon 2015; Lynch 2013). Therefore, Bradley (2016) suggested a key solution to meet these challenges by applying talent management processes. These processes improve a university's performance over the long term by understanding the strategy enacted through its talented individuals; hence, the Australian higher education industry should find methods and strategies for attracting, developing and retaining talented staff (Bradley 2016; Kamal 2017; Osigwelem 2017; Rudhumbu & Maphosa 2015). For instance, Australian universities should offer

globally recognised working conditions and competitive salaries to attract and retain talented individuals (Lynch 2015).

The Australian higher education sector Australian higher education is selected for the following reasons. *Firstly*, the higher education sector has become one of the key foundations of a progressive knowledge-based economy (Boreham & Salisbury 2016; Kasemsap 2017; Marinas et al. 2014). *Secondly*, the Australian higher education sector strategically assists universities in implementing talent management systems (Bradley 2016). Research examining attraction, development and retention of talented individuals can inform these types of strategic decisions. *Thirdly*, both talent management and knowledge management research in the area of higher education is currently not extensive (Paisey & Paisey 2018; Sunalai & Beyerlein 2015; Veer Ramjeawon & Rowley 2017). Hence, research that can explore the relationship between talent management and knowledge management is relevant in this sector (Daraei et al. 2014). *Lastly*, the Australian higher education sector is one of the major higher education service and international entrepreneurialism exporting nations (Carnegie & Tuck 2010; Deschamps & Lee 2015; Harmon 2015; Lynch 2013; Vijaya Sunder M 2016). In summary, the scope of this research project is limited to the Australian higher education sector. This study has adopted this sector as the case study to enhance understanding of talent management processes that influence knowledge management processes.

1.7. Operational definitions

An operational definition is 'a set of actions that an observer should perform in order to detect or measure a theoretical concept'(Walliman 2011, p. 174). In this part of the research, according to Cooper and Schindler (2011); Creswell (2014), a researcher should define the terms of their research for individuals who are outside the field of study to more fully understand the research. Significant key concepts and operational definitions of the constructs developed for this study are as follows:

Talent Management (TM): is focused on attracting, developing, and retaining talented individuals to transfer their specialised knowledge to less skilled individuals (Reilly 2008; Rothwell 2011). This concept is explained further in Chapter Two, Section 2.2.

Talent Management Processes (TMPs): can be defined as the processes of attracting, developing and retaining talented individuals. They are used at each level of an organisation to meet current and future organisational needs (Khdour 2016; Pimapunsri 2013; Powell et al. 2013). This concept is explained further in Chapter Two, Section 2.3.

***Talent Attraction (TA)*:** is primarily aimed to attract talented candidates from either internal or external labour markets (AlKerdawy 2016). This concept is explained further in Chapter Two, Section 2.3.1.

***Talent Development (TD)*:** is focussed on achieving and maintaining an organisation's human capital through learning which changes behaviour in the organisation and in its talented employees (Lyria 2014). This concept is explained further in Chapter Two, Section 2.3.2.

Talent Retention (TR): is a process where an organisation is responsible for retaining talent, to have them remain within an organisation (Abdul Hamid et al. 2011; AlKerdawy 2016). This concept is explained further in Chapter Two, Section 2.3.3.

***Knowledge Management (KM)*:** refers to available knowledge and collection of developed business processes in an organisation which include creating, transferring, share, access, and application of available knowledge, obtaining and saving new knowledge. (Sibbald et al. 2016). In this study, knowledge management is operationalised from the literature and clarified further in Chapter Two, Section 2.4.

Knowledge Management Processes (KMPs): refer to how knowledge is managed within an organisation, which can be pooled under four main headings (i) 'knowledge creation and acquisition, (ii) 'knowledge application, (iii) knowledge storage and retrieval, (iv) and knowledge transfer' and sharing (Alavi & Leidner 2001, p. 131; Ragab & Arisha 2013). This concept is explained further in Chapter Two, Section 2.5.

Knowledge Transfer (KT): is a process that allows employees to transfer their tacit-to-tacit and explicit-to-explicit knowledge with other employees both internal and external their organisations (Bajwa et al. 2015; Birasnav 2014). This definition is fully clarified in Chapter Two, Section 2.5.1.

Knowledge Creation (KC): is a set of processes such as discovery, knowledge production, absorption, purchase, possession, inventions, generation and gaining processes (Badah 2012). In this research, knowledge creation is operationalised from the literature and discussed further in Chapter Two, Section 2.5.2.

Knowledge Sharing (KS): is a process of sharing information, skills, expertise, and experiences among individuals, groups, or organisation's departments (Shao et al. 2017; Tesavrita & Suryadi 2016). This concept is explained further in Chapter Two, Section 2.5.3.

1.8. The research objectives and research questions

The first stage of business research is defining the research objective(s) that address the purpose of a research project through the use of scientific ways (Cooper & Schindler 2011; Kothari 2004; Zikmund et al. 2013). Given the focus of the research objectives, building competitive advantage using talent management and knowledge management can present many challenges for organisations which need to adopt new and more strategic roles in order to be successful (Daraei et al. 2014; Egerova et al. 2013; Jones 2008; Urbancová & Vnoučková 2015). Currently, there is limited research on the relationship between talent management and knowledge management, therefore, an important series of significant bridges between talent management and knowledge management needs to be built through focused research (Sparrow & Makram 2015). Besides, talent management studies with knowledge management frameworks are ideally interested in determining and estimating organisational-level interferences that may inhibit knowledge organisations from exploiting their talented employees in order to enhance creative capabilities (Daraei et al. 2014; Gallardo-Gallardo et al. 2015).

Through the primary literature review, it was found that there is no specific model addressing talent management processes (attraction, development, and retention) and knowledge management processes (transfer, creation, and sharing) in the higher education sector. This research has concentrated on the transfer, creation, and sharing of knowledge for employees who are talented within the organisation. Therefore, the aim of this research is to reveal how organisations can attract, develop, and retain their

talented staff. This leads to the transfer, creation, and sharing of knowledge together with the necessary active involvement of all staff within educational organisations. There are two primary objectives of this study:

1. To comprehend the best processes that are currently used in managing talent and knowledge in Australian higher education; and

2. To investigate the relationship between talent management processes and knowledge management processes that are derived from objective one.

To achieve these objectives, this research project has adopted a sequential exploratory strategy as a specific mixed-methods design. The sequential exploratory strategy allows a researcher to better comprehend the current condition of a phenomenon (qualitative) and consequently generate suggestions which can then be tested in the larger second phase (quantitative) (Bentahar & Cameron 2015; Creswell 2014; Johnson & Onwuegbuzie 2004). The first phase of the research comprised qualitative multi-method studies including: (i) a brainstorming session to develop sets of questions; (ii) a focus group session to define the scope of individual interviews; and (iii) individual interviews to obtain an in-depth understanding on the subject (Dilshad & Latif 2013; Gururajan et al. 2014; Torres & Carte 2014). Qualitative methods were enough to comprehend the best practices that are currently utilised in managing talent and knowledge in the higher education environment. Following comprehension, the quantitative phase was used to investigate the relationship between talent management processes and knowledge management processes in Australian higher education.

Based on the outcomes of the qualitative phase of this research (refer to Chapter 6), the best practices and constructs of talent management were selected. These indicators are considered to include: attraction, development and retention of talent. Similarly, in the case of knowledge management processes, transfer, creation, and sharing of knowledge were chosen as the best practicess and constructs of knowledge management.

In regards to research questions, Tharenou et al. (2007); Zikmund et al. (2013) define these as expressing the research problem and objectives that can be addressed. Researchers are often faced with some difficulties in writing research questions for mixed studies because a research question may need to cover both the qualitative and quantitative aspects involved in the research (Lowenthal & Leech 2009). Research questions can occupy an important space for mixed research as they can assist in controlling whether an issue should be examined with a mixed framework. It is evident that there are many indicators of both talent management processes and knowledge management processes in the literature, and these have been applied in different ways in different studies and projects. In order to meet the qualitative and quantitative requirements of a mixed methods approach, and to achieve the second research objective set out above, this study has addressed the following nine research questions.

RQ1: To what extent does talent attraction influence knowledge transfer in the Australian higher education industry?

This question seeks to explore the relationship between talent attraction and knowledge transfer. Daraei et al. (2014); Urbancová and Vnoučková (2015); Vaiman et al. (2015) all observe that knowledge must be transferred to appropriate successors who are likely to contribute in talent management strategies. Chadee and Raman (2012a) discovered that talent management may enhance the ability of overseas information technology service providers in developing countries, with knowledge transfer leading to high-level performance. Therefore, talent attraction might have a direct influence on knowledge transfer (Vaiman et al. 2015). To address and measure this research question, the researcher developed the following hypothesis: *There is (no) significant positive influence of talent attraction on knowledge transfer in a university*. This hypothesis is explained further in Chapter Seven, Section Five, in order to establish a clear connection between this research question and the hypothesis for this research.

RQ2: To what extent does talent development affect knowledge transfer in the Australia higher education industry?

This question is aimed at exploring the relationship between talent development and knowledge transfer. It is possible that talent development has a direct influence on knowledge transfer towards an organisation's goals (Ling 2016; Prinsloo 2017; Vaiman et al. 2015). As such, Peet et al. (2010) argues that knowledge transfer improves programs of leadership development. The knowledge of retired managers can be completely retrieved and transferred to new managers. This view is supported by Osigwelem (2017) who emphasises that succession planning and training, and mentoring programs of talented individuals assist knowledge transfer within an organisation. A succession planning strategy develops talented employees for leadership positions to allow transfer of their expertise and knowledge among staff members (Osigwelem 2017). Thus, talent development is likely to have a direct effect on knowledge transfer (Vaiman et al. 2015). To address this research question, the researcher developed the following hypothesis: *There is (no) significant positive impact of talent development on knowledge transfer in a university*. This hypothesis is clarified further in Chapter Seven, Section Five, in order to establish a clear link between this research question and the hypothesis.

RQ3: To what extent does talent retention impact knowledge transfer in the Australia higher education industry?

This question seeks to explore the relationship between talent retention and knowledge transfer. This is significant because Calo (2008); Rambe and Mbeo (2017) found that talent retention is an important process for successful organisations that seek to successfully expand by facilitating and ensuring knowledge transfer among employees within the organisation. This founding is supported by Koseoglu et al. (2010) who investigated that when staff members transfer their knowledge to others it assists with increasing rates of retention and satisfaction (Kianto et al. 2016). Therefore, talent retention may have a direct effect on knowledge transfer (Vaiman et al. 2015). To address and measure this research question, the researcher developed the following hypothesis: *There is (no) significant positive effect of talent retention on knowledge transfer in a university*. This hypothesis is explained further in Chapter Seven, Section Five, in order to establish a clear connection between this research question and the hypothesis.

RQ4: To what extent does talent attraction influence knowledge creation in the Australia higher education industry?

This question seeks to explore the relationship between talent attraction and knowledge creation, as Whelan and Carcary (2011) found that knowledge creation is beneficial and critical for a talent management system in an expanding organisation. Besides, Scaringella and Malaeb (2014), has indicated that mixing talent attraction with knowledge creation may assist organisations to face major challenges related to individual knowledge levels. Thus, talent attraction may have a direct influence on knowledge creation (Vaiman et al. 2015). To address and measure this research question, the researcher developed the following hypothesis: *There is (no) significant positive influence of talent attraction on knowledge creation in a university*. This hypothesis is clarified further in Chapter Seven, Section Five, in order to establish a clear connection between this research question and the hypothesis.

RQ5: To what extent does talent development impact knowledge creation in the Australia higher education industry?

Answering this question addressed a gap in knowledge by exploring the relationship between talent development and knowledge creation. Talent management practices may have a direct effect on knowledge creation and information for an organisation's objectives (Gateau & Simon 2017; Vaiman et al. 2015). Researchers like Ling (2016); Whelan and Carcary (2011); Wu et al. (2016) have found that knowledge creation can contribute to talent development by better communications among all of an organisation's staff. This finding is supported by Kong et al. (2013); Osigwelem (2017) whose investigations have shown that talent development through coaching and training assists to create new knowledge. Therefore, talent development might have a direct impact on knowledge creation (Vaiman et al. 2015). To address and measure this research question, the researcher developed the following hypothesis: *There is (no) significant and positive impact of talent development on knowledge creation in a university*. This hypothesis is clarified further in Chapter Seven, Section Five, in order to establish a clear connection between this research question and the hypothesis.

RQ6: To what extent does talent retention affect knowledge creation in the Australia higher education industry?

The purpose of addressing this question is to fill a gap in knowledge by exploring the relationship between talent retention and knowledge creation. This is important because Dries (2013); Karatop et al. (2015) argue that talent retention of knowledge workers and greater opportunities for organisations are more likely to increase in terms of strategic relavence, as organisational knowledge is effectively created via individual experiences, competencies, and talents. Similarly, Brockbank (1999); Kong et al. (2013) have found that talent retention can be enhanced by greater learning capabilities through encouraging creativity and and innovation culture, thereby creating new knowledge and continuous learning. Thus, talent retention may have a direct effect on knowledge creation (Vaiman et al. 2015). To address and measure this research question, the researcher developed the following hypothesis: *There is (no) significant positive impact of talent retention on knowledge creation in a university*. This hypothesis is explained further in Chapter Seven, Section Five, in order to establish a clear connection between this research question and the hypothesis.

RQ7: To what extent does talent attraction influence knowledge sharing in the Australia higher education industry?

This question seeks to explore the relationship between talent attraction and knowledge sharing. This is significant because Kim et al. (2014); Lai et al. (2014); Li and Devos (2008); Zhu (2017) point out that knowledge sharing externally may be a form of organisational promotion, which also facilitates the process of attracting interested talent to the organisation through lessons-learned databases, knowledge libraries (Kim et al. 2014), research publications, and conference presentations. Creating a proper environment of effective collaboration among organisational individuals makes for a more desirable workplace and encourages the process of attracting talented employees (Zhu 2017). Thus, knowledge sharing may have a significant influence on talent attraction (Lai et al. 2014). In terms of the organisational exellence as a key dimension of talent attraction, Wang and Noe (2010) suggest that organisational exellence, through organisational climate and culture, may assist to enhance knowledge sharing among organisational staff members. This view is

supported by Allen and Doladee (2011) who note that organisational culture is an essential factor for success or failure in organisational knowledge sharing. This view is supported by Osigwelem (2017) who found that the link between organisational culture and knowledge sharing benefits the organisation. A supportive-organisational culture promotes retention of talented employees in the organisation. As such, when talented individuals feel supported with their talent valued, they encourage and share their embedded talent with other staff members (Osigwelem 2017). Overall, to address and measure this research question, the researcher developed the following hypothesis: *There is (no) significant positive influence of talent attraction on knowledge sharing in a university*. This hypothesis is clarified further in Chapter Seven, Section Five, in order to establish a clear connection between this research question and the hypothesis.

RQ8: To what extent does talent development impact knowledge sharing in the Australia higher education industry?

Answering this question addresses a gap in knowledge by exploring the relationship between talent development and knowledge sharing. Some authors and researchers state that facilitating knowledge sharing through encouraging collaboration within teams and between departments, can develop talents through tailored training programs and facilitate on-the-job learning (Beyerlein et al. 2017; Gateau & Simon 2017; Zhu 2017). Creating an appropriate environment of effective collaboration among staff members can lead to high performance (Al-Awamleh 2009; Ali et al. 2017; Cooke 2017; Egerova et al. 2013; Li & Devos 2008). Wang and Noe (2010) have suggested that training, career advancement opportunities, and performance management, as essential elements of talent development, may facilitate knowledge sharing among an organisation's emolyees. Moreover, knowledge sharing may have a significant influence on talent development (Naim et al. 2017). To address and measure this research question, the researcher developed the following hypothesis: *There is (no) significant and positive impact of talent development on knowledge sharing in a university*. This hypothesis is explained further in Chapter Seven, Section Five, in order to establish a clear connection between this research question and the hypothesis.

RQ9: To what extent does talent retention affect knowledge sharing in the Australia higher education industry?

The purpose of this question is to fill a gap in knowledge by exploring the relationship between talent retention and knowledge sharing. This is important because tools of knowledge sharing can also be effective in retaining talent by making work tasks easier through sharing best practices, and a supportive collegial environment of mutual assistance (Li & Devos 2008; Zhu 2017). Wang and Noe (2010) point out that rewards and incentives, as essential elements of talent retention, facilitate knowledge sharing, and assist in building a supportive culture of sharing information among the staff members of an organisation. In addition, when employees share their knowledge with others, this assists to increase averages of their retention and satisfaction (Kianto et al. 2016; Koseoglu et al. 2010; Wang & Noe 2010). To address and measure this research question, the researcher developed the following hypothesis: *There is (no) significant positive impact of talent retention on knowledge sharing in a university*. This hypothesis is clarified further in Chapter Seven, Section Five, in order to establish a clear connection between this research question and the hypothesis.

In summary, this section has attempted to provide a brief summary of the research objectives and research questions. Therefore, to fully achieve the overall objective of this study, the researcher draws on, and formulates, several hypotheses from the overarching research questions. The rationale for this approach is to assist the researcher to test the relationship that may exist between talent management processes and knowledge management processes indicators. The conceptual model and the hypotheses of the study are presented in "Chapter Seven".

1.9. Structure of the thesis

This thesis contains twelve themed chapters as outlined below in Figure 1.2. The structure and format of this thesis follows the referencing style manual of Harvard AGPS6 version 2 (Australian Government Publishing Service, 2002) and the "Guidelines for the Preparation of a Higher Degree by Research Thesis" (University of Southern Queensland, 2015).

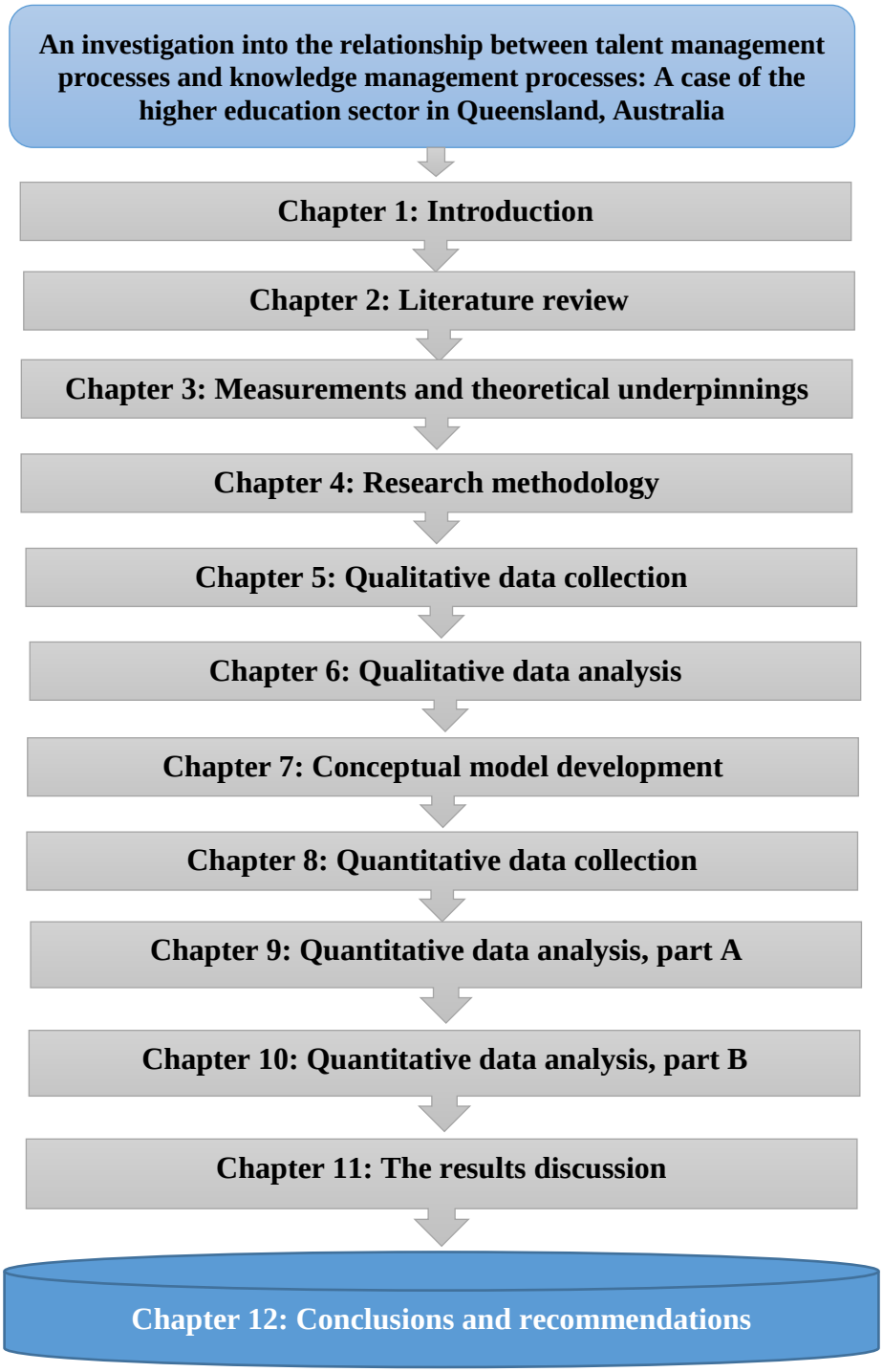


Figure 1.2: Structure of the thesis

Chapter one: Introduction

This chapter includes the introductory information for the study. It is organised into nine sections. The chapter starts by presenting an overview of this chapter. The introduction of the chapter is reviewed and addressed in the next section (two). An

explanation of the motivation and justification for research is presented in Section three, which is then followed by a discussion of the research setting and audience in section four, while section five discusses the statement of the problem. In section six, the scope of the study is analysed. Operational definitions are presented in section seven, and section eight provides details about the research objectives and research questions. In the last section, the structure of the thesis is elaborated on and addressed.

Chapter Two: Literature review

This chapter consists of several areas related to the objectives of this research. The review of the literature is organised into nine sections. First, it presents an overview of this chapter. The next section (two) discusses the conceptual identity and intellectual frameworks of talent management. Talent management processes are reviewed and addressed in section three. The conceptual identity and intellectual frameworks of knowledge management are dealt with in section four, and section five discusses knowledge management processes. The relationship between talent management and knowledge management is explored in section six, while gaps in the literature are presented in the subsequent section. Lastly, the summary of this chapter is outlined in section eight.

Chapter Three: Measurements and theoretical underpinnings

This chapter reviews the measurements and theoretical underpinnings for the study associated with talent management and knowledge management. It outlines significant outcomes and provides an examination of both the key construct-measurements and relevant theories of the study. The chapter has six sections. It starts by presenting an overview of the chapter. Introductory information is made about the theoretical underpinnings that constitute the theories associated with talent management processes and knowledge management processes. In the second section, talent-management measurements are discussed through three constructs: talent attraction, talent development, and talent retention. Section three reviews the theoretical underpinnings of talent management processes through a number of theories. Section four examines knowledge-management measurements in the from of three constructs: knowledge transfer, knowledge creation, and knowledge sharing. Section five then explaines the theoretical underpinnings of knowledge management. Finally, a summary of this chapter is provided in section six.

Chapter Four: Research methodology

This chapter outlines the methodological approach for the study. It involves ten sections. First there is an overview of the chapter. Next is the research philosophy and a brief explanation of this concept is provided. Research design in the form of a discussion of mixed methods research is given in section three, and it involves both qualitative (e.g. brainstorming, a focus group discussion, and an individual interview) and quantitative (survey questionnaire) methods. The research approach, which includes both inductive and deductive approaches, is discussed in section four. Sources of data are presented in section five, while section six provides an explanation of population and participant sampling, and the seventh section discusses quantitative data collection methods and analysis techniques. Instrument reliability is then discussed in section eight. Ethical considerations such as benefit and risk, informed consent process as well as respondent rights and protections are presented in section nine. Finally, the chapter is summarised in section ten.

Chapter Five: Qualitative data collection

This chapter consists of several areas related to the qualitative data collection of this research. The review of the data collection is divided into nine sections. The chapter starts by presenting an overview. Brainstorming, focus group discussions and individual interviews as methods are outlined in section two. The next section provides an explanation and justification of the brainstorming, focus group discussions and interview techniques utilised in this research. The fourth section explains the pre-testing of the brainstorming group, focus group discussion and individual interviews questions. A pilot study is presented in section five. Section six addresses the practices and proceedings followed to employ the brainstorming, focus group discussions and interview techniques. The next section reviews the methods of conducting a brainstorming session, a focus group session and an individual interview. Furthermore, the difficulties and challenges with using three qualitative techniques, followed by a discussion of the strategies to overcome and control these issues, are addressed in section eight. The ninth and final section summarises the justifications, practices, and proceedings for the qualitative techniques utilised in this research.

Chapter Six: Qualitative data analysis

This chapter discusses all procedures and processes related to how the analysis has been conducted, and the processes used to extract factors and themes from the qualitative data. It includes outcomes from semi-structured interviews that were analysed with content analysis procedures utilising NVivo 11. This chapter provides significant findings associated with the relationship between talent management and knowledge management in the context of the higher education industry. The review of the qualitative data analysis contains six sections. The first provides on overview of the chapter. Section two provides the introduction of the qualitative data analysis. Reliability and validity of qualitative data are addressed in section three. The next section deals with a pilot of the qualitative data analysis. Qualitative data analysis is further expanded upon in section five. Finally, the summary of this chapter makes up section six.

Chapter Seven: Conceptual model development

Chapter seven starts with an overview and ends with the initial research conceptual model development for investigating the relationship between talent management processes and knowledge management processes. The review of the conceptual model development contains six sections. Firstly, an overview of this chapter is presented. In section two, further development and refining of the research conceptual model is discussed based on the qualitative data analysis. A preliminary conceptual framework is presented that provides the predicted relationship between talent management processes and knowledge management processes. Definitions of factors used in the initial framework are provided in section three. Then research hypotheses are reviewed and addressed in section four. The next section (five) is a discussion of the focus topics in this chapter. Lastly, the conclusions of the chapter are summarised in section six.

Chapter Eight: Quantitative data collection

The quantitative data collection chapter confirms the modified model, which was refined and developed through quantitative data collection and analysis methods. This chapter focuses on the details of designing, developing and conducting the quantitative instrument. This chapter results in significant outcomes to determine the justifications and practices that form part of the proceedings of the quantitative techniques utilised

in this research, which in turn served to answer the research questions. The review of the quantitative data collection chapter is divided into nine sections. The chapter starts by presenting an overview. The introduction of the chapter is reviewed in section two. The next section provides an explanation and justification of the quantitative approach utilised in this research. The subsequent section is about the development of the quantitative instrument. Section five reviews the pilot study, while the administration of the survey questionnaire is outlined in section six. This is followed by a discussion of methods of analysis in section seven. The difficulties and challenges with using a quantitative approach, followed by a discussion of the strategies to overcome and control these issues, are addressed in section eight. Finally, the summary of the chapter makes up section nine.

Chapter Nine: Quantitative data analysis, Part A

This chapter examines all procedures and processes related to how the analysis has been conducted in this study. It includes outcomes from the pre-test and pilot survey. The significant results of this chapter are discussed to ascertain whether the research hypotheses should either be accepted or rejected. The analysis of the quantitative data is covered in seven sections. Section one is on overview of the chapter. The introduction of the chapter is reviewed and addressed in the next section (two). The validity and reliability testing of the questionnaire instrument is dealt with in section three. The descriptive statistical analysis is addressed in section four, which is then followed by a discussion of exploratory factor analysis in section five. This involves three key parts: sampling adequacy, principal component analysis, and correlation analysis. Section six highlights regression analysis to test the research hypotheses. Finally, the chapter is summarised in section seven.

Chapter Ten: Quantitative data analysis, Part B

This chapter discusses all procedures and processes related to how the analysis using SEM has been conducted. The analysis of the quantitative data is covered in six sections. Section one is overview of the chapter. The next section (two) provides the introduction of the chapter. It is then followed by a discussion of the rationale behind the selection of SEM in section three. Multivariate data analysis: measurement model analysis is addressed in section four. This involves four stages to evaluate the

measurement model of the study. The subsequent section discusses multivariate analysis: structural model analysis. Finally, the summary of this chapter is outlined in Section six.

Chapter Eleven: The results discussion

This chapter discusses the results from both qualitative and quantitative examinations. The results discussion is divided into five sections. It starts with a general overview of the chapter. The next section provides a clear explanation and discussion of qualitative results gathered through brainstorming, focus group, and individual interview techniques. It discusses the practical outcomes presented in Chapter Six (qualitative data analysis). Section three emphasises the implications of the research resulting from statistical hypotheses testing. It discusses the practical outcomes presented in Chapter Nine (quantitative data analysis) through comparing the results to the literature. Section four presents the contributions of the research. Finally, the summary of this chapter is provided in section five.

Chapter Twelve: Conclusions and recommendations

The final chapter presents the conclusions and recommendations for the study. It is divided into four sections and starts with a general overview. Theoretical and practical conclusions are outlined in section two. Limitations of the study are highlighted in section three of this chapter. Finally, section four outlines recommendations.

CHAPTER 2: LITERATURE REVIEW

2.1. Chapter overview

The introductory review of the research topic was discussed in chapter one. The purpose of this chapter is to perform a literature review across several areas related to the objectives of this research. A literature review is a process of summarising studies about a topic (Creswell 2014; Tharenou et al. 2007).

The review of the literature is organised into eight sections. Section 2.1 provides the overview of this chapter. Section 2.2 explains talent management theory and discusses the conceptual identity and intellectual frameworks of talent management. Talent management processes are reviewed and addressed in Section 2.3, including attraction, development, and retention of talent. The conceptual identity and intellectual frameworks of knowledge management are dealt with in Section 2.4, while Section 2.5 discusses knowledge management processes. Section 2.6 highlights the relationship between talent management and knowledge management, which is followed by the discussions of gaps in the literature in Section 2.7. Finally, this chapter is summarised in Section 2.8. This chapter contains eight sections that are shown in the following graphical layout.

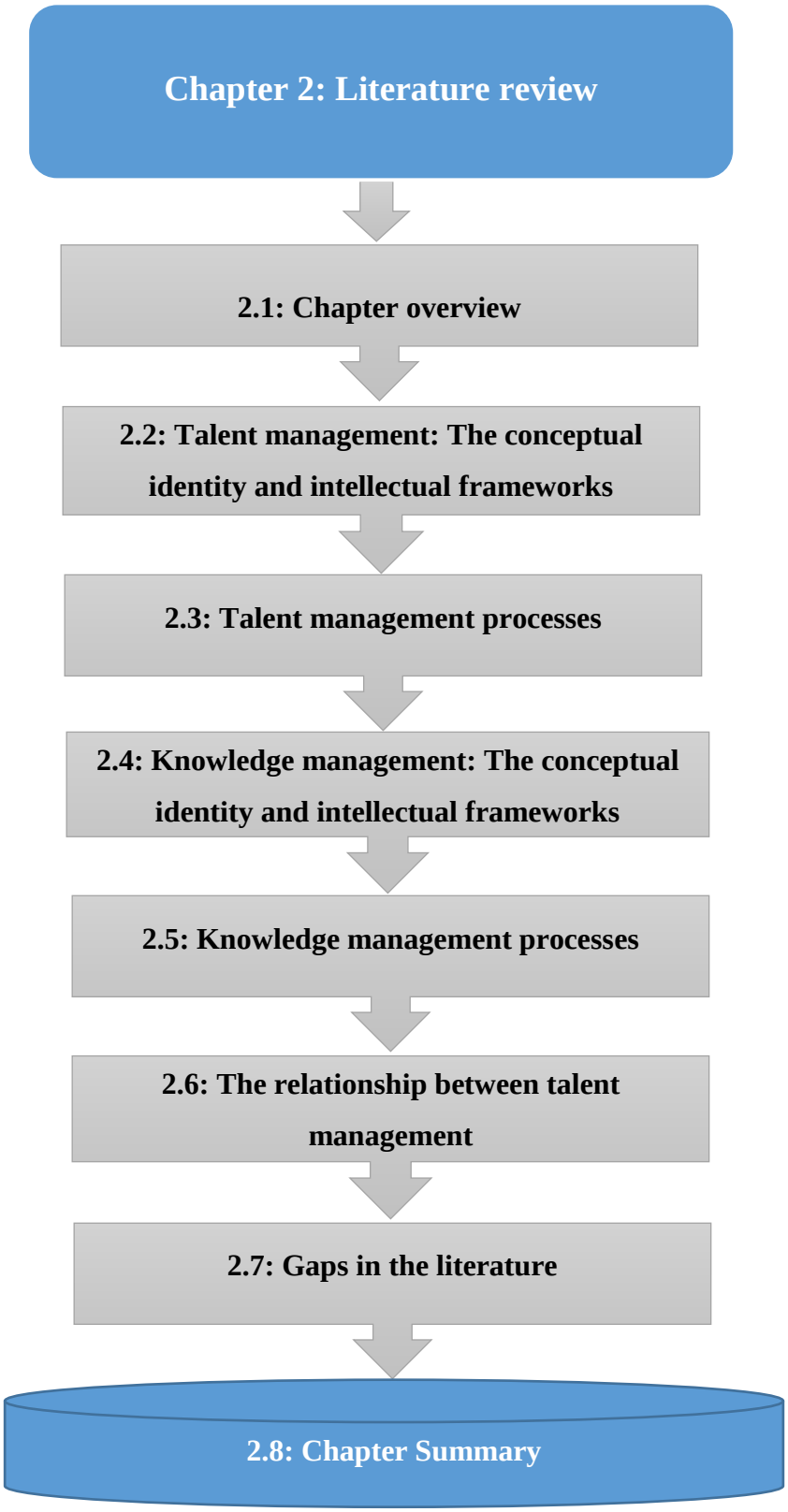


Figure 2.1: A graphical layout for Chapter 2

Source: Prepared by the researcher.

2.2. Talent management: The conceptual identity and intellectual frameworks

It is best to introduce an understanding of the historical foundation to talent management prior to discussing it as a concept. Hence, this section is divided into two components: the evolution of talent management, followed by the conceptualisation of talent management.

2.2.1 Talent management: Historical background

Since the mid-1990s, there has been a dramatic increase in talent management studies (Cascio & Boudreau 2016). Talent management has become a common term since the McKinsey group 'first mentioned it in their 1997 report, "*The War for Talent"* (Cui et al. 2016; Farndale et al. 2010; Iles, Preece, et al. 2010; Martin 2015; McDonnell et al. 2017; Mellahi & Collings 2010; Mohammed et al. 2017, p. 1132; Swailes 2016). Then, Michaels et al. (2001) discussed talent management in more detail in their book (Gallardo-Gallardo et al. 2017; Martin 2015; Verma & Ahmad 2016). 'Since then, the topic has attracted enthusiastic interest from scholars in various fields' and sectors (Cui et al. 2016; Mohammed et al. 2017, p. 1132). Talent management is worthwhile to organisations, as talented employees constitute a critical resource of creativity, innovation, and therefore future revenues for organisations (Bradley 2016; Kim et al. 2014). Thus, it can provide considerable benefits to an organisation (Hazelkorn 2017; Jones 2008; Lynch 2015; Shabane 2017; Urbancová & Vnoučková 2015). For example, it improves the organisation's overall performance, its ethos and spirit, its competitiveness, and talent retention, which in turn prevent risks to the organisation (Khdour 2016). Moreover, to explain why talent management has become so significant, Bersin (2006); Silzer and Dowell (2010) have outlined the evolution of human resources management towards talent management in six stages:

Stage 1: Single position staffing (*1950s)*

According to Cappelli (2008a); Cappelli and Keller (2014) the need for talent management is associated with the increase of organisations in the 1950s. At the time Ginzberg (1958) focused on human resources as wealth, and the human resources department's function was focused on immediately filling open positions and followed a reactive approach to requests in this era (Silzer & Dowell 2010). In addition, the practices and methods universally related to in-house 'talent management were: workforce plans to set direction; sophisticated recruitment and selection techniques for

hiring entry-level candidates; assessments of potential (including assessment centers, ability and personality tests, etc.); developmental assignments like job rotations, shadowing, and action learning with coaches; assessments of performance such as 360 feedback and forced rankings; career ladders; and succession planning to fill the important jobs' (Cappelli & Keller 2014, p. 312). Herzberg's Two-Factor Theory is the key contribution to talent management theory in that era (Herzberg et al. 1959). The main concept of this theory is the variation between hygiene factors and motivation factors that affect employees' attitudes towards work (Fareed & Jan 2016; Hur 2017). Hygiene factors are connected to work environments and conditions such as organisational policies and managerial procedures, supervision, benefits, job security, relations with peers, and salary (Fareed & Jan 2016; Hur 2017; Matei & Abrudan 2016). Motivation factors are associated with work itself and include achievement, recognition, empowerment, advancement and self-development opportunity (Fareed & Jan 2016; Hur 2017; Matei & Abrudan 2016).

Stage 2: Replacement planning (*1960s)*

In the 1960s, inclusive approaches to talent management were advanced to include all parts of the workforce within an organisation (Cappelli & Keller 2014). The business transactions of managing, leasing and paying individuals as well as implementing roles to facilitate these transactions were focused on by human resources (Bersin 2007). Moreover, the focus was continuously on short-range and open locations. Planning commonly included only the next one year (Silzer & Dowell 2010). In addition, there was a need to provide work environments with human resources' principles requiring equal treatment of employees in terms of health benefits as well as retirement policies (Cappelli & Keller 2014). In the 1960s, a number of emerging theories contributed to the development of talent management. For example, Becker (1964); Schultz (1961) founded human capital theory, while John S. Adams established equity theory around employees' motivation (Kaur et al. 2014; Miles et al. 2015; Mutuma et al. 2017; Ryan 2016). This theory focuses on economic aspects in terms of investment in human capital for an organisation and its employees over the long-term (Becker 1962). Through the 1960s, considerable research contributions to human resources management and talent management grew around the themes of 'human motivation' (Beer 1964; Calder 1961; Cofer & Appley 1964; Galbraith & Cummings 1967;

Herzberg 1968; Myers 1964; Opsahl & Dunnette 1966; Vroom 1964), 'investment in human capital' (Becker 1962; Schultz 1961), 'social responsibilities' (Blau 1964; Calder 1961; Davis 1960; Heald 1970; Hetherington 1968), 'human learning' (Fitts 1964; Gagné 1965), 'human performance'(Fitts & Posner 1967; Porter & Lawler 1968), 'human needs theory applications' (Alderfer 1969; Hall & Nougaim 1968), and 'retirement preparation programs' (Franke 1962; Greene 1969; Walker 1963; Wermel 1960; Wermel & Beideman 1961).

***Stage 3: The Personnel Department** (1970s)*

In this era, "The Personnel Department" was the group of individuals responsible for human resources functioning. Hiring, paying, and caring for individuals as well as understanding business functions were the responsibility of this group with payment payroll as the supporting system for this (Bersin 2006). In the 1970s, Henri Tajfel founded Social-Identity Theory (He et al. 2012). According to this theory, employees assign social categories to all people like 'organisational membership, religious association, gender and age' (Ersoy & Aksehirli 2015; Viktoria Rampl & Kenning 2014). Social-Identity Theory is used to comprehend the process of attracting talented employees (Ersoy & Aksehirli 2015; Kaewsawang & Winit 2016). Dependent on the most commonly cited research in human resources management and talent management, significant research contributions in this field throughout this period were focused on 'human needs theory applications' (Alderfer 1972), 'evaluation training programs' (Kirkpatrick 1975), the economic approach to human behavior' (Becker 1976), 'hiring' (Goodman et al. 1973; Quinn 1979), 'social identity' (Tajfel 1978b), 'the equality of pay' (Brown 1977; Snell 1979), and 'social intergroup' (Brewer 1979; Tajfel 1978a; Turner et al. 1979).

***Stage 4: Human resource planning (**1980s and 1990s)*

The focus in this period was on making plans and managing employees' desires as well as including succession planning (Silzer & Dowell 2010). Meanwhile, organisations realised that the human resources function related to the emerging concepts in human resources management (Bersin 2006). Human resources departments established new functions such as recruiting, development, staff communications, total compensation, and organisational design (Bersin 2007). Planning usually looked forward to the next 1-3 years; it contained leadership

movements, management development and forecasting of employees' levels (Silzer & Dowell 2010). The first serious discussions of human resource planning emerged during 1980 with James W. Walker who published the first book on this topic (Walker 1980). Devanna et al. (1981); Tichy et al. (1982) then developed their perspectives on strategic human resources management based on Walker's work (Baird & Meshoulam 1988). In 1984, a Danish scholar called Wernerfelt (1984) developed *resource-based view theory* (Lepak & Snell 1999). This theory considers human assets of an organisation as a strategic and rare resource for fulfillment a competitive advantage (Coff 1997; Grant 1991; Wade & Hulland 2004). Through the 1980s, considerable research contributions to human resources management and talent management grew around the theme of 'applications of strategic human resources management' (Baird & Meshoulam 1988; Lengnick-Hall & Lengnick-Hall 1988; Miles & Snow 1984).

In the 1990s, much of the literature focused on applications of human resources management and talent management theories. According to the most frequently cited academic studies in this field, the significant research in this period was focused on themes of 'a strategic approach to resource-based view'(Barney 1991; Hart 1995; Mahoney & Pandian 1992; Peteraf 1993; Prahalad & Hamel 1990), 'resource-based view applications' (Russo & Fouts 1997), and 'human capital applications' (Coleman 2000; Lepak & Snell 1999; Woolcock 1998). The most significant evolution of human resources management towards talent management occurred in 1997 when the McKinsey group first published *The War for Talent* (Cui et al. 2016; Farndale et al. 2010; Iles, Preece, et al. 2010; Martin 2015; McDonnell et al. 2017; Swailes 2016).

***Stage 5: Talent management** (2000s)*

The dominant human resources management topic of the initial twenty-first century was talent management (Cappelli 2008a; Lockwood 2006). During this time, studies of human resources management have developed largely around the theme of talent management (Axelrod et al. 2001; Bhattacharya et al. 2008; Cappelli 2008a; Deery 2008; Lewis & Heckman 2006; McCauley & Wakefield 2006). Furthermore, business organisations entered a new phase: human resources' function was seen as organiser of organisational talent management processes. Without belabouring the drivers for talent management (i.e., labour lacks, leadership conduits), the new function of human

resources became highly varied and it was not sufficient to partner it with job aspects (Bersin 2006). The development and administration of talent groups, the alignment of human resources processes and programs to appropriate talent needs, and the consideration of the required time for attracting and developing required employees the characteristics of whom were narrowed down by human resources (Silzer & Dowell 2010). Human resources management now realised that it had to critically determine individual talents; understand and assess their potential; and, incorporate institutional practices to attract, develop, recompense, promote, and retain these talents (Bersin 2007).

Stage 6: Strategic Talent Management (STM) *(2010s – the present)*

Through the second decade of the twenty-first century, a majority of organisations have faced significant challenges in terms of human resources management in general and talent management specifically (Becker & Huselid 2006; Dries 2013; van den Broek et al. 2018). As a result, organisations have become increasingly aware of human capital and its strategic role in achieving organisational success and excellence (Collings & Mellahi 2009; Hatum 2010; Lockwood 2006). Lewis and Heckman (2006) propose that a key future academic direction of talent management work will be the consideration of the concept of *strategic talent management.* Since 2010, the notion of talent management has become a strategic source of competitive advantage (Beamond et al. 2016; McDonnell et al. 2017; Meyers & Van Woerkom 2014; Tomany 2012). During this period of talent management evolution, a complete integration with business and talent strategies has begun to drive the human resources function. It is strategically driven as a key business operation, the planning cycle of which contains business strategy and process timetables, and is aligned with talented minds throughout the organisation (Cheese 2008; Hatum 2010; Silzer & Dowell 2010). Through the 2010s, considerable research contributions to talent management have developed around a 'strategic view of talent management' (Ashton & Morton 2005; Berger & Berger 2010; Boudreau & Ramstad 2005; Christensen Hughes & Rog 2008; Collings & Mellahi 2009) and 'global talent management' (Beechler & Woodward 2009; Brown & Tannock 2009; Cheese 2008; Farndale et al. 2010; Mellahi & Collings 2010; Schuler et al. 2011; Tarique & Schuler 2010). Arguably, talent management is presently becoming integrated with other key functions within an organisation (Bersin 2006; Hatum 2010). Thus, efficient talent management is crucial in acquiring

institutional excellence and a driving power for successful organisational processes within highly competitive business environments (Ambrosius 2016; Hatum 2010; Lockwood 2006).

2.2.2 The conception of talent management

Globally, talent management has received growing attention among a range of organisations (Ingram 2016; Kimathi 2015; Morley et al. 2017). Prior to reviewing talent management, it is essential to describe the term *talent* itself (Mohammed et al. 2017). This term stems from the Latin term *talenta* and the Greek *talanton* (τάλαντον); the Latin term *talenta* was utilised to indicate a unit of money or weight (Gallardo-Gallardo et al. 2013; Meyers 2013; Tansley 2011). Butter (2015); Dries et al. (2014); Ross (2013); Scaringella and Malaeb (2014) all introduce talent as an innate ability to learn things in an effortless and skilful manner inherent in these intelligent and creative individuals. Other researchers, such as, Chuai (2008); Lockwood (2006); Murongazvombo (2015) defined talent as an essential driver and success element for organisations, both in the short and long-term.

With a focus on the talent of human capital, Barron (2007); Blass (2007); Cannon and McGee (2011); Festing and Schäfer (2014); Iles, Chuai, et al. (2010); Li and Devos (2008); Naim et al. (2017); Tansley et al. (2013) all define talented individuals as high performing employees who have been considered to have significantly contributed to the progress of an organisation and its future development. Other interpretations of talent such as those by Harstad (2007); Rudhumbu and Maphosa (2015); Sparrow and Makram (2015), consider these employees who are capable to add value by increasing organisational production. Some other characteristics ascribed to the talent of human capital are that it is beneficial, unique (De Vos 2013; Gelens et al. 2013), and a major organisational resource (Armstrong & Taylor 2014; Goldsmith & Carter 2010). Macfarlane et al. (2012) have defined talent as those who exhibit leadership qualities, play a pivotal function within the organisation and show superior behaviour. Having experience, mastery, knowledge, the skills, abilities, and the potential for development are all considered by Beardwell and Thompson (2014); D'Annunzio-Green (2008);

Gümüş et al. (2013); Silzer and Church (2009); Silzer and Dowell (2010); Tansley et al. (2006) as indications of talent.

As a concept, although the roots of talent management originate within the human resources management concept, it has a more specific focus (Christensen Hughes & Rog 2008; Latukha 2015). In the higher education environment, talent management as a primary component of strategic human resources management can improve a university's performance in the long term by understanding the strategy that is enacted through its talented individuals (Bradley 2016; Paisey & Paisey 2018). This is a key for organisational success by making it possible for organisational systems to fulfil higher goals (Calo 2008; Sweem 2009). As a result, talent management is considered a form of investment because individuals are viewed as the core basis of innovation and social advancement (Bradley 2016; Mohammed et al. 2017). In the literature, 'there are six common perspectives on talent management' (Mohammed et al. 2017, p. 1132): (1) process; (2) strategic; (3) developmental; (4) cultural; (5); competitive; and (6) human resources planning perspectives (Al-Awamleh 2009; Li & Devos 2008).

1. The process perspective

This was defined by Blass (2007); Cappelli (2008a); Iles, Chuai, et al. (2010), for whom talent management appears as a complex set of processes that operate in large organisations so that the organisations and individuals within them can meet current and future needs with overall benefits for the organisation. In a similar vein, Ali et al. (2017); Blackman and Kennedy (2008); Dessler (2015); Tansley et al. (2006) portray the talent management process as needing full integration, in order to become a standard practice to attract individuals who have high potential for creative development and to retain them in order to generate a unique value to the organisation. In other words, it is a specific method for attracting and retaining abilities and essential knowledge for the future (Ali et al. 2017; Blackman & Kennedy 2008; Dessler 2015; 2006).

2. The strategic perspective

Talent management is a strategy to attract the right talent and provide workers with potential contributions via strategic workforce planning and high-quality development

experiences that build organisational capabilities (Lawler III 2010; Sparrow & Makram 2015; Stahl et al. 2007). In the same way, it is a strategic function for identifying talent gaps and managing succession planning, along with attracting, selecting, motivating, developing and maintaining highly qualified individuals (Cerdin & Brewster 2014; Whelan & Carcary 2011). Talent management can be useful in empowering employees to understand their essential capabilities and to produce an effective climate which professionally empowers them to underpin, capture, and develop these talents into individual productivity (Ross 2013; Sparrow & Makram 2015). Therefore, talent management should inform the selection of high performance incumbents to fill positions (Collings & Mellahi 2009; Peet et al. 2010; Stahl et al. 2007).

3. The developmental perspective

Talent management is a strategic priority for business organisations and is perceived as a crucial driver in developing organisational performance (Davies & Davies 2010; Ingram 2016; Lockwood 2006). Similarly, Cannon and McGee (2011); Moczydłowska (2012); Silzer and Dowell (2010) explain talent management as a set of procedures, programs, and activities applied to highly qualified individuals who are characterised by high performance in their development in order to fulfil an organisation's goals now and in the future. The reason for this is that, if an organisation fails to provide talented development and training, it may lose available talent (Torrington et al. 2014).

4. The cultural perspective

According to this perspective, talent management focuses on social and cultural contexts of available human resources within a range of qualities (Storm 2015). These qualities include innate ability, intelligence, and creative skills (Butter 2015; Dries et al. 2014; Ross 2013; Scaringella & Malaeb 2014). Proponents of this perspective propose that individuals are successful only when they have sufficient talent, and believe that the success of organisational work will be followed by their own success (Blass 2009; Li & Devos 2008; Storm 2015).

5. The competitive perspective

As perceived by Beamond et al. (2016); Bhatnagar (2007); Meyers and Van Woerkom (2014); Tomany (2012) talent management is an engine of sustainable competitive

advantage, which is tricky to simulate, is rare and valuable, and cannot be replaced by competitors. From the same perspective, Collings and Mellahi (2009); Gelens et al. (2013); Iles, Chuai, et al. (2010); Waheed et al. (2013); Yap (2016) define it as activities, processes and the development of skills, which require individuals to achieve a sustainable competitive advantage and organisational success by providing competent and highly qualified individuals who are more capable than competitors in other organisations.

6. The human resources planning perspective

Beardwell and Thompson (2014); Cappelli (2008a); Cui et al. (2016); Lewis and Heckman (2006); Visuri (2014) introduce talent management as a tool of human resource planning to develop a plan to meet organisational human resource needs, in order to attract individuals with the appropriate skills in the appropriate areas of work. This involves a number of procedures designed to attract, develop, and retain extremely talented staff to meet organisational needs. In other words, talent management anticipates the necessity for human resources and then builds a strategy to meet it. Table 2.1 shows a summary of perspectives on talent management.

Table 2.1: Talent management perspectives

No.	The perspective	Description
1	Process	The goal of optimising through talent management processes.
2	Strategic	Guides how an organisation can implement talent management. It involves all the other five perspectives.
3	Developmental	Concentrates extensively on development capabilities, which accelerate groups of employees.
4	Cultural	The belief that individuals are successful only when they have sufficient talent and that the success of organisational work will follow their own success.
5	Competitive	Before organisations can successfully compete with other organisations, they should identify the talents in order to understand their needs. This perspective is occasionally used in more professional human resource services.
6	Human resources planning	Matching the right individuals to well-designed job roles. This perspective often applies to fast growing organisations.

Source: adapted by the researcher from (Blass 2009; Brunila & Baedecke Yllner 2013).

For the purpose of this study, the scope of talent management is restricted to the strategic perspective for three reasons:
(1) the strategic perspective includes all the perspectives above (Brunila & Baedecke Yllner 2013);
(2) this perspective outlines how an organisation can efficiently implement talent management processes (Bish & Jorgensen 2016; Brunila & Baedecke Yllner 2013; Lockwood 2006); and

(3) talent management is a process of attracting, developing, and retaining talented individuals who are strategically important to an organisation's success (Bish & Jorgensen 2016; Kim et al. 2014; van den Broek et al. 2018).

To conclude this section, talent management has been through a number of stages before reaching the current stage. This development was a result organisations becoming more aware of talented individuals and their strategic role in achieving organisational success and excellence, compared to competitors, and the resulting 'war for talent'. Although scholars and researchers differ in determining a unified concept of talent, specialised literature has produced two trends in terms of its definition. The first is that the concept of talent has traditionally been based on high intelligence, while the modern trend is based on excellent performance, mental ability, technical and dynamic skills, creative thinking, and leadership abilities. The review of the literature included various alternative views of talent but all scholars and researchers agree that talent is a valuable resource for all organisations. In regards to talent management, the literature review also identified six common perspectives of which the strategic perspective was identified as most relevant to achieving the research objectives.

2.3 Talent management processes: A critical review

'In the twenty-first century, talent management has become more important and has received attention from organisations that seek a foothold in the organisational map of excellence' (Mohammed, Baig, et al. 2018, p. 8). High-performing organisations are identifiable by their talented individuals who are able to show initiative, creativity and excellence in performance (Collings & Mellahi 2009; Hatum 2010; Lockwood 2006). Therefore, a majority of organisations have started to rethink their procedures and

policies to achieve better acquisition and retention of individual talents. It is obvious that there is strong competition between organisations in this modern technology-driven era, which is driving an increase in knowledgeable employees along with vast market changes (Becker & Huselid 2006; Dries 2013; van den Broek et al. 2018). Hence, organisations have begun to think about how to improve their performance, operations, skills, and employee knowledge in order to maintain excellence and flexible development (Calo 2008; Sweem 2009).

In general, a review of the talent management literature indicates that 'talent management processes can be grouped into five core categories: (i) recruitment, attraction and selection; (ii) training and development; (iii) retention; (iv) identification; and (v) performance management of talent'(Bethke-Langenegger et al. 2011; Gallardo-Gallardo & Thunnissen 2016; Li & Devos 2008; Mohammed et al. 2017, p. 1135; Oladapo 2014). However, in order to understand the previous view of talent management research, a review was conducted of a number of studies in various sectors and industries in Table 2.2. This provides a clear and comprehensive outline of the extant scholarly research of talent management studies from the period 2006-2017.

Table 2.2: Talent management processes, according to scholarly studies in various sectors from 2006-2017

No.	Author name and year	Country	Sector/ Industry	Method	Talent management processes															
					Talent selection	Talent engagement	Talent attraction (recruitment)	Talent development	Leadership development	Succession planning	Talent acquisition	Support and training	Talent retention	Compensation and reward	Talent identification	Skills gap analysis	Workforce and talent planning	Performance management	Career management	Talent evaluation
1	(Becker & Huselid 2006)	-	-	Theoretical	*		*						*							
2	(Lewis & Heckman 2006)	-	-	Theoretical	*		*							*				*		
3	(Lockwood 2006)	-	-	Theoretical	*	*	*	*					*							
4	(Bhatnagar 2007)	India	ICT	Mixed		*	*					*	*						*	
5	(Ready & Conger 2007)	-	-	Theoretical		*	*	*	*	*			*	*	*	*		*	*	*
6	(Stahl et al. 2007)	North America, Europe/Middle, Asia-Pacific, & East/Africa	Private	Mixed	*		*	*			*		*							*
7	(Christensen Hughes & Rog 2008)	-	-	Theoretical		*	*						*							
8	(Li & Devos 2008)	Canada	Army	Qualitative			*	*					*		*					
9	(Beechler & Woodward 2009)	-	-	Theoretical			*	*					*	*						
10	(Meyskens et al. 2009)	-	-	Theoretical	*		*	*					*	*						

11	(Shen & Hall 2009)	-	-	Theoretical				*					*							
12	(McDonnell et al. 2010)	United Kingdom (UK), Ireland, Germany, & rest of Europe	Various	Quantitative				*	*	*					*					
13	(Mellahi & Collings 2010)	-	-	Theoretical			*						*							
14	(Scullion et al. 2010)	-	-	Theoretical	*		*	*					*							
15	(Tarique & Schuler 2010)	-	-	Theoretical			*	*					*							
16	(Peet et al. 2010)	United States of America (USA)	Higher education	Qualitative			*	*		*								*		
17	(Tymon Jr et al. 2010)	India	Private	Quantitative			*						*	*				*	*	
18	(Preece et al. 2011)	China	Private	Qualitative			*	*					*							
19	(Schuler et al. 2011)	-	-	Theoretical	*		*	*					*	*						
20	(Whelan & Carcary 2011)	N/a	ICT	Qualitative			*											*		
21	(Chadee & Raman 2012a)	India	ICT	Quantitative	*		*	*						*	*			*		
22	(Garavan 2012)	Europe, Asia, & USA	Industrial	Qualitative			*	*	*	*				*						
23	(Kim & McLean 2012)	-	-	Theoretical				*			*		*							
24	(Holden & Vaiman 2013)	Russia	Private	Qualitative					*				*						*	
25	(Festing et al. 2013)	German	Private	Quantitative	*		*	*					*							
26	(Kong et al. 2013)	India	ICT	Qualitative			*						*							
27	(Preece et al. 2013)	The Asia Pacific region	Industrial	Qualitative			*		*			*	*	*	*	*				
28	(Skuza et al. 2013)	Poland	Private	Qualitative				*							*					*
29	(Beardwell & Thompson 2014)	-	-	Theoretical	*		*	*					*							
30	(Claussen et al. 2014)	N/a	Video-gaming	Quantitative					*	*									*	
31	(Collings 2014)	-	-	Theoretical				*	*	*					*					
32	(Cooke et al. 2014)	China & India	Industrial	Qualitative			*	*						*		*		*		

33	(Farndale et al. 2014)	USA & some Europe countries	Private	Qualitative					*	*			*	*						
34	(Deery & Jago 2015)	N/a	Healthcare	Qualitative			*						*							
35	(Schiemann 2014)	-	-	Theoretical	*		*			*								*		
36	(Sidani & Al Ariss 2014)	Arab Gulf countries	Various	Qualitative					*					*			*	*		
37	(Latukha 2015)	Russia	Private	Qualitative			*	*						*						
38	(Dessler 2015)	-	-	Theoretical	*		*	*		*				*				*		
39	(Khilji et al. 2015)	-	-	Theoretical				*			*		*				*			
40	(Mathew 2015)	India	Private	Quantitative		*	*	*	*	*		*	*	*			*	*	*	
41	(Thunnissen & Van Arensbergen 2015)	Netherland	Higher education	Qualitative	*			*							*					
42	(Vaiman et al. 2015)	-	-	Theoretical	*		*	*					*		*					
43	(Beamond et al. 2016)	-	-	Theoretical					*		*					*			*	
44	(Crowley-Henry & Al Ariss 2016)	-	-	Theoretical	*		*	*					*		*					
45	(McNulty & De Cieri 2016)	North America, UK, Europe, Africa, &Asia Pacific	Various	Qualitative			*	*					*							
46	(Tatoglu et al. 2016)	Turkish	Private	Quantitative			*			*			*			*				
47	(Ali et al. 2017)	China	Industrial	Quantitative	*		*	*						*	*			*		
48	(Suk Kim & Kotchegura 2017)	China, Russia, & Brazilian	Public	Qualitative			*						*							
49	(Suseno & Pinnington 2017)	Australia	Private	Qualitative		*			*		*		*					*		
50	(Tafti et al. 2017)	Iran	Industrial	Qualitative			*	*			*		*		*					*
51	(van den Broek et al. 2018)	Netherland	Healthcare	Qualitative			*						*							
Total					**16**	**6**	**38**	**31**	**12**	**10**	**6**	**3**	**34**	**16**	**12**	**5**	**3**	**12**	**7**	**4**
% of research studies					**31.3**	**11.7**	**74.5**	**60.7**	**23.5**	**19.6**	**11.7**	**5.8**	**66.6**	**31.3**	**23.5**	**9.8**	**5.8**	**23.5**	**13.7**	**7.8**

As shown in Table 2.2, it is obvious that many scholars have focused their empirical attention on attraction, retention, and development of talent. Of all articles reviewed, 38 articles concentrated on talent attraction, while 34 focused on talent retention and 31 articles were about talent development. One of the key reasons behind this significant attention from researchers and scholars is that these processes are strategically very essential in today's ephemeral knowledge economy, as they firstly assist organisations to fulfill strategic business objectives, meet basic business requirements, and they set up the foundation for the implementation of business strategies (Ford 2017; Hejase et al. 2016; Kim et al. 2014; Mohammed et al. 2017; Rothwell 2011; Rothwell et al. 2014; Tatoglu et al. 2016; Waheed et al. 2013). Secondly, organisations that establish their principal competence in talent attraction, talent development, and talent retention guarantee their own stability and growth in relation to their competitors in the same business sector (Lockwood 2006; Mohammed et al. 2017; Mwangi et al. 2014; Suk Kim & Kotchegura 2017; van den Broek et al. 2018). Finally, attraction, development, and retention of talent are essential for growth and success of higher education institutions in the long term by engaging an institution's strategy with its highly qualified employees (Bradley 2016; Rudhumbu & Maphosa 2015; Wu et al. 2016).

Looking to Table 2.2, the least attention was paid to the processes of support and training, workforce and talent planning, and talent evaluation with only three or four articles each. In addition, it is apparent that talent management studies are either theoretical, using a qualitative or quantitative design, with few studies conducting a mixed method approach. Furthermore, the vast majority of talent management research is outside the higher education sector, and the few studies from within are in non-Australian contexts.

This finding is supported by the previous studies. For example, Paisey and Paisey (2018) found that talent management research in the higher education sector were limited. The majority of talent management studies focus on theoretical frameworks, and they have little focus on empirical studies (Gallardo-Gallardo et al. 2015; Gallardo-Gallardo & Thunnissen 2016; Thunnissen 2016; Tomany 2012). Moreover, empirical studies on talent management is either quantitative or qualitative with only one-fifth of the research utilising a mixed-method design (Gallardo-Gallardo &

Thunnissen 2016; McDonnell et al. 2017). In summary, the researcher has matched the five core categories mentioned above with sixteen sub-categories in Table 2.3 below.

Table 2.3: The core and subcategories of talent management processes

No.	Core categories	Sub-categories
1	Recruitment, attraction and selection	• Talent selection • Talent engagement • Talent attraction (recruitment)
2	Training and development	• Talent development • Leadership development • Succession planning • Talent acquisition • Support and training
3	Retention	• Talent retention • Compensation and reward
4	Identification	• Talent identification
5	Performance management of talent	• Skills gap analysis • Workforce and talent planning • Performance management • Career management • Talent evaluation

Thus, based on the outcomes of the qualitative phase of this study (refer to Chapter 6 of the thesis), attraction, development and retention of talent were selected as the constructs of talent management in this thesis.

2.3.1 Talent attraction

In modern knowledge-based organisations, talent attraction is one of the most essential success elements (Bish & Jorgensen 2016; Kimathi 2015; Thompson 2013). Higher education organisations, for example, are strongly based on the attraction of experienced staff to fill key positions (Bradley 2016; Hazelkorn 2017; Lynch 2013). They primarily aim to attract talented candidates from the internal or external labour market (AlKerdawy 2016). However, there are some difficulties and challenges in

attracting qualified staff to higher education organisations (Hazelkorn 2017; Lynch 2013). These issues include safety and security, workloads (Lynch 2013), and conflicting opinions (Hazelkorn 2017). To meet these challenges, Beardwell and Thompson (2014) highlight the following approaches that have been identified as effective for attracting talent.

- *The job-based approach*: this includes writing a comprehensive description of a job which is filled, and then create the desired person specification, which is based on that job description. However, this approach is inflexible because the changes that can occur in the main tasks or list of responsibilities of the main job are not taken into consideration.
- *The person-based approach*: this focuses on identifying individual attitudes sought by an organisation. It can be adopted in order to recruit individuals to fill a vacant job and participate in achieving the broader business targets of the organisation.
- *The competency-based approach*: this tries to recruit people by, for example, specifications, knowledge, experiences, skills, and personal values that are attached to a job and used as a guide for an individual. However, this approach can encounter practical implementation difficulties and therefore may not achieve the organisation's goals.

Talent attraction can be divided into two sub variables: (1) social domain, and (2) organisational excellence. Throughout the thesis, the term 'social domain' is used to refer to support in difficult times, social innovation, and work-life balance. An organisation can attract more talented employees by providing them with social support in critical areas, for example motherhood and monetary difficulties (Nogueira Novaes Southgate & Mondo 2017). In regard to work-life balance, the last decade has seen a growing trend towards family-friendly workplaces (Chandra 2012). Thompson (2013) defines work-life balance as a personal perspective that is related to compatibility for talented employees inside and outside their workplace. Socialising with colleagues, lifestyle opportunities, or appropriate locations are determinant factors for attracting new talented individuals, because they add work-life balance to organisations, which in turn contributes increasingly to their productivity (Chandra 2012; Kimathi 2015; Thompson 2013; Yap 2016).

In the literature, the term "*organisational excellence*" is generally understood to mean a strong tool and a key driver that assists organisations to achieve their strategic and operational aims (Aladwan & Forrester 2016; Rookhandeh & Ahmadi 2016). Excellent organisations adopt managerial attitudes that focus on total quality in all internal processes to attract high-quality individuals (Li & Devos 2008; Moayedi & Vaseghi 2016). As previously stated, the qualitative study explores a number of excellence-related factors that contribute to attracting new talents to higher education institutions. These factors include talent branding, the reputation of an organisation, organisational culture, organisational climate, and work environment.

Talent branding as a key element of talent attraction enables organisations to manage talent of employees through an organisations' identity, loyalty, and culture, as a means of attracting high-potential individuals (He et al. 2012; Li & Devos 2008; Moayedi & Vaseghi 2016; Suseno & Pinnington 2017; Viktoria Rampl & Kenning 2014). Organisational branding depends on the available resources for employees' recruitment. In order to fulfil financial and time goals, organisations have to consider particular resources in terms of where to obtain the profile required. In order to be excellent and successful in attracting talent, organisations need to follow appropriate strategies, adopt ethical principles in each phase of their current practices, and build a strong and distinctive reputation in the labour market to be competitive (Anwar et al. 2014; Chuai 2008). There are two different strategies for recruiting talent to an organisation (Dessler 2015; Li & Devos 2008; Oduor 2017; Tiwari & Lenka 2015):

(1) Internal brands: An organisation relies on its candidates. This will decrease the risks connected with the recruitment process and will save costs. An organisation may know or can observe a candidate's strengths and weaknesses as well as the fact that current employees are possibly more committed to the organisation. In particular, avoiding external advertisements enables organisations to save costs of external channels. However, Dessler (2015), argues that rejected applicants may become discontented, and it can also waste time since often the manager already knows whom they want to hire.

(2) External brands: Organisations cannot always get all the employees they need from their current staff and therefore need to tap into external sources to find candidates (Dessler 2015; Li & Devos 2008). However, online recruitment channels

may encourage excessive numbers of applications to reach a limited audience (online job-search), or the process is seen as too impersonal, discouraging some candidates (Beardwell & Thompson 2014; Dessler 2015). Therefore, organisations should develop a strong and distinguishable employer brand, which links organisational values to the employee management strategy and the organisation's brand (Andersen 2013; Beardwell & Thompson 2014). This can attract the best possible talent by promoting a unique combination of mental and practical benefits in the work place (Andersen 2013; Beardwell & Thompson 2014).

Indeed, an organisation that has excellence in its activities builds a good reputation, which then allows it to attract the best talents (Irshad et al. 2014; Lyria 2014; Matos et al. 2012; Suseno & Pinnington 2017). This view is supported by Cruz-Castro et al. (2016); Horseman (2018) who write that reputation and university ranking are key elements of organisational excellence to attract talented individuals. Furthermore, a desirable organisational climate is a determinant of attracting new talented employees (Lyria 2014; Schlechter et al. 2014; Thompson 2013). Similarly, a supportive organisational culture with innovation can be an excellence-related factor for attracting qualified employees (Aladwan & Forrester 2016). In regards to consideration of the work environment, this is a driving force for attracting talent (Lyria 2014; Yap 2016). Working environment factors such as improved health, stress reduction, autonomy, job security, and satisfaction within an organisation are considered determining aspects for attracting talent to the organisation (Chandra 2012; Kimathi 2015; Schlechter et al. 2014; Thompson 2013).

In summary, it has been demonstrated in this review that talent attraction is a basic factor of success in various sectors in general, and in the higher education sector specifically, because of the key role that talent attraction plays in the functioning of higher education organisations. Thus, talent attraction in educational institutions is a function of social domain and organisational excellence. These two dimensions are significant elements of expressing the relationship between talent attraction and knowledge management processes.

2.3.2 Talent development

In a perfect business world, because of strong competition, organisations should develop their talented employees to enable them to become productive more rapidly (Malmgren McGee & Hedström 2016). Hence, the talent development process needs to be embedded within staffing progress, and be regarded as a successful measure for organisations to improve the skills of their highly qualified individual staff members (Chuai 2008; Moayedi & Vaseghi 2016; Mohan et al. 2015; Wu et al. 2016). Talent development is considered a critical resource of differentiation and sustainable competitive advantage (Beardwell & Thompson 2014; Mohan et al. 2015). It is strategically important for an organisation's success (Bhatia 2015; Mohan et al. 2015; Mwangi et al. 2014). For instance, the development of talent working within higher education organisations also assists in retaining talented employees (Mohan et al. 2015), which in turn assists in increasing university rankings and profits (Hazelkorn 2017; Lynch 2015). University rankings are aligned with the talent of high-performing employees, and these talented individuals contribute significantly to a university's performance by recruiting new students, conducting professional teaching, conducting high-level research, and securing research funding (Bradley 2016; Hazelkorn 2017; Horseman 2018; Lynch 2015; Refozar et al. 2017).

The development process of talent involves three elements: (1) performance management; (2) coaching talent; and (3) leadership development.

1. *Performance management* – As one of the key processes of talent development, this assists in filling the gap between the current and planned performance of highly qualified employees (Al Ariss et al. 2014; Jyoti et al. 2015; Mohan et al. 2015). It evaluates the current performance of talents to assist them in identifying their competency level, and then developing their capabilities (AlKerdawy 2016; Lyria 2014). Through this process, training needs can be identified to develop talent (Al Ariss et al. 2014; Vnoučková et al. 2016). Organisations should offer their experienced staff appropriate development strategies to improve their strong points and hence improve their total performance, including particular competencies, strengthening their motivation, and boosting their career development (Lockwood 2006; Nyaribo 2016; Wu et al. 2016).

2. *Coaching talent* –This the second sub variable of talent development. The existing literature on coaching talent is extensive and focuses on learning and development of talent (Joo et al. 2012; Prinsloo 2017). Even though coaching talent can be a significant tool for achieving high talent development through learning skills and creating knowledge, the difficulty in transforming these skills from outside an organisation has been a disadvantage (Meyers 2013; Moayedi & Vaseghi 2016). Coaching talent through internal job rotation can develop individual knowledge and experience from different departments and divisions within an organisation (Cooke et al. 2014; Rothwell 2005; Tatoglu et al. 2016). Training and mentoring programs are valuable tools for developing talent (Prinsloo 2017; Tafti et al. 2017; Walker 2017). These programs can be offered online (AlKerdawy 2016), and can also include face-to-face learning and teaching courses for academic staff (Al Saifi 2014) to gain required knowledge and skills (Al Saifi 2014; AlKerdawy 2016). In addition, leading organisations provide their talented employees with career development opportunities (Brunila & Baedecke Yllner 2013; Chami-Malaeb & Garavan 2013; Joo et al. 2012; Yap 2016).

3. *Leadership development* – This is a key process of talent development (Mohan et al. 2015). It assists organisations in achieving overall organisational sustainability (Chami-Malaeb & Garavan 2013; Dalakoura 2010; Prinsloo 2017). Effective and developed leadership is a key element of organisational sustainability (Terblanche et al. 2017). Organisational sustainability through leadership assists organisations to strategically generate intrinsic values and wellbeing for all stakeholders (Terblanche et al. 2017). The leadership development process includes 'coaching, multi-source feedback, stretch assignments, mentoring, international job assignments and formal development programmes' (Chami-Malaeb & Garavan 2013, p. 4047), as well as succession planning (Hejase et al. 2016; Mathew 2015; Rothwell 2005). In academic organisations, high level leadership provides talented individuals with sufficient opportunities in regard to functional planning programs (Bradley 2016; Mohan et al. 2015). Conversely, a lack of formalised organisational leadership training could negatively affect employees from achieving their advancement potential (Walker 2017). Therefore, the leadership development process enables leaders to obtain the skills and competencies necessary to be

effective through role-assignment leadership programs (Chami-Malaeb & Garavan 2013; Dalakoura 2010).

In brief, it has been shown in this review that talent development is a critical source of sustainable competitive priority in various sectors in general, and in the higher education sector specifically. It assists in retaining highly qualified employees and increasing university rankings and profits. Thus, talent development in academic institutions is a function of performance management, coaching talent, and leadership development.

2.3.3 Talent retention

Talent retention becomes a progressively worthwhile process of building an organisation's ability to acquire and maintain a competitive advantage (Kabwe 2011; Smith 2017; Visuri 2014). It is focused on retaining talent amongst an organisation's staff so they remain with an organisation (AlKerdawy 2016). Due to fierce competition to attract talent among leading organisations in all sectors in general and particularly in the higher education sector, the retention of talented staff in higher education organisations is problematic (Bradley 2016; Robyn & Du Preez 2013; Salau 2017; Walker 2017). This is partly due to constant growth in the economy that makes job opportunities for academic talent almost unlimited (Bradley 2016; Salau 2017). Retention of talented individuals is mainly aimed at enabling an organisation to keep a high-value workforce and to build a unique source of competitive advantage, which can lead to organisational growth and success (Alnaqbi 2011; Koranteng 2014). Talent retention is constructed using five sub-variables: (1) benchmarking; (2) job satisfaction; (3) non-financial rewards; (4) employee empowerment; and (5) employee motivation.

First of all, benchmarking can broadly be defined as a key tool for setting aims by utilising learning and external standards from other organisations which can act as best practice for performance (Horseman 2018). This tool has received considerable attention within Australian organisations (Warmerdam et al. 2017). It is seen as a beneficial way of retaining talented staff within higher education organisations through assessing the current strategies of talent retention from the best performing

organisations (Dunkerly & Wonh 2017; Horseman 2018). There are several types of benchmarking within the higher education sector (Horseman 2018): internal benchmarking compares performance to other divisions of the university; competitive benchmarking compares performance against a chosen group of peer universities; sector benchmarking is a comparison with all universities in the same country; strategic benchmarking involves a comparison with overseas universities. Competitive compensation is considered an essential element of success towards retaining highly qualified individuals within an organisation that seeks to achieve a competitive advantage (Bhattacharyya 2015; Stahl et al. 2007). Thus, organisations should have a competitive benchmarking system, which is a determining factor for retaining their highly qualified staff (Bhattacharyya 2015; Lyria 2014; Moayedi & Vaseghi 2016).

The second sub-variable of talent retention is job satisfaction. It was not until the late 1930s that historians began to consider job satisfaction as worthy of scholarly attention (Kianto et al. 2016). Job satisfaction involves a positive emotional attitude in workplaces to assist higher education organisations to retain experienced staff and achieve a competitive advantage (Asrar-ul-Haq et al. 2017; de Lourdes Machado-Taylor et al. 2017; Lima et al. 2017; Refozar et al. 2017; Walker 2017). It can be understood in terms of work environments, work conditions, relationships with supervisors, and career opportunities (Asrar-ul-Haq et al. 2017; Lima et al. 2017; Salau 2017). Existing high-quality working environments and conditions promote job satisfaction, which assists the improvement of performance at both individual and organisational levels (Asrar-ul-Haq et al. 2017; Salau 2017; Walker 2017). Therefore, high job satisfaction of talented individuals in academic workplaces are a reflection of existing effective retention strategies (Salau 2017; Walker 2017).

Thirdly, non-financial rewards can play a crucial role in assisting an organisation in retaining its talented staff through increasing productive time and engagement among individuals, and consequently improving their overall productivity (Bhatnagar 2007; Hina et al. 2014; Lyria 2014; Nyaribo 2016; Uzonna 2013). Non-monetary rewards improve retention rates of highly qualified employees working in higher education organisations (Robyn & Du Preez 2013). Those rewards involve certification, genuine appreciation, and recognition (Nyaribo 2016). Likewise, Hina et al. (2014) hold the view that non-financial rewards include personal growth, interesting work,

participation, flexibility, acknowledgement, significance of a role, and achievement. Non-financial rewards in higher education organisations constitute funding external education, promotion, and participation (Belleflamme & Jacqmin 2016).

Employee empowerment is the fourth element of the talent retention construct. A large and growing body of literature about 'human relations movement' has developed since the 1990s (Chitorelidze 2017; Kim & Fernandez 2017; Smith 2017). Employee empowerment practices are an essential element of motivating and retaining highly qualified employees for a long time within an organisation (Ali et al. 2017; Sandhya & Kumar 2011; Tsai 2012). Employee empowerment in academic workplaces assists in retaining talented staff, both academic and professional (Chitorelidze 2017; Tsai 2012). It improves the satisfaction levels of an organisation's employees through granting them self-efficacy in their workplaces (Saleem et al. 2017; Twyman-Abrams 2017). Successful organisations that seek to increase their productivity should empower employees through encouraging creative ideas and involvement in decision-making (Bhatnagar 2007; Malik et al. 2015; Sandhya & Kumar 2011; Smith 2017). Thus, employee empowerment is a process which values employees by providing them with sufficient responsibility and authority to manage their work professionally (Sandhya & Kumar 2011).

The fifth and final sub-variable of talent retention is employee motivation. Motivational and valued work, professional advancement, and supportive learning environments are seen as the key to retaining talented employees (Anwar et al. 2014; Refozar et al. 2017). In higher education environments, employee motivation plays a key role in retaining valued staff (Gakure et al. 2013; Refozar et al. 2017; Salau 2017; Walker 2017). An organisation should offer proper financial rewards to its employees to ensure employee motivation (Lockwood 2006; Ogbogu 2017). Career advancement is a creation of opportunities for highly qualified individuals that could lead them to improve and develop their career paths (Schlechter et al. 2014; Thompson 2013). These created opportunities are essential for retaining talented individuals (Brunila & Baedecke Yllner 2013; Chami-Malaeb & Garavan 2013; Joo et al. 2012; Yap 2016).

In summary, it has been shown in this review that talent retention is a main area of interest within the field of talent management. It is a key source for sustaining

competitive advantage in various organisations in general, and educational organisations specifically. Thus, talent retention is a function of benchmarking, job satisfaction, employee empowerment, employee motivation, and non-financial rewards.

To conclude this section, a review of the talent management literature identifies a number of processes in various sectors and organisations. The most common practices of talent management are attraction, development, and retention. This view is supported by the outcomes of the qualitative study of this research.

2.4 Knowledge management: The conceptual identity and intellectual frameworks

It is best to introduce and understand the historical foundation to knowledge management prior to discussing it as a concept. Therefore, this section is divided into two components: firstly the evolution of knowledge management, and secondly knowledge management as a concept.

2.4.1 Knowledge management: Historical background

Knowledge management has a history of almost thirty years (Girard & Girard 2015; Hansen & Husmoen 2016; Kakabadse et al. 2003; Kasemsap 2017; Metaxiotis et al. 2005; Mohammed et al. 2017). 'It is one of the outcomes of a combination of information science and management science' (Zhao & de Pablos 2011), as cited in (Mohammed et al. 2017, p. 1132). Knowledge management has been popularly developed by Peter Drucker, Paul Strassmann, and Peter Senge who are management theorists from the USA (Barclay & Murray 1997), as well as Svieby and Risling (1986) from Sweden (Grant & Grant 2008). Even though knowledge management did not become common until the late 1980s, the historical foundation began much earlier (Dalkir 2017). Dalkir (2017) summarises the developmental stages in knowledge management history. In the 1800s, the era of the industrial revolution was characterised by beginning industrialisation; 50 years into the industrialised era, transportation technologies became the key focus; communications then started in the

1850s, while in the 1900s the communication era began; in the early 1950s, computerisation started. In the 1980s, the virtualisation era emerged, while in the beginning of the twenty-first century, the period of profiling technologies and personalisation began (Dalkir 2017, p. 17). A brief summary of developmental phases in knowledge management history is shown in Figure 2.2.

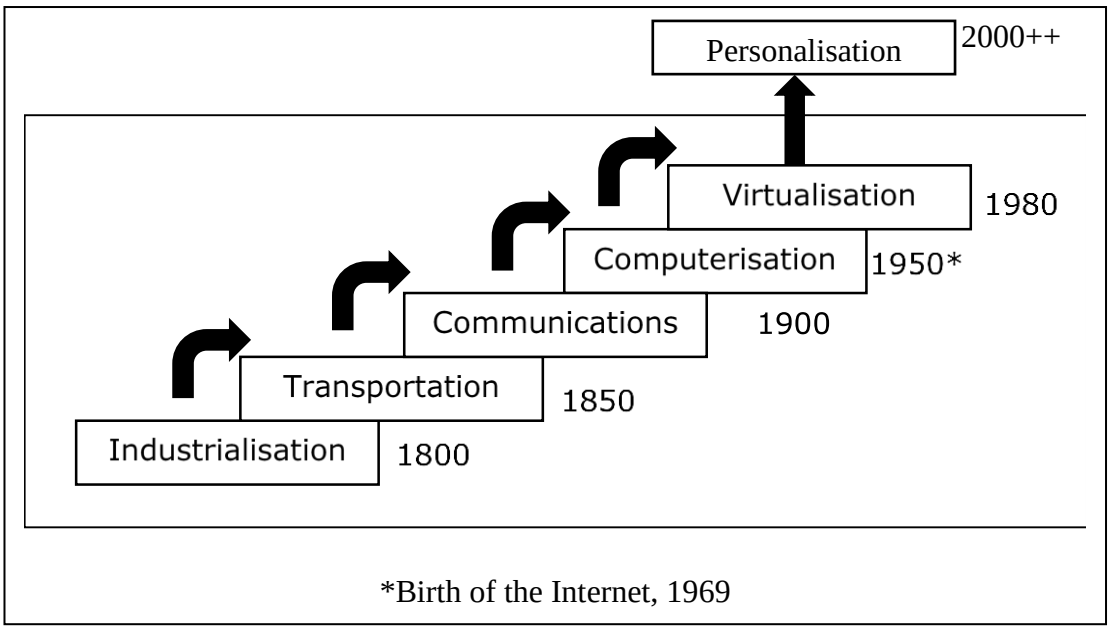


Figure 2.2: Developmental stages in knowledge management history

Source: (Dalkir 2017, p. 18).

Across 60 years, the academic literature on knowledge management has revealed the emergence of several fields such as economic, philosophy, strategic management, organisation theory, human resource management, information systems, and total quality management (Baskerville & Dulipovici 2006; Kakabadse et al. 2003; Metaxiotis et al. 2005). This research highlights significant contributions to the development of knowledge management over the previous six decades. It was started by the efforts of the philosophy scholar Polanyi (1958, 1966) who highlighted 'personal knowledge' as a difference between explicit and tacit knowledge (Grant 2015; Kakabadse et al. 2003). In 1959, Drucker (1964, 1975, 1993) created the term 'knowledge worker' (Dalkir 2017; Grant & Grant 2008; Kakabadse et al. 2003; Strassman 1977). The economic scholar Marshall (1965) then argued that capital included knowledge (Kakabadse et al. 2003; Metaxiotis et al. 2005).

In the 1970s, Habermas (1972) claimed 'that knowledge does not exist as some abstract entity, but is the product of intentional and, sometimes, unconscious human activity' (Metaxiotis et al. 2005, p. 7). In 1975, the first publication by Slamecka (1975) was titled *Pragmatic observations on theoretical research in information science*, in which he stated that knowledge management 'as a social resource, appears to be a viable new framework for defining major roles and tasks for theory-oriented work in information science' (Slamecka 1975, p. 318). Also, in the same year, 'knowledge-focused management' was adopted by Chaparral Steel as a means of explicit knowledge management (Dalkir 2017; Wiig 1997b, 1997a). Throughout the years 1976 and 1977, information became more significant within business organisations. For example, a report by Porat (1976) highlighted the information economy and research by Strassman (1977) focused on the role of information technology in organisational productivity.

In 1980, the first comprehensive knowledge-based system (XCON) was installed by Digital Equipment Organisation for the underpinning of its sales activities and layout engineering (Wiig 1997b, 1997a). The Applied Artificial Intelligence Center was started by the Arthur D. Little Organisation to construct pragmatic knowledge-based systems for governmental and commercial customers (Wiig 1997b, 1997a). In 1983, the first version of knowledge-based systems was developed by the United Services Automobile Association (USAA) to transmit experiences to practitioners (Wiig 1997a). Svieby and Risling (1986) then contributed to the development of knowledge management through their early and significant work on 'Intellectual Capital' in Sweden (Grant & Grant 2008). Sveiby and Lloyd (1987) published the book entitled *Managing Knowhow* in Europe (Wiig 1997b, 1997a). In the same year, the Purdue University-Technology Transfer Community organised the first conference of knowledge management entitled *Knowledge Assets into the 21st Century* (Wiig 1997b, 1997a). In 1989, 'Organizational learning: The key to management innovation' by Stata (1989) was the first article about knowledge management published in the journal of *Sloan Management Review* (Wiig 1997b, 1997a). In the same year in Europe, the International Knowledge Management Network started (Wiig 1997b, 1997a).

In the early 1990s, knowledge management became popular when Senge (1990) focused on the term 'learning organisation' as a cultural component of knowledge management (Barclay & Murray 1997; Dalkir 2017; Grant 2015; Grant & Grant 2008; Wiig 1997b, 1997a). Similarly, Garratt (1990); Savage (1990) published their books about learning organisations in USA and Europe (Wiig 1997b, 1997a). The German scholar Krcmar (1990) published his first research related to information systems in the *Wirtschaftsinformatik Journal*. In 1991, *The knowledge value revolution* was an early book published in the USA by the Japanese academic Skandia (Wiig 1997b, 1997a). In the same year, *Harvard Business Review* published the first paper by Nonaka (1991) on knowledge management (Wiig 1997b, 1997a). Similarly, Stewart Thomas (1991) published his first research in *Fortune Journal* entitled 'Brainpower' (Barclay & Murray 1997; Grant & Grant 2008; Wiig 1997b, 1997a). During the early 1990s, a great deal of research focused on processes and practices of knowledge management (Grant & Grant 2008). For instance, American scholar Wiig (1994); Wiig (1993); Wiig (1995) published three books about knowledge management as a business process (Grant & Grant 2008; Wiig 1997a). In addition, Liebowitz (1999a); Wiig (1993) contributed to building the foundations of knowledge management (Metaxiotis et al. 2005). In 1994, the Internet was expanded by the International Knowledge Management Network *(IKMN)* (Wiig 1997b, 1997a). This expansion assisted in transferring and sharing information throughout the world. More broadly, Nonaka (1994); Nonaka and Takeuchi (1995), based on the work of Polanyi (1958), suggested a spiral model that indicates that new knowledge is created and transferred tacitly and/or explicitly to the different levels of an organisation through four phases: Socialisation, Externalisation, Combination, and Internalisation (SECI) (Grant & Grant 2008).

In the middle of the 1990s, the development of private network applications such as e-mail, voice mail, and internal networks were broadly used in many organisations (Grant & Grant 2008). In addition, there was the development of websites and an increase in their users, especially in the USA and Canada (Grant & Grant 2008). During the middle to late 1990s, great-scale research and case studies appeared such as those by Kaplan and Norton about the American Productivity and Quality Center (APQC) (1996); Edvinsson and Malone's 1997 study (Dalkir 2017); and Zack's in 1999 (Grant & Grant 2008). At the same time, the use of organisational knowledge as

a competitive advantage began to emerge (Dalkir 2017; Grant & Grant 2008; O'Dell et al. 1999). Thus, the (APQC) (1996) was the first industry benchmarking research of knowledge management (Dalkir 2017; O'Dell et al. 1999; Wiig 1997b, 1997a). This study explored six key strategies that best-practice organisations use in their knowledge management (Dalkir 2017, p. 17; O'Dell et al. 1999, p. 204): '(1) knowledge management as a business strategy; (2) transfer of knowledge and best practices; (3) customer-focused knowledge; (4) personal responsibility for knowledge; (5) intellectual asset management; and (6) innovation and knowledge creation'. In 1997, the studies of knowledge management grew up around the themes of 'knowledge management frameworks' (Holsapple & Joshi 1997; Van Heijst et al. 1997), and "intellectual capital" (Bassi 1997).

Throughout the new millennium (2000++), a large number of developments occurred in relation to knowledge management, including the appearance of programs in universities (Dalkir 2017). Throughout the twenty-first century, considerable research contributions to knowledge management have grown up around the themes of 'knowledge management systems'(Alavi & Leidner 1999, 2001; Hahn & Subramani 2000; Österle et al. 2011), 'information technology and knowledge management' (Kim & Lee 2006; Marwick 2001), 'artificial intelligence and expert systems' (Hsu & Fang 2009; Liebowitz 1999b, 2001), 'e-learning and knowledge management' (Garrison & Kanuka 2004; Wild et al. 2002), 'organisational learning and knowledge management' (Thomas et al. 2001; Vera & Crossan 2003), 'knowledge management practices' (Koh & Kim 2004; Mårtensson 2000; Ngai & Chan 2005; Robertson & O'Malley Hammersley 2000; Ryu et al. 2003), 'knowledge management frameworks' (Baskerville & Dulipovici 2006; Liao 2003; Rubenstein-Montano et al. 2001), 'engendering and knowledge management' (Egbu 2004; Egbu & Botterill 2003; Robinson et al. 2005), 'software tools and knowledge management' (Hlupic et al. 2002; Tyndale 2002), 'knowledge management map' (Kim et al. 2003), 'advancement in organisational knowledge creation theory' (Nonaka & Von Krogh 2009), 'strategic knowledge management' (Armistead 1999; Carneiro 2000; Choi & Lee 2002; Egbu et al. 2005; Graham & Pizzo 1996; Greiner et al. 2007; Holsapple & Singh 2001; López-Nicolás & Meroño-Cerdán 2011; Storck & Hill 2000), 'information management and knowledge management' (Bouthillier & Shearer 2002; Kebede 2010; Krcmar 2015), and 'higher education and knowledge management'(Deem et al. 2007; Kidwell et al.

2000; Luan 2002; Metaxiotis et al. 2005; Metaxiotis & Psarras 2003; Olssen & Peters 2005; Rowley 2000). Overall, Dalkir (2017) highlights some significant contributions to the development of knowledge management over the period between1969-2000, which are displayed in Figure 2.3.

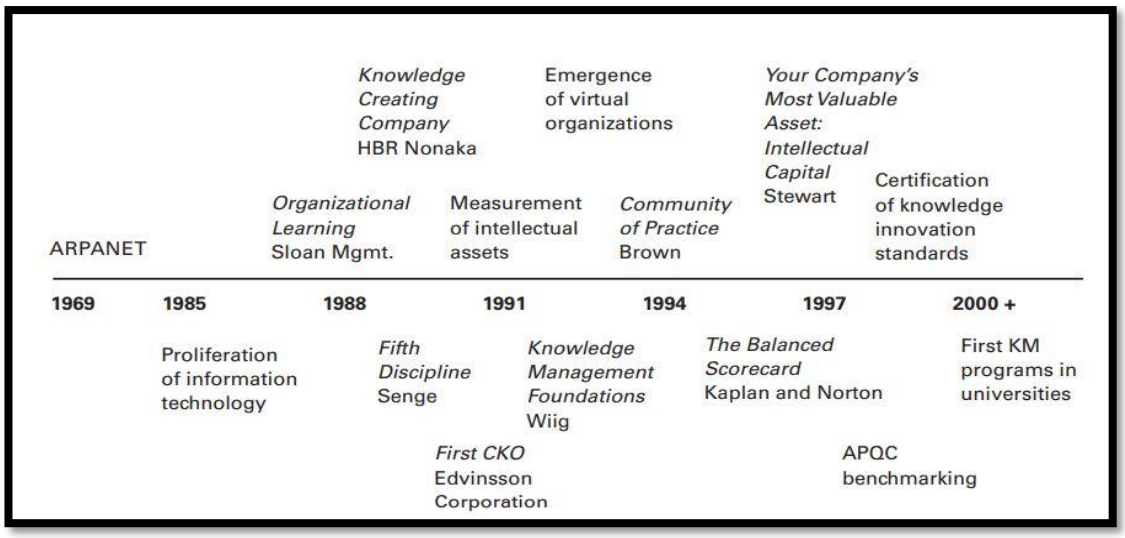


Figure 2.3: A brief timeline of knowledge management

Source: (Dalkir 2017, p. 18).

2.4.2 The conception of knowledge management

In the knowledge-based economy, existing knowledge within academic organisations becomes a key source in producing more knowledge (Howell & Annansingh 2013; Tan & Ramayah 2014; Yasir et al. 2017). It is best to introduce and understand the term "knowledge" prior to discussing the concept of knowledge management (Ragab & Arisha 2013). 'Plato (1953) first defined the concept of knowledge as "justified true belief" in his Meno Phaedo and Theaetetus' (Kakabadse et al. 2003, p. 76). According to Polanyi (1966), any type of knowledge is either implicit or part of individual experience (Barclay & Murray 1997; Dalkir 2017). In the literature, knowledge tends to be defined as a kind of object, a key resource with which organisations achieve their aims and objectives (Goodluck 2011; Howell & Annansingh 2013; Murni et al. 2018; Xue 2017). Other authors, for instance Biswanath Dutta et al. (2015); Evangelista et al. (2010); Zikmund et al. (2013), see knowledge as a combination of 'experience', 'values', and 'wisdom' of experts; it serves as a basis for assessing and combining new

experiments, generates awareness, and is utilised in the professional minds of those who become an integral part of organisations. Others observe that knowledge is a capability, for example Calo (2008); Cao et al. (2013); Zack (1999), refer to organisational knowledge as a prime strategic resource and to organisational learning as the prime strategic capability.

Similarly, Gray (2013); Martelo-Landroguez and Cepeda-Carrión (2016); Minbaeva et al. (2003) define knowledge in terms of "absorptive capacity" which refers to success in innovation and organisational growth. This is fulfilled through absorbing incoming knowledge from external environments in the form of inter-organisational learning, individuals' ability and motivation, use of new knowledge, sharing new knowledge inside and outside the organisation, and creation of new technologies (Gray 2006; Gray 2013; Minbaeva et al. 2003). In the higher education environment, absorptive capacity is considered an essential element for the success of university-industry connections (Audretsch et al. 2012; Kodama 2008) as it enables exchanging knowledge between academic institutions and enterprises. Enterprises benefit themselves, through the process of absorptive capacity, from using scientific information yielded by the universities (Kodama 2008).

In the same sense, Bhosale et al. (2016) define knowledge as the organisational asset that can assist to fulfil competitive features within hyper-competitive environments in a sustainable manner. Others, like Bhatti et al. (2011); Nonaka et al. (2014); Nonaka, Toyama and Konno (2000); Yiu and Law (2014), view knowledge as access to information that is contextual, relevant and actionable; as it is often relevant to a specific space and time. Conversely, Kakabadse et al. (2003); Tian (2017) clarify their conceptialisation of knowledge by noting that knowledge is both data and information, an integrated series of stages progressing through data, information, realisation, action, reflection, and ending in wisdom, which is the chain of knowledge, as shown in Figure 2.4.

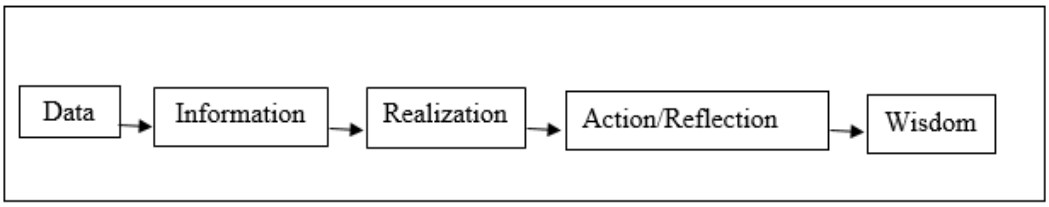


Figure 2.4: Looking at knowledge as a chain

Source: (Kakabadse et al. 2003, p. 77).

Bollinger and Smith (2001); Tian (2017); Wiewiora et al. (2015) indicate that the two phases of the investigation and contemplation represent knowledge as in Figure 2.5 below:

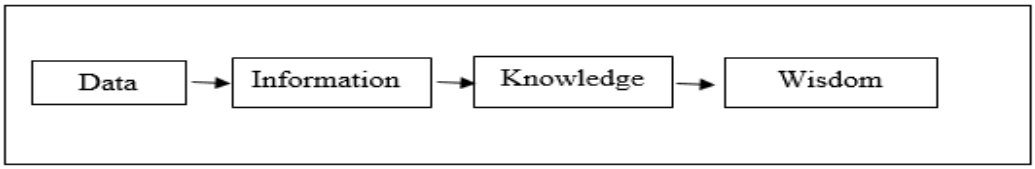


Figure 2.5: Realisation and action/ reflection as knowledge in the chain

Source: (Bollinger & Smith 2001, p. 9).

Thus, knowledge can be defined as a group of experiences and values stored in the minds of individuals that enables them to use and develop innovative ideas and information. Such innovative ideas and information assist an organisation to achieve a competitive advantage (Shujahat 2017; Tian 2017; Zikmund et al. 2013).

As a concept, for many years, knowledge management research was surprisingly neglected and lacked clarity from researchers and authors in the higher education environment (Baptista Nunes et al. 2017; Sunalai & Beyerlein 2015). However, more recently there has been an increasing amount of literature considering the creation, transfer, sharing, and utilisation of knowledge in educational organisations (Hazelkorn 2017; Kasemsap 2017; Masa'deh et al. 2017; Oktavia et al. 2017; Rambe & Mbeo 2017; Shams & Belyaeva 2017; Sunalai & Beyerlein 2015; Veer Ramjeawon & Rowley 2017). As such, knowledge management in higher education organisations is considered an integrated process that organisations can use to overcome challenges

associated with highly competitive environments (Hazelkorn 2017; Kasemsap 2017; Masa'deh et al. 2017; Oktavia et al. 2017; Rambe & Mbeo 2017; Shams & Belyaeva 2017; Sunalai & Beyerlein 2015; Veer Ramjeawon & Rowley 2017). It is also a key factor in improving innovation and performance of talent management in an organisation (Kasemsap 2017; Powell & Ambrosini 2017; Rambe & Mbeo 2017).

Several definitions of knowledge management as a dialectical and modern term have been proposed (Allameh & Zare 2011). Knowledge management can broadly be defined as a critical element of success for all kinds of organisations (Hansen & Husmoen 2016; Poor & Lebady 2017). Chen and Huang (2009) view knowledge management as a method that more actively leverages expertise and knowledge to generate value for effective organisations. Additionally, Meihami and Meihami (2014) see knowledge management as a range of methods in which the conversion of both tacit and explicit knowledge is integrated. It is recognised as crucial for improving organisational performance and sustaining competitive advantage (Anish Sachdeva et al. 2015; Kim et al. 2014; Mohammed et al. 2017; Yasar 2016).

Focusing on the process, Biswanath Dutta et al. (2015) note that this involves obtaining the suitable information for the suitable individual at the suitable time, through knowledge management. Knowledge management is thus a process that consists of different phases, as has been indicated by various scholars (García-Fernández 2015). According to Hajiabedin and Amani (2016); Laudon and Laudon (2017), knowledge management can be defined as a combination of available knowledge and a collection of developed business processes in an organisation: processes of creating, transferring, saving, applying and obtaining knowledge. It likewise includes processes that allow an organisation to share, capture, use, access, and store knowledge (Sibbald et al. 2016). Managing knowledge is a process of creating intangible assets, easily accessible within organisational memory (Yasar 2016; Zikmund et al. 2013).

In conclusion, the review of the literature has comprised varied definitions describing the concept of knowledge. However, all researchers agree that knowledge is a key way to build a new generation knowledge society and establish a civilization based on ideas and the amount of knowledge individuals possess. The value of an organisation is derived from the knowledge capabilities of its individuals and not from

its physical assets. The literature has also shown that knowledge management in the higher education sector is in a position to support learning and teaching activities, and improve educational performance through creativity, novelty, appropriateness in research and development, and transfer of individual and organisational knowledge (Baptista Nunes et al. 2017; Kasemsap 2017; Oktavia et al. 2017; Rambe & Mbeo 2017; Veer Ramjeawon & Rowley 2017).

2.5 Knowledge management processes*:* A critical review

Over the past decade, many higher education organisations have realised that applying knowledge management processes can make an organisation become more effective, efficient, and competitive (Kasemsap 2017; Oktavia et al. 2017; Veer Ramjeawon & Rowley 2017). Consequently, knowledge management processes are strategic elements in improving and developing innovative organisations (Koohang et al. 2017). Knowledge management processes 'can involve human, methodological, and technological elements; and as a result can be very complex' (Mohammed et al. 2017, p. 1132). These processes 'refer to creation, application, capture, storage, dissemination, and organisation of knowledge' (Allameh & Zare 2011; Mohammed et al. 2017, p. 1132). Knowledge management processes typically include: creation, storage, transfer, and application (Donate & de Pablo 2015).

In the literature, knowledge management processes can be organised under five essential groups: (1) knowledge creation, discovery, capture, development, and construction, internalisation and acquisition; (2) knowledge storage, protection and organisation; (3) knowledge application and utilisation; (4) knowledge sharing and transfer (Alavi & Leidner 2001; Mohammed et al. 2017; Ragab & Arisha 2013; Sunalai & Beyerlein 2015); and (5) knowledge identification (Sunalai & Beyerlein 2015). Overall, based on an extensive review of high ranking journals in the field of knowledge management, Table 2.4 provides a clear and comprehensive outline of the extant scholarly research of knowledge management research during the period 2006-2017.

Table 2.4: Knowledge management processes, according to scholarly studies in various sectors from 2006-2017

No.	Author name and year	Country	Sector/ Industry	Method	Knowledge management processes															
					Knowledge creation & generation	Knowledge capture	knowledge discovery	Knowledge acquisition	knowledge development	Knowledge understanding	Knowledge internalisation	Knowledge storage	Knowledge organisation	Knowledge protection	Knowledge application	Knowledge utilisation	Knowledge transfer & conversion	Knowledge sharing & dissemination	Knowledge identification	Knowledge collection
1	(Gray 2006)	UK	ICT	Quantitative				*		*						*	*			
2	(Palacios Marqués & José Garrigós Simón 2006)	Spanish	ICT	Quantitative	*				*	*				*		*				
3	(Turner & Makhija 2006)	-	-	Theoretical				*		*						*	*			
4	(Singh et al. 2006)	Turkey	ICT	Qualitative	*	*												*	*	
5	(Claver-Cortes et al. 2007)	Spanish	Private	Qualitative	*										*		*			
6	(Jung et al. 2007)	-	-	Theoretical	*				*			*	*			*		*		
7	(Zaim et al. 2007)	Turkey	ICT	Quantitative	*				*			*				*	*	*		
8	(Seidler-de Alwis & Hartmann 2008)	-	-	Theoretical	*												*		*	
9	(Aurum et al. 2008)	Australia	Private	Mixed	*			*					*		*	*			*	
10	(Dwivedi et al. 2009)	Thailand	Private	Qualitative	*			*				*				*	*			
11	(Fugate et al. 2009)	USA	Industrial	Quantitative	*					*								*		
12	(Hsieh et al. 2009)	Taiwan	Public	Qualitative	*	*						*			*	*		*	*	
13	(Liao & Wu 2010	-	-	Theoretical				*							*		*			

14	(Sedera & Gable 2010)	Australia	Public	Quantitative	*									*	*		*			
15	(Sun 2010)	New Zealand	Public & Private	Qualitative	*			*								*		*		
16	(Chang & Chuang 2011)	Taiwan	Industrial	Mixed				*								*		*		
17	(Donate & Guadamillas 2011)	Spanish	Technology	Quantitative			*									*				
18	(Martín-de Castro et al. 2011)	Brazilian	Private	Quantitative	*			*				*			*			*		
19	(Mills & Smith 2011)	Jamaica	Higher education	Quantitative				*						*	*		*			
20	(Whelan & Carcary 2011)	N/a	ICT	Qualitative	*				*					*			*	*		
21	(Yates & Paquette 2011)	Haiti	Technology	Qualitative											*			*		
22	(Biasutti & Heba 2012)	Egypt & Italy	Education	Quantitative	*			*			*				*			*		
23	(Lee et al. 2012)	South Korea	Various	Quantitative	*									*	*		*			
24	(Pinho et al. 2012)	-	-	Theoretical	*			*									*	*		
25	(Ferraresi et al. 2012)	Brazilian	Private	Quantitative				*						*		*	*			
26	(Abd Rahman et al. 2013)	Malaysia	Industrial	Quantitative				*						*	*		*			
27	(Alegre et al. 2013)	France	Private	Quantitative								*						*		
28	(CN Wee & YK Chua 2013)	Singapore	ICT	Qualitative	*											*		*		
29	(Benton & Magnier-Watanabe 2014)	Japan	Industrial	Quantitative				*				*			*			*		
30	(Birasnav 2014)	Bahrain	Private	Quantitative				*							*		*			
31	(Ho et al 2014)	Taiwan	Various	Quantitative	*			*			*					*		*		
32	(Lai et al. 2014)	Taiwan	Industrial	Quantitative	*			*				*						*		
33	(Villar et al. 2014)	Spanish & Italian	Industrial	Quantitative								*			*			*		
34	(Wu & Chen 2014)	Taiwan	Industrial	Quantitative	*								*		*		*			
35	(Parent et al. 2014)	Canada	Sport	Qualitative	*			*				*			*		*		*	
36	(Al Saifi 2015)	-	-	Theoretical	*										*			*		

37	(Chang & Lin 2015)	Taiwan	Various	Quantitative	*							*			*		*			
38	(Donate & de Pablo 2015)	Spanish	Industrial	Quantitative	*							*			*		*			
39	(Lee & Wong 2015)	Malaysia	ICT	Quantitative	*			*				*			*	*	*			
40	(Liu & Deng 2015)	China	Private	Quantitative				*						*	*		*			
41	(Tan & Wong 2015)	Malaysia	Industrial	Quantitative	*							*		*	*	*	*	*		
42	(Hasani et al. 2016)	Iran	Higher education	Quantitative	*			*				*			*			*		
43	(Obeidat et al. 2016)	Jordan	Private	Quantitative				*								*		*		
44	(Martelo-Landroguez & Cepeda-Carrión 2016)	Spanish	Banking	Quantitative	*							*			*		*			
45	(Sibbald et al. 2016)	Canada	Healthcare	Qualitative		*						*				*	*	*		
46	(Zapata Cantu et al. 2016)	Mexican	Public	Qualitative	*												*			
47	(Arpaci 2017)	Turkey	Education	Quantitative	*		*					*			*			*		
48	(Ferraris et al. 2017)	Europe	Industrial	Quantitative				*		*								*		
49	(Masa'deh et al. 2017)	Jordan	Higher education	Quantitative	*							*	*		*			*	*	*
50	(Koohang et al. 2017)	USA	Industrial	Quantitative		*		*								*	*			
Total					**32**	**4**	**2**	**24**	**4**	**5**	**2**	**19**	**4**	**8**	**26**	**19**	**26**	**26**	**6**	**1**
% of research studies					**64**	**8**	**4**	**48**	**8**	**10**	**4**	**38**	**8**	**16**	**52**	**38**	**52**	**52**	**12**	**2**

As can be seen in the table above, 32 articles of all articles reviewed have concentrated on knowledge creation, followed by application, transfer and sharing of knowledge with 52 per cent (26 articles for each process of them), knowledge acquisition with 24 articles (48 per cent), and both knowledge storage and utilisation with 38 per cent (19 articles for each process of them). The least attention was paid to discovery, internalisation, and collection of knowledge with one or two articles each. It is apparent from looking critically at Table 2.4 that the majority of knowledge management research is based outside the higher education sector, while the few studies from within are in non-Australian contexts. This echoes past studies that point out that knowledge management research in the higher education sector is limited (Sunalai & Beyerlein 2015; Veer Ramjeawon & Rowley 2017). Thus, a critical review of the knowledge management literature has led to aligning the five core categories stated above with sixteen sub-categories in Table 2.5 below.

Table 2.5: The core and subcategories of knowledge management processes

No.	Core categories	Sub-categories
1	knowledge creation, discovery, capture, development, and construction	• Knowledge creation • Knowledge capture • knowledge discovery • Knowledge acquisition • knowledge development • Knowledge understanding • Knowledge internalisation
2	knowledge storage, protection and organisation	• Knowledge storage • Knowledge organisation • Knowledge protection • Knowledge collection
3	knowledge application and utilisation	• Knowledge application • Knowledge utilisation
4	knowledge sharing and transfer	• Knowledge transfer • Knowledge sharing
5	knowledge identification	• Knowledge identification

Thus, based on the outcomes of the qualitative part of this research (refer to Chapter 6 of the thesis), transfer, creation, and sharing of knowledge were selected as the constructs of knowledge management. The following further justifications of these selected processes are derived from the knowledge management literature:

(1) This research follows the propositions of several researchers for future studies on talent management processes and knowledge management processes in the higher education sector (Chadee & Raman 2012b; Osigwelem 2017).

(2) Knowledge creation is one of the key elements in achieving high talent requirements for staff (Kasemsap 2017; Scaringella & Malaeb 2014);

(3) Both transfer and creation of knowledge are suitable for creative organisations which are constantly discovering, developing, and attracting creative talents' (Gateau & Simon 2016; Kasemsap 2017; Mohammed et al. 2017, p. 1134). Higher education organisations are an optimal example of creative organisations (Kasemsap 2017; Masa'deh et al. 2017; Oktavia et al. 2017; Veer Ramjeawon & Rowley 2017);

(4) Knowledge 'transfer plays a great role in the implementation of talent management processes', the reason being that, 'when talented individuals of an organisation retire, their skills and capabilities are critical and [need] to be transferred to others' (Daraei et al. 2014; Kim et al. 2014; Mohammed et al. 2017, p. 1134; Reilly 2008; Urbancová & Vnoučková 2015);

(5) Both knowledge transfer and knowledge creation contribute 'significantly in the investment of human capital within an organisation through building a distributed capability system of talent management' (Mohammed et al. 2017, p. 1134; Sparrow & Makram 2015); and

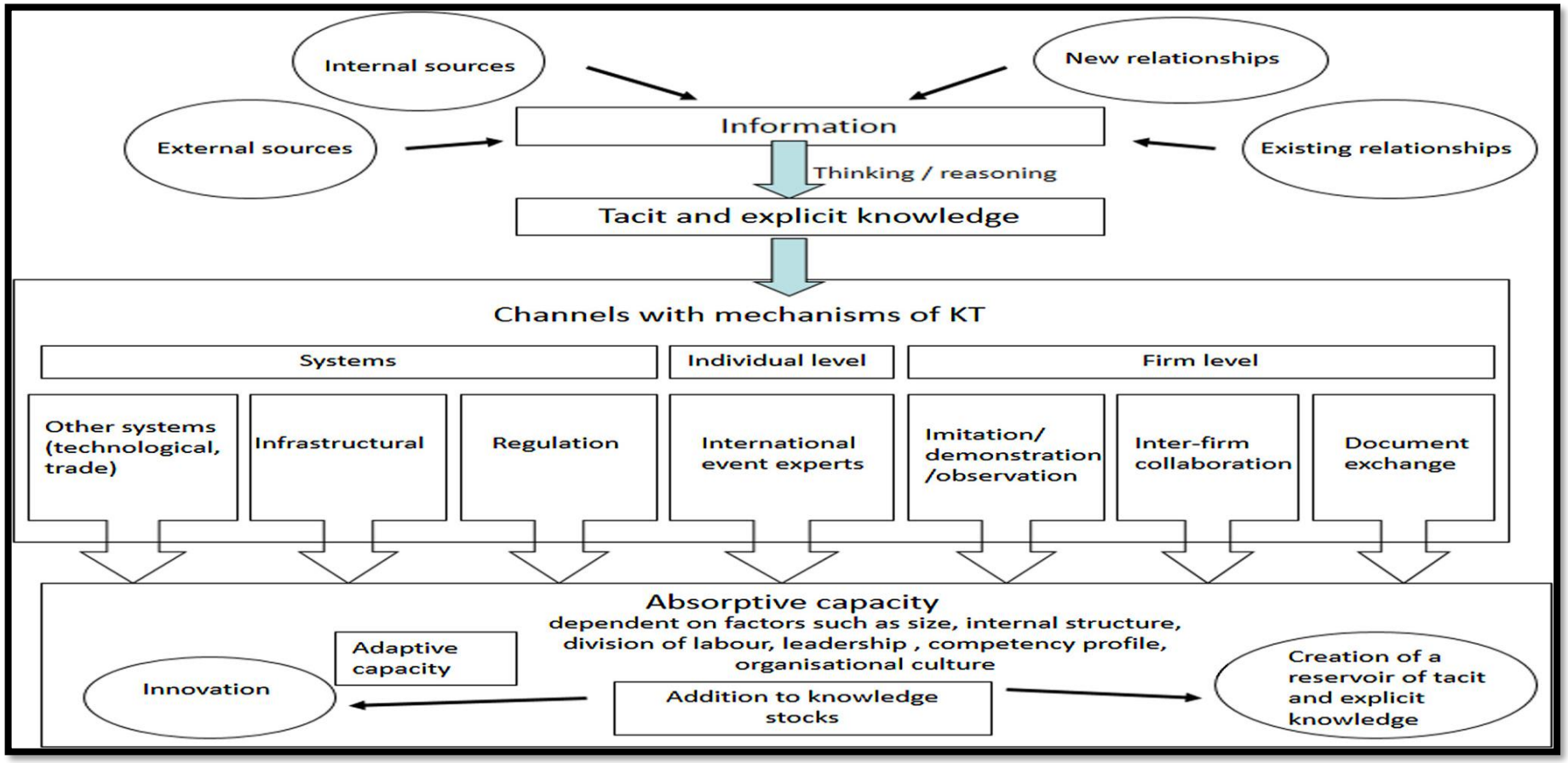
(6) A strategic key for successful knowledge management in higher education organisations is the focus on creation, sharing, and transfer of knowledge (Howell & Annansingh 2013; Veer Ramjeawon & Rowley 2017).

2.5.1 Knowledge transfer

During the past 50 years, research on knowledge transfer has begun to be considered by authors and researchers (Vlacic et al. 2018). In recent times, much more information has become available in higher education organisations and knowledge is transferred on to others in higher volumes (Rossi & Rosli 2015). The knowledge transfer process refers 'to all commercialisation and academic engagement channels' (Perkmann et al. 2013; Sengupta & Ray 2017, p. 883). This process allows employees to transfer their

tacit to tacit and explicit to explicit knowledge to other employees inside and outside of their organisations (Birasnav 2014; Chunliang & Lee 2016). Even though knowledge transfer and knowledge sharing are usually mentioned together or used interchangeably (Alavi & Leidner 2001; Harvey 2012; McAdam et al. 2012; Renzl 2006; Wang & Noe 2010; Wang et al. 2014; Xiao et al. 2017), knowledge transfer is different from knowledge sharing (Wang & Noe 2010). Knowledge transfer is communication among individuals involving the interaction of knowledge directly from source to receiver, rather than the collective character of knowledge sharing (Renzl 2006; Wang & Noe 2010).

Knowledge transfer has been identified as significant to the functioning of academic organisations (Rambe & Mbeo 2017; Sunalai & Beyerlein 2015). It plays a strategic role in improving the educational and financial performance of universities through interacting with industry and other institutions, in the form of communication, training, and initiatives to popularise science (Fullwood & Rowley 2017; Kasemsap 2017; Rambe & Mbeo 2017; Veer Ramjeawon & Rowley 2017). Knowledge transfer can be formally and informally operated as an approach to collaboration, interaction, discussion, social networks, and meetings (Tan & Wong 2015). To fulfil successful knowledge transfer, receivers should combine these processes with their personal knowledge networks and apply ideas and thought to it (Werner et al. 2015). In this context, Werner et al. (2015) have suggested a model for knowledge transfer processes that is shown in Figure 2.6 below.



Source: (Werner et al. 2015, p. 184).

Figure 2.6: Werner's model of knowledge transfer process.

Looking at Figure 2.6, it is apparent that information sources are both external and internal to an organisation from either new or current relationships. These sources can generate relevant tacit and explicit knowledge through cognitive processes, which are subsequently transferred via one of three channels: systems, individual, and organisation. At the systems level, infrastructure, regulation, technology and trade act as crucial channels and mechanisms of knowledge transfer. Knowledge can be individually brokered and moved through global networks of experts. At the organisational level, knowledge transfer is operationalised via document exchange, observation and adoption, and inter-organisation cooperation (Werner et al. 2015).

The knowledge that is transferred is then added to knowledge stocks in an organisation as either tacit or explicit knowledge, and is distributed between, and stored by, employees and managers. This distribution and storage process can be adapted and transformed as innovations, including being 'captured' by new technologies as they become more readily available. On the other hand, knowledge transfer can be a complex process which may depend on both the absorption and the adaptive capability of an organisation (Hallin & Marnburg 2008; Weidenfeld et al. 2010). Regardless however, knowledge transfer is an essential key element for driving innovation, and for creating and maintaining a competitive advantage for an organisation (Calo 2008; Daraei et al. 2014).

Two key strategies of knowledge transfer have emerged: codification and personalisation (Rhodes et al. 2008; Tangaraja et al. 2016; Venkitachalam & Willmott 2016). These strategies play a key role in designing knowledge management systems (Elfar et al. 2017). Hence, these elements of knowledge transfer are used in this study to investigate the relationship between talent management processes and knowledge transfer (Daraei et al. 2014; Vance et al. 2014).

The term "codification of knowledge transfer" is used here to refer to information or other knowledge resources that are only transferred explicitly (Ding et al. 2013; Liu et al. 2013; Venkitachalam & Willmott 2016). It focuses on the computer and the individual-to-documents approach in which staff members exchange extensive information between each other (Elfar et al. 2017; Ganesh & Pravin Kumar 2017; Mašić et al. 2017). Employees use technological tools such as e-mail, meetings, discussions and internal networks to transfer their knowledge to others (Abd Rahman

et al. 2013; Li & Devos 2008; Rhodes et al. 2008; Tan & Wong 2015). Likewise, the codification method can transfer knowledge through an organisation's social media channels (Cao et al. 2012; Guan et al. 2018; Offong & Costello 2017).

In contrast to codification of knowledge transfer, information that forms part of the personalisation strategy can be transferred via explicit or tacit means (Liu et al. 2013; Tangaraja et al. 2016; Venkitachalam & Willmott 2016). This refers to the "soft" approach to information transfer, which utilises face-to-face communication (Elfar et al. 2017; Mašić et al. 2017). The personalisation method includes transfer of employee experiences to other employees to improve individual and organisational output (Abd Rahman et al. 2013; Ganesh & Pravin Kumar 2017; Rhodes et al. 2008; Tan & Wong 2015). In addition, information can be transferred by sharing managerial techniques amongst organisational colleagues (Cao et al. 2012; Offong & Costello 2017).

In summary, many authors and researchers have considered knowledge transfer in their research, because of the key role that knowledge transfer plays in the functioning of educational organisations. There are two strategies of knowledge transfer: codification and personalisation. A comprehension of the tools of knowledge transfer, for example e-mail, meetings, discussions, internal networks, and employee experiences, is vital to understanding knowledge management.

2.5.2 Knowledge creation

Over the last 20 years, much theoretical work has been focused on knowledge creation within organisations (Von Krogh et al. 2012). Nonaka and Von Krogh (2009) define knowledge creation as an 'available process' 'amplifying knowledge', which an organisation's knowledge system creates via individuals connecting and clarifying knowledge (Von Krogh et al. 2012). Others focus more on knowledge creation as the conversion of knowledge from tacit (embedded in individuals' minds) to explicit (identified as in formal ways) knowledge, which in itself creates new knowledge, ideas, and best practices (Birasnav 2014; Lee & Wong 2015; Steyn 2004). Knowledge creation has been recognised as significant for the functioning of educational organisations (Sunalai & Beyerlein 2015). Knowledge creation in the higher education sector is in a position to improve educational performance through creating new

knowledge in the form of documents, procedures, videos, and the creation of diversity at various levels (faculty, students, administration, academics, etc.) (Kasemsap 2017; Oktavia et al. 2017; Rambe & Mbeo 2017; Veer Ramjeawon & Rowley 2017; Yasir et al. 2017). In this sense, the best practices of knowledge creation in academic organisations are represented by advancing educational technologies; producing high-quality research, learning, teaching, and consultancy services; and publishing in high level academic journals (Baptista Nunes et al. 2017; Kasemsap 2017; Rambe & Mbeo 2017; Yasir et al. 2017). For the purposes of this study, knowledge creation is a function of four dimensions (Nonaka 1994; Nonaka & Konno 1998; Nonaka & Takeuchi 1995; Nonaka & Toyama 2003):

1- Socialisation: this occurs by converting tacit knowledge among an organisation's individuals (Allal-Chérif & Makhlouf 2016; Steyn 2004). It also promotes employees to spend time with each other in informal meetings and exchanging of roles between employees (Steyn 2004; Tyagi et al. 2015). This dimension can be affected through individual discussions (Bashir Memon et al. 2017; Sasaki 2017), training, coaching, mentoring, and reward programs (Bashir Memon et al. 2017). It can be understood in terms of learning tacit skills from each other by observation, imitation, or practice (de Aguiar & Paterson 2017; Ganesh & Pravin Kumar 2017; Sasaki 2017); learning written knowledge about the technology from colleagues, e.g. writing a paper (Cao et al. 2012; Offong & Costello 2017); and encouraging employee creativity and innovation through collaboration (Tho & Trang 2015).

2- Externalisation: this factor transcribes tacit knowledge into new formats for the understanding of others' facts (de Aguiar & Paterson 2017; Sasaki 2017) as well as concepts, verbalisation, models, hypotheses, or written documents (Ganesh & Pravin Kumar 2017; Sasaki 2017). This element is associated with technology and information systems (Bashir Memon et al. 2017). As such, an organisation adopts a problem-solving system and learning collaboration tools for group work e.g. meetings (Li et al. 2009); develops new techniques to appraise the performance of talented individuals; offers opportunities for learning outside the organisation, e.g. sabbaticals (Hung 2014); or creates new knowledge shared through effective communication strategies (Sankowska 2013).

3- Combination: it is made by changing explicit knowledge into new and more systematic groups of knowledge, then disseminating this amongst an organisation's individuals (de Aguiar & Paterson 2017; Sasaki 2017; Von Krogh et al. 2012). This dimension is also related to technology and information systems (Bashir Memon et al. 2017). For example, an organisation adopts information repositories, best practices, lessons learned, and web-based access to data (Li et al. 2009); and provides support and improvement to employee skills (Rhodes et al. 2008).

4- Internalisation: this process is created by converting explicit knowledge into tacit knowledge inside the organisation (Allal-Chérif & Makhlouf 2016; de Aguiar & Paterson 2017; Ganesh & Pravin Kumar 2017; Sasaki 2017) and it can create new insights as it occurs (Alavi & Leidner 2001). This element can also be influenced through individual discussions, training, coaching, mentoring, and reward programs (Bashir Memon et al. 2017). The transferred tacit knowledge can occur through 'on-the-job training' or through learning by observing practice (Li et al. 2009). In addition, educational knowledge can be created by learning and teaching processes (Baptista Nunes et al. 2017; Oktavia et al. 2017).

In brief, knowledge creation is essential to improve the performance of universities through producing new knowledge at various diverse levels. Knowledge creation is a function of socialisation, externalisation, combination, and internalisation. These four dimensions are significant elements of expressing the relationship between talent management processes and knowledge creation.

2.5.3 Knowledge sharing

Knowledge sharing is a key source for sustaining competitive advantage, and assists the organisation's employees to improve their abilities and experiences (Abzari et al. 2016; Naeem et al. 2017; Naim et al. 2017). Although knowledge sharing has been used synonymously with knowledge exchange (McAdam et al. 2012; Wang & Noe 2010; Wang et al. 2014; Xiao et al. 2017), knowledge sharing is different from knowledge exchange (Wang & Noe 2010). Knowledge exchange contains 'both knowledge sharing (or employees providing knowledge to others) and knowledge seeking (or employees searching for knowledge from others)' (Wang & Noe 2010, p.

117). Hence, knowledge sharing is a process of exchanging information from one staff member, a group of staff members, or an organisation to others (Abzari et al. 2016).

In this knowledge-intensive era, sharing information is essential for educational organisations to overcome the challenges of the knowledge community (Fullwood & Rowley 2017; Howell & Annansingh 2013; Yasir et al. 2017). This process improves administrative decision-making (Fullwood & Rowley 2017; Howell & Annansingh 2013). Hence**,** sharing knowledge through interdepartmental research collaborations, education, skills development, teaching experiences, training, and learning should be considered within higher education organisations (Fullwood & Rowley 2017; Kasemsap 2017; Tan & Ramayah 2014). Furthermore, a culture of sharing best information among employees assists in meeting organisational and individual objectives for academic organisations (Fullwood & Rowley 2017; Howell & Annansingh 2013; Naeem et al. 2017; Santosh & Panda 2016).

Sharing information in scientific research can increase experience and develop the ability of staff members to 'express, exchange, negotiate, and understand tacit knowledge' (Howell & Annansingh 2013, p. 33; Shih & Tsai 2016; Tan & Ramayah 2014). This facilitates the transmission and knowledge creation processes through collaboration and discussion processes between research groups (Howell & Annansingh 2013; Kong et al. 2013; Naeem et al. 2017; Tan & Ramayah 2014). These experienced individuals contribute significantly to a university's performance by attracting new students, facilitating high-quality learning, conducting high-level research, and securing funds for further research (Bradley 2016; Hazelkorn 2017; Horseman 2018; Lynch 2015; Refozar et al. 2017). However, to continue competitively in the knowledge-based economy, universities need to efficiently manage their knowledge sharing practices (Howell & Annansingh 2013; Veer Ramjeawon & Rowley 2017). In addition, sharing of information should reach outside the higher education sector in order to exchange benefits, ideas, and skills between various sectors (Fullwood & Rowley 2017).

In summary, knowledge sharing is a key source for sustaining competitive advantage in various sectors and organisations. Sharing information is vital for higher education institutions. Thus, knowledge sharing is a function of sharing information among staff members both inside and outside academic organisations.

Overall, this section has provided a brief summary of the literature relating to knowledge management processes in various organisations and sectors. The most popular practices of knowledge management are transfer, creation, application and acquisition. However, the processes of transfer, creation, and sharing of knowledge were selected for this study.

2.6 The relationship between talent management and knowledge management

Talents and knowledge are approaches for meeting organisational demand for increased competitiveness (Daraei et al. 2014; Hazelkorn 2017; Jones 2008; Kasemsap 2017; Lynch 2015; Norhafizah 2016; Obeidat & Abdallah 2014; Shabane 2017; Urbancová & Vnoučková 2015).'Talent management studies and knowledge management frameworks can be used [to assist] organisations meet [these] demands through investing their human capital in order to create talented capabilities' (Daraei et al. 2014; Gallardo-Gallardo et al. 2015; Urbancová & Vnoučková 2015), as cited in (Mohammed et al. 2017, p. 1132). Managing of knowledge can be useful for talent management in five basic spheres (1) identification of knowledge workers (2) knowledge retention, (3) development of knowledge competencies, (4) knowledge sharing, and (5) knowledge creation (Whelan & Carcary 2011).

Blass (2009); Daraei et al. (2014) have further view that when talented staff leave an organisation, they also suffer knowledge loss because a substantial portion of knowledge in a company is in a tacit form. In a similar vein, Li and Devos (2008) examine the relationship between talent management and knowledge management and how a talent factory can supply a framework to inspire information sharing through tools , strategies, , and human behaviours. Gallardo-Gallardo (2011) proposes that talent is knowledge and values that can lead managers to make good decisions and deliver outcomes in a correct method; a highly qualified individual who depends on insights and knowledge received through formal education and gained practical experiences can offer certain skills. Some scholars emphasise that talent management foundations can be entrenched in a comprehensive knowledge management (Kong et al. 2013; Sparrow & Makram 2015).

With a focus on scope, Alicja (2007) examines the link between knowledge management and talent management as well as how the scope of knowledge is essential for talents. Daraei et al. (2014); Urbancová and Vnoučková (2015) articulate that the knowledge of successful employees needs to be transferred to improve talent management programmes. Similarly, Stahl et al. (2007) note how administrators are deeply involved in acquring talent and developing the skills and knowledge of their staff. Thus, talent management practices lead to improve knowledge management (Keat & Abdullah 2017; Vaiman & Vance 2008).

Focusing on individuals, organisations can enhance systems that strengthen efficient talent management decisions formed by increasing its managers' knowledge (Lawler III 2010). By contrast, Dresselhaus (2010); Piti (2010) observe talent as the completion of individuals' abilities which include intelligence knowledge, skills, career, and experience. Knowledge conceptualisedin this way means that it is a part of talent. Other perspectives examine the relationship between talent management and knowledge management; such as, that talent management processes have a direct influence on acquiring, generating, , storing, creating, organising, applying , and transferring knowledge in line with an organisation's objectives (Mohammed et al. 2017; Vaiman et al. 2015). Al-Awamleh (2009); Blass (2009), proposed that talent management is a means for changing institutional inputs (e.g. visions, missions, and strategies) into knowledge outputs. In this interpretation, talent management results in knowledge management.

In conclusion, this section has attempted to provide a brief summary of the literature relating to the relationship between talent management and knowledge management. Both talent and knowledge management are strategic sources for sustaining competitive advantage in all kinds of organisations. Therefore, both knowledge and talent are essential in terms of managements for innovative organisations (Keat & Abdullah 2017; Mohammed et al. 2017; Orlova et al. 2015).

2.7 Gaps in the literature

From the literature review, it is evident that researchers have published findings on both talent management and knowledge management (Blackman & Kennedy 2008; Calo 2008; Osigwelem 2017; Peet et al. 2010; Whelan & Carcary 2011; Whelan et al.

2010; Yumei & Xiantao 2009) (See Table 2.6). Nevertheless, less research has examined the link between talent management and knowledge management (Ali et al. 2017; Dries 2013; Kim et al. 2014; Mohammed et al. 2017; Scaringella & Malaeb 2014; Sparrow & Makram 2015). Also, outcomes of previous studies (Ali et al. 2017; Daraei et al. 2014; Keat & Abdullah 2017; Kim et al. 2014; Osigwelem 2017; Scaringella & Malaeb 2014; Shabane 2017; Whelan & Carcary 2011; Whelan et al. 2010) were conducted in specific workplaces, and thereby cannot be extended to all institutional settings. Thus, the generalisability of much published research on this issue is problematic.

These previous studies are limited in terms of sample size, methodology, or generalisation of results (Mohammed et al. 2017), for example, a research by Whelan and Carcary (2011), is based on one focus group including only three participants. In Scaringella and Malaeb (2014)'s study, the variables are subjectively measured, and only one issue of talent management has been considered. A study by Daraei et al. (2014) only focused on higher diploma to master degrees, and ignored other degrees such as a diploma or under. A study by Kim et al. (2014) initiated with limited practical information gathered from highly performing institutions concentrating on their talent management. A thesis by Shabane (2017) examines only dual government departments, and just 13 participants comprised of mid-to-upper level managers. A master 's thesis by Osigwelem (2017) has focused only on a singular higher education organisation with a sample size of 55 participants (five of them for the qualitative study, and 50 for quantitative study). A study by Khor (2017) was initiated in the limited Malaysian private colleges. In addition, it only focused on knowledge management in general without mentioning its processes.

Generally, significant gaps and suggestions were identified from prior research and are summarised as follows:

(1) Blackman and Kennedy (2008) proposed further case studies are needed in order to investigate alternative results of talent management by utilising a wider survey tool;

(2) Whelan and Carcary (2011) suggested proper knowledge management processes which can be added to develop and improve the framework of the connection between talent management and knowledge management need to be a determined in future work;

(3) Chadee and Raman (2012a) suggested that it is worth extending the examination to a broader sample of organisations with a range of sectors such as the manufacturing sector, to gain a strategically further comprehension into the relationship between knowledge management and talent management;

(4) Daraei et al. (2014) proposed that it would be important to enlarge the broader population consisting of all an organisation's employees who are working in the top, middle, and operational administration levels. Further investigation of a broader sample of organisations with different sectors, such as the university sector is necessary to gain further strategic comprehension into the connection between talent management and knowledge management (Daraei et al. 2014);

(5) Kim et al. (2014) recommended that future investigations should examine a wider sample of organisations to provide a deeper comprehension of talent management combined with knowledge management. Such research might work on various data collection methods such as quantitative questionnaires, observation, and documentation to generate comprehensive results;

(6) Scaringella and Malaeb (2014) suggested that it would be valuable to investigate ways to construct deeper associates between attraction, development, and retention of talent with knowledge management;

(7) Sparrow and Makram (2015) proposed there is a need for academic work that examines the combining of talent management processes with knowledge management frameworks, which may lead to novel and worthy outcomes;

(8) Urbancová and Vnoučková (2015) state that there are practical benefits gained through talent management by organisations in Czech and Slovak's which confirm knowledge continuity, and this requires to be repeated and extended sample groups to other states and other industries to be included;

(9) Future studies should investigate the nexus between internal and external knowledge management strategies and talent management in other countries, or with a narrower job category (i.e., managers or technicians), to generate insights from other countries (Ali et al. 2017);

(10) It is worth extending the investigation to a wider sample of organisations and with a mixed methods design (Shabane 2017); and

(11) Future research should extend the investigation of the relationship between talent management and knowledge management to a wider sample of educational organisations (Osigwelem 2017).

In summary, more studies are required to further investigate the association between talent management processes with knowledge management processes (Ali et al. 2017; Daraei et al. 2014; Kim et al. 2014; Mohammed et al. 2017; Osigwelem 2017; Scaringella & Malaeb 2014; Shabane 2017; Sparrow & Makram 2015; Urbancová & Vnoučková 2015; Vaiman et al. 2015). There are limited empirical research papers addressing talent attraction, talent development, and talent retention with knowledge management processes (i.e. transfer and creation) (Mohammed et al. 2017). The previous studies discussed are summarised in the tables below.

Table 2.6a: Previous studies about talent management and knowledge management

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
1- (Blackman & Kennedy 2008) 'Talent management: developing or preventing knowledge and capability'	The Australian public service	Qualitative, exploratory study: A case study, depending on three sources: -documentary analysis of materials. -semi-structured interviews. -group discussions.	To assess whether talent management practices selected within the Australian public service sector are realised to assist or prevent developing abilities within an organisation.	-Subjects of talent management emerged from both data and the theory. Unrealistic expectations, and minimal influential long-range knowledge management and organisational learning as a consequence of the stress between ability and progress were explored in this study.	-Blackman and Kennedy s' study is limited and authors recommended: Further case studies are needed in order to investigate alternative results of talent management utilising a wider quantitative questionnaire tool.
2- (Calo 2008) 'Talent management in the era of the aging workforce: The critical role of knowledge transfer'	Behaviourist theory	Conceptual	To explain and identify the challenges and specific risks which organisations confront in assuring the variable knowledge transfer that elderly employees own prior to them leaving work.	A fundamental constituent for all talent management is strategically assured that worthwhile knowledge owned by elderly employees can be transferred to suitable designated staff and to the organisational knowledge bases.	- Courageous leadership in establishing practices, policies, and cultural changes to simplify the inclusive knowledge transfer is mostly demonstrated by human resources and institutional executives within organisations.
3- (Yumei & Xiantao 2009) 'Research on coupling of knowledge with talent management in accomplishment transformation of science and technology'	The theory and methods of talent management and knowledge	Conceptual,	To increase 'performance, independent creative ability and national comprehensive ability' (p.5917) through the integral whole between knowledge and talent management.	Adoption strategy based on assessment method may increase connections between talent management and knowledge management in regards to 'accomplishment transformation of science and technology' (p.5917).	- None

Table 2.6b: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
4- (Peet 2010) 'Generative knowledge interviewing: a method for knowledge transfer and talent management at the University of Michigan'	- Office of University Development '(OUD)'s talent management approach and services' model. -Higher education sector in the USA	Qualitative: Semi-structured interviews. The sample: A small pool of senior managers (7 leaders).	-To examine the method of Generative Knowledge Interviews (GKI) with a pool of senior managers as a means of knowledge transfer, and -To observe how skilled knowledge can be utilised to interest talent management potential.	-The knowledge of retired managers can be completely transferred and retrieved to new managers in a number of semi-structured interviews. - The main finding of this study is relevant in terms of talent management potential and leadership development within higher education.	*Limitations of this study are:* **1**- The results related to the unique culture, and an organisation with an inclusive talent management strategy and leadership of OUD were difficult to separate. **2**- All individuals involved in this research were women, whether the researcher or the participants. *Future studies:* -It is not obvious how the knowledge transfer or knowledge use generation interviews may be achieved with a group of men or outside the university context.
5- (Whelan et al. 2010) 'Managing talent in knowledge-intensive settings'	-Technological gatekeeper theory -The Ireland Health Sector	Mixed-method: a single case study: - semi-structured interviews; - social network analysis; and - a questionnaire. The sample (48): 10 for the qualitative study, and 38 for the quantitative study.	To determine the particular talents displayed by key staff involved in simplifying these vital knowledge inflows and outflows.	It is not often that a single employee takes possession of all required talents to efficiently acquire and spread external knowledge. - Acquiring valuable external knowledge can be specialised due to the limited number of professionally skilled employees, and the dissemination of information technology, while disseminating that knowledge internally can be done according to specialisation by a different group of employees**.**	*Limitations of this study:* A single case study is adopted with a medical apparatuses research and development group. *Further academic work:* - should investigate varied knowledge in-depth groupings in various industries. - should explore an empirical relationship between innovation-related individual performance and the knowledge prevalence processes

Table 2.6c: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
6- (Björk Löf et al.2011) 'Students' views on talent management'	-FAME model -View on talent management within the construction industry in Sweden	Conceptual	To create a model that gives an overview of the connections between talent management and knowledge management.	Talent management can add value to the organisation in the long term which can lead to: (i) effective business process through increased productivity; (ii) collaborative working atmosphere to create trust between employees and customers; and (iii) strong knowledge management implementation.	*Further academic work:* A comprehensive review of the use of generative knowledge interviewing in many contexts would confirm the effectiveness of many different modes of acquaintance and knowledge management aspects.
7- (Whelan & Carcary 2011) 'Integrating talent and knowledge management: where are the benefits?'	Knowledge-based view of the organisation theory, ICT sector	Qualitative: - Focus group discussion.	- How talent management can benefit knowledge management and then share best practice with focus groups of knowledge management practitioners. - leveraging talent management principles to improve knowledge management techniques	The results identify that applying talent management practice to knowledge management should address: knowledge sharing, knowledge retention, knowledge creation, knowledge workers, and competency development.	*Limitations of this study are:* **1**-The authors did not provide the time for the focus group to reflect how other knowledge management challenges might be enhanced through talent management. **2**- Outcomes of this investigation cannot be generalised to other organisational contexts due to small size which included only three participants. *Further academic work:* -should investigate what further knowledge management processes can add to the frame and, - should seek to discover if an empirical relationship exists between talent management processes and the success of knowledge management processes in a bigger group of organisations.

Table 2.6d: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
8- (Chadee & Raman 2012a) 'External knowledge and performance of offshore IT service providers in India: the mediating role of talent management'	IT services sector in India	Quantitative: questionnaire - The target population was 841 IT professionals who are Offshore IT Service providers (OSPs) - The sample: 68 OSPs	- To consider the nexus between external knowledge and offshore performance with talent management as a middle variable. .	Significant and positive influences have been strongly identified between 'talent management and external knowledge on organisational performance' (p.477).	*Limitations of this study are*: 1- A small size sample. 2- There are some challenges of data collection in India even under the availability of the best conditions. 3- Lack of generalisation, and therefore cannot be extended to other countries because the study was focused only OSPs in India. *Future research:* - It would be beneficial to expand the research to greater population of institutions with several sectors such as the manufacturing sector, to gain additional understandings into the link between such variables.
9- (Kong et al.2013) 'Managing Indian IT professionals for global competitiveness: the role of human resource practices in developing knowledge and learning capabilities for innovation'	IT services sector in India.	-Qualitative: In-depth interviews -The sample: 11 Information Technology Professionals (ITPs).	To explore the contribution of HR processes to the knowledge learning and improvement potential of ITPs in India.	ITSPs have fully progressive talent management frameworks that links to powerful organisational cultures based on creating knowledge to share within an iterative learning process.	*Limitations of this study are:* - A small size sample. -The expertise of a large organisation is only considered by this study as its targeted sample. *Future research:* The need to apply this research organisationally and individually in other countries with various other organisations.

Table 2.6e: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
10- (Dries 2013) 'The psychology of talent management: A review and research agenda'	Theory building and new academic empirical research.	A theoretical method	To participate in the progression of the research on talent management through a critical review of the relevant literature.	A number of related theoretical insights on talent were discussed including capital, giftedness, perception, individual variation, strength, and identity.	Future work is needed for research into other concepts on talent management for example knowledge management in order to deeply investigate the relationship between them.
11- (Daraei et al. 2014) 'An analysis on the relation between strategic knowledge management and talent management strategy in profitability of the Southern Khorasan Electric Distribution Company (SKEDC)'	Electric distribution sector in the southern Khorasan Province, Iran.	-Quantitative: a case study, The sample: 163 individuals	To establish an association between SKEDC profits, and the strategic use of talent and knowledge management.	Strategic knowledge management and talent management strategy have a positive influence on profitability at the SKEDC	*Limitations of this study are:* 1- Lack of generalisation, and therefore cannot be extended to other countries because the study was focused only on the power sector in Iran. 2- Only focused on higher diploma to master degrees, and ignored other degrees such as a diploma or under. *Future research:* -It would be worthwhile to extend a broader sample of employees including all organisational employees who are working in the top, middle, and operational administration levels. -Further investigation of a broader sample of organisations with various sectors, such as the university sector is necessary to gain further strategic comprehension into the connection between talent management and knowledge management.

Table 2.6f: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
12- (Kim et al.2014) 'A strategic model for technical talent management: a model based on a qualitative case study'	Technical, professional, and scientific service sector in the USA	Qualitative: A case study - In-depth interviews The sample: 5 best-practice partners	To provide an in-depth comprehension of how organisations effectually conduct technical talent management towards the profession life cycle by exploring best practice organisations.	The outcomes are abstract in a structured model that commonly and technically depicts elements of effectual talent management programs.	*Limitations of this study are:* -The model of this study is not globally applicable. - It begins with limited practical information gathered from highly performing organisations concentrating on their talent management practices. - *Future research:* - There is a need to examine a wider sample of organisations to provide a deeper comprehension of talent management combined with knowledge management. - Such investigations might work on various data collection methods such as quantitative questionnaires, observation, and documentation to generate comprehensive results.
13- (Scaringella 2014) 'Contributions of talented people to knowledge management'	A knowledge-based theory of the economy. Organisations of micro-nano technologies and software in France	Quantitative: questionnaire - Survey of 566 people	- To determine the contributions of individuals whose role requires a high degree of talent	*Three major results are:* 1. Talented individuals can be included in exploration rather than examination. 2. They can be dynamically capable of realisation, transfer, and learning within knowledge wealth. 3. Those individuals can be included in the knowledge creation rather than in the knowledge use.	*Limitations of this study are:* - variables of this study are a subjective measurement. - lacks generalisation, and hence cannot be extended to other organisational divisions. - The contribution of his study only focused on talent as a single aspect. *Future research:* It would be beneficial to investigate ways to construct deeper associates between attraction, development, and retention of talent with knowledge management.

Table 2.6g: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
14- (Sparrow & Makram 2015) 'What is the value of talent management? Building value-driven processes within a talent management architecture'	A theory of value	Theoretical conceptualisation	The aim of this research was to demonstrate dual concepts behind value theory, talent management research and philosophies	*The main conclusion is*: - Features to a receiving unit can be brought by talent in the form of knowledge creation and exploitation.	*Further studies are needed:* - To examines the combining of talent management processes with knowledge management frameworks, which may lead to novel and worthy outcomes.
15- (Urbancová & Vnoučková 2015) 'Application of talent and knowledge management in the Czech and Slovak Republics: First empirical approaches'	Czech and Slovak Republic sectors (primary, secondary, and tertiary)	-Quantitative, questionnaire -The sample size was 109 Czech organisations and 340 Slovak organisations.	To determine key factors **(**motivation, organisational culture, organisational climate, trust, organisational structure, stimulation, and willingness to share knowledge**).** Analysing Czech and Slovak organisational approaches.	The main conclusion is that there are practical benefits gained through talent management by Czech and Slovak organisations, which ensure knowledge continuity.	*Limitations of this study:* - a low response rate. *Future research:* - extend sample groups to other countries. - Increase verification of various learning and teaching methodologies for improvement of core competency to talented workers or knowledge employees.

Table 2.6h: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
16- (Gateau &Simon 2016) 'Clown scouting and casting at the Cirque du Soleil: designing boundary practices for talent development and knowledge creation'	Canadian commercial performance sector	-Qualitative method (individual interviews). -The sample: Six artists from Ukraine, USA, Canada, Germany, Russia, and France.	-To acquire a specific contextual case. - To argue the impact of spanners and boundary objects, and to open up reflection on opening contextual boundary practices. -To analyse a difficult and rather uncommon managerial problem of an inventive organisation developing in a niche market.	-The authors are highly convinced that the implications of innovation management emerging out of a perspective experience at Cirque du Soleil (CDS) can be generalised and extended to other innovative industries. -They also conclude from open interviews that talent management and knowledge management face new challenges.	*The limitation of this study:* - only theoretical. *Future research:* Further research should focus on transfer and creation of knowledge to fulfil an integration of creative high skilled individuals and knowledge as a result of talent management.
17- (Norhafizah 2016) 'The effect of talent- and knowledge management on the performance of SMEs: Evidence from Malaysia'	Small-and-medium-sized enterprises (SMEs) in Malaysia	Quantitative, questionnaire, The sample size was 144 Malaysian SMEs	To investigate talent management and knowledge management and their relationships with financial and innovation performance of Malaysian SMEs.	The outcomes show inverted U-shape curvilinear relationships of talent management practices and knowledge management strategy with organisational performance.	*The limitation of this study:* - the self-reporting by the senior management - this study only examines the 'association' rather than 'causality' between talent management practices and knowledge management strategy and their effects on organisational performance. *Future research:* Future studies should explore other intervening mechanisms that can possibly relation talent management and knowledge management with organisational performance.

Table 2.6i: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
18- (Ali et al. 2017) 'Relationship of external knowledge management and performance of Chinese manufacturing firms: The mediating role of talent management'	Chinese manufacturing organisations	-Quantitative: questionnaire -The sample: 249 individuals	To examine the association between Chinese economic growth, and talent as well as knowledge management	Manufacturing organisations boosted performance with external knowledge management and talent management	*Limitations of this study are:* 1- small sample due to language barrier. 2- a wider target area can improve rate size. 3- internal knowledge is omitted from the analysis. *Future research:* -It should investigate the nexus between internal and external knowledge management strategies and talent management in other countries, or with a narrower job category (i.e., managers or technicians), which can generate insights from other countries.
19- (Shabane 2017) 'The integration of talent management and knowledge management in the South African public service'	The South African public service	Qualitative method (document analysis and individual interviews). -The sample: 13 (seven senior managers and six middle managers)	To increase the retention rate of employees through the connection between knowledge management and talent management in the South African government	The link between knowledge management and talent management can reduce staff turnover and improve the retention rate in the South African public service	*The major limitations of this study are*: 1- a small size sample. 2- lacks generalisation, and hence cannot be extended to other organisational divisions. *Future research:* - it is worth extending the investigation to a broader sample of organisations and a mixed methods design.

Table 2.6j: Previous studies about talent management and knowledge management (continued)

Author(s) and Topic	Theory/model /sector	Methods/ tools/sample	Purpose/aim	Outcomes	Limitations/Future research
20- (Osigwelem 2017) "Exploring the application of profile theory based strategy for managing talent positioning in a Nigerian Higher Education Institution"	Nigerian Higher Education	Mixed-method: A single case study: - semi-structured interviews; - document analysis; and - a questionnaire. The sample: 55 (5 for the qualitative study, and 50 for the quantitative study)	To improve the performance of talent management in the higher education sector in Nigeria.	A strategy system is required to select individuals in roles and duties based on their skills/ competencies to identify talent making it possible to obtain the right candidate with suitable skills in the correct roles.	*Limitations of this study are:* -lacks generalisation, and therefore cannot be extended to other organisational contexts. -a possibility of biases from participants. -lacks the paucity of profile theory literature. *Future research:* -it is significant to extend the investigation of the relationship between knowledge management and talent management to a broader sample of academic institutions.
21- (Khor 2017) 'the relationships between managing talent practices, knowledge management and organizational performance of Malaysian private colleges'	Private higher education business sector in Malaysia	Quantitative: questionnaire - a sample size of 243 participants - 49 private colleges	To investigate the relationship between organisational performance and talent management practices with knowledge management as a middle variable	There are significant impacts from different talent management processes: attraction, development, and retention and knowledge management	*Limitations of this study are:* - 'private higher education business sector within Malaysia'; - lacks generalisation, and hence cannot be extended to other organisational departments.

2.8. Summary

This chapter has attempted to provide a clear explanation of the literature relating to talent management and knowledge management. The review of the literature has included eight sections. It began by presenting an overview of this chapter. In section two, general explanations were made about talent management. The most significant part of this section was the development of talent management. The review of the talent management literature included various views of talent. There is agreement among scholars and researchers that talent is a valued resource for all organisations. Talent management processes were presented in the third section. This review has provided a clear and comprehensive picture of the extant scholarly research of talent management processes and knowledge management processes from the period 2006-2017. Here, the processes that were included in the review were retention, development, and attraction of talent. Knowledge management was outlined in section four. The academic literature on knowledge management has revealed the emergence of several fields for 60 years. The subsequent section reviewed knowledge management processes. This review has provided a clear and comprehensive picture of the extant scholarly studies of knowledge management processes from the period 2006-2017. The processes that were involved in the review were transfer, creation, and sharing of knowledge. Section six outlined the relationship between talent management and knowledge management. This was followed by the identification of gaps in the literature in section seven. In this section, previous research that has investigated the link between talent management and knowledge management was deeply extended. It was found that further research is required to further investigate the link between talent management processes and knowledge management processes. Finally, this summary concludes this chapter.

CHAPTER 3: MEASUREMENTS AND THEORETICAL UNDERPINNINGS

3.1. Chapter overview

In chapter two, the literature review was conducted. This chapter reviews the measurements and the theoretical basis for this study, which relate to the research objectives and the research questions of this study. Measurement in research is a process of describing empirical events and consists of assigning numbers in a reliable and valid method (Cooper & Schindler 2011; O'Dwyer & Bernauer 2014; Zikmund et al. 2013). In addition, best practices of academic research should be based on appropriate theories and tools (Creswell 2014; Kim et al. 2014; Tharenou et al. 2007). A theory as a key theoretical underpinning is a formal, explanatory system that discusses how things relate to one another through applying a scientific method to establish and connect theoretical statements about events, and through analysing empirical evidence (Johnson & Christensen 2014; Zikmund et al. 2013).

Based on the qualitative results of this research, six constructs emerged around both talent management processes and knowledge management processes. The researcher has utilised several theoretical underpinnings that provide a foundation for this study in order to construct the conceptual model of this study. Thus, the conceptual model of this study is centred on talent management processes and knowledge management processes. A full discussion of the conceptual model development is presented in Chapter Seven of this thesis. This chapter (3) outlines significant outcomes and provides an examination of the key construct-measurements of the study. In addition, general explanations are made about the theoretical underpinnings that underlie the relevant theories.

The aim of this chapter is to introduce the measurements and theoretical underpinnings of the key variables of this study in six sections. The chapter starts by presenting an overview of this chapter (3.1). The next section (3.2) emphasises talent-management measurements, and discusses three constructs: talent attraction, talent development, and talent retention.

Section 3.3 examines the theoretical underpinnings of talent management processes through a number of theories. This section is subdivided into three parts. Firstly, it examines talent-management theory; secondly, it discusses two theories on talent attraction, namely Maslow's hierarchy of needs, followed by social identity theory. The final and third part outlines two theories of talent retention: Herzberg's Two-Factor theory and Equity theory.

In the fourth section, knowledge-management measurements are examined, through three constructs: knowledge transfer, knowledge creation, and knowledge sharing. Section 3.5 explains the theoretical underpinnings of knowledge management. It has two subsections: knowledge-based theory and organisational knowledge creation theory. Section 3.6 summarises all the information for the measurements and theoretical constructs associated with talent management processes and knowledge management processes. This chapter comprises six sections overall, which are shown in the following graphical layout.

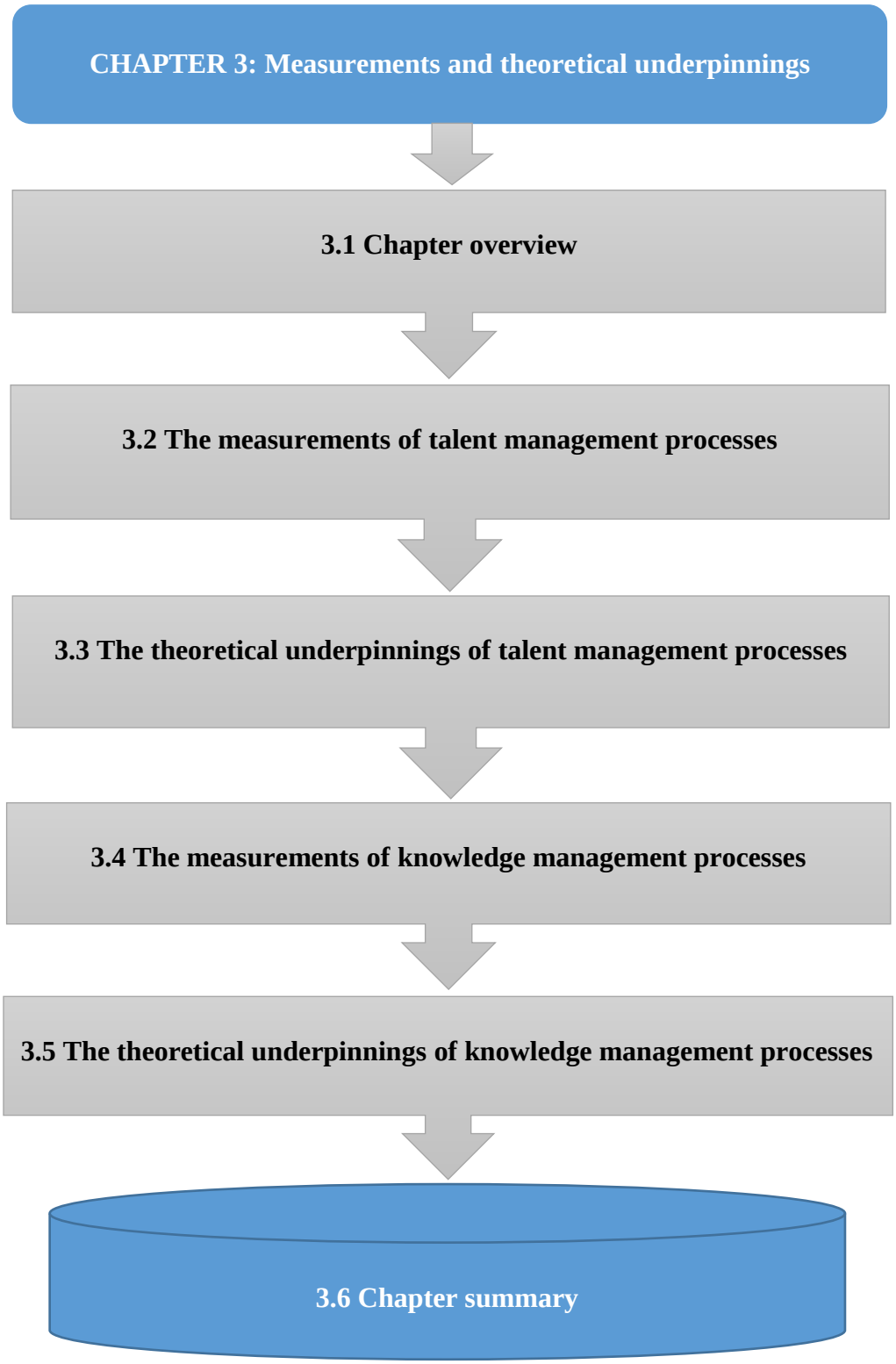


Figure 3.1: A graphical layout for Chapter 3

Source: Prepared by the researcher.

3.2 The measurements of talent management processes

Based on the qualitative results of this study (refer to Chapter 6 of this thesis), talent management processes as an independent variable can be outlined by three constructs: (1) talent attraction; (2) talent development; and (3) talent retention. In general, talent management processes in this research project were rated on a standard 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). As mentioned earlier in Chapter Two, the existing literature on the measurements of talent management processes is extensive; however, the vast majority of research is outside the higher education sector, and the few studies from within are in non-Australian contexts. Therefore, in order to understand the measurements of the key research constructs in greater detail, a review was conducted of talent management research for each construct per the following:

3.2.1 Talent attraction construct

The literature on talent attraction has highlighted several measurements. Starting with studies that highlight the main constructs, research by Stahl et al. (2007) summarises the best practices of talent recruitment in nine points. A study by Tymon Jr et al. (2010) measured the talent attraction in terms of hygiene factors-compensation, benefits, and location, and social aspects. Studies by Chadee and Raman (2012a); Festing et al. (2013) measured talent development in terms of one item each. A doctorate thesis by Lyria (2014, p. 65) measured talent attraction in the banking sector in Kenya, using five latent variables: 'existence of communication and implementation of employer branding, good working conditions and fair wages, employee job security, talent search matrix, employee training and career progression and work-life balance as well as social are networking'. Thompson (2013, p. 32) measured talent attraction in banking and financial services, human resources, mining, and consulting legal services in Belgium, Brazil, Canada, Finland, Germany, Namibia, South Africa, the United States of America, Zimbabwe, and the United Kingdom utilising the 'non-financial reward elements of: work-life balance, learning, and career advancement'. The measurement in Thompson's study was taken from Pregnolato (2010), and contained 20 questions (Thompson 2013). Furthermore, a study by Schlechter et al. (2014, p. 8) measured talent attraction in a wide range of industries in South Africa using total reward factors represented by 'job-related factors, remuneration-related factors, and

work-life–related factors'. Ali et al. (2017) measured talent attraction using one item, while a study by Keat and Abdullah (2017), based on the work of Oehley (2007) measured talent attraction in the private higher education business sector in South Africa. Their measurement included five items.

The next focus is on talent attraction measurements in terms of categories and items. For example, social domain is measured by the degree of which an organisation provides 'social support in difficult times (maternity, paternity, death, financial difficulties)', health issues (Nogueira Novaes Southgate & Mondo 2017, p. 99), making employees socialised, and supporting eager employees (Daneshfard et al. 2016). The social domain in the form of work-life balance is measured by the availability of a desirable organisational climate, which can be a motivating factor for an organisation's employees (Lyria 2014; Schlechter et al. 2014; Thompson 2013).

Organisational excellence is measured by having an organisation characterised by desirable working conditions related to improved health, stress reduction, autonomy, and job security and satisfaction within an organisation (Chandra 2012; Kimathi 2015; Schlechter et al. 2014; Thompson 2013). Organisational excellence through talent branding is measured by the degree of organisational involvement in the implementation and communication of employer branding, building a good brand image (Lyria 2014), and dependence on its internal and external branding to attract talented individuals (Tiwari & Lenka 2015). Career advancement can be measured by the ability of an organisation to clearly outline a progress and career development policy to all its employees, a plan for employee career growth (Waithiegeni Kibui 2015), and offers of opportunities for career advancement such as job advancement or promotions, internal job postings, and internships or apprenticeships with experts (Carter et al. 2011; Thompson 2013).

In the scope of this research, the talent attraction construct is measured by two latent variables: social domain, and organisational excellence. The social domain variable comprises five items. Three of these were derived from the qualitative study, one item from Lyria (2014), and another single item from both the qualitative study and Nogueira Novaes Southgate and Mondo (2017). The organisational excellence involves six items. Five items were adopted from the qualitative study, and one item

from Lyria (2014). The operationalisation of the talent attraction construct is fully discussed in "Chapter Eight" of this thesis.

3.2.2 Talent development construct

Several current studies include the measurement of talent development, which can be discussed on two levels: (1) the main constructs, and (2) categories and items. For example, research by Stahl et al. (2007) summarises the best practices of talent development in the form of seven items. McDonnell et al. (2010, p. 155) measured the development of talent in terms of three categories: 'short and long-term international assignments, formal global management training, and performance assessment against global management competencies and external qualifications'. Studies by Chadee and Raman (2012a); Festing et al. (2013) each measured talent development in the form of one item. For instance, in her doctoral study, Lyria (2014) measured learning and development through six sub-processes: (1) coaching talent; (2) leadership development; (3) in-house development programs; (4) e-learning; (5) training needs identification; and (6) appropriate development strategies. A study by Subramaniam et al. (2015, p. 4) was based on the work of McGill et al. (2013), and measured talent development in the health sector in Malaysia. It was comprised of thirteen items under three latent variables: '(1) *c*linical competence; (2) communication competence; *and* (3) personal and professional competence'. These were ranked on a non-standard 5-point Likert scale (1 = Do not facilitate, 5 = Highly facilitate) (Subramaniam et al. 2015, p. 4). A study by Mohan et al. (2015) measured talent development in Malaysian Government-linked universities using six items adapted from Collings and Mellahi (2009); Davies and Davies (2010). A thesis by Waithiegeni Kibui (2015, p. 64) reported on measuring talent development in state corporations in Kenya and employee career development was represented in that study by six sub-variables: 'opportunities for growth, training and development, provision of opportunities for growth, rewards for value addition, encouragement for growth and learning, and personal initiatives for career growth'. By contrast Ali et al. (2017) measured talent development utilising one item. Finally, research by Keat and Abdullah (2017) was based on the work of Oehley (2007) and measured talent development in the private higher education business sector in Malaysia. This measurement included six items.

Most of these studies were rated standard on a 5-point Likert scale (Keat & Abdullah 2017; Mohan et al. 2015; Subramaniam et al. 2015; Waithiegeni Kibui 2015).

If we shift focus now to the talent development measures in terms of categories and items, we can start with performance management measures. One study measured talent development establishment within manufacturing and non-manufacturing industries 'from the membership of the Society for Human Resource Management' using six items from Lepak et al. (2007, p. 234) to measure 'the extent to which establishments use objective quantifiable results, measure contribution to strategic objectives, provide developmental feedback, emphasize employee learning, measure productivity, and emphasize meeting customer needs'. Other measurements utilised included seven items based on the work of 'Chen and Huang (2009) and Conway and Monks (2008) that determined the extent of performance management techniques such as internal or external assignments, participation in conferences, seminars, workshops, and faculty development programmes for teachers in the education sector' (Jyoti et al. 2015, p. 439).

Performance management can also be measured by the ability of an organisation to identify competencies needed to develop key talent (Vnoučková et al. 2016), determine training needs accurately, and establish human resource planning to ensure skills utilisation (AlKerdawy 2016). Researchers add to the measurement of performance management by ascertaining appropriate development strategies within an organisation to meet the needs of talented individuals (Al Ariss et al. 2014; Garavan et al. 2012; Reilly 2008), which should be known by all of the organisation's staff (Waithiegeni Kibui 2015), and with talent strategy as a component of the overall key organisational strategies (AlKerdawy 2016).

Coaching talent is measured by how regularly individuals in an organisation receive coaching (Joo et al. 2012; Strydom et al. 2014). It is also measured by the ability of an organisation to introduce enough opportunities to develop talented individuals (AlKerdawy 2016), and to underpin its talented staff with the development of their skills by employing its own online coaching resources for highly qualified individuals to gain required knowledge and skills (AlKerdawy 2016; Garavan et al. 2012).

In regards to leadership development measurements, research by Dalakoura (2010, p. 64) was based on the work of Tichy (1997), McCall (1998), O'Toole (2001), and Tichy and Cardwell (2002). In Dalakoura's study, leadership development was measured in Greek multinational firms operating in Greece, using 12 items.

In the current study, the talent development construct is measured by three latent variables: performance management, coaching talent, and leadership development. The performance management variable covers five items. Two of them were derived from the qualitative study, another two items from both the qualitative study and AlKerdawy (2016), and the final item was derived from AlKerdawy (2016) as well. The coaching talent also involves five items, four of which were adopted from the qualitative study, with one item adopted from (AlKerdawy 2016). Likewise, the leadership development variable contains five items, four of which were adopted from the qualitative study, and one item from Chami-Malaeb and Garavan (2013). The operationalisation of the talent development construct is fully discussed in Chapter Eight of this thesis.

3.2.3 Talent retention construct

The literature on talent retention has highlighted several measurements, beginning with talent attraction measures as the main construct. For example, research by Stahl et al. (2007) summarises the best practices of talent retention in the form of six items. A study by Tymon Jr et al. (2010) measured talent development in terms of job satisfaction and rewards. Studies by Chadee and Raman (2012a); Festing et al. (2013) measured talent development using one item each. A study by Schlechter et al. (2014, p. 8) measured talent retention with groups of artisans in South Africa, using total reward factors representing 'job-related factors, remuneration-related factors, and work-life–related factors'. Research by Lyria (2014, p. 25) measured talent retention the banking sector in Kenya, utilising six categories: 'competitive compensation, employee motivation, company image, flexible working hours, non-monetary rewards, and internal recruitment policy'. Ali et al. (2017) measured talent attraction using two items, while a study by Keat and Abdullah (2017) was based on the work of Oehley (2007) in order to measure talent retention in private colleges in Malaysia. This measurement included six items. These previous studies rated their measures on a

standard 5-point Likert scale. Finally, in his doctoral study, Walker (2017, p. 100) focused on three strategies for retention of qualified staff in higher education organisations: 'relationship management, the work environment, and promotional opportunities'.

Focusing now on talent retention measurements in terms of categories and items, a study by Germain et al. (1996, p. 26) measured benchmarking with council of logistics management members in the USA, using five industry competitors: '(1) functional costs; (2) customer service; (3) productivity levels; (4) operations (such as warehousing); and (5) profitability'. These were rated on a 7-point scale (1 = rarely used, 7 = frequently used). Similarly, Lyria (2014) measured talent retention in the form of ten items. For example, 'an organisation has a competitive compensation system which is a motivating factor to retain talented employees'. AlKerdawy (2016, p. 87) measured talent retention in the banking sector in Egypt utilising six items, such as 'our bank has enough budget to support talent management'.

Following a discussion of job satisfaction measures, Malik et al. (2015, pp. 1992-4) measured job satisfaction 'in telecommunication industry, textile industry and food producers in Pakistan, India, Nepal and Sri Lanka' across three dimensions: 'the intrinsic, extrinsic, and general job satisfaction'. A study by Asrar-ul-Haq et al. (2017) measured job satisfaction in the higher education sector utilising 15 items consisting of five dimensions adopted from (1) pay, (2) relationship with supervisor, (3) career opportunities, (4) workload, and (5) working conditions. Similarly, a study by Lima et al. (2017) used the measurement of Spector (1985) in regards to job satisfaction, which was applied in the Finance Shared Service Center in Malaysia using nine items under five components: 'pay, promotion, nature of work, supervisory relationship and co-worker relationship' (Lima et al. 2017, p. 31). These studies all used a standard 5-point Likert scale. Ombima (2014) examined job satisfaction in higher education organisations via 26 items under five elements: co-worker relationship, supervisory relationship, job security, human resources policies, and health. However, this was rated on a 6-point scale (1 = don't know, 6 = strongly agree).

In regards to the reviewing of non-financial rewards measures, a research project by Nyaribo (2016, p. 109) measured non-financial rewards in micro finance institutions

in Kenya utilising four components: 'job design, better workplace environment, career development, and training'. Another measurement of non-monetary rewards was applied in 'the Lagos State Ministry of Environment, Nigeria', using: 'opportunity for autonomy, creativity and innovative thinking' (Ogbogu 2017, p. 183); existing ideal system of non-financial rewards (Lyria 2014); and leaving early as a reward for hard work of highly qualified individuals (Thompson 2013). Akhter et al. (2016) developed the measurement of non-monetary rewards by Stajkovic and Luthans (2003) further to include awards, promotion, social support, and performance feedback (Idris et al. 2017).

In terms of employee empowerment measures, a study by Malik et al. (2015) used the measurement of Spreitzer (1992) to examine employee empowerment. As mentioned earlier in relation to job satisfaction measures, this study targeted three industries in four countries using 12 items under four factors: 'meaning, competence, self-determination and impact'. Likewise, the same measurement of a later study by Spreitzer (1995) was also used in research by Saleem et al. (2017) in universities, using 16 items. Still another study measured employee empowerment in the federal government in the U.S.A through four dimensions: (1) 'providing information about goals and performance'; (2) 'offering rewards based on performance'; (3) 'providing access to job-related knowledge and skills'; and (4) 'granting discretion to change work processes' (Kim & Fernandez 2017, p. 9). Finally, in his master study, Chitorelidze (2017) explored seven dimensions of employee empowerment in the academic workplace: involvement in decision-making, autonomy, initiative, impact, specialised knowledge, resources, and rewards.

In regards to employee motivation measures, a paper by Sandhya and Kumar (2011) examined motivation theories in which recommendations for retaining staff members of the organisation focussed on six aspects: 'open communication, employee reward program, career development program, performance based bonus, recreation facilities, and gifts at some occasions'. It was further measured by the ability of an organisation to employ a variety of methods, as well as managing employees effectively to motivate and satisfy its employees (Nakhate 2016; Njoroge & Yazdanifard 2014). AlKerdawy (2016) measured motivation practices through the ability of an organisation to ensure talented individuals are satisfied and motivated all the time. In addition, this category

can be measured by the ability of an organisation to financially reward its employees through regular promotion, which motivates employees to work harder (Ogbogu 2017).

Within the scope of this thesis, the talent retention construct is measured utilising 25 items under five latent variables: benchmarking, job satisfaction, non-monetary rewards, employee empowerment, and employee motivation. The benchmarking variable contains five items, three of which were derived from the qualitative study, one item from Lyria (2014), and another single item from Stahl et al. (2007). Both job satisfaction and non-monetary rewards involve each of the same five items. Four of those were adopted from the qualitative study, with one item adopted from Lyria (2014). Five items of the employee empowerment variable were adopted from the qualitative study. The final latent variable of talent retention is employee motivation, which also comprises five items adopted from the qualitative study of this research project. The operationalisation of the talent retention construct is fully discussed in Chapter Eight of this thesis.

3.3 The theoretical underpinnings of talent management processes

Different theories exist in the literature regarding the talent management variable, which is discussed in this section.

3.3.1 Talent-management theories

According to various theoretical frameworks, this research uses human capital (Becker 1964; Schultz 1961) and resource-based theories. These theories support the argument and hypothesis of this study. They are relevant to this study because they highlight economic aspects in the investment of human capital for an organisation and its individuals over the long-term (Becker 1962). Furthermore, these theories indicate high levels of talented individuals as a rare, inimitable, and valuable resource that will lead to maximise organisational effectiveness (Al Ariss et al. 2014; Harris et al. 2012; Shaw et al. 2013; Wright et al. 2014). Human capital theory is very important for creative organisations as it focuses on human resources as a strategic resource creating a competitive advantage (Kim et al. 2014). Moreover, the significant outcomes of

human capital theory are considered to be the creative lifeblood of innovation, 'a stock of knowledge, information, and productive and innovative skills', which can create and transfer new knowledge (Harris et al. 2012, p. 410; Kim et al. 2014). A similar view of the importance of resource-based theory is that it considers human assets of an organisation as a rare and strategic resource that can be used to achieve a competitive advantage (Coff 1997; Grant 1991; Wade & Hulland 2004). Thus, talent-management theories are suitable to support the conceptual model of this research project.

3.3.2.Theories on talent attraction:

In this section two theories of talent attraction are discussed, which are used in this study.

3.3.2.1. Maslow's need hierarchy theory

Maslow (1943, 1954) founded a needs hierarchy theory, which is considered a major theory of interest in regards to human needs and motivation (Alderfer 1969; Graham & Balloun 1973). According to this theory, human needs can be classified into five group of needs: 'physiological, safety, love, esteem and self-actualization needs' (Botana & Neto 2015; Hayashi Jr 2016; Visuri 2014). Examples for each need are shown in Figure 3.2 below. This theory is relevant to this study as it highlights the needs that, if met adequately, can help achieve employees' job satisfaction and attract talent workforces, which in turn are the key drivers of organisational success (Liu et al. 2016; Singh 2013; Visuri 2014). It is very important to improve knowledge workers and talented individuals because they are constantly looking to update their skills (Chiedu et al. 2017; Haimi et al. 2016; Miranda et al. 2015).

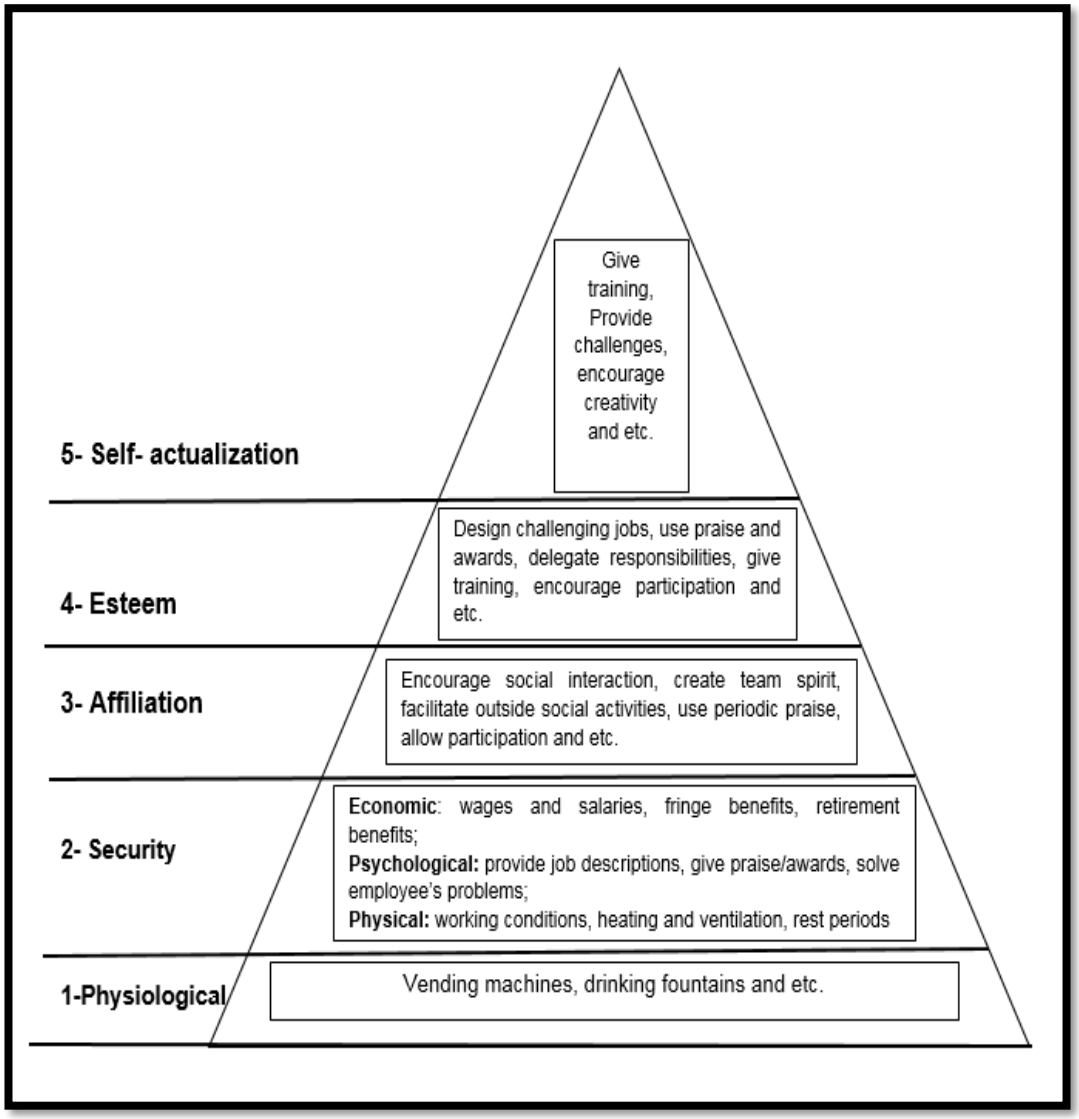


Figure 3.2: Maslow's need hierarchy theory

Source: Adopted by the researcher from (Ramlall 2004).

3.3.2.2. Social-identity theory

In 1970s, Henri Tajfel founded social-identity theory, which explained that people may neglect their personal identities to develop or claim different social identities for a better sense of themselves (He et al. 2012). According to this theory, employees assign social categories to all people like 'organisational membership, religious association, gender and age' (Baker 2015; Ersoy & Aksehirli 2015; Viktoria Rampl & Kenning 2014). It can be used to comprehend the process of attracting talented employee (Ersoy & Aksehirli 2015; Kaewsawang & Winit 2016).

This theory is relevant for the aim of this research project because it focuses on talent branding (He et al. 2012; Kaewsawang & Winit 2016; Lyria 2014; Viktoria Rampl & Kenning 2014), and work-life balance (Lyria 2014; Tiwari & Lenka 2015), which constitute items of talent attraction. Furthermore, this theory supports talent branding, which can help organisations to manage the talent of their employees through organisational identity and loyalty to attract potential individuals (He et al. 2012; Tiwari & Lenka 2015). Arguably, social identity theory is an appropriate theory to support the research theoretical model.

3.3.3 Theories on talent retention:

Maslow's theory as mentioned earlier in talent attraction's theories, is also used in talent retention as it focuses on employee motivation through job satisfaction (Adyasha 2013; Skenderi & Skenderi 2014; Talukder & Saif 2014; Visuri 2014). Likewise, this study addresses two other theories of talent retention: Herzberg's two-factor theory and equity theory.

3.3.3.1 Herzberg's two-factor theory

Herzberg's two-factor theory is also known as 'Herzberg's dual-factor theory'(1959) or 'motivation-hygiene theory' (Alshmemri et al. 2017; Hur 2017). This theory was developed by Herzberg (1968); Herzberg et al. (1959) to explain employee motivation (Alshmemri et al. 2017; Fareed & Jan 2016; Hur 2017). Motivation-hygiene theory is relevant for this study because it focuses on retaining, motivating and keeping talented individuals who then remain with an organisation for longer (Adyasha 2013; Coladonato 2013; Nakhate 2016; Park et al. 2015; Skar & Rustad 2015; Skenderi & Skenderi 2014; Talukder & Saif 2014; Temple 2013). Hence, it is very important for an organisation's success to retain talented, satisfied individuals as part of the sustainability of the organisation (Alshmemri et al. 2017; Nakhate 2016; Waithiegeni Kibui 2015; Welch 2013). Thus, motivation-hygiene theory is an appropriate theory to support this research project's conceptual model.

3.3.3.2 Equity theory

In the 1960s, John S. Adams established the equity theory of employee's motivation (Kaur et al. 2014; Miles et al. 2015; Mutuma et al. 2017; Ryan 2016), which contributes significantly to understanding human motivation (Anyalebechi & Madu 2016; Ryan 2016). It emphasises the necessity for employees to perceive equitability in terms of output/input ratio being equal to the output/input ratio of others in the same rank, whether in the same organisation or in other organisations (Adam & Fayolle 2015; Alfy & David 2017; Colliander et al. 2016; Johnson 2013; Miles et al. 2015; Rossmann et al. 2017; Ryan 2016; Uzonna 2013). Thus, equity theory highlights that employee inputs, such as education, experience, and effort, must be equal with employee outputs, for example financial and non-financial rewards. It includes equitability in relation to other employees whether in the same organisation or in other organisations.

In the context of this research, equity theory is important for retention of talented individuals as it impacts on the perception of individuals working within organisations in which they can obtain equitability and justice (Gelens et al. 2013; Kinyili et al. 2015; Namusonge & Karanja 2014; Odongo 2016; Osibanjo et al. 2016). It offers both financial and non-financial rewards to employees to ensure their motivation (Anyalebechi & Madu 2016; Ogbogu 2017). Hence, equity theory is a suitable theory to support this research project's conceptual model.

3.4 The measurements of knowledge management processes

In a similar fashion to the talent management constructs, knowledge management has been identified in a number of processes by conducting qualitative techniques (refer to Chapter 6 of the thesis). Knowledge management processes, as a dependent variable, can be included through three constructs: (1) knowledge transfer; (2) knowledge creation, (3) and knowledge sharing. Knowledge management processes were also ranked on a standard five-point Likert scale. The existing literature on the measurements of knowledge management processes is extensive, but nonetheless, the vast majority of research is outside the higher education sector, and the few studies situated within are in non-Australian contexts. Therefore, in order to comprehend the

potential measurement of these key research constructs in greater detail, a number of studies were reviewed in various sectors and industries for each construct.

3.4.1 Knowledge transfer construct

Several studies currently exist for measuring knowledge transfer. Starting with knowledge transfer measures as the main constructs, Palacios Marqués and José Garrigós Simón (2006, p. 154) measured the transfer of information using two items: 'Mechanisms are in place to encourage the members of an organisation to share information', and 'information technologies and systems (intranet, internet, etc.) are available to give the employee access to the information required'. Research by Zaim et al. (2007) measured knowledge transfer by utilising one item: 'Transferability of organisational knowledge resources'. A study by Rhodes et al. (2008) measured knowledge transfer in high-tech companies in Taiwan using seven items consisting of two dimensions: codification and personalisation of knowledge transfer with a standard five-point Likert scale. This measurement was adopted from various authors and researchers (Alavi & Leidner 2001; Bhatti et al. 2011; Nonaka & Takeuchi 1995).

Sedera and Gable (2010) measured knowledge transfer in the Australian public sector utilising a seven-item scale (1 = Strongly Disagree to, 7 = Strongly Agree), but only focusing on one item. A masters thesis by Khuyen (2010, p. 22) measured knowledge transfer in Taiwanese, Thai, and Vietnamese higher education using three dimensions: 'absorptive capacity, shared understanding, and arduous relationship', as proposed by (Ko et al., 2006). Mills and Smith (2011) measured knowledge conversion in Jamaican higher eduction using a standard seven-point Likert scale and six items. Similarly, a study by Lee et al. (2012) used a seven-point Likert scale with five items to measure knowledge conversion in various sectors in South Korea. Ferraresi et al. (2012) measured knowledge conversion using a ten-point Likert scale with ten items in the Brazilian private sector. Furthermore, a study by Abd Rahman et al. (2013) measured knowledge conversion using a seven-point Likert scale with seven items in the Malaysian manufacturing sector. A research project by Sankowska (2013) measured knowledge transfer in 'Polish companies listed on the Warsaw Stock Exchange', using a seven-item scale (1 = Strongly Disagree to, 7 = Strongly Agree) across seven items consisting of two dimensions: absorption and diffusion, which was

adopted from Wei-he and Qiu-yan, (2006), whereby absorption was sub-divided into three items, and four items were used to measure diffusion. A research project by Birasnav (2014) measured knowledge transfer in the Bahraini private sector using a five-point Likert scale with five items. Moreover, Wu and Chen (2014) measured transfer of information in the Taiwanese manufacturing sector utilising a seven-point Likert scale and three items.

A study by Chang and Lin (2015) measured knowledge transfer in various sectors in Taiwan using a seven-item scale with three items. A research project by Donate and de Pablo (2015) measured transfer of knowledge in the Spanish manufacturing sector utilising a seven-item scale with eight items. Lee and Wong (2015) measured knowledge transfer in the Malaysian ICT sector using a five-piont Likert scale with five items. In addition, a study by Liu and Deng (2015) measured knowledge transfer in the Chinese private sector utilising a standard seven-point Likert scale with five items. Tan and Wong (2015) measured transfer of knowledge in the Malaysian manufacturing sector using a six-item scale and four items. A study by Martelo-Landroguez and Cepeda-Carrión (2016) measured knowledge transfer in the Spanish banking sector using ten items. More recently, Koohang et al. (2017) measured transfer of information in the manufacturing sector in the USA using a seven-item scale and one item. Other research by Offong and Costello (2017) measured knowledge transfer in the public sector in Nigeria, utilising nine items comprising three elements: explicit, trust knowledge, and tacit knowledge transfer, which was adopted from Cao et al. (2012). Research by Sengupta and Ray (2017, p. 883) measured knowledge transfer in the higher education sector in the UK utilising two dimensions: 'the research commercialisation channel–encompassing, patents, licensing, university spin outs etc. – and academic engagement channels, which includes contract research, collaborative research, and consultancies'. Furthermore, a masters thesis by Osigwelem (2017) measured knowledge transfer in Nigerian higher education utilising a standard five-point Likert scale and 21 items.

Focusing next on knowledge transfer measurements in terms of categories and items, with a seven-point Likert scale (1 = not at all to, 7 = a great extent), a doctorate thesis by Hsu (2012) measured transformation of knowledge utilising six items developed via Dhanaraj et al. (2004). Research by Abd Rahman et al. (2013) measured

knowledge conversion amongst Malaysian manufacturers and also utilising a seven-point Likert scale (1 = Strongly Disagree to, 7 = Strongly Agree), with seven items that were adopted from Gold et al. (2001). Another study measured knowledge transfer in the manufacturing sector utilising four items (Tan & Wong 2015). A study by Tho and Trang (2015) measured knowledge transfer using four items proposed by Ko et al. (2005).

In terms of codification of knowledge transfer, this process can be measured by the potential of an organisation to save and renew significant information into a computer, whether this information is classified in a database for use by all organisational staff or not (Rhodes et al. 2008). It can also be measured by the use of technology by individuals, for example via e-mail, and in meetings, discussions, and internal networks, which would enable staff to share their knowledge with other colleagues (Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015). In regards to personalisation of knowledge transfer, it can be measured by the degree to which an organisation can transfer knowledge to its staff through training courses, presentations, and internal publications (Reichardt et al. 2009; Wiewiora et al. 2015). It can also be measured by the degree to which an organisation can transfer employee experiences to other employees (Abd Rahman et al. 2013; Tan & Wong 2015).

In the current study, the knowledge transfer construct is measured by two latent variables: codification and personalisation. The codification of knowledge transfer variable contains five items. Three of them were derived from the qualitative study, with one item adopted from Cao et al. (2012); Offong and Costello (2017), and another single item from (Rhodes et al. 2008). The personalisation of knowledge transfer involves five items, four of which were derived from the qualitative study, and one them adopted from Cao et al. (2012); Offong and Costello (2017). The operationalisation of the knowledge transfer construct is more fully discussed in Chapter Eight of this thesis.

3.4.2 Knowledge creation construct

Several studies currently exist for the measurement of knowledge creation, which can be discussed on two levels: (1) the main constructs; and (2) categories and items. To

begin with the main construct measures, Palacios Marqués and José Garrigós Simón (2006, p. 154) measured knowledge creation in terms of continuous learning in an organisation, using three items: 'the firm has a career plan to stimulate continuous learning', 'employees receive general training which is applied to their usual tasks', and 'a continuous improvement system is in place allowing for improvement in processes which have reached the set quality standards'. Research by Zaim et al. (2007, p. 60) measured knowledge generation utilising two items: 'level of support for R&D activities', and 'organizational knowledge generation'. Furthermore, a study by Fugate et al. (2009) measured knowledge generation using nine items. Li et al. (2009) measured knowledge creation in manufacturing industries, high-tech, and service industries in Taiwan utilising a standard five-point Likert scale, adopted from Sabherwal and Becerra-Fernandez (2003). It contains 16 items consisting of four dimensions: socialisation (four items), externalisation (five items), combination (four items), and internalisation (three items).

Sedera and Gable (2010) measured both external and internal knowledge creation in the Australian public sector utilising a seven-item scale (1 = Strongly Disagree to, 7 = Strongly Agree), with six items. A study by Martín-de Castro et al. (2011) measured knowledge creation in Brazilian companies using a standard five-point Likert scale with four items. In addition, Biasutti and Heba (2012) measured knowledge creation in the Egyptian and Italian education sectors utilising a standard five-point Likert scale with three items. The four dimensions of knowledge creation were supported by Sankowska (2013, p. 85) who adopted Wei-he and Qiu-yan's (2006) measurement in 'Polish companies listed on the Warsaw Stock Exchange', using a non-standard seven-point Likert scale with three items in each of the four dimensions. A study by Ho et al. (2014) measured knowledge creation in various sectors in Taiwan utilising a standard five-point Likert scale with two items. Lai et al. (2014) measured knowledge creation in the Taiwanese manufacturing sector using a five-point Likert scale with three items. Moreover, a research project by Wu and Chen (2014) measured creation of information in the Taiwanese manufacturing sector by utilising a seven-piont Likert scale with three items.

Chang and Lin (2015) measured knowledge creation in various sectors in Taiwan using a seven-item scale and three items. A study by Donate and de Pablo (2015)

measured creation of knowledge in the Spanish manufacturing sector utilising a seven-item scale and four items. Lee and Wong (2015) measures knowledge creation using a five-piont Likert scale with four items in the Malaysian ICT sector. In addition, Tan and Wong (2015) measured creation of knowledge in the Malaysian manufacturing sector utilising a six-item scale with three items. Hasani et al. (2016) measured creation of information in Iranian higher education using a five-piont Likert scale with five questions. A study by Martelo-Landroguez and Cepeda-Carrión (2016) measured knowledge creation in the Spanish banking sector using ten items. More recently, Arpaci (2017) measured creation of knowledge in the Turkish education sector utilising a five-point Likert scale with three questions. Masa'deh et al. (2017) measured knowledge creation in Jordanian higher education using a five-point Likert scale with four questions.

In regards to the use of knowledge creation measures in terms of categories and items, a study by Tan and Wong (2015) measured knowledge creation in the manufacturing sector utilising four items. According to Li et al. (2009), the socialisation of knowledge creation process can be measured by adopting cooperative projects across directorates and brainstorming retreats, and transferring knowledge via mentees and mentors. Similarly, Sankowska (2013, p. 91) measured socialisation as: 'The organization encourages employees to exchange ideas and concepts frequently'. In regards to externalisation measures, this process is measured by adopting'a problem-solving system based on a technology', 'groupware and other collaboration learning tools', and 'pointers to expertise'(Li et al. 2009, p. 444). Equally, Sankowska (2013, p. 91) measured externalisation as follows: 'The organization set up [an] abundant data base of product and services'. Focusing on a combination measures, Li et al. (2009, p. 444) measured this by the extent to which an organisation had adopted 'web-based access to data; web pages and databases; and repositories of information, best practices, and lessons learned'. Also, Sankowska (2013, p. 91) measured combinations in terms of whether 'teams in the organization continuously search and share new knowledge'. Internalisation is measured by the extent to which 'on-the-job training' and observational learning have been adopted (Li et al. 2009). Similarly, Sankowska (2013, p. 91) measured internalisation in terms of whether 'the organization regularly collects information from sales, manufacturing or R&D'.

In the scope of this research project, the knowledge creation construct is measured by four latent variables: socialisation, externalisation, combination, and internalisation. The socialisation variable comprises five items, four of which were adopted from the qualitative study, with one item adopted from Cao et al. (2012); Offong and Costello (2017). The externalisation involves five items which were all derived from the qualitative study. Similarly, the combination variable covers five items, three of which were derived from the qualitative study, with one item derived from Rhodes et al. (2008), and another single item from Li et al. (2009). The final latent variable (internalisation) consists of five items, four of which were adopted from the qualitative study, with one item derived from Li et al. (2009). The operationalisation of the knowledge creation construct is more fully discussed in Chapter Eight of this thesis.

3.4.3 Knowledge sharing construct

The literature on knowledge sharing has highlighted several measurements. Starting with knowledge sharing measures as the main constructs, a study by Lin (2007) measured knowledge sharing in the university sector in Taiwan using four elements: 'organisational commitment, trust in co-workers, justice, and cooperativeness'. Research by Zaim et al. (2007) measured knowledge sharing utilising two items: 'adequacy of informal procedures for an effective knowledge sharing' and 'efficiency of knowledge sharing throughout the organisation'. A study by Fugate et al. (2009) measured knowledge sharing using five items. Wang and Noe (2010) developed a knowledge sharing framework for future research in the form of five categories: 'organisational context, interpersonal and team characteristics, cultural characteristics, individual characteristics, and motivational factors'. In addition, a study by Martín-de Castro et al. (2011) measured knowledge sharing in Brazilian companies using a standard five-point Likert scale with four items. Biasutti and Heba (2012) measured knowledge sharing in the Egyptian and Italian education sectors utilising a standard five-point Likert scale with three items. Research by Alegre et al. (2013) measured knowledge dissemination utilising a standard seven-point Likert scale with four items in the French private sector.

A thesis by Al Saifi (2014) measured knowledge sharing in 'manufacturing companies in the North Island of New Zealand' using six sub-variables: 'the use of multiple communication styles, brainstorming and problem solving, learning and teaching, training, employee rotation, and consultation'. Furthermore, a study by Ho et al. (2014) measured knowledge sharing in various sectors in Taiwan utilising a standard five-point Likert scale with two items. Lai et al. (2014) measured knowledge sharing in the Taiwanese manufacturing sector using a five-point Likertscale with two items. A research project by Villar et al. (2014) measured knowledge dissemination in the manufacturing sector in Spain and Italy utilising a standard seven-point Likert scale with four items.

Tan and Wong (2015) measured the sharing of knowledge in the Malaysian manufacturing sector using a six-item scale with four items. Hasani et al. (2016) measured sharing of information in Iranian higher education using a five-point Likert scale with five questions. A study by Obeidat et al. (2016) measured knowledge sharing in the Jordanian private sector utilising a standard five-point Likert scale with five items. More recently, Arpaci (2017) measured the sharing of knowledge in the Turkish education sector using a five-point Likert scale with three questions. A research project by Ferraris et al. (2017) measured knowledge dissemination in Europe utilising a standard seven-point Likert scale with five items. Masa'deh et al. (2017) measured knowledge dissemination in Jordanian higher education using a five-piont Likert scale with four questions.

Switching to knowledge sharing measurements in terms of categories and items, a study by Tan and Wong (2015, p. 834) measured knowledge sharing in the manufacturing sector utilising four items: 'employees participate in meetings, discussions or other knowledge sharing activities, employees use technological tools (groupware, e-mails, networking tools, etc.) to share knowledge, mentorship is encouraged in the company, and employees share knowledge through collaboration and interaction with each other'. Research by Naeem et al. (2017, p. 8) in the higher education domain measured knowledge sharing using three items: 'I willingly share my knowledge with colleagues within my department, I voluntarily share my knowledge with colleagues outside of my department, I willingly share my skills with colleagues within my department, when they asked me about it'. Those items were

adopted from Van Den Hooff and De Ridder (2004). Similarly, a masters thesis by Osigwelem (2017) measured knowledge sharing in Nigerian higher education utilising a standard five-point Likert scale with seven items: 'there is willingness to share knowledge between staff; experienced senior academic staff members always share their operational knowledge with other staff members; exit or absence of such faculty affects operation of the college towards achieving its goal(s); there is collaboration among faculty members either within or outside the institution; there is ICT-enabled collaboration facilities in use in the College; all faculty members are conversant with ICT technology; and all faculty members integrate ICT technology in their operation within the institution'. In the same domain, Yasir et al. (2017) measured knowledge sharing in the university sector in Pakistan using five items developed via Yang and Chen (2007).

In the present study, the knowledge sharing construct is measured by one latent variable (information sharing). It comprises five items which were all derived from the qualitative study. The operationalisation of the knowledge sharing construct is more fully discussed in Chapter Eight of this thesis.

3.5 The theoretical underpinnings of knowledge management processes

Two theories of the knowledge management variable have been proposed: knowledge-based theory, and organisational knowledge creation theory.

3.5.1 Knowledge-based theory

Scholars and researchers consider that knowledge-based theory of the organisation is one of the applications of the resource-based view of theory because knowledge is a key organisational resource (Nonaka, Toyama & Nagata 2000; Spender & Grant 1996). This theory is adopted for knowledge management processes and variables by proposing that knowledge resources of an organisation should be analysed (Blome et al. 2014; Khalique et al. 2013). This sheds light, depending on existing institutional trends and innovations, on long-term implications for management activities and practices (Grant 1996; Lee et al. 2017). This theory is relevant for the objectives of this study by highlighting that knowledge can represent itself in the shape of an

organisation's capability, know-how, and information; and that creating and transferring this knowledge can produce a competitive advantage (Blome et al. 2014; Gioacasi 2015; Lee et al. 2017). The theory thus enables knowledge transfer by promoting sustained success at an individual level as well as in an organisational unit (Harzing et al. 2015; Moein & Pålhed 2015). Therefore, this theory is appropriate in support of this research project's overall theoretical model.

3.5.2 Organisational knowledge creation theory

Organisational knowledge creation theory by Nonaka (1994) is based on the SECI model (Nonaka & Toyama 2003). New knowledge is created and transferred to the different levels of an organisation through four phases: socialisation, externalisation, combination, and internalisation (Al-Awamleh 2009; Kao & Wu 2016; Li & Zhang 2015; Nonaka 2005; Von Krogh et al. 2012). It is significant to observe that spiral formations of knowledge creation move through this model in the form of the four phases (Nonaka 2005). Figure 3.3 shows organisational knowledge creation theory.

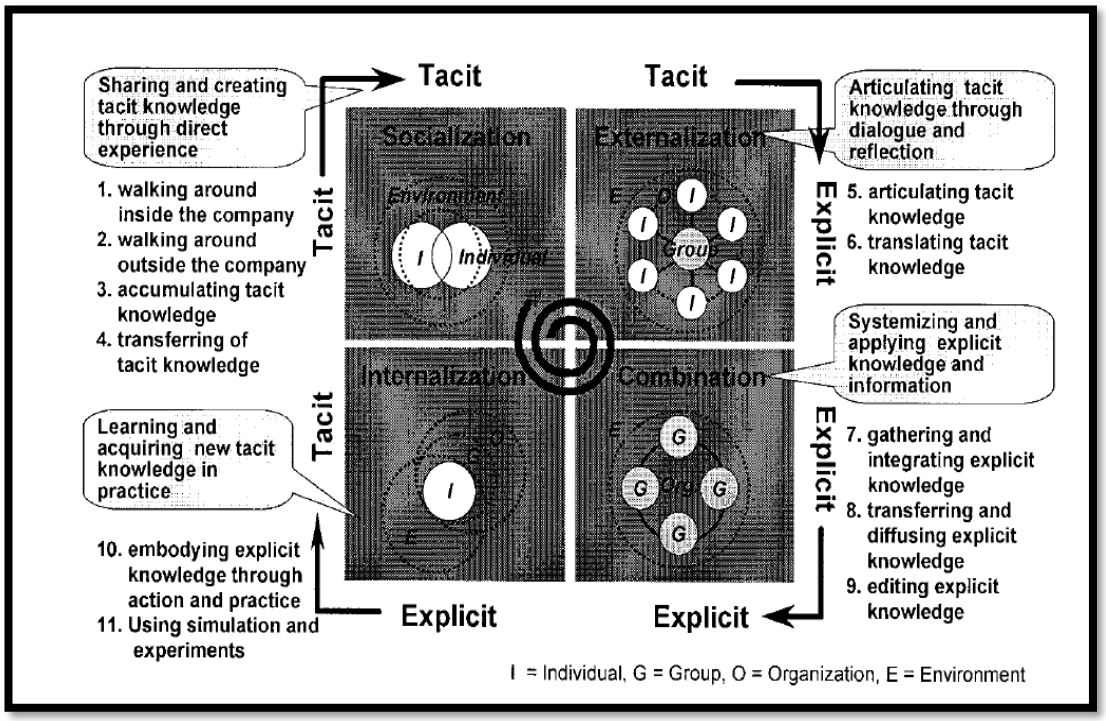


Figure 3.3: Organisational knowledge creation theory

Source: (Nonaka & Toyama 2003, p. 5).

As Figure 3.3 shows, both tacit, and explicit knowledge are created (Nonaka et al. 2014). It is significant to observe that spiral formations of knowledge creation in this model move through four different phases or methods (Nonaka 2005). This form of knowledge creation can be a combination of explicitly and tacitly amplified knowledge (Nonaka & Toyama 2003). Also, knowledge creation requires an environment that nurtures creativity through the creation of new ideas, whilst knowledge commercialization demands well-regulated and systematic processes (Bajwa et al. 2015). Thus, organisational knowledge creation theory is relevant for this research study's objectives as knowledge creation is a key variable in this study.

3.6. Summary

The researcher has utilised several theoretical underpinnings that provide the foundation for this study and have helped to construct the conceptual model of this study. The review of past research in talent management and knowledge management revealed a distinct lack of focus on the Australian higher education sector. Through pragmatic use of elements of previous research approaches combined with a comprehensive qualitative study in this thesis (referred in Chapter 6), this study develops vital practical measurement tools for talent management and knowledge management in Australian universities.

This chapter has focused on targeted measures and theories in six different sections. Section one started by presenting an overview of this chapter. Section two emphasised talent-management measurements, with a discussion of three constructs of talent management: talent attraction, talent development, and talent retention. Section three reviewed the theoretical underpinnings of talent management processes through a number of theories. This section was divided into three sub-divisions. Firstly, it examined talent-management theory, followed by two theories on talent attraction being detailed in the second sub-section. The first theory was Maslow's hierarchy of needs in relation to talent attraction, which was then followed by social identity theory. The final part of section three outlined two theories of talent retention: Herzberg's two-factor theory and equity theory. Section four explained the emergent constructs of knowledge management measurements, and discussed three constructs of talent management: talent attraction, talent development, and talent retention. Section five

emphasised the theoretical underpinnings of knowledge management and was divided into two sub-sections: (1) knowledge-based theory, and (2) organisational knowledge creation theory. Finally, a summary of all measurements and theoretical constructs related to talent management processes and knowledge management processes has been described in this sixth section.

CHAPTER 4: RESEARCH METHODOLOGY

4.1. Chapter overview

Research in its common meaning 'refers to a search for knowledge'(Kothari 2004, p. 1). Business research can be defined as the scientific method applied to business phenomena for locating facts (Babin & Zikmund 2016; Zikmund et al. 2013). According to Babin and Zikmund (2016); Zikmund et al. (2013), the main aim of the scientific method is utilising information and evidence to reach impartial findings about the business world. They state that this is accomplished by collecting facts and examining creative ideas to support administrative decision-making (Babin & Zikmund 2016; Zikmund et al. 2013). This chapter therefore discusses how the scientific method of business research has been applied as part of the methodological approach for this study.

This research methodology Chapter contains ten sections. Section 4.1 presents the general overview of this chapter. In Section 4.2, general explanations are provided about the research philosophy. A pragmatist approach is adopted as the research philosophy. The research design of this study is mixed methods, which is discussed in Section 4.3. It involves both qualitative (i.e. brainstorming, focus group discussions, and individual interviews) and quantitative (survey questionnaire) methods. This is then followed by a discussion of the research approach, which includes both inductive and deductive approaches. The subsequent section discusses qualitative methods, while quantitative methodology is outlined in Section 4.6. Sources of data are articulated in Section 4.7; both primary and secondary sources are addressed in this section. Population and participant sampling are covered in Section 4.8, while Section 4.9 reviews ethical considerations such as benefit and risk, the informed consent process, as well as respondents' rights and protections. Finally, the summary concludes this chapter in Section 4.10. This chapter covers ten sections which are shown in the following a graphical layout:

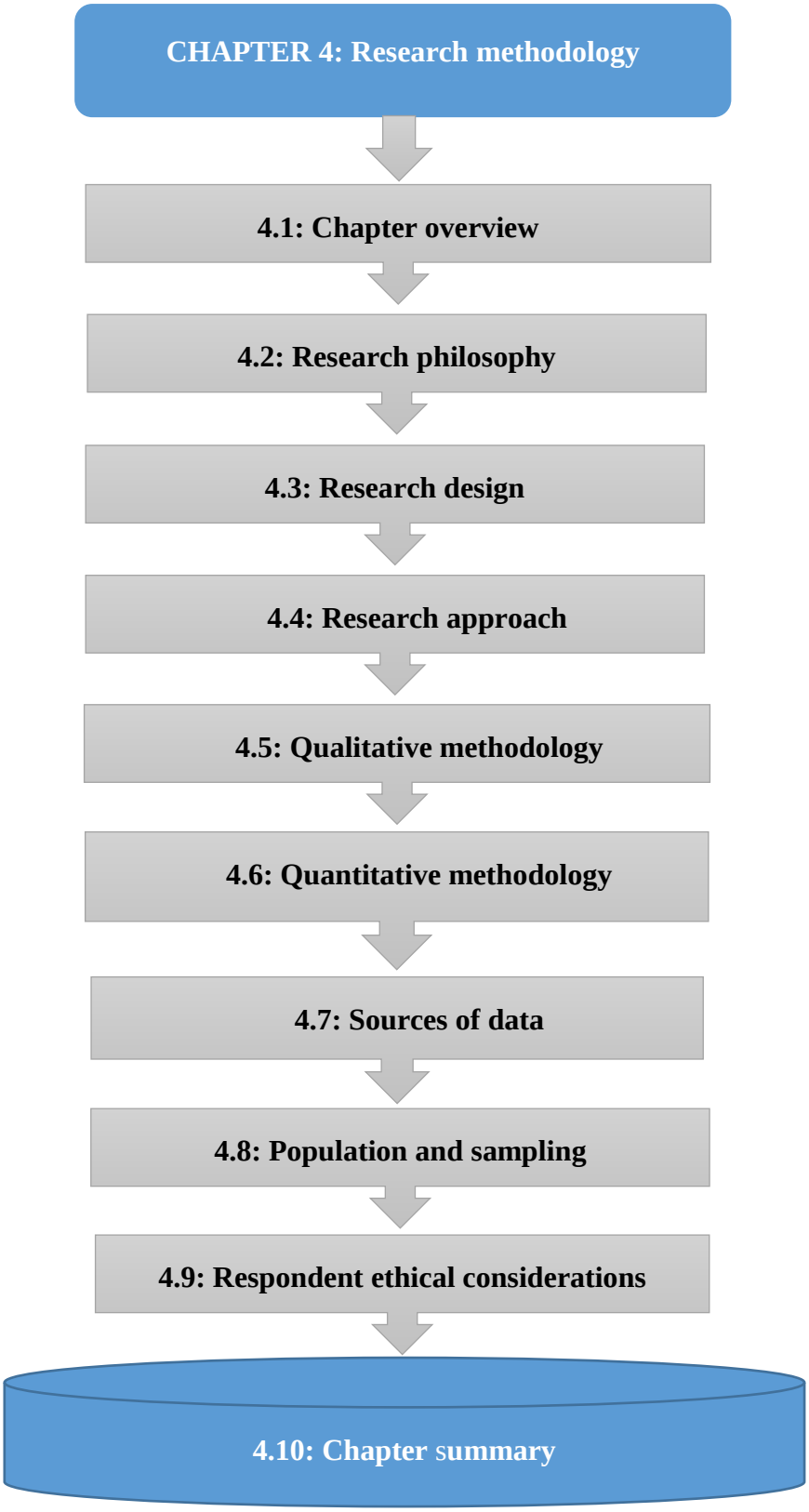


Figure 4.1: A graphical layout for Chapter 4

Source: Prepared by the researcher.

4.2. Research philosophy

Research philosophy is a range of presumptions and beliefs about improving or adding to knowledge in a particular field when embarking on research in that field (Collis & Hussey 2013; Saunders et al. 2016; White & Rayner 2014). Research philosophy is a substantial part of the research process because it may open a researcher's mind to other possibilities, which may in turn result in both an improvement in his/her research skills and an improvement in his/her self-confidence (Holden & and Lynch 2004). According to Saunders et al. (2016, p. 135), business and management studies can be divided into key philosophical categories: 'positivism, critical realism, interpretivism, postmodernism and pragmatism'. The question here is which philosophy is the best for business and management. In this regard, Saunders et al. (2016) state that no particular recommendations resolve a proper research philosophy; it depends on the research questions and methods. Hence, each philosophy is discussed here in terms of applicability and suitability for the current study.

4.2.1 Positivism philosophy

Positivism is a philosophical position that identifies only quantitatively verifiable suggestions as meaningful (Goldenberg 2006; Sarantakos 2013; Saunders et al. 2016). Auguste Comte developed the positivist philosophy by outlining this philosophy in his publications in the 1830s and the early 1840s (Remenyi et al. 1998). Positivist philosophy is highly focused on quantitative, objective, scientific, experimentalist, and traditionalist research (Collis & Hussey 2013; Remenyi et al. 1998; Sarantakos 2013; Saunders et al. 2016). Typical methods for studies that use the positivist philosophy include deductive large samples, and measurement (Saunders et al. 2016). Positivist philosoph may be a suitable for the quantitative part of this study; however, this study includes a qualitative aspect as well, so other philosophical approaches need to be considered.

4.2.2 Critical realism philosophy

Critical realism philosophy is a systematic method based on knowledge derived from the real world (objective) instead of human thoughts (subjective) (Mingers et al. 2013; Saunders et al. 2016). In other words, it is the idea that the world cannot be accessed

directly but only obliquely and mentally (Sarantakos 2013). This philosophy was founded by the scholar Roy Bhaskar in the1970s (Bhaskar 2008; Mingers et al. 2013; Yeung 1997). The critical realist philosophy is suitable for studies that have to fit either qualitative or quantitative subject matter (Saunders et al. 2016). This suggests that critical realism is also inappropriate for meeting the research objectives of the present study due to its focus on a single approach in each study instead of possible dual approaches.

4.2.3 Interpretivism philosophy

Interpretivism is a philosophical position that emphasises humans differ in regard to subjective meanings, cultural backgrounds, causality, impressions of social worlds, and incorporation of active processes in common settings (Sarantakos 2013; Saunders et al. 2016). Interpretivism emphasises on interpretations, stories, narratives, and perceptions (Saunders et al. 2016). This philosophy 'has its roots in *verstehen* (understanding) of social life, which is connected with the work of Max Weber (1864-1920), Wilhelm Dilthey (1833-1911), and the Neo-Kantian philosophers Wilhelm Windelband (1848-1915) and Heinrich Rickert (1863-1936)' (Sarantakos 2013, p. 40). Interpretivism is relevant for studies that are inductive, include subjective meanings, have small samples, and involve qualitative in-depth investigation (Goulding 1998; Sarantakos 2013; Saunders et al. 2016). Therefore, this philosophy does not fit the current study because of its sole emphasis on qualitative meanings.

4.2.4 Postmodernism philosophy

The philosophy of 'postmodernism', highlights socially constructed themes and language roles that sustain principal facts through powerful relations (Calás 2003; Saunders et al. 2016). It emphasises on absences, silences and oppressed/repressed meanings, voices, and interpretations (Saunders et al. 2016). Postmodernism and interpretivism are similar in terms of a focus on in-depth qualitative investigation (Saunders et al. 2016). Postmodernism was first mentioned in the literature in the early 1930s and 1940s (Dickens & Fontana 2015). Typical approaches to research that use this philosophy are also inductive, include subjective meanings, and involve in-depth qualitative investigation (Atkinson 2002; Saunders et al. 2016). Hence, the

postmodernist philosophy is not applicable to the research objectives of the current study, which focuses on mixed-methods design.

4.2.5 Pragmatism philosophy

Pragmatism philosophy highlights the concepts and methods that support the research questions of the current study (Saunders et al. 2016). The pragmatist philosophy is suitable for a range of methods, for example mixed, multiple, qualitative, quantitative, and action research (Creswell 2014; Saunders et al. 2016; Wahyuni 2012). John Dewey developed philosophical pragmatism of human action, comprising reflective thinking and experiential learning (Hickman 1990; Miettinen 2000; Sleeper 1986). This suggests that this philosophy is applicable and suitable for the research objectives of the current study, which focuses on mixed-methods design. In addition, pragmatist philosophy highlights mixing qualitative and quantitative data in one research project to enable them to better comprehend social reality through the experiences, personal meanings, and perspectives that individuals attach to the social world (Gray 2013; Saunders et al. 2016; Wahyuni 2012). Furthermore, pragmatist research philosophy can underpin the practice of beginning with a research question to determine the research framework (Johnson & Christensen 2014; Wahyuni 2012). It provides the best methods to answer the research question through following the research problem (Johnson & Christensen 2014; Saunders et al. 2016). Pragmatist philosophy seeks to meet both objective and subjective meanings, values and facts, precise and rigorous knowledge and various contextual experiences through considering theories, concepts, ideas, hyopotheses and research outcomes (Saunders et al. 2016). Thus, for these reasons, this study uses a pragmatist approach as its research philosophy.

4.3. Research design

In the social science field, research design is a major plan that outlines methods and processes for data collection and analysis (Creswell 2014; Zikmund et al. 2013). Research design in the field of Business Administration should coordinate conditions of collecting and analysing data in a style that seeks to involve the research purpose with a perspective on the economy in a relevant way (Waithiegeni Kibui 2015). A

suitable research design can overcome complexities when conducting mixed method research (Fiorini et al. 2016; Johnson & Christensen 2014; Lowenthal & Leech 2009).

As mentioned earlier in the "Introduction" chapter, in order to achieve the first and second research objectives of the current research, this study has selected mixed methods (both qualitative and quantitative) as its research design. The first key research objective of the study was *to understand the best processes that are currently used in managing talent and knowledge in Australian higher education.* This objective was met by conducting three qualitative multi-method approaches that are commonly used in empirical studies, namely brainstorming, focus group discussions, and individual interviews. The second key research objective of the study was *to investigate the relationship between talent management processes and knowledge management processes in Australian higher education.* This objective was met by conducting quantitative survey questionnaires. In addition, this study has adopted mixed methods to fill the gap in both talent management and knowledge management research in the higher education industry (Paisey & Paisey 2018; Sunalai & Beyerlein 2015; Veer Ramjeawon & Rowley 2017). Furthermore, although mixed method research has an extensive history in administrative sciences (Bazeley 2015), practical studies on talent management is either quantitative or qualitative with only twenty percentage of the research projects utilising a mixed-method design (Gallardo-Gallardo & Thunnissen 2016; McDonnell et al. 2017). Also, using both qualitative and quantitative methods in the one study increases reliability and validity of outcomes through utilising the advantages of both methods (Creswell 2014; Köker 2014; Punch 2014; Venkatesh et al. 2013).

A sequential exploratory strategy as a specific mixed-methods design (qualitative and quantitative designs) is adopted in this study to achieve the aforementioned research objectives (Cameron 2009; Cooper & Schindler 2011; Creswell 2014; Johnson & Christensen 2014; Leavy 2017). Qualitative data collection and analysis, as a first stage, is followed by the second stage of quantitative data collection and analysis (Cameron 2009; Creswell 2014; Mauceri 2014). This strategy is suitable for the research objectives by allowing a researcher, in the qualitative phase, to better comprehend the current conditions of a phenomenon and consequently generate suggestions to be tested later in the larger second phase (quantitative) (Bentahar &

Cameron 2015; Creswell 2014; Johnson & Onwuegbuzie 2004). Considering the research methodologies, Figure 4.2 shows a sequential mixed-methods design that was adopted in the current study.

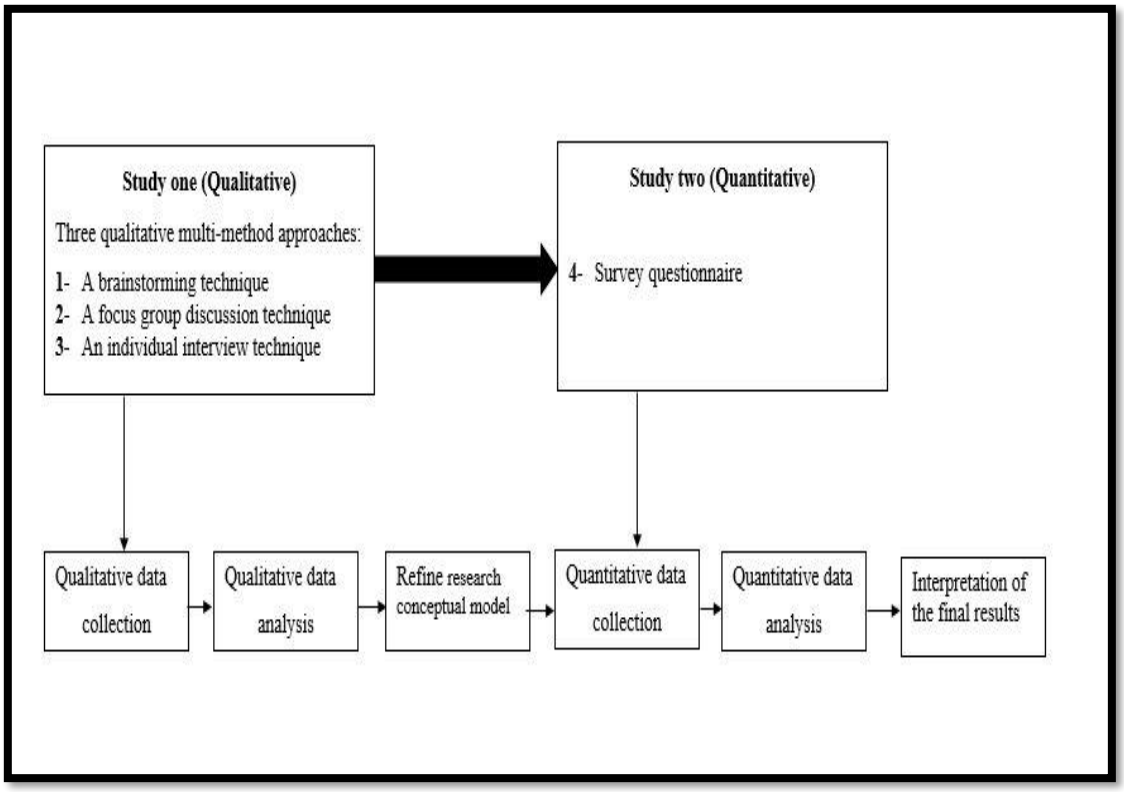


Figure 4.2: A sequential mixed methods design

Source: Adopted from Creswell (2014).

As shown in Figure 4.2, study one includes the three qualitative multi-method approaches that are commonly used in empirical qualitative studies, namely, the brainstorming, focus group discussions and individual interviews (Gururajan et al. 2015; Ritchie et al. 2013; Torres & Carte 2014). The first technique is *brainstorming*, which has been employed in this research project for the following reasons: (1) the majority of academic research studies recommend that brainstorming is an optimal method for generating ideas in terms of both quantity and quality (Boddy 2012; Goldenberg & Wiley 2011; Haddou et al. 2014; Hägg & Musse 2016; Korde 2014; Kornish & Hutchison-Krupat 2017; Levine et al. 2016; Rietzschel et al. 2006; Sekhar & Lidiya 2012). To explain this further, firstly, brainstorming provides a great number of creative ideas that are novel, practicable, specific, and relevant (Brewer 2017; Dean

et al. 2006; Helquist et al. 2017). In addition, Boddy (2012); Gřibek (2011); Potter and Losee (1996) have provided other benefits of the brainstorming technique as follows: (2) it equalises the involvement of group members by providing each participant with equal time to think and speak (Litcanu et al. 2015); (3) it encourages creative, fast and organised generation of many ideas (Litcanu et al. 2015; Sekhar & Lidiya 2012); and finally, (4) brainstorming provides useful potential input into focus group (Fitzgerald 2015; Gallo & Gonos 2014; Keeney 2012; Lee et al. 2015; O'campo et al. 2015). This would allow the researcher to identify talented individuals for participation in the focus group where ideas that may have arisen from the brainstorming session can be discussed further.

The *focus group* technique is the second method of the qualitative phase. It was selected in this study for the following reasons: (1) focus group discussions can explore participants' experiences and knowledge in an open-ended format resulting in benefits for interpersonal communication, group dynamics, and information sharing (Dilshad & Latif 2013; Eizenberg et al. 2017; Morgan et al. 2016; Thrul et al. 2017; van Venrooij & Barnhoorn 2017). Furthermore, (2) through idea evaluation and formulation, the benefits of full, reactive focus group discussions can be achieved (Boddy 2012; Eizenberg et al. 2017; Mandić et al. 2013; Thrul et al. 2017; van Venrooij & Barnhoorn 2017). In addition, (3) this method is commonly used in qualitative research (Brown 2015; Morgan et al. 2016; Pearson & Vossler 2016; Zikmund et al. 2013); and (4) this kind of qualitative technique improves a researcher's experience as a result of engaging with participants' perspectives and experiences (Eizenberg et al. 2017; Jeong 2016; Mandić et al. 2013; Thrul et al. 2017; Tshehla 2014). Finally, (5) it can be low-cost compared to other surveying methods, with results obtained relatively quickly and as a result of an increased sample size and talking with several individuals at once (Brown 2015; Eizenberg et al. 2017; Jeong 2016; Masadeh et al. 2016; Morgan 1997; Pearson & Vossler 2016; Saberiyan 2015; Yelding & Cassim 2016; Zikmund et al. 2013).

The last technique of the qualitative study is *individual interviews* which have been employed in this study for the following reasons: (1) individual interviews can lead to a more consciously aware of the strength of the organisational and social environment of participants' experiences through exploring the understanding of people as well as

the meanings they create around their own experience (Brashear et al. 2012; Lucas 2014). Moreover, (2) one-to-one interviews are typically performed when the research objectives are complex, and in-depth information on a situation and factors under study are required (Al Ariss et al. 2014; Morgan et al. 2016; Saberiyan 2015). In addition, (3) personal interviews are useful in potentially making generalisations for a larger population of concern and they are more inductive in their operation (Dworkin 2012); and (4) individual interviews seek to provide a deeper comprehension and exploration of the complex problems, structures, operations, and policies that pervade participants' stories (Ahorbo 2014; Brashear et al. 2012; Brédart et al. 2014; Manly 2016). Also, (5) individual interviews are helpful at the final phase of survey development, to guide participant comprehension of survey items and examine them for content validity (Brédart et al. 2014; Creswell 2014; Howard et al. 2016; Veronese et al. 2016). Finally, (6) individual interviews do not involve particular skills; they involve interaction only with a specific individual, attempting to understand their ideas and experience as well as their opinions about a specific topic (Silverman 2014).

Based on the results of the qualitative study, the initial research model was refined. The qualitative phase was followed by the quantitative research phase, which was developed based on the results of the qualitative study. A survey questionnaire as a key tool for quantitative data collection was used to investigate the relationship between talent management processes and knowledge management processes in Australian higher education. Survey questionnaires proved more trustworthy and objective than other research approaches statistics are used to generalise outcomes, the need to restructure complex instruments is decreased with a limited number of variables, and new theories can be created as well as research hypotheses tested (Bryman & Bell 2015; Creswell 2014; Tharenou et al. 2007).

In conclusion, this study has chosen mixed methods (both qualitative and quantitative) as its research design to achieve the research objectives. This involved both qualitative (i.e. brainstorming, focus group discussions and individual interviews) and quantitative (survey questionnaire) methods. Overall, based on a deep understanding of this sequential exploratory strategy, qualitative methodology as a first stage is discussed in Section five of this chapter, followed by the second stage of quantitative methodology in Section six.

4.4. Research approach

In the literature on research approaches, there are two core categories (inductive and deductive) that are applicable depending on how the research process is associated with theory (Cho & Lee 2014; Ledin et al. 2016; Tanwar et al. 2017). The deductive or the hypothetico-deductive approach is followed when theory and hypothesis are developed in the first phase, and the research question is to test existing theory or re-test existing theory (Brannen 2017; Cho & Lee 2014; Hamad et al. 2016; O'Dwyer & Bernauer 2014; Sekaran & Bougie 2016; Tanwar et al. 2017; Walliman 2011). Logically, the deductive method refers to moving from theory to data (Hawashe & Ruddock 2014; Leavy 2017). By contrast, with the inductive or the analytic-inductive approach, themes are directly based on the results to generate a theory (Brannen 2017; Cho & Lee 2014; Hamad et al. 2016; Leavy 2017; Sekaran & Bougie 2016; Tanwar et al. 2017; Walliman 2011). Inductive research is based on a theory that is developed from observation of practical actuality (Collis & Hussey 2013).

As this research project adopted a sequential mixed-methods design, both deductive and inductive approaches were selected to addres the research problem, utilising various types of data (Sekaran & Bougie 2016). According to Brannen (2017); Saunders et al. (2016); Sekaran and Bougie (2016), the inductive approach is one of the most suitable tools to qualitatively explore rich information from participants. This research project used the inductive approach by conducting qualitative multi-method research with talented individuals to explore themes that were included in the final research model. The analytic-inductive approach of the study explored six key themes and seventeen sub-themes regarding both talent management processes and knowledge management processes in Australian higher education (refer to Chapter 6: Qualitative data analysis of the thesis).

In contrast, a deductive approach to quantitatively test a research theory has also been emphasised. This study adopted the hypothetico-deductive approach by using a quantitative survey questionnaire. The qualitative findings were employed to develop this survey and generate nine hypotheses. The nine hypotheses were tested using the survey to investigate the relationship between talent management processes and knowledge management processes in Australian higher education (refer to Chapters 9 and 10: Quantitative data analysis of the thesis). Thus, the two aforementioned

approaches served the aim of this research by promising to offer reasonable answers to the two research questions of the study.

4.5. Qualitative methodology

Qualitative research is a common approach utilised by social science researchers to discover and realise the meaning groups ascribe to a human issue (Creswell 2014). Prior to conducting qualitative techniques and data analysis, the researcher evaluated the reliability and validity of the qualitative data (brainstorming group, focus group discussion, and individual interview instruments), through an academic peer review, to determine technical issues before conducting the pilot (Antaya & Parrish 2014; Eschler et al. 2015; Gururajan et al. 2014; Gururajan et al. 2013; Yurtseven & Altun 2015). Testing the reliability and validity of the qualitative data occurs in Chapters five and six of this study. In Chapter five the qualitative data collection is discussed, and in Chapter six the qualitative data is analysed. The qualitative phase contains two parts, namely the qualitative data collection and the analysis, in order to gain an understanding of the best practices that are currently used in managing talent and knowledge in Australian higher education. Figure 4.3 shows and summarises the qualitative methods that were used in this research project.

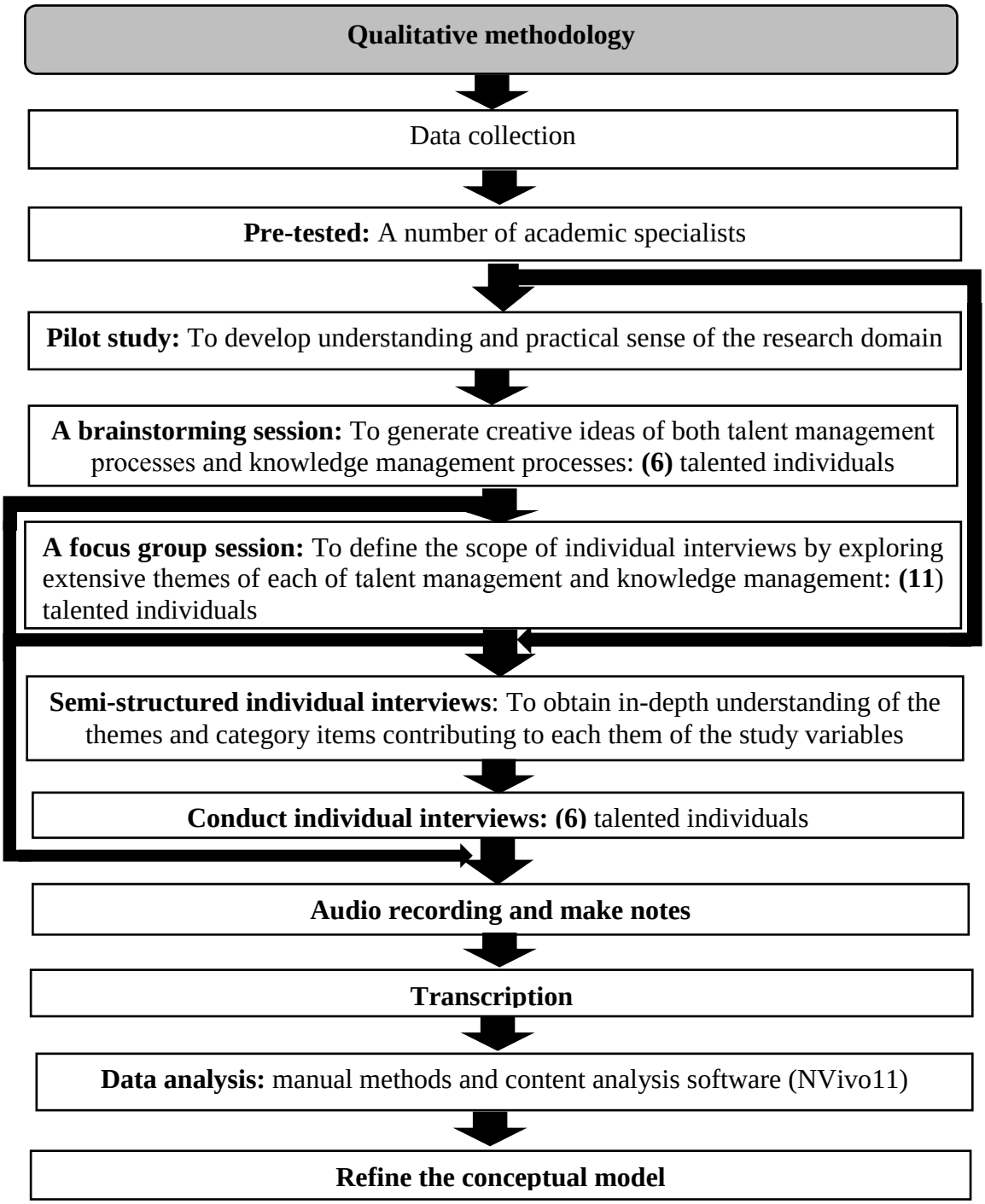


Figure 4.3: Qualitative methodology

As can be seen from Figure 4.3, the qualitative study has two key parts: the qualitative data collection and the data analysis.

4.5.1 The qualitative data collection

The qualitative data collection is a procedure of collecting information, which can not be characterised via numbers (Zikmund et al. 2013). This multi-method study was

highly dependent on the three qualitative methods: (i) the brainstorming session to develop sets of questions, (ii) the focus group session to define the scope of individual interviews, and (iii) the individual interviews to obtain a deep understanding of the research topic (Aldhaban 2016; Dilshad & Latif 2013; Gururajan et al. 2014; Torres & Carte 2014). These methods were sufficient to comprehend the best practices that are currently utilised in managing talent and knowledge in the higher education environment, and thereby address the first research question of this study.

The processes of the qualitative data collection method are fully discussed in Chapter five of this thesis. The following significant points are explained in Chapter five:

(1) introduction of the brainstorming, focus group and individual interviews;
(2) justifications of the qualitative methods;
(3) pre-testing of the brainstorming group, focus group discussion and individual interviews questions;
(4) administering of qualitative data collection research, which can be divided into four significant aspects: (i) selection of participants; (ii) structure of qualitative techniques; (iii) the brainstorming and focus group moderator; and (iv) pre-qualitative techniques and steps involved;
(5) conducting brainstorming, focus group and individual interviews;
(6) challenges of using three qualitative techniques and the strategies to overcome these issues; and
(7) the summary of justifications, practices, and proceedings for the qualitative techniques utilised in this research.

4.5.2 The qualitative data analysis

The qualitative data analysis is the application of rationale to comprehend the data that have been gathered (Zikmund et al. 2013). It provides detail, process, sensitivity and richness to a context (Tharenou et al. 2007). Prior to data analysis, it is important to address two considerations. First of all, the researcher provided all participants with a copy of the transcript of the brainstorming session and the focus group session, as well as of singular interviews, for their reading and approval prior to inclusion in the definitive data collection. Secondly, all talented individuals were provided with a time frame to review the transcript and request any changes.

With a focus on data analysis, all procedures and processes related to how the analysis was conducted, and the processes utilised to extract constructs, themes, and variables from the qualitative data, were analysed. Altogether, transcripts and notes were analysed utilising both manual methods and content analysis software (NVivo 11) to code, recode and generate themes (Ngulube 2015; Paulus & Bennett 2017). Hence, this phase of qualitative research was significant to refine and revise the research model by adding and/or deleting one or more constructs, categories, and/or items of talent and knowledge management. Following the data analysis of individual interviews, the researcher could identify new talent management processes and/or knowledge management processes depending on the outcomes of the qualitative stage of this research. Therefore, the qualitative study in this research was useful for designing a questionnaire that took place in the second phase of this research. The procedures of the qualitative data analysis methodology are fully discussed in Chapter six of this study. The following key themes are described in Chapter six:

1- introduction of the qualitative data analysis;
2- qualitative pilot study;
3- pilot qualitative data analysis; and
4- qualitative data analysis.

4.6. Quantitative methodology

Quantitative research is a procedure that examines objective theories through testing the relationship among variables (Creswell 2014; Sarantakos 2013). As mentioned earlier as part of the qualitative data collection and analysis, the quantitative phase also involves two parts, namely the quantitative data collection and analysis to test the relationship between talent management processes and knowledge management processes. Figure 4.4 shows and summarises the quantitative methodology that was used in this research.

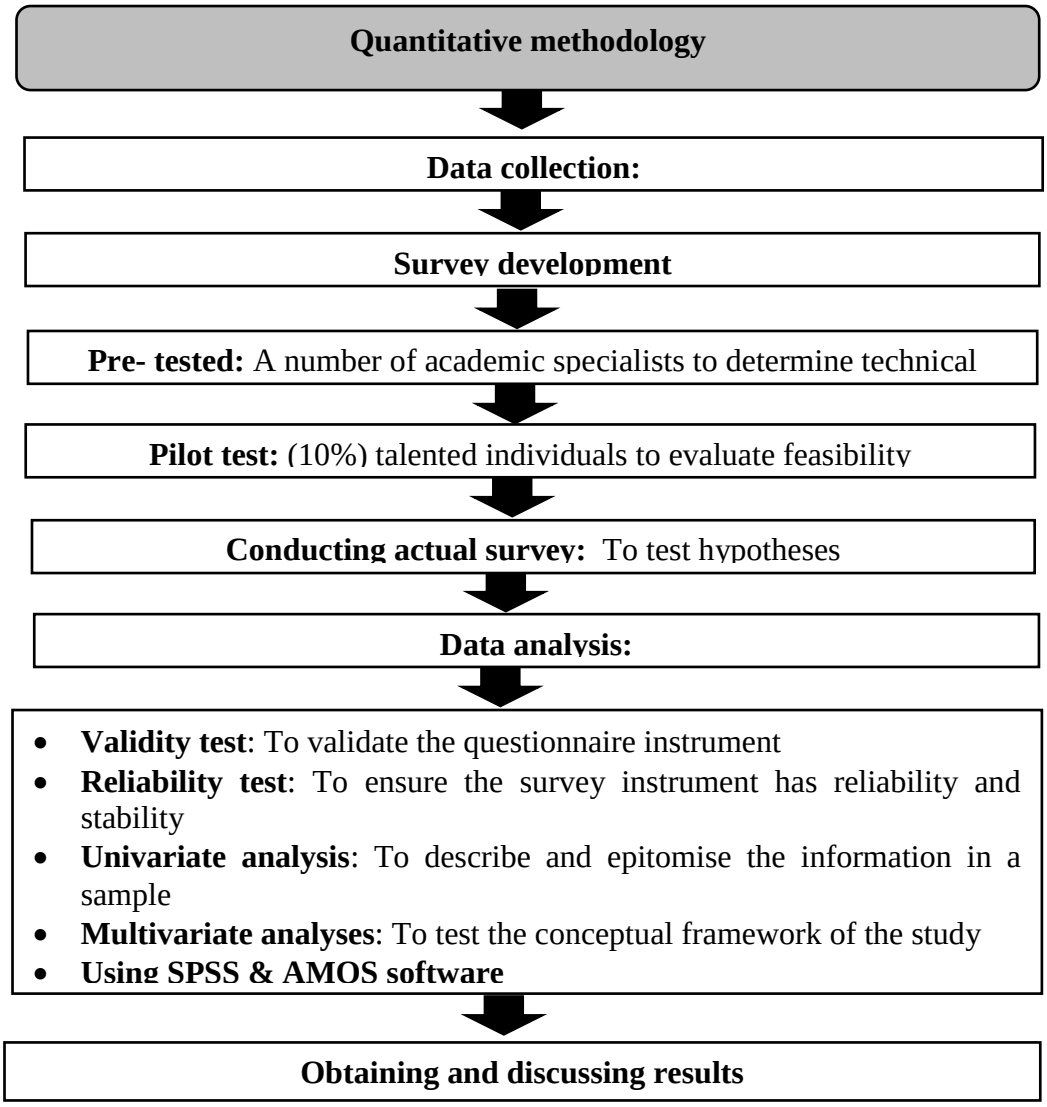


Figure 4.4: Quantitative methodology

As can be seen in Figure 4.4, the quantitative study has two key elements: the quantitative data collection and the data analysis.

4.6.1 The quantitative data collection

The quantitative data collection is a process of collecting information that is characterised via numbers (Zikmund et al. 2013). After completing the qualitative data analyses, this research moved to the quantitative phase. Quantitative research is an empirical and systematic method, which includes data in the form of measurements or numbers (Punch 2014). The survey questionnaire was developed and employed with higher education organisations. To explore the relationship between the study's variables, required data were gathered by questionnaire. The survey was administered

to Australian higher education organisations. A five-item Likert scale was selected in this questionnaire as it is one of the most common ones in quantitative research (Clason & Dormody 1994; Dimitrov 2012; Zikmund et al. 2013).

Prior to conducting the survey, the researcher refined the questionnaire through an academic peer review process, which is a very important procedure of any study structure (Raj 2013; Ritchie et al. 2013). The researcher organised a special form to gather and examine the opinions of two groups: academic experts who specialise in the fields of human resources management and information systems, as well as academics that are not specialists in these fields, in order to obtain a different view on the research tools that could be incorporated into the research design. After completing the peer review procedure, the researcher piloted the questionnaire with academic specialists and talented individuals who were not involved in the final research. The pilot questionnaire individuals made up approximately 10% of the sample (Lyria 2014; Waithiegeni Kibui 2015). This was done to evaluate the feasibility of the questionnaire tool.

The procedures of the quantitative data collection method are fully discussed in Chapter eight of this thesis. The following significant points are described in Chapter eight:

1- justifications of the quantitative approach;
2- development of the survey questionnaire instrument;
3- quantitative pilot study;
4- methods of data analysis;
5- administering of the quantitative data collection; and
6- difficulties, challenges, and strategies to minimise the impacts of quantitative data collection.

4.6.2 The quantitative data analysis

The quantitative data analysis is the application of rationale to comprehend the data that have been gathered (Zikmund et al. 2013). It is best used when the objective is to test theoretical forecasts (Tharenou et al. 2007). As can be seen from Figure 4.4 above, the quantitative data analysis contains several tests: validity testing, reliability testing,

descriptive statistics, and multivariate analyses (Correlation, regression, and structural equation modeling analyses), which are used for analysis in Chapters nine and ten of this study.

4.6.2.1. Validity testing

Validity can be introduced as the concept of interest which is accurately represented by a range or pool of measures (Hair et al. 2010). It is critical to validate the research instrument, as it will underpin the identification of attitudes regarding dissatisfaction (Fink 2003). This study used several ways to measure the validity of results, such as content and construct validity (Cooper & Schindler 2011; Fink 2003; Nguyen Hong 2016). As part of content validity, the instrument peer review measured the suitability of questionnaire items by exploring the clarity of each statement in terms of meaningful and grammatical content. The construct validity test is used to summarise and reduce items into a smaller number of generated items that are associated with each of them (Osborne & Costello 2009; Yong & Pearce 2013). Exploratory construct validity is considered an ideal method to measure the validity of questionnaire instruments (Aladwani 2014; Hajian et al. 2016; Olufadi 2015, 2017). Exploratory construct validity of the measurement model is evaluated by conducting exploratory factor analysis, which is commonly used in statistical applications in the social sciences (Osborne & Costello 2009; Yong & Pearce 2013). The results from exploratory factor analysis may expose one or more components or constructs that are suggested in the conceptual framework model. In addition, there are a number of statistical tests that can be used to assess the convergent validity of the measurement model of the study, such as the average variance extracted technique (Fornell & Larcker 1981; Hair et al. 2010).

4.6.2.2. Reliability testing

To ensure the survey instrument has reliability and stability, a pilot test should be conducted (Johnson & Christensen 2014). The reliability of the quantitative data gathered for this study was examined using Cronbach's alpha test (coefficient alpha) to measure internal constancy (Field 2018; Hair et al. 2010; Johnson & Christensen 2014). It is an extent of values between 0 to 1, with 0.70 considered an acceptable minimum in exploratory studies (Field 2018; Hair et al. 2010; Tabachnick & Fidell

2007). This test was performed on each key construct of this study. Moreover, there are a number of statistical tests that can be used to assess the reliability of the measurement model of a study, such as the composite reliability technique (Bagozzi & Yi 1988; Nunnally & Bernstein 1994).

4.6.2.3. Descriptive statistics

Descriptive statistics include demographic characteristics, such as the age of respondents, current position, and qualifications. In addition, univariate analysis was examined by reporting on measures of central tendency (mean) and dispersion (standard deviation).

4.6.2.4. Correlation, regression, and structural equation modeling analyses

Correlation, simple regression, and SEM analyses were used to identify any significant relationship between talent management processes and knowledge management processes. For testing the research hypotheses of this study, simple regression analysis and structural equation modeling were used. The Statistical Package for the Social Science (SPSS) software (version 25), was used for correlation and simple regression analyses. Analysis of Moment Structures (AMOS) software (version 25), was utilised for structural equation modeling. Both simple regression analysis and structural equation modeling were used for the same purpose, that is, to investigate the relationship between talent management processes and knowledge management processes in Australian higher education. The reason for using both these techniques was to maximise reliability of the quantitative findings of the study (Graham 2003; Hair et al. 2011; Jeon 2015). In this regard, Chin (1998a); Gefen et al. (2000) have recommended using both analysis techniques for the same research objective in one study to provide greater flexibilty to examine the relationship between theory and data. Regression analysis should be used as the first generation analysis technique, followed by structural equation modeling as the second-generation analysis technique (Chin 1998a; Gefen et al. 2000).

In this study, the simple regression analysis was used in the first instance as the first generation analysis technique to comprehend the relationship level between talent

management processes and knowledge management processes (Baig 2010; Chin 1998a; Gefen et al. 2000; Jeon 2015). Then, structural equation modeling was utilised as the second generation analysis technique to investigate the extent to which the study met recognised standards for highly qualified statistical analysis (Awang 2012; Chin 1998a; Gefen et al. 2000; Hair et al. 2010; Hair et al. 2011; Musil et al. 1998; Schumacker & Lomax 2010). Structural equation modeling provided a progressive level of statistical analysis and confirmed the results that were obtained by simple regression analysis through providing further investigation into the relationship between talent management processes and knowledge management processes in Australian higher education. Structural equation modeling can deal with large numbers of independent and dependent variables in one model (Hair Jr et al. 2016; Lau et al. 2016). Structural equation modeling is related to AMOS, which was simultaneously utilised to investigate direct and indirect structural links between more than one independent composite variables and dependent composite variables (Ardasheva 2016; Awang et al. 2015; Hayton et al. 2014; Lau et al. 2017; Lau et al. 2015; Lau et al. 2016; Othman & Naintin 2016; Vikkraman & Duraikannan 2015). AMOS software is the most widely available and used among other applications and programs of structural equation modeling packages (Awang et al. 2015; Byrne 2016).

4.7. Sources of data

Cooper and Schindler (2011) define data as the evidence offered to researchers from the research's environment. Both primary and secondary sources were utilised as key sources of data collection for this study (Cooper & Schindler 2011; Hox & Boeije 2005).

4.7.1. Primary data

Primary data are collected for specific research objectives by a researcher using tools such as interviews and surveys (Cooper & Schindler 2011; Hox & Boeije 2005; Koranteng 2014). The primary source of data for this study was collected utilising mixed method techniques. These techniques included brainstorming, focus group discussion, individual interview, and questionnaire. Mixed method techniques were used to collect data from talented individuals working within Australian higher education in Queensland.

4.7.2. Secondary data

Secondary data are collected from various sources, which any researcher can use, such as books, reports, theses, journals, scientific magazines, and official statistics (Cooper & Schindler 2011; Hox & Boeije 2005; Koranteng 2014; Zikmund et al. 2013). Published data are useful to a researcher as they are widely available Zikmund et al. (2013). Secondary data save cost and time; these data are faster and less expensive to acquire than primary data as the researcher is able to access secondary data quickly and cheaply (Hox & Boeije 2005; Zikmund et al. 2013). Moreover, the researcher has to investigate secondary data for reliability, validity, bias, and format (Rozenblat et al. 2017; Zikmund et al. 2013). In this research, all aforementioned sources were used in regards to talent management and knowledge management.

4.8. Population and sampling

This section contains two subsections: target population and sampling, which in turn includes two-divisions: sampling criteria, and sampling size.

4.8.1 Target population

A population is any integral group of independent elements from which a sample is selected (Bryman & Bell 2015; Cooper & Schindler 2011; Zikmund et al. 2013). Prior to collecting data, the researcher needs to first determine the target population and an appropriate sample (Al Haidari 2015; Zikmund et al. 2013). Determining the target population is the first stage of selecting a sample; it is specifically an integral group of population elements related to a research topic (Cooper & Schindler 2011; Zikmund et al. 2013).

Talented individuals from across nine universities (seven public and two private) in Queensland were the focus and target of this study for four different reasons.

1. It was convenient and accessible for data collection to the researcher;
2. It was location-, cost- and time-effective, as well asfeasible for the researcher;
3. Australian universities including Queensland have a significant number of professional and academic staff who play a strategic role in their growth and success over the long term (Bentley et al. 2014; Bradley 2016; Choon Boey Lim

2009). Hence, those universities should attract, develop and retain talented individuals; and

4. Queensland has a significant number of public and private universities which are active in implementing talent management programs (Training 2016). There are seven public universities and two private universities.

4.8.2 Sampling

The target population phase is followed by the sampling stage, which is a procedure of drawing a sample as a proportion of a population (Cooper & Schindler 2011; Hair Jr et al. 2016; Johnson & Christensen 2014; Leavy 2017; O'Dwyer & Bernauer 2014; Tharenou et al. 2007; Zikmund et al. 2013). A sequential design as a specific sampling mixed-methods strategy was adopted in this research project to determine the target population (Collins et al. 2006, 2007; Migiro & Magangi 2011). The first stage involved a purposive sampling technique for the qualitative study. The second stage involved quantitative research, which was to be stratified random sampling (Collins et al. 2006, 2007). A purposive sampling is a method where the researcher uses a non-random sampling, allowing free choice of an appropriate number of participants, considering the quality and quantity in the selection process (Tongco 2007).

The purposive sampling technique was adopted in this research for several reasons (Archie et al. 2014; Dean et al. 2016; Peterson et al. 2012):

1) This method is a form of non-probabilistic sampling that can be effective when the research aim requires studying specific skills and gaining knowledge of a particular phenomenon (Lwin & Lynch 2015; Martinez 2015; Senganimalunje et al. 2016; Spearman 2015; Yengoh et al. 2015; Zabel 2014).
2) It can be useful for researchers to obtain significant information from limited chosen cases (Gururajan et al. 2016; Yengoh et al. 2015).
3) Choosing the sample using purposive techniques may also be essential to help ensure the quality of data gathered (Gururajan et al. 2016; Tongco 2007).
4) A strong base to find respondents in focus groups and interviews research is provided via the purposive sampling technique (Silverman 2014).

In terms of the objectivity of participant selection during the quantitative research stage, random sampling is an optimal technique to avoid a biased selection procedure (Creswell 2014; Johnson & Christensen 2014; Saunders et al. 2016). This technique is used to allow a researcher to make a generalisation from a sample to the population (Johnson & Christensen 2014; Migiro & Magangi 2011). In addition, this method has benefits if the population is homogeneous and extensive (Bryman 2015; Collins et al. 2007; Migiro & Magangi 2011).

4.8.2.1 Sampling criteria

As indicated earlier in the Introduction chapter, this study has chosen higher education as its scope. Within the scope of this study, talented individuals working in the higher education industry in Queensland were recruited for the following reasons:

(1) talented individuals have become a competitive weapon and resource for organisations in obtaining a sustainable competitive advantage (Chadee & Raman 2012a; Ortlieb & Sieben 2012; Thomas 2015);

(2) an increase in the strategic importance of human resources management for competitive advantage can be achieved by talented individuals (Arnold 2016; Kong et al. 2013; Thomas 2015);

(3) these individuals provide accurate information about talent management processes and knowledge management processes due to their high level of expert knowledge (Ortlieb & Sieben 2012; Thomas 2015); and

(4) talented individuals play a significant role in an organisation's survival in a dynamic environment (Borisova et al. 2017; Kong et al. 2013; Rong & Grover 2009).

In this particular study, as suggested by the previous literature, the criteria for talented individuals include: education level, experience level, technical qualifications, and analytical level (Table 4.1) (Baublyte 2010; Gümüş et al. 2013; Kimathi 2015; Macfarlane et al. 2012).

Table 4.1: The criteria for samples

The criteria	The description
Education level	Academic and professional staff with a diploma, bachelor, master or PhD degree in the fields of human resources management, talent management, and knowledge management.
Experience level	Academic and professional staff who have a five years or more professional track record.
Technical qualification level	Academic and professional staff employed in professional information technology who have technical knowledge in computing.
Analytical level	Academic and professional staff who are in the top and middle managerial levels and have the responsibility of managing action plans related to talent management and knowledge management in their universities.

Arguably, although sampling in mixed research is complicated, it is a key step in helping to establish quality inferences that a researcher can make from the study's outcomes (Lowenthal & Leech 2009).

4.8.2.2 Sampling size

Determining the appropriate sample size for research that adopts a mixed method approach depends on the availability of resources and research objectives (Kelley et al. 2003). In terms of feasibility, the researcher used different sample sizes for each phase in this research. The sample size for the qualitative research techniques should be smaller than the quantitative questionnaire (Kelley et al. 2003; Sabbah 2017). The sample for the brainstorming part consisted of six to eight participants, and this sufficed and guided the group in terms of the brainstorming's purpose and procedure (Hopf et al. 2014; Lefika & Mearns 2015; Peek & Fothergill 2009; Todd et al. 2012). The focus group size was expected to vary between four and ten individuals, depending on the site and availability of staff on the day of the focus group interview (Ahmed et al. 2015; Atanga 2007; Gates & Statham 2013; Gururajan et al. 2015; Ritchie et al. 2013; Todd et al. 2012; Zikmund et al. 2013). In terms of individual interviews, researchers propose different sample sizes, between five and eleven participants, to be effective for conducting interviews (Blackman & Kennedy 2008; Gateau & Simon 2016; Kong et al. 2013; Peet et al. 2010; Whelan et al. 2010).

For the quantitative phase, even though there are some difficulties in obtaining a sufficient number of responses when conducting a large sample (Kelley et al. 2003), large-scale surveys provide a good evaluation of the target population (Kelle 2006; Kelley et al. 2003). In this regard, to test the hypotheses of this research, regression and structural equation modeling techniques were used (Chin 1998a; Gefen et al. 2000). There is empirical evidence that the required sample size for structural equation modeling in the quantitative research should be equal or greater than 200 respondents to be considered adequate (Byrne 2016; Ekermans et al. 2011; Fabrigar et al. 2010; Hoe 2008; Hooper et al. 2008; Igundunasse 2016; Jöreskog & Sörbom 1996; Kuo & Yang ; Lei & Wu 2007; McCoach 2003; Nokelainen 2007; Siddiqui et al. 2015). Therefore, the researcher initially sampled between 900 and 1100 individuals among the nine universities in Queensland. 355 questionnaires were received but only 286 were properly completed and therefore used for further analysis. The procedures of determining sample size are fully discussed in Chapter eight of this thesis. The summary of the population and research sample is shown in the Table below.

Table 4.2: The population and research sample

Description	Qualitative study	Quantitative study
Population	Talented individuals at nine universities in Queensland	
Justification	Consideration of convenience, feasibility, cost, time, and location	
Sampling method	Non-probabilistic: Purposive	Probabilistic: Random
Sample size	Brainstorming = 6	286
	Focus group = 11	
	Individual interviews = 6	

4.9. Respondent ethical considerations

Research morals in the business administration field consists of an application of ethical behaviours that guide researchers in conducting reliable research without any harm or adverse consequences from their research activities (Cooper & Schindler 2011; Zikmund et al. 2013). A number of scholars have recommended that, in any business research project, ethical considerations are important to guide a researcher in conducting his/her applied research and provide sample participants with information

about the aim of the research. However, avoiding ethical problems as part of human interactions between sample members is also important (Cooper & Schindler 2011; Creswell 2014; Ritchie et al. 2013; Saunders et al. 2016; Tharenou et al. 2007; Zikmund et al. 2013). Potential issues include lack of informed consent, affiliation and conflicts of interest, ethical dilemmas, harm to participants, and invasion of privacy (Bryman & Bell 2015; Tharenou et al. 2007; Zikmund et al. 2013). This study involved human participation in a brainstorming technique, a focus group discussion, individual interviews, and a survey. Therefore, the researcher has applied all required procedures to obtain ethics approval from the University of Southern Queensland's Office of Research/Human Research Ethics Committee (HREC). This research was considered to comply with the *National Statement on Ethical Conduct in Human Research* (2007), and full approval was provided with the approval number H17REA138 for a period of three years (from 6 July 2017 until 6 July 2020). The approval letter of the University of Southern Queensland (USQ) is shown in Appendix A. In terms of communication of research outcomes, the researcher facilitated a debriefing to qualitative participants at the end of the study. For quantitative participants, the data were made available upon request. In addition, three key ethical considerations are highlighted in this research in relation to compliance with ethical requirements, namely benefit and risk, informed consent forms, and respondent rights and protections (Cooper & Schindler 2011; Tharenou et al. 2007).

4.9.1 Respondent benefits and risks

The possible benefits related to participation in a research project should be explained to participants ahead of time (Leavy 2017). In terms of benefits, researchers should acknowledge and report significant benefits for their research to be ethically acceptable (Wessels & Visagie 2017). In this respect, this research addressed a number of advantages:

1- participants (the qualitative study) had an opportunity to discuss with others issues that were similar for each of them;

2- participants (both the qualitative and quantitative studies) benefitted because they had an opportunity to consider relevance to their organisations; and

3- participants (both the qualitative and quantitative studies) were able to understand various processes external to their organisations with regards to talent management and knowledge management processes.

With the focus on risks of applied research, Furniss et al. (2016, p. 4); Jack et al. (2015); Wessels and Visagie (2017) define risk as any procedure of research that could cause harm to the participants i.e.'raising concerns, and anxieties levels of stress'. In terms of the qualitative study, there were minimal risks associated with participation in this project. The main risk was minor time imposition. Participation was voluntary and participants could leave the research at any time without comment or penalty. The following procedures were implemented to decrease the potential risk of research. Firstly, participation by participants was voluntary. They were informed that they could withdraw at any time. There was unlikely to be any ethical concerns with participants. Furthermore, the instruments of this study were developed with consideration of supervisors, and they were peer reviewed by appropriate people. Data that contained participant identifiers remained confidential within the research team. De-identified data were reported on in the aggregate format. Prior to any procedure of reporting on results and publication, all identifiers related to the participants were removed to ensure anonymity. In terms of the quantitative study, there were no expected risks beyond normal day-to-day living related to participation in this research project. The questionnaire survey was subjected to a pilot study to help assess the clarity of the questionnaire's items. These strategies were used to minimise the risks.

4.9.2 Respondent consent forms

Respondent consent is a form to help a participant understand what an investigator wants him/her to do, and allow them to consent to the research project in an informed manner (Creswell 2014; Zikmund et al. 2013). Participants completed consent forms prior to the research and the researcher clarified the research procedures based on the information sheet (Cooper & Schindler 2011). Informed consent applied to the three qualitative techniques of this research. This research took different approaches. The researcher distributed the consent forms to participants in person, via email, post, or via the participant's unit manager (e.g. head of management school, manager of ICT services etc.). Once they had approved and signed to participant in this research, the participants were advised they could withdraw at any time without consequences. Appendix B provides a consent form of the brainstorming, focus group, and individual interview techniques of this study. In the online survey, the following statement of consent was included in the email invitation, in the information sheet, and on the first

screen of the online survey: "Your participation in this research is purely voluntary and can be withdrawn at any time. The research team appreciates your support and time". This statement made it clear that all participants had the right to discontinue participation at any time.

4.9.3 Respondent rights and protections

During this research, the paper files were stored in the researcher's locker. In addition, the data were stored at USQ (in the researcher's computer) managed by USQ ICT services. This computer is password protected. After completion of the study, all electronic files and data were stored in the USQ record repository. For the purpose of data retention, the electronic data were stored on the USQ cloud storage site (Cloudstor+) which provides designated storage for USQ research data. The data is not publically available because the data may contain information on organisational processes. In addition, according to the Research Data Management Policy at USQ, the data collection of this research should be securely retained. The paper files were scanned and stored the same way. The data obtained from the online survey were stored on the QCIF data centre, which is co-owned by USQ for use by USQ during the data collection phase and copied to the principal investigator's own external hard disk and USQ network drive (all password protected) for backups.

4.10. Summary

This chapter has focused on the research methodology in ten sections. Section one started by presenting an introduction to this chapter. In Section two, general explanations were made about the research philosophy with a brief explanation of this concept. The research design, a sequential exploratory strategy as mixed methods, was discussed in Section three. This involved both qualitative (i.e. brainstorming, focus group discussions, and individual interviews) and quantitative (survey questionnaire) methods. The research approach, inductive and deductive approaches were discussed in Section four. Qualitative methods were presented in the fifth section. Quantitative methodology was addressed in Section six, while sources of data were outlined in Section seven. Population and participant sampling were dealt with in Section eight. Section nine reviewed ethical considerations. Finally, this summary in section ten has concluded this chapter. Figure 4.5 provides a timeframe of the thesis processes.

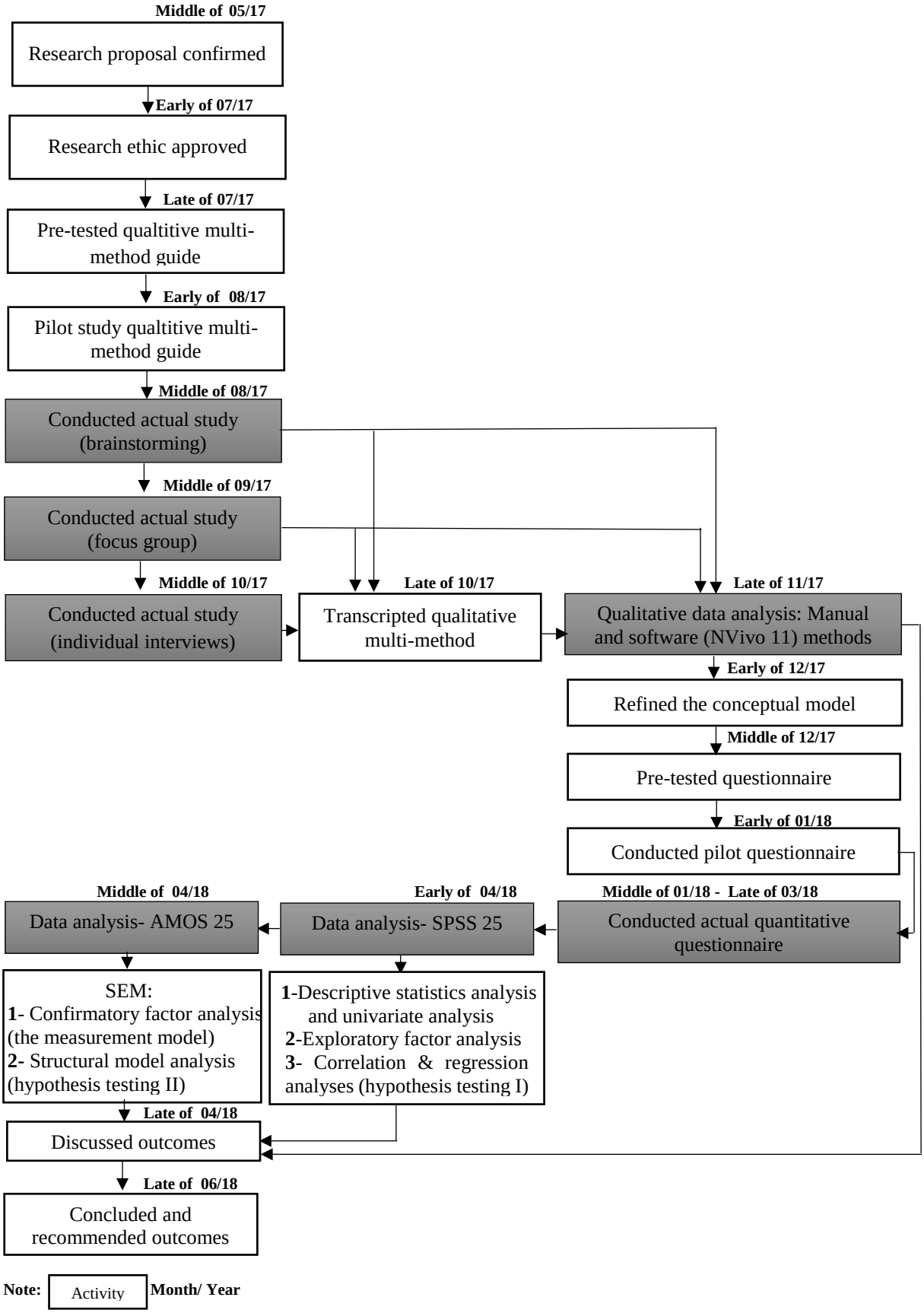


Figure 4.5: A timeframe of the thesis processes

CHAPTER 5 QUALITATIVE DATA COLLECTION

5.1. Chapter overview

Qualitative research is a common approach utilised by social science researchers to discover and realise the meaning groups ascribe to a human issue (Creswell 2014). In chapter four, the research methodology was explained. This chapter reviews qualitative data collection. The qualitative methods of research, i.e. brainstorming, focus group, and single interviews, were organised to address the first research objective of the study. The core focus in this stage of the current study was to explore processes associated with talent management and knowledge management that may be used in the higher education environment.

The review of the qualitative data collection is organised into nine sections. The introduction to brainstorming, focus group discussions, and individual interviews is outlined in Section 5.2. The third section provides an explanation and justification of brainstorming, focus group and individual interview techniques utilised in this research. This is then followed by a discussion in the fourth section of pre-testing in research settings to confirm the reliability and validity of the initial research results gained from utilising all three methods. The next section (5.5) provides an explanation of a qualitative pilot study. Section 5.6 provides details on the administration of the qualitative data collection techniques. The subsequent section discusses the implementation of each technique in this study. The difficulties and challenges with using three qualitative techniques is followed by a discussion of the strategies to overcome and control such issues in Section 5.8. The ninth and final section summarises the justifications, practices, and proceedings for the qualitative techniques utilised in this research. This chapter covers nine sections which are shown in the following graphical layout:

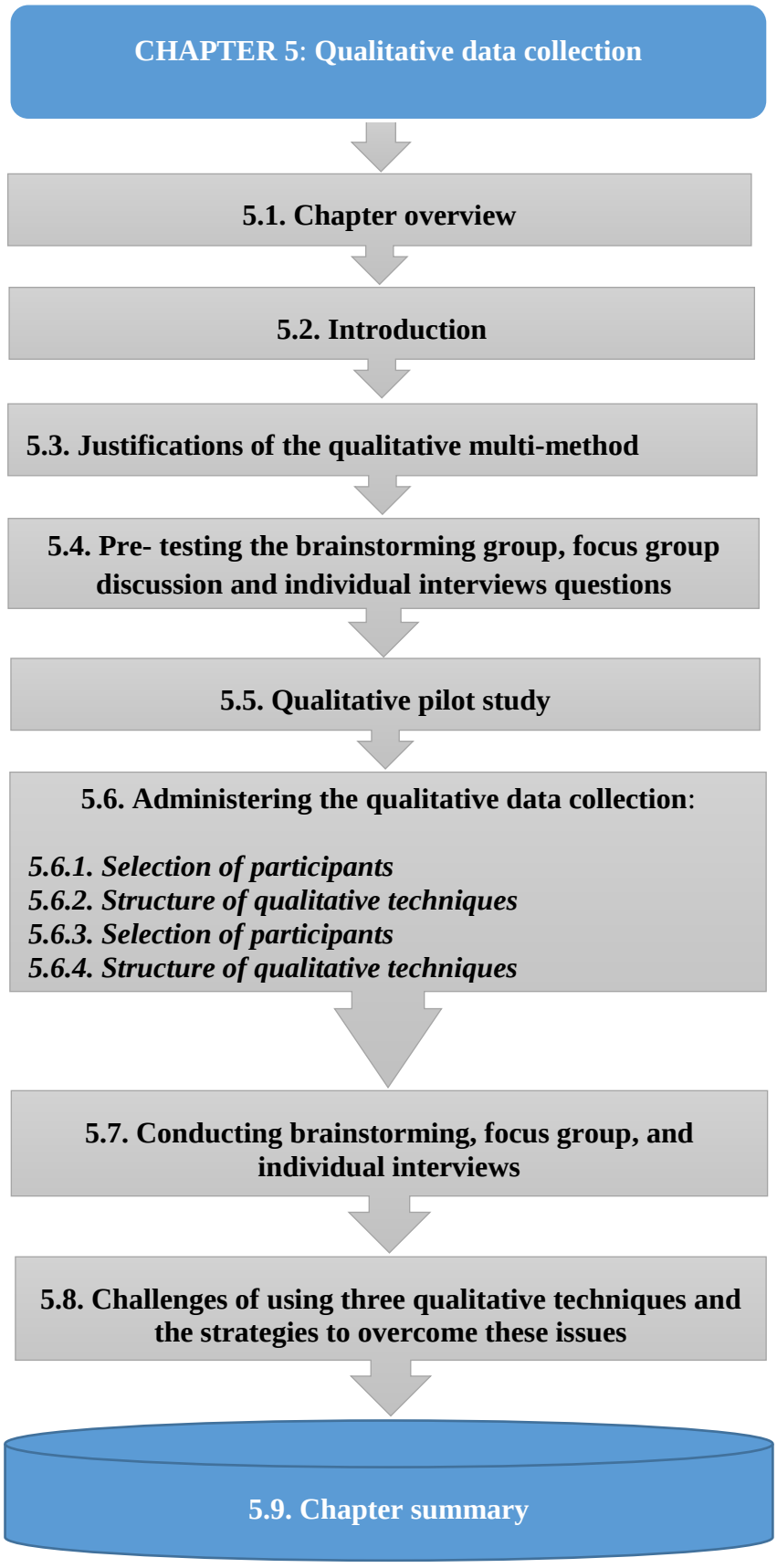


Figure 5.1: A graphical layout of Chapter 5

Source: Prepared by the researcher.

5.2. Introduction

As stated earlier in Chapter Two: "Literature Review", the existing literature on the measurements of both talent management processes and knowledge management processes is extensive; however, the vast majority of research is outside the higher education sector, and the few studies from within are in non-Australian contexts. Therefore, the first key research objective of the study is *to understand the best processes that are currently used in managing talent and knowledge in Australian higher education.* This objective was addressed by conducting three qualitative multi-method studies that are commonly used in empirical studies, namely: brainstorming, focus group discussions, and individual interviews (Aldhaban 2016; Dilshad & Latif 2013; Gururajan et al. 2014; Torres & Carte 2014).

In this study, a high-level brainstorming session was conducted in the first instance to derive themes regarding both talent management processes and knowledge management processes. Then, a focus group session was conducted to confirm the findings of the brainstorming session and define the scope of the individual interviews. The final method of the qualitative phase was individual interviews, which were conducted to obtain in-depth information on the research topic. These qualitative methods were conducted in the talented individuals' (the research participants') work environment.

The participants of the brainstorming session, the focus group session, and the individual interviews comprised a representative sample of highly qualified individuals who are responsible for managing action plans related to talent management processes, and knowledge management processes within the university. For example, the participants of the qualitative phase included managers, directors, heads of faculties, as well as senior academics at associate professor and professor level. Some participants had technical knowledge in computing such as individuals employed in professional Information Technology (IT). All the participants were required to complete a consent form to maximise their comprehension of the information shared and how it would be used (Speer & Stokoe 2014; Webster 2017). (See Appendix B). The same consent form was used for the brainstorming session, the focus group session, and the individual interviews.

Brainstorming is a group-based method that is one of the most useful tools to generate multiple creative ideas as well as creative solutions for various issues (Hägg & Musse 2016; Helquist et al. 2017; Keeney 2012; Litcanu et al. 2015; McMahon et al. 2016; Rowley & Phibbs 2012). Alex Osborn, an advertising executive, developed this technique in the discipline of marketing in the 1940s (Boddy 2012; Hender et al. 2001; Shih et al. 2011; Shirani et al. 2012). Osborn (1953) suggested that for a brainstorming process to be most effective, it should contain both group and individual ideation (Johnson & D'Lauro 2018; Korde & Paulus 2017; Kornish & Hutchison-Krupat 2017; Levine et al. 2016; Wilson 2013). The results of additional experiments have supported the original brainstorming method process (Hägg & Musse 2016; Korde & Paulus 2017; McMahon et al. 2016). The objective of this methodology is to generate ideas for which group members are given time to brainstorm (Dilshad & Latif 2013; Gururajan et al. 2014; Shih et al. 2011; Torres & Carte 2014). Once all generated ideas are highlighted, the group goes through the ideas by discussing their helpfulness, and combining and improving similar ideas or solutions (Boddy 2012; Gřibek 2011; Keeney 2012; Korde & Paulus 2017; Rietzschel et al. 2006; Rowley & Phibbs 2012; Shih et al. 2011; Shirani et al. 2012).

According to Aldhaban (2016); Gururajan et al. (2015), after completing a brainstorming session, the data collection process should then progress towards a focus group session. The focus group method is a qualitative technique which collects data in a group situation (Albanesi 2014; Keeley et al. 2016; Krueger & Casey 2015; Walliman 2011). It acquires rich information from a group of participants and a deep understanding of the topic being explored (Dilshad & Latif 2013; Kozleski et al. 2015; Saberiyan 2015; Sutton & Arnold 2013; Then et al. 2014; Walliman 2011). The aim of this technique for this study was to confirm the findings of the brainstorming session and define the scope of the individual interviews (Dilshad & Latif 2013; Gururajan et al. 2014; Torres & Carte 2014). The focus group methodology is a valuable interview method which is facilitated by a trained moderator to explore particular topics within the problem domain (Cooper & Schindler 2011; Gururajan et al. 2015; Krueger & Casey 2015; Litosseliti 2003; Sherriff et al. 2014; Silverman 2014; Zikmund et al. 2013). Thus, focus group discussions involve the use of in-depth group discussions on themes for which participants are specifically selected (Jeong 2016; Pearson & Vossler 2016; Sherriff et al. 2014; Then et al. 2014).

Throughout history, the focus group technique has been used extensively to collect data and gain an understanding of a topic (Doody et al. 2013; Imison 2014; Tadajewski 2016). This technique was developed throughout the 1940s when social scientists started using 'focused interviews' for a group (Davis 2017; Dickau 2017; Hennink 2014; Kamberelis & Dimitriadis 2013; Krueger & Casey 2015; Mauceri 2016; Stewart & Shamdasani 2015; Tadajewski 2016). The technique was developed by Paul Lazarsfeld and Robert Merton, the latter of whom is considered the 'father of the focus group' (Carey & Asbury 2016; Duarte et al. 2015; Tadajewski 2016, p. 319). Merton found that individuals shared sensitive information when they felt comfortable in an environment with individuals like themselves (Abumere 2014; Eklund 2015; Hennink 2014; Krueger & Casey 2015; Pozzar et al. 2014; Then et al. 2014). Paul Lazarsfeld was a director at the Office of Radio Research (Columbia University) (Carter 2008; Nicholls 2014). In 1933, Lazarsfeld and his colleagues developed a social group method for quantifying data to describe the community's mood (Mauceri 2016; Nicholls 2014). In parallel fashion, in the early 1930s, Lazarsfeld and Herta Herzog, who was Lazarsfeld's student, developed 'subsequent methodological and conceptual innovations' of the focus group method (Carter 2008; Tadajewski 2016). Throughout the following decades, the focus group method became commonly utilised in marketing research and public opinion (Brown 2015; Tadajewski 2016). In the 1980s, it was being employed via "sociologists and other social scientists" in areas such as politics, health, and education, as well as by other researchers (Brown 2015; Tadajewski 2016). In the 2000s, it was being utilised in healthcare research (Brown 2015). Since then, the focus group technique has been, and still is, extensively used within the management field of research (Tadajewski 2016).

The last step of the qualitative study consisted of individual interviews (Aldhaban 2016; Gururajan et al. 2015). One-to-one interviews as a qualitative method are considered one of the most widely employed and commonly known qualitative research approaches (Bryman 2015; Cridland et al. 2016; Keeley et al. 2016). A personal interview is a direct interview between a researcher and a research participant to discuss a specific topic (Bryman & Bell 2015; Cooper & Schindler 2011; Zikmund et al. 2013). There are three common types of individual interviews: structured, semi-structured, and unstructured (Al Sawafi 2014; Bryman 2015; Bryman & Bell 2015;

DeFour-Howard 2015; Doody & Noonan 2013; Leavy 2017; McTate & Leffler 2017). Table 5.1 shows the comparison of the three types of interviews.

Table 5.1: Comparison of the three types of interviews

Structured interviews	Semi-structured interviews	Unstructured interviews
Pre-determined set of questions	Have an agenda of general themes	Allow participants to talk freely
Permit very little flexibility	Allow eliciting more details and explanations	Allow more flexibility to elaborate
Conducted face-to-face in a formal structured setting and can be done over the phone too	Interviewer has some control over the flow of the interview	Reduce the effect of the interviewer
Provide less details	Provide more details	Provide in-depth detail
Less time to analyse	More time to analyse	Very time consuming to analyse
Easier to be analysed and interpreted	Difficult to be analysed and may provide irrelevant data	Data may often be irrelevant and hard to analyse
Can be used with large samples	Less suitable for larger samples	Unsuitable for larger samples

Source: (Al Sawafi 2014, p. 64).

As can be seen in Table 5.1 each kind of interviews has advantages and drawbacks (Al Sawafi 2014). In this research project, semi-structured interviews were adopted by using open-ended questions to acquire a sufficient comprehension of the topic, and to enable additional questioning based on a participant's response (Al Sawafi 2014; Brédart et al. 2014; DeFour-Howard 2015; DeStefano 2016; Gururajan et al. 2016; Gururajan et al. 2014; Gururajan et al. 2015; McTate & Leffler 2017; Mwakima 2014).

5.3. Justifications of qualitative multi-method

This research project selected the aforementioned techniques for the following reasons:

(i) Qualitative multi-method studies have benefits as they lead to a high possibility of corresponding well with participant desires (Huff et al. 2015).

(ii) These methods can improve and increase the reliability and validity of research results (Ayón et al. 2016; Huff et al. 2015).

(iii) Focus groups and individual interviews are a good example of the fundamental need to recognise the team members' expertise (Ayón et al. 2016).

(iv) There are no previous qualitative studies related to the relationship between talent management and knowledge management, which have collected data using brainstorming, focus group discussions, and interviews. Evidence of this, based on a literature review, can be seen in Table 5.2:

Table 5.2: Previous qualitative research on both talent management and knowledge management

Author (s) and Topic	Method	No. of sample	Time	Sector
1- (Blackman & Kennedy 2008) 'Talent management: developing or preventing knowledge and capability'	A case study, depending on three sources: *-Documentary analysis of materials.* *-Semi-structured interviews.* *- Group discussions*	5	N / a	The Australian public service sector
2- (Calo 2008) 'Talent management in the era of the aging workforce: The critical role of knowledge transfer'	Conceptual, qualitative: *- Literature scan*	N / a	N / a	N / a
3- (Whelan et al. 2010) 'Managing talent in knowledge-intensive settings'	A single case study. - *Semi-structured interviews.*	10	30 - 75 minutes	Health sector in Ireland
4- (Peet 2010) 'Generative knowledge interviewing: a method for knowledge transfer and talent management at the University of Michigan'	Semi-structured interviews through three stages: *1-Knowledge retrieval interviews.* *2- Verification interviews.*	7	Two hours for knowledge retrieval interviews	Higher education sector in the USA

	3- Continuation interviews with managers.			
5- (Whelan & Carcary 2011) 'Integrating talent and knowledge management: where are the benefits?'	Qualitative: *- Focus group discusion*	3	N / a	IT organisations in Ireland
6- (Björk Löf et al.2011) 'Students' views on talent management'	Conceptual, qualitative: *- Literature scan*	N / a	N / a	Various
7- (Kong et al.2013) 'Managing Indian IT professionals for global competitiveness: the role of human resource practices in developing knowledge and learning capabilities for innovation'	A multiple-case study: *-Semi-structured in-depth interviews*	11	Lasted about 60 minutes each	IT services sector in India
8- (Kim et al.2014) 'A strategic model for technical talent management: a model based on a qualitative case study'	A case study *-In-depth interviews*	5	A half-day (each partner 2 to 3 hour)	Technical, scientific service, and professional sector in the USA
9- (Gateau & Simon 2016) 'Clown scouting and casting at the Cirque du Soleil: designing boundary practices for talent development and knowledge creation'	A single in-depth case study: - *In-depth interviews*	6	Two months	the Canadian commercial performance sector
10- (Shabane 2017) 'The integration of talent management and knowledge management in the South African public service'	A case study, depending on two sources: *-Documentary analysis of materials.* *-Semi-structured interviews.*	13	Seven hours, 26 minutes for all interviews.	The South African public service

As can be seen in Table 5.2, the majority of qualitative studies relating to the relationship between talent management and knowledge management depend on semi-structured interviews (70%), and most of them are based on in-depth interviews. After that, 40% of the identified studies are based on case studies, and half of them are a single case study. It must be considered that 20% of qualitative research is conceptual,

documentary analysis, and focus group discussions, while social network analysis represents about 10% of qualitative studies as secondary data.

Qualitative investigation methods can improve and increase the reliability and validity of a study's results (Ayón et al. 2016; Huff et al. 2015; Mauceri 2014). Therefore, this study highlights the use of brainstorming, focus groups, and individual interviews as stage one of qualitative data collection methods. Conducting three qualitative methods in one study will improve the quality of the results. There is clear evidence to suggest that, when a researcher uses qualitative method combinations such as focus group and individual interviews in one study, it increases the validity and reliability of qualitative results, due to the ability to cross reference and aggregate the findings from the different methods (Arino et al. 2016; Bogdan & Biklen 2007; Mauceri 2014; Miles et al. 2014). For example, the results of the focus group session confirmed the results of the brainstorming session, as both methods used the same questions with different participants.

5.4. Pre-test brainstorming group, focus group discussion and individual interview questions

The researcher evaluated the reliability and validity of the brainstorming, focus group and individual interviews instruments through an academic peer review process to determine technical issues before the trial (Antaya & Parrish 2014; Gururajan et al. 2014; Gururajan et al. 2013). Once peer-reviewed academics had given their opinion, a decision was made to modify and evaluate the brainstorming, focus group and individual interview questions, and accept/delete them completely/partly before piloting it. This procedure is very important for any structured qualitative study to ensure quality of outcomes (Gururajan et al. 2014; Ritchie et al. 2013; Wyse et al. 2016).

The researcher organised a special form to examine the opinions of two groups: academic experts who specialise in the fields of human resources management and information systems, and academics who are not specialists in these fields. Non-specialist academics were used to obtain a different view on the research tools that could be incorporated into the research design. The individual interview protocol

contained in-depth questions, which needed only two minor changes. Overall, several procedures and considerations were adopted in this study with regards to the framing of the brainstorming, focus group, and individual interviews questions as follows:

As this phase (qualltative) of the study used inductive reasoning, open-ended questions (questions that do not have specific answers) were selected for data collection. Qualitative scholarly literature supports the idea of open-ended questions as part of the inductive approach as it assists in getting rich information regarding a certain issue (Brannen 2017; Cho & Lee 2014; Hamad et al. 2016; Leavy 2017; Sekaran & Bougie 2016; Tanwar et al. 2017; Walliman 2011). Open-ended questions have a great impact on enriching the discussion and creating an open flow between speakers. They are one of the accepted tools to create inter-personal interaction during the discussion to investigate the relationship between talent management processes and knowledge management processes in the higher education setting. For instance, although the individual interview questions were utilised to guide the process, the researcher allowed interviewees to raise new subjects regarding the research topic. To be consistent with open-ended questions, this research maintained the following protocol in the actual individual interviews:

1- Wording of the interview questions was carefully constructed, so that they would not result in simple Yes/No type answers. For example, all qualitative questions started with “How”or “Why”.
2- Individual and experience-based thinking by the participants were encouraged.
3- Questions were formed to motivate individuals to get involved in discussions.
4- The question sequence followed a style from broad to specific. For instance, the individual interview protocol was conducted with six focused questions, which were derived from the brainstorming session and the focus group session. These questions were extended through the discussion in the individual interviews to elicit a deeper understanding.

5.5. Qualitative pilot study

A pilot study is an exploratory small-sample effort that collects data from respondents similar to those that will be used in a larger study (Pyrczak & Bruce 2016; Shader 2015; Zikmund et al. 2013). In this respect, the researcher presents the various conceptual and methodological revisions informed by the qualitative pilot study to improve the actual study. Pilot studies, 'pilot trials', 'feasibility studies', 'pilot work' or 'small size studies' are implemented when there is uncertainty over the probable outcomes of randomised controlled experiences (Morris & Rosenbloom 2017; Vogel & Draper-Rodi 2017). The purpose of using the qualitative pilot study is to develop understanding and a practical sense of the domain in which a phenomenon is located (Kezar 2000; Van Teijlingen & Hundley 2002). In regards to the pilot brainstorming and focus group sample size, Morgan (1997) recommended that the pilot group interviews size should be between four and six individuals.

In this research, after obtaining the ethics approval, a qualitative pilot study was used to establish the feasible criteria of the content, time, and other activities. The pilot qualitative agenda was conducted in the form of two sessions with six expert participants (three talented individuals per session). These sessions were conducted on the 1st and 4th of August 2017 to examine the quality of brainstorming and focus group questions and to test whether the qualitative phase results were acceptable. Two questions were used to conduct the brainstorming and focus group pilot process. The first question was related to talent management processes, and the second question was associated with knowledge management processes, as used in the university. These questions were used to guide the actual qualitative study, yet the convener allowed participants to open new discussion topics.

In brief, the researcher avoided selection bias by selecting participants from a diverse range of social environments. Given the example, all brainstorming and focus group participants were from a range of different sections of the university and a mixture of position levels; moreover, across the individual interviews participants were from different universities. This helped in ensuring external validity of the study. Furthermore, this study avoided bias in the selection of data collection method because the research did not target a certain type of methods but rather selected different heuristic qualitative methods. For further detail regarding the pilot study findings, see

Chapter Six, Section four. Appendix C provides a copy of the brainstorming, focus group, and individual interview questions.

5.6. Administering the qualitative data collection

Administering the qualitative data collection as a key method involves specific procedures for gathering the data (Ayón et al. 2016; Creswell 2014). For the administration of a brainstorming group, the process should be planned and organised to obtain a variety of opinions on the significant issues under investigation (Balasubramanian et al. 2008; Lu & Yuan 2011; Torres Kompen 2016). The brainstorming session is formed by listing members with pertinent and complementary skills. Group members are given about 60 minutes to brainstorm (Börekçİ 2015; Helquist et al. 2017; Keeney 2012; McMahon et al. 2016; Sekhar & Lidiya 2012). Five principles for the successful running of a brainstorming session have been outlined as follows: (1) preparation, (2) orientation, (3) idea generation, (4) evaluation, and (5) post-session follow-up (Shirani et al. 2012). The brainstorming session includes three stages (Hender et al. 2001): (1) 'read the issue'; (2) 'generate ideas by free association'; and (3) 'continue to generate ideas by free association', utilising the issue and new ideas generated as motivation. The brainstorming session usually has two parts: the first one is a brain-dump, in which all ideas are explored freely; and the second is a procedure where some ideas are assessed (Boddy 2012; Rowley & Phibbs 2012).

The brainstorming technique has four central guidelines (Goldenberg & Wiley 2011; Gřibek 2011; Haddou et al. 2014; Levine et al. 2016; Shih et al. 2011; Shirani et al. 2012):

1. Focus on quantity: brainstorming participants are asked to create numerous ideas without any regulation of quality.
2. Withhold criticism: those included in the session cannot criticise the ideas generated, thereby limiting the suppression of ideas (Börekçİ 2015).
3. Welcome unusual ideas: brainstorming participants are free to express all of their ideas, even unconventional ones, without fear of derision.
4. Combine and improve ideas: brainstorming participants are encouraged to integrate further ideas into their knowledge inventory (Börekçİ 2015).

All guidelines above were addressed and highlighted by the researcher when both the pilot and actual studies were administrated and conducted with a number of talented individuals. For instance, prior to starting the brainstorming session, the researcher provided some suggestions to participants. The researcher suggested to participants that they should feel free throughout the session time to express their ideas, through a focus on quantity in creating ideas without fear of derision, so as to avoid blocking the production of ideas through evaluation or criticism of group members.

The administration of focus group discussions should be planned and organised to obtain a variety of opinions on the topic under examination (Ayón et al. 2016; Creswell 2014; Krueger & Casey 2015). The aim of conducting a focus group session is to provide qualitative data from a focused discussion of a topic (Krueger & Casey 2015). Delli et al. (1994) recommended that focus group interviews should be conducted with participants who have group skills, for example engagement in a task and group social interaction (Hennink 2014; Sanders 2016; Stewart & Shamdasani 2015). Shared experience positively influences opinions, attitudes, and behaviors of the group members (Lyon et al. 2016; Paans et al. 2017; Sokol et al. 2018).

Semi-structured individual interviews were applied in this research by using open-ended questions to acquire a sufficient comprehension of the topic and enable additional questioning based on the responses of the participant (Brédart et al. 2014; DeStefano 2016; Gururajan et al. 2016; Gururajan et al. 2014; Gururajan et al. 2015; Mwakima 2014). This technique is especially suitable for identifying the problems that can be used in developing quantitative questionnaires (Brédart et al. 2014), and for probing individual subjective experiences (Cheong et al. 2014). Thus, this research has sought to enable participants to voice their experience through interviews (Cheong et al. 2014).

Arguably, administration of qualitative data collection can be divided into four significant aspects: (1) selection of participants; (2) structure of qualitative techniques; (3) the brainstorming and focus group moderator; and (4) pre- qualitative techniques.

5.6.1. Selection of participants

The first significant aspect of administering the qualitative data collection is the selection of participants. Careful thought about sample size is worthwhile in qualitative research (Gururajan et al. 2016; Lowenthal & Leech 2009). As indicated earlier in the Methodology Chapter (4) – Section 8: Population and sampling, this study has selected a purposive sampling technique.

5.6.2. Structure of qualitative techniques

The other key part of administering the data collection is the structure of the qualitative techniques. In this respect, there are several considerations that are significant to qualitative techniques:

1. Planning and organising of the needed procedures of brainstorming, focus group and individual interviews;
2. Determining the suitable number of groups as well as the number of sessions (brainstorming and focus group); and
3. Determining the sampling size of brainstorming, focus group, and individual interview techniques.

5.6.2.1. Planning and organising of the needed procedures of brainstorming, focus group, and individual interviews

After completing the instrument peer review and the pilot study, the researcher started with the brainstorming group and asked all participants to generate new ideas that were related to the investigation of the talent management processes and knowledge management processes. Next, ideas were evaluated by determining which were worthy. Finally, the researcher asked participants if they had any final opinions or comments. These procedures took around 64 minutes.

The aim of the focus group session was to obtain new themes and concerns of talent management processes and knowledge management processes and to shed light on them in depth (Cooper & Schindler 2011). These procedures took around 70 minutes.

In terms of individual interview protocol, there was one section for conducting individual interviews. It contained in-depth questions on talent management processes and knowledge management processes in Australian higher education. One-to-one interviews were held either in person or by phone for the interviewees to save time and cost. All individual interviews were recorded audio-visually and transcribed. In addition, the researcher also recorded answers by making handwritten notes to ensure accuracy of the transcription process (Creswell 2014).

5.6.2.2. The suitable number of groups and sessions (brainstorming and focus group)

Qualitative research is different from other research in several aspects, e.g. in terms of research environment, and research conditions (Cowton & Downs 2015). Hopf et al. (2014); Morgan (1997); Peek and Fothergill (2009); Todd et al. (2012), have suggested that the suitable number of groups and sessions should be 3-5. Some scholars have different views on the appropriate number for a brainstorming session and a focus group, depending on the research question (Kitzinger & Barbour 1999). Others recommend that the number of sessions for brainstorming and focus groups should be dependent on the saturation period, when a researcher no longer obtains any new information (Connelly 2015; Markotic et al. 2017).

In contrast, Fern (2001) has mentioned that the number of groups has no direct influence on the brainstorming and focus groups processes in all cases. Sinagub et al. (1996) recommended that determining the appropriate number of brainstorming and focus group sessions depends on the experience of the moderator. This research conforms to the view of Kitzinger and Barbour (1999) who emphasised that a suitable number of groups and sessions depends on the research question. Therefore in this research, there was only one brainstorming session and one focus group. This was enough to refine the first research question by defining the scope of the individual interviews (Dilshad & Latif 2013; Gururajan et al. 2014; Torres & Carte 2014) and exploring themes (Dilshad & Latif 2013; Gururajan et al. 2014; Shih et al. 2011; Torres & Carte 2014). Therefore, the final results of the study will be dependent on the survey questionnaire technique which will be developed based on the outcomes of the individual interviews (the third step of the qualitative study).

5.6.2.3. Determining sampling size of the brainstorming, focus group and individual interview

1- Ideal group size of the brainstorming session

Ideal group size is a critical factor for any group's success (Liamputtong 2011; Ritchie et al. 2013). In order to determine the ideal number of participants for the brainstorming session, a number of factors need to be considered. Scholars and researchers have differed in determining an optimal size for a brainstorming group. Some of them advocate a large number for the group. Even though a group with a larger number of participants is difficult to manage and control (Lefika & Mearns 2015; Liamputtong 2011), a larger group is more likely to exchange more expertise and thereby create more diverse solutions (Boddy 2012; Hender et al. 2001; Panchal 2015). In this case, a large group is more than eight participants (Korde & Paulus 2017; Paulus et al. 2013).

In contrast, a small number of participants is useful for a better opportunity to express their opinions and perceptions in more depth, as they relate to the significant issues under investigation (Hopf et al. 2014; Lefika & Mearns 2015; Mårtensson & Hensing 2012; Peek & Fothergill 2009; Todd et al. 2012). A small group means eight participants or less (Korde & Paulus 2017; Michinov et al. 2015; Paulus et al. 2013). Shirani et al. (2012) have provided various alternate solutions; they recommend that the perfect group size is between five to ten participants (Shirani et al. 2012), or six to nine participants (Srivastava et al. 2017).

Overall, as mentioned in the literature, no particular recommendations are consistent about the ideal group size (Atanga 2007; Börekçİ 2015). In this research project, a smaller group of 6-8 participants was used. This was deemed sufficient to allow for a successful session (Hopf et al. 2014; Lefika & Mearns 2015; Mårtensson & Hensing 2012; Peek & Fothergill 2009; Todd et al. 2012), because it allowed for sufficient exploration of themes related to talent management processes and knowledge management processes.

2- Ideal group size of the focus group session

To determine a focus group size, as explained previously in regards to the brainstorming technique, optimal group size is a significant aspect for success (Liamputtong 2011; Ritchie et al. 2013). A majority of researchers and scholars have considered that the ideal focus group size ranges between four and ten individuals (Ahmed et al. 2015; Atanga 2007; Boman et al. 2015; Gates & Statham 2013; Gururajan et al. 2015; Halcomb et al. 2007; Krueger & Casey 2015; Ritchie et al. 2013; Shanbhag et al. 2016; Sherriff et al. 2014; Todd et al. 2012; Wiklund et al. 2017; Zikmund et al. 2013). Others have considered that the ideal group size ranges from six to twelve participants (Crowe et al. 2017; Luo 2015; Wang et al. 2017). Still others have recommended that the suitable number for a focus group is between eight and twelve participants (El-Gohary et al. 2013; Sim 1998).

Overall, the ideal sample size depends on the research questions (Jumisko 2016; Sherriff et al. 2014). For this research, a large number for the group was considered: six to twelve participants. This was deemed sufficient to allow for a successful session (Crowe et al. 2017; Luo 2015; Wang et al. 2017). The reasoning behind this was that the larger group was more likely to exchange expertise and discuss a greater number of diverse solutions (Boddy 2012; Hender et al. 2001; Panchal 2015). This session was important to confirm the findings of the brainstorming session and define the scope of the questions for the individual interviews.

3- Ideal sample size of individual interviews

Researchers propose different sample sizes for individual interviews, namely between five and eleven participants (Blackman & Kennedy 2008; Gateau & Simon 2016; Kong et al. 2013; Peet et al. 2010; Whelan et al. 2010). Similarly, as for the brainstorming and focus group techniques, the ideal sample size depends on the research questions (Jumisko 2016; Sherriff et al. 2014). For this study, the sample size of individual interviews was six participants. This was deemed adequate to develop the conceptual research model for use in the quantitive stage.

In summary, regardless of the final sample size of the brainstorming session, 'it is important to invite more participants than necessary, so as to fill gaps left by those who fail to turn up' (Baig 2010, p. 98). Besides, the research supposes that the sample size

may not be uniform depending on the site and availability of staff on the day of the brainstorming and focus group sessions (Gururajan et al. 2015). To overcome this issue the investigators invited 8-10, 12-15, and 8-10 individuals respectively, to take part in the brainstorming and focus group sessions, and to allow for some replacements for individual interviews. In the end, it was actually conducted with six participants for brainstorming, eleven in the focus group session, and six individual interviews respectively. All were conducted in Queensland universities.

5.6.3. The brainstorming and focus group moderator and facilitator

The third key aspect of administering qualitative data collection is the use of a moderator and facilitator guide (Markotic et al. 2017). The moderator is a person who leads a group session and ensures that all participants get a chance to speak and contribute to the discussion (Abumere 2014; Goldenberg & Wiley 2011; Goldman & Waymer 2014; Khan et al. 2017; Mandić et al. 2013; Then et al. 2014). The moderator plays a significant role in the success of brainstorming groups (Fern 2001; Isaksen 1998; Sutton & Hargadon 1996) and focus group discussions (Cooper & Schindler 2011; Goldenberg & Wiley 2011; Gururajan et al. 2015; Krueger & Casey 2015; Litosseliti 2003; Sherriff et al. 2014; Silverman 2014; Zikmund et al. 2013).

When the moderator is doing a focus group session, the time for, and number of, both questions and group members should be controlled (Gavora 2015; Krueger & Casey 2015). In the case of the brainstorming session, for a highly technical topic, additional information is provided first in the form of reading materials before the meeting. After participants understand the topic, new ideas are generated. However, this process gets interrupted when participants ask for more information (Sutton & Hargadon 1996). In regards to focus group sessions, experience dealing with various numbers of focus groups, and understanding the nature and scope of focus group research, can be critical factors in the moderater's success (Stewart & Shamdasani 2015). This depends on the capabilities and skills of the moderator to promote interaction amongst group members (Then et al. 2014).

In this research, the researcher takes several roles in the focus group session such as 'moderator', 'listener', 'observer', and 'analyst' (Krueger & Casey 2015; Markotic

et al. 2017). The moderators of this research project were experienced academics in managing group sessions. They were aware of the relevant research procedures. Thus, the moderator and facilitator took a critical role in extracting the required information from participants of the brainstorming session and the focus group session.

5.6.4. Pre-qualitative techniques and steps

The fourth significant issue in providing an optimal framework is pre-qualitative data collection planning, which is employed through the following phases (Baig 2010, p. 103):

Step 1: Acquiring ethical approvals

Step 2: Determining aims of three qualitative techniques

Step 3: Identifying the population and sample

Step 4: Preparing a list of sample members from the specified 'population for participation' in the three qualitative techniques

Step 5: Communicating suitable information

Step 6: Drawing up 'a list of questions'

Step 7: 'Identifying a facilitator and discussing the agenda'

Step 8: 'Drafting possible follow-up questions to the probable answers'

Step 9: 'Validation and pre-testing questions'

Step 10: Choosing suitable sites, to ensure a comfortable environment to participants

Step 11: 'Contacting possible participants through a personal letter with an outline about the objectives and goals of the project'.

5.7. Conducting brainstorming, focus group, and individual interviews

Asking participants suitable questions requires significant skills, which the researcher should develop. This process is integral to the gathering of quality information in qualitative research. As part of this process, the qualitative study started with a brainstorming question as the first method in the qualitative phase.

5.7.1 Brainstorming session

The brainstorming process involves a series of steps. Invitations are first sent to participants by email or phone (Sutton & Hargadon 1996). The goals and principles of brainstorming will then be explained to them, including the protocol, so that participants come to the brainstorming session understanding the articulated goals of the session, and are prepared to initiate contributions to the discussion (Boddy 2012). Group members in a brainstorming session may be resistant to exchanging ideas for fear of derision (Gřibek 2011; Tshehla 2014). Each team member anonymously addresses possible ideas in a set time period, and then the facilitator records the ideas (Gřibek 2011; Saberiyan 2015). As has been recognised, while ideas are commonly addressed in the form of current concerns (Silver 2014), a brainstorming procedure is also designed to involve team members in a discussion about future aims (Saunders 2013). Ideally, at the session's end, some key solution areas should be identified (Börekçİ 2015). Therefore, the brainstorming session is planned and organised in which the participants themselves suggest themes (Balasubramanian et al. 2008; Lu & Yuan 2011; Torres Kompen 2016).

A high-level brainstorming session was conducted in the first instance to derive themes around talent management processes and knowledge management processes. The brainstorming session occurred in a meeting room at the University of Southern Queensland's Toowoomba Campus. The brainstorming session was conducted on 11 August 2017 and lasted 64 minutes. The investigator arrived an hour prior to the starting time to prepare all the required materials such as writing materials and recording devices, and to check that the room was correct. As part of the invitations, the researcher approached possible participants with an information sheet of the project including the research objectives (Appendix D). This ensured participants were fully informed about the nature of the research before being involved in the brainstorming session (in person and via email). Once they agreed to participate, further details were provided as well as the consent form. The participants needed to read the consent form and sign it. The participants were advised that they could withdraw at any time without consequence.

The brainstorming session began with a short introduction where the moderator and the facilitator welcomed participants, and then introduced themselves and the research

topic. A quick summary explanation of the session's purpose was supplied to the six participating managers (four males and two females) who then were tasked with introducing themselves to the group before beginning the formal discussion. This took five to ten minutes. One key question was designed to collect general information and ideas, and this was presented to all participants (Figure 5.2). The session lasted 64 minutes on the scheduled day. The brainstorming question was significant in generating valuable ideas, which in turn assisted in achieving the main research objective.

The brainstorming session was conducted to assist in generating themes associated with talent management processes and knowledge management processes, to be utilised in modifying the study model. The question assessed thoughts by determining worthwhile processes of talent management and knowledge management in the Australian higher education sector to potentially be included in the research model. Each round ideally required five minutes for each participant to answer (Börekçİ 2015). Börekçİ (2015, p. 5) explains this as follows: 'When his/her turn came, the speaking participant had three minutes to think out loud and share his/her ideas on the problem area, after which, for two minutes the listening participants were allowed to speak and ask questions while continuing with their note-taking'. This research is similar to Börekçî's study in that it followed the same method. The six participants shared their ideas, thoughts, and information about talent management processes and knowledge management processes in their organisation, which took about 40 to 50 minutes. Before the brainstorming session ended, the researchers asked participants for any final opinions or additional comments. Finally, the moderator and facilitator acknowledged and thanked participants for their time and effort. This took five to ten minutes. After the session, the researchers evaluated the details and formulated a synopsis of events to complete the procedures of audio recording and transcribing. The brainstorming session was audio-recorded in MP3 format, then transcribed without eliminating the spontaneity. The following diagram shows the main processes with estimated times of each process.

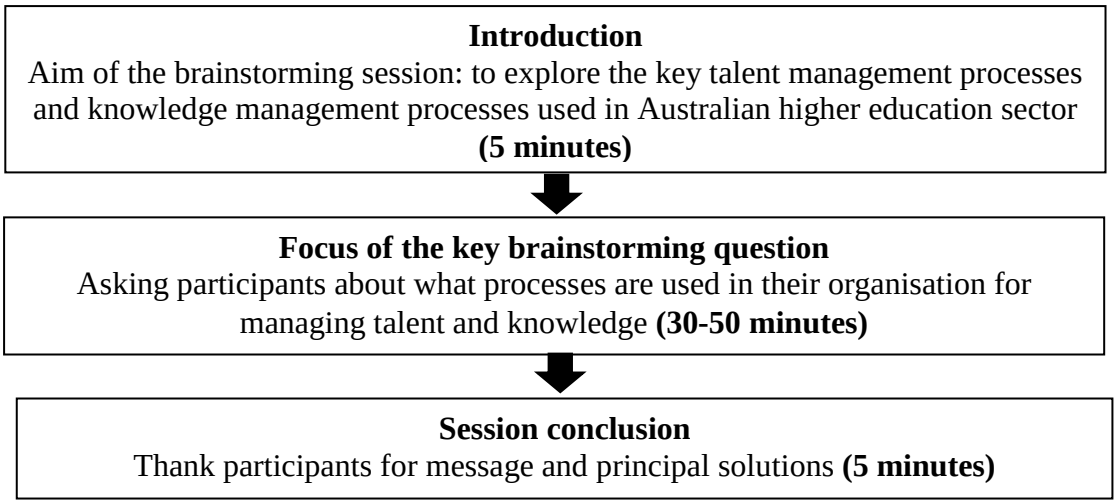


Figure 5.2: The schedule of the brainstorming session

5.7.2 Focus group session

As explained previously, according to Aldhaban (2016); Gururajan et al. (2015), after completing a brainstorming session, the data collection process should progress towards a focus group session. The aim of conducting a focus group session is to gather qualitative data from a focused discussion of a topic (Krueger & Casey 2015). Researchers in focus group discussions should be as flexible as possible to enable the members' discussion to guide new topics and interests and shed light on them (Litosseliti 2003; Tshehla 2014). The focus is on discovering new themes and concerns and to clarify them in depth, which then provides from 60-90 minute focus group discussions for analysis (Cooper & Schindler 2011; Krueger & Casey 2015). Ahmed et al. (2015) have addressed optimal processes for conducting and analysing focus group discussions, which involve a researcher firstly determining the number of participants, followed by the date, time, and place. The third task is conducting the data collection, which should involve an introduction, an explanation of the objectives of the focus group session, main questions, discussion, and conclusion of the topic. The final task is acquiring and analysing the data as well as formulating the results.

In this study, the focus group session was conducted to confirm the findings of a brainstorming session and define the scope of individual interviews. The focus group session occurred in a meeting room at the University of Southern Queensland's

Toowoomba campus. The focus group session was conducted on 18 September 2017 and lasted 70 minutes. The facilitator arrived an hour prior to the starting time to prepare all required materials such as writing materials, refreshments, and recording devices. The facilitator had approached possible participants in advance with an information sheet of the project including the research objectives (Appendix D). This enabled the prospective respondents to be fully informed about the nature of the research before being involved in the focus group session. Once they agreed to participate in the focus group session, further details were provided as well as the consent form. The participants needed to read the consent form and sign it. The participants were advised that they could withdraw at any time without consequence.

The focus group session began with a short introduction where the moderator and the facilitator welcomed participants with an introduction of themselves and the research topic. A quick summary explanation of the purpose of the session was supplied and the eleven participating managers (eight males and three females) were then asked to introduce themselves before beginning the formal discussion. This took about five minutes. Two questions were designed to collect about 40-60 minutes' worth of information on the scheduled day (Figure 5.3). Answering these questions was significant to confirm the findings of the brainstorming session and define the scope of individual interviews, while working towards the first research objective. This process assisted with determining the themes related to talent management and knowledge management. As mentioned earlier in the brainstorming session, each round ideally requires five minutes for each participant to answer (Börekçİ 2015).

The eleven participants shared their thoughts and information, for about forty to sixty minutes, around talent management processes and knowledge management processes in their university. Before the focus group session ended, the moderator asked participants for any final opinions, or additional comments. Finally, the moderator and facilitator acknowledged and thanked participants for their time and effort. It was evident that participants felt involved and motivated about the research topic due to the particularly meaningful discussion that occurred. After this session, the researchers evaluated the details and formulated a synopsis of events prior to undertaking the procedures for transcription. The focus group session was also audio-recorded in MP3 format, then transcribed without the spontaneous character of the

speeches being eliminated. The following diagram shows the main process with the estimated time of each part of the focus group session.

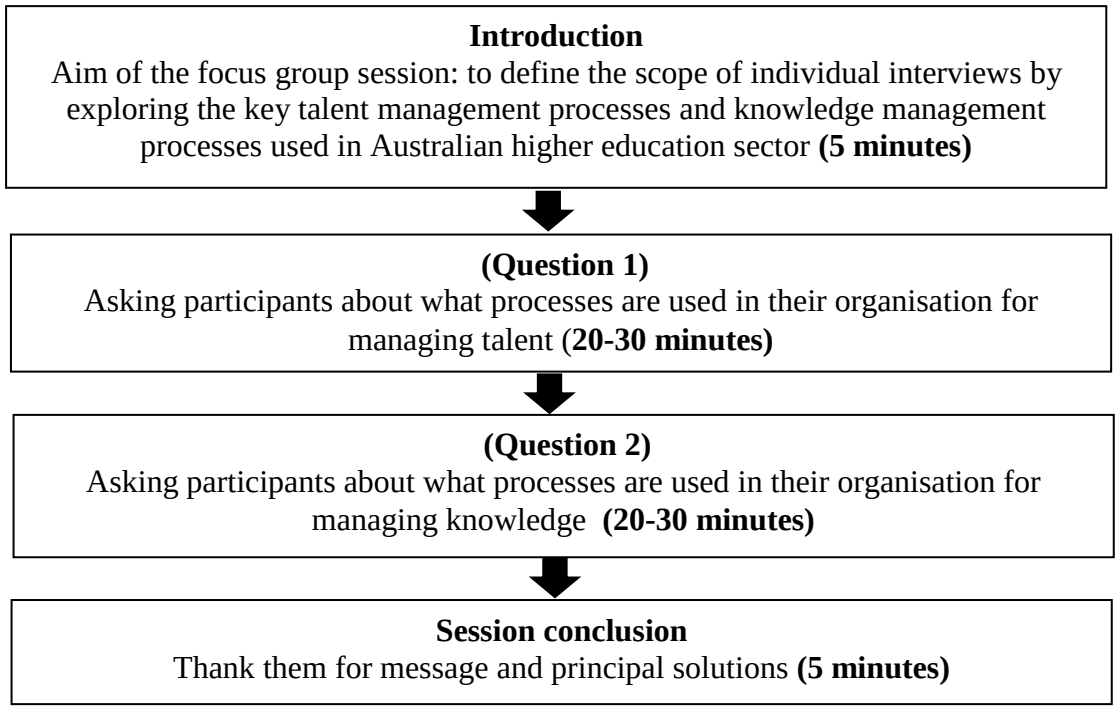


Figure 5.3: The schedule of the focus group session

5.7.3 Individual interviews

Researchers have recommended that after finalising the focus group session, one should advance towards individual interviews, to guide participant comprehension of survey items, and to examine them for content validity (Aldhaban 2016; Brédart et al. 2014; Creswell 2014; Howard et al. 2016; Veronese et al. 2016). For conducting one-to-one interviews, there are six recommended stages (Alice Yeo et al. 2013; Ritchie et al. 2013):

1- The arrival stage:

The interviewer should make sure that the interviewee's first impression of them is as a successful, enthusiastic, self-confident, and professional, and that the interview will benefit both the interviewee and their organisation. This helps participants feel more comfortable, and builds confidence and trust between the interviewer and the

interviewee (Sabbah 2017). It includes the preparation of recording devices, personal introductions, settling down, background noise checks. etc.(Doody & Noonan 2013; Woods 2011). In addition, the environmental requirements should be private, quiet, and comfortable for an interview without distractions (Brennen 2017; Sabbah 2017; Woods 2011).

2- Introducing the research:

This includes the purpose of the interview, the research topic, why the participant has been chosen, and the research objectives (Brennen 2017; Sabbah 2017; Woods 2011). This assists the interviewee to understand the research topic, to build trust, and may lead to a deeper discussion.

3- Beginning the interview:

In this stage, the interviewer starts with individual questions including questions related to career background. The researcher should offer these questions in a way that helps to set the interview style, prompting the participant for detailed qualitative reponses, and unprompted replies (Sabbah 2017; Woods 2011).

4- During the interview:

The interviewer should guide the interviewee towards major themes. During this phase, the interviewee will be more narrowly focused on answering deeper questions related to the topic under discussion. There are likely to be more powerful questions to discuss. These questions will extend beyond the predetermined questions developed for the interview.

5- Ending the interview:

This takes 5 to 10 minutes. In this stage, the interviewer can gradually begin to return the conversation to a public conversation level to signal that the interview is completing.

6- After the interview

The aim of conducting one-to-one interviews is to obtain a thorough understanding of the topic under investigation. Therefore, in this phase, the researcher is going to end the interview process by acknowledging participants and showing their appreciation

for their valuable time and effort to be a part of the research. After the interview, the researcher should compile a document including the interview notes and full transcription (Doody & Noonan 2013). Overall, the first three stages assist the interviewer to transition the respondent from the casual everyday mindset to a deeper cognitive level where the issue may be recognised and explored; the next three stages are designed to do the opposite (Berglund 2016; Magnusson et al. 2015).

In this research project, the individual interviews were conducted by the researcher with six talented individuals (three males and three females) in the period from 17 to 27 of October 2017, and they lasted between 31 and 38 minutes. This number of individual interview participants was sufficient to obtain in-depth information on the research topic. The six participants were either at a managerial level (professional roles) or upper-level academic staff (e.g. Dean, Associate Dean and professorial), and all were from different universities thus providing adequate cross-sectional data. In addition, the researcher discontinued collected data when there was little likelihood of further information to be obtained from individual interviews. The six interviewees revealed strong commonalities in the processes and issues of talent management and knowledge management in their universities, without significant divergence in their strategic perspectives.

Individual interviews were conducted via telephone and face-to-face. The interviewer arrived half an hour prior to the beginning time to prepare all required materials such as writing materials, and recording devices. The researcher had targeted possible interviewees and had invited them to participate in the research prior. The information sheet of the project, including the research objectives, was sent via the researcher's email account to the prospective respondents (Appendix D). Interviewees were thus fully informed about the nature of the research before being involved in the individual interviews. Once they agreed to participate, further details were provided, as well as the consent form. The interviewees needed to read the consent form and sign it before taking part in the interview. The participants were advised that they could withdraw at any time without consequence.

The individual interviews began with a short introduction where the interviewer welcomed participants and introduced himself and his research topic. A quick

summary explanation of the primary purpose of the individual interview was supplied to the interviewee before starting the actual interview. Individual interview protocol was adhered to with six focused questions, which were derived from the brainstorming session and the focus group session. Answering these questions was important to obtain an in-depth comprehension of the themes and category items contributing to both talent management processes and knowledge management processes. The interview ended when sufficient information was obtained. Subsequently, the researcher compiled a document that included the interview notes and a full transcription. In terms of recording, all individual phone and face-to-face interviews were audio recorded to save time and cost. After each interview, the researcher evaluated the details and formulated a synopsis of events before undertaking the procedures for transcription. Each individual interview was audio recorded in MP3 format, then transcribed, without eliminating the spontaneous character of the speeches.

5.8. Difficulties, challenges, and strategies to minimise the impacts of qualititive methods

Authors such as, Ritchie et al. (2013) have stated that although the qualitative research phase is helpful for qualitative data collection, it also posed potential difficulties and requires complex experiences. This is because there is a requirement to comprehend phenomena which are inherently and conceptually problematic (Ritchie et al. 2013). Conducting qualitative fieldwork is a challenge and a difficult process (Bamu et al. 2016). For example, qualitative data analysis is complicated as there are occasionally enormous amounts of data generated (Cowton & Downs 2015). In terms of environmental challenges, a research site may not be closely controlled by the researcher and this may affect the process of communicating with participants; another challenge is time restrictions which can influence the quality and quantity of data collected (Bamu et al. 2016). In the literature, there are further difficulties and challenges related to each technique of qualitative methods, which are outlined in the subsections that follow.

5.8.1 Brainstorming

Firstly, the brainstorming process takes time to learn and requires distinct skills (McMahon et al. 2016; Potter & Losee 1996; Sutton & Hargadon 1996; Wilson 2013). Secondly, even though the brainstorming methodology is popular, it can be misleading because fewer ideas than expected might be produced through its procedural mechanisms (Goldenberg & Wiley 2011; Kavadias & Sommer 2009). Finally, in terms of efficient and effective teams, the logistics of session facilitation as part of the brainstorming technique is difficult. For example, to get a brainstorming team of professionals to work together at the same time and in the same place can be problematic (Goldenberg & Wiley 2011; Hender et al. 2001).

However, to overcome the possible difficulties of the brainstorming method, there were a number of strategies adopted. For instance, in terms of learning the brainstorming method, the researcher joined an academic research group to increase knowledge and experience of group management before conducting pilot brainstorming, focus group, and individual interviews. This assisted in reducing adverse events and improved the quality of the data collected. In terms of increasing knowledge and experience of group management, membership in the research group allowed the researcher to learn skills and strategies in managing group dynamics, interaction and discussion; in focusing on active contribution and how roles can be distributed among group members; and in identifying 'group think' or participants dominating group opinion (Ayar 2012; Pabari 2016; Rosenlund 2017; Toiviainen 2003).

In the case of less ideas being produced, the study maximised the production of ideas through applying a number of procedures, including making a session less complex and as straightforward as possible (Helquist et al. 2017); avoiding blocking the production of ideas and evaluation or criticism of group members (Fillion 2015; Goldenberg & Wiley 2011); using an expert moderator to manage the brainstorming group; and supplementing brainstorming with a focus group discussion that results in a concentration of effort (Goldenberg & Wiley 2011). In the case of the logistics of session facilitation, the researcher limited the number of groups and sessions. There was only one brainstorming group and one session. This was enough to refine the research question, and explore themes (Dilshad & Latif 2013; Gururajan et al. 2014;

Shih et al. 2011; Torres & Carte 2014). Overall, by using the strategies discussed above, the brainstorming session can be a useful resource to inform the focus group session (Fitzgerald 2015; Gallo & Gonos 2014; Keeney 2012; Lee et al. 2015; O'campo et al. 2015).

5.8.2 Focus group

First of all, focus group data can be more complicated to analyse than individual interviews (Doody et al. 2013; Masadeh et al. 2016; Then et al. 2014). Given this, focus group results depend on dynamic responses of a group but these may be difficult to analyse (Masadeh et al. 2016; Sæther & Mehus 2016). This means it is difficult to conduct even one focus group (Morgan et al. 2016). The second drawback is that the environmental and social context may negatively influence comments from a group (Besen-Cassino 2017; Goyder & Shickle 2016; Then et al. 2014). Thirdly, the logistics of session facilitation, using the focus group technique, is difficult. For example, to get a focus group team of professionals from different specialisations to work together at the same time and in the same place can be challenging (Dilshad & Latif 2013; Mandić et al. 2013; Morgan et al. 2016; Then et al. 2014). The fourth challenge is that vocal participants are likely to dominate the focus group discussion and, in this sense, can be a negative influence on group dynamics (Dilshad & Latif 2013; Pearson & Vossler 2016; Sæther & Mehus 2016; Then et al. 2014; Zikmund et al. 2013). Finally, focus group members may conform to the common view, and findings cannot be generalised because a group may not be a representative sample of a target population (Cochran et al. 2016; Giles & Adams 2015; Mandić et al. 2013; Masadeh et al. 2016; Then et al. 2014).

The following strategies were followed to overcome the challenges of the focus group technique. In the case of data analysis, the research relied on the limited use of focus groups (a single session and group). This was enough to confirm the findings of a brainstorming session and define the scope of the individual interviews (Dilshad & Latif 2013; Gururajan et al. 2014; Torres & Carte 2014). For the environmental and social context, the researcher was careful to invite participants from a diverse range of social environments. All focus group participants were from a range of different sections of the university and a mixture of position levels. In regards to the logistics of

session facilitation, the researcher used his experience in "Negotiation Management" from when he was a manager at the University of Baghdad. This facilitated the approval process of talented individuals to participate in the focus group session. Moreover, there was a potential practical alternative to conduct focus group sessions via telephone, Skype or Zoom (Morgan et al. 2016).

To overcome a group member dominating in the session, the researcher was careful to provide equal time to all, to increase the attention capacity and sharing rate of participants (Goldenberg & Wiley 2011; Hägg & Musse 2016; Kavadias & Sommer 2009; Kornish & Hutchison-Krupat 2017; Litcanu et al. 2015). Moreover, an expert moderator was used to manage the focus group session (Cooper & Schindler 2011; Goldenberg & Wiley 2011; Gururajan et al. 2015; Krueger & Casey 2015; Litosseliti 2003; Sherriff et al. 2014; Silverman 2014; Zikmund et al. 2013). In the case of dealing with the generalisation of results, the focus group method was used to confirm the findings of a brainstorming session and to define the scope of the individual interviews. Therefore, the generated results of the research are based on the quantitative survey questionnaire technique, which was developed from the outcomes of the three steps of the qualitative study. Overall, in utilising the strategies discussed above, the focus group session was considered beneficial for developing the individual interviews protocol (Campbell 2005; Gururajan et al. 2015).

5.8.3 Individual interviews

Individual interviews have the following notable difficulties (Myers & Newman 2007):

1- **Lack of trust** – an interviewee may not trust an interviewer and he/she may consider in-depth information to be sensitive to give to the interviewer (Johnsrud 2016; Meho 2006; Pelteret 2014; Wu 2016). This leads to a lack of access to the required information which affects the quality of results.
2- **Lack of time** – lack of sufficient time for interview results may lead to creation of opinions under pressure, which in turn may lead to incomplete data collection (Johnsrud 2016; Pelteret 2014).

3- **Constructing knowledge** – when interviewees build their stories, they reflect on topics they may not have sufficient knowledge about. This can influence interviewers who usually want to show in-depth knowledge in their research, so it becomes difficult to construct a logical and consistent story (Johnsrud 2016; Pelteret 2014).
4- **The ambiguity of language** – in some cases when questions are asked about the topic under study, one may not get significant answers due to ambiguity and lack of full understanding by interviewees. This may inhibit the objectives of the interview process (Gupta & Hilal 2014; Johnsrud 2016; Pelteret 2014).
5- **Interviews can go wrong** – unintentional mistreatment or misunderstanding between the interviewer and the interviewee may occur, after which the interviewee may completely neglect the interview (Johnsrud 2016; Pelteret 2014).
6- **Elite bias**- The interviewer might meet only responsible participants, and if importance is only provided to their viewpoints, as opposed to other non-elite views, this may lead to bias and a narrower comprehension of the topic (Johnsrud 2016; Jolly 2017; Pelteret 2014; Woods 2011).

However, there are a number of solutions to decrease the disadvantages and overcome the difficulties of the individual interviews. In terms of lack of trust, the interviewer sought to establish a friendly relationship with the interviewee before conducting the interview (Golding 2009; Malloy et al. 2012). Likewise, the interviewer made the interview process a learning opportunity to increase self-knowledge (Hoerr 2004; Wright 2007). Similarly, to increase the trust of the interviewee, interviewees were informed of measures around anonymity and confidentiality (Doody & Noonan 2013). To address lack of time, the researcher controlled the interview time through organising an interview protocol that provided sufficient and flexible allowance of time (Penven 2016). In addition, the researcher focused on the key questions to achieve the research objectives, and reduced the overuse of time.

Dealing with limitations of constructing knowledge, the researcher was careful to select participants that were experts in the relevant field (Henderson 2016; Li et al. 2017; Zahidy et al. 2016; Zulkifli 2016). The relevant fields in this research were knowledge management and talent management. To deal with ambiguity of language, the interview questions were focused on understandable language with a clear structure

to reduce multiple interpretations and gain accurate answers (Brennen 2017; Doody & Noonan 2013; Ervo 2016; Martínez-Gómez 2014).

In the case of controlling an interview going wrong, the interviewer was 'able to respond by moving away from the topic, rephrasing the question or, in some cases, pausing or ending the interview' (Doody & Noonan 2013, p. 6). Similarly, the researcher ended an interview when the discussion got out of control. In terms of dealing with the elite bias in this specific research, individuals who are in the top and middle managerial levels needed to be interviewed (Durward & Blohm 2017; Kupfer et al. 2016; Sigvaldadóttir & Taylor 2016) because those individuals have the responsibility of managing action plans related to talent management processes and knowledge management processes in their universities.

Overall, by utilising the strategies discussed above, individual interviews provided helpful input to developing the survey questionnaire (Brédart et al. 2014; Creswell 2014; Howard et al. 2016; Veronese et al. 2016). Semi-structured interviews are especially suitable for identifying problems of concern when developing questionnaires (Brédart et al. 2014; Veronese et al. 2016), probing individual subjective experiences (Cheong et al. 2014; Howard et al. 2016), and obtaining enough understanding on the subject (Dilshad & Latif 2013; Gururajan et al. 2014; Torres & Carte 2014).

5.9. Summary

In this review of the qualitative methodology, a number of procedures were proposed for the planning and organising of the qualitative data collection. In this study, a brainstorming session and a focus group session, as well as singular interviews, were conducted to formalise data collection. The brainstorming session explicitly identified the beneficial aspects of prospective alternatives, and guided brainstormers to generate worthwhile alternatives and ideas as well as to understand the context. This was the case as most participants in a brainstorming session can create individual alternatives to any points raised in a group discussion. The ideas generated by the brainstorming session were useful sources for exploring the basic key themes of this research. The planning and organising of the focus group was important for creating structured group

interaction, with the discussions between group members enabling them to investigate what, why, as well as how they think that way; and in this way define the scope of the individual interviews. Individual interviews were beneficial as a subsequent phase of survey development, to inspect content validity, address participant perceptions of survey items, and obtain enough understanding of the subject.

This chapter has focused on qualitative data collection in nine sections. Section one has started by presenting an overview of this chapter. Section two introduced brainstorming, focus group discussions, as well as individual interviews. The third section provided an understanding of the rationale behind the selection of brainstorming, focus group, and individual interview techniques in collecting qualitative data. Pre-testing of the brainstorming group, focus group discussion, and individual interview questions was evaluated in section four. The next section provided an explanation of the qualitative pilot study. Section six addressed the practices and procedures related to the selection of participants for the brainstorming, focus group, and individual interview techniques. Section seven outlined the conducting of the brainstorming session, focus group session, and individual interviews. The difficulties and challenges in using each qualitative technique were addressed in section eight. In the same section, the strategies to overcome and control these issues were discussed. The ninth and final section has summarised the practices, justifications, and proceedings for the qualitative techniques utilised in this research.

CHAPTER 6: QUALITATIVE DATA ANALYSIS

6.1. Chapter overview

In the previous chapter, the qualitative data collection was explained. This chapter analyses the qualitative data. This chapter discusses all procedures and processes related to how the analysis has been conducted, and how the process has been used to extract factors and themes from the qualitative data. Data collected from qualitative multi-method studies were analysed by using both manual methods and NVivo 11 software to code, re-code and generate themes.

The qualitative data analysis contains six sections. Section 6.1 provides the overview of this chapter. The qualitative data analysis is introduced in Section 6.2. Reliability and validity of qualitative data are addressed in Section 6.3, while Section 6.4 discusses a pilot of the qualitative data analysis. The subsequent section (6.5) examines the qualitative data from the actual study to develop the survey quantitative questionnaire-items. This section is divided into four subsections: (1) qualitative data analysis to identify talent management themes; (2) validity check for thematic analysis: talent management processes; (3) qualitative data analysis to identify knowledge management themes; and (4) validity check for thematic analysis: knowledge management processes. Finally, the summary of this chapter is provided in Section 6.6. This chapter covers six sections which are presented in Figure 6.1.

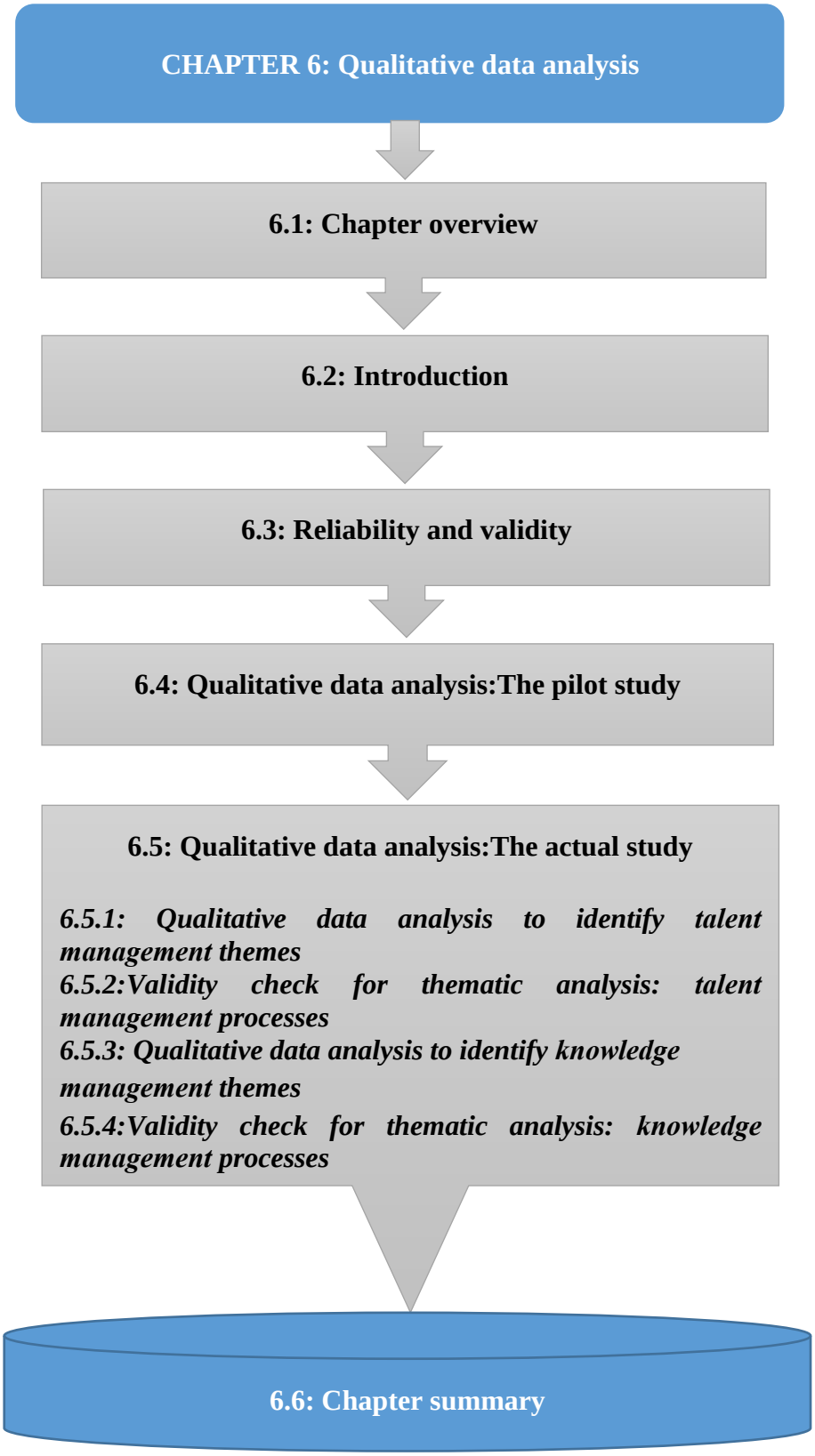


Figure 6.1: A graphical layout for Chapter 6

Source: Prepared by the researcher.

6.2. Introduction

As mentioned earlier in the "Theoretical underpinnings" chapter, the existing literature on the measurements of both talent management processes and knowledge management processes is extensive; however, the vast majority of research is outside the higher education sector, and the few studies from within are in non-Australian contexts. In this regard, the first key research objective of this study was *to understand the best processes that are currently used in managing talent and knowledge in Australian higher education.* This objective was achieved by conducting the three qualitative multi-method approaches that are commonly used in empirical studies, namely brainstorming, focus group discussions, and individual interviews.

As explained previously in Chapter four, to track themes, all transcripts and notes were analysed by using both manual methods and content analysis software (NVivo 11) to code, recode, and generate themes (Ngulube 2015; Paulus & Bennett 2017). As part of the manual data analysis, a thematic method was used to inductively derive and identify phrases and words that were related to the research question (Mayer 2015; Tong et al. 2014). *'Text query search*' is a technique in *NVivo* software to create a word cloud and comprehend the context of the words used (Chalanuchpong et al. 2017; Hatcher 2017).

To increase the internal validity of the qualitative results, some authors and researchers recommend using a three-stage approach of thematic analysis (Denton-Schneider 2016; Leitch et al. 2010; Perry et al. 2013). The qualitative procedures were based on a three-stage thematic analysis approach. The first stage was used to create a set of broad thematic items with associated descriptions regarding both talent management processes and knowledge management processes; the second stage was employed to refine items into a smaller set of categories; and finally, the third stage was utilised to develop categories that are relationally associated with one or more themes. Thus, the qualitative findings were employed to develop the quantitative questionnaire statement.

6.3. Reliability and validity

Even though reliability and validity have traditionally been related to quantitative studies, they have also been applied to qualitative studies (Golafshani 2003; Hansen & Husmoen 2016; Johnson & Christensen 2014). Ensuring reliability and validity is important for qualitative data analysis due to potential risks for participants (Gunawan & Wahab 2015; Gururajan et al. 2016). There is clear evidence to suggest that, when a researcher uses qualitative method combinations such as focus group and individual interviews in one study, it increases the validity and reliability of qualitative data, as the research themes may provoke similar and contradictory responses to the same questions (Arino et al. 2016; Bogdan & Biklen 2007; Mauceri 2014; Miles et al. 2014).

Reliability is a measure utilised to ensure the consistency of the research procedures used in gathering qualitative data (Wyse et al. 2016; Yurtseven & Altun 2015). It is measured by keeping records and transcripts, taking consistent notes, carefully selecting participants and performing other relevant procedures related to the qualitative data collection (Eschler et al. 2015). This research project ensured the consistency of the research procedures used in the qualitative data collection by keeping records and taking notes consistently. In addtion, this study ensured consistency by selecting participants who were considered to be experts in knowledge and talent management and carrying out other procedures associated with data collection during brainstorming, focus group, and individual interviews. Records of each method were made available to participants upon request.

In terms of validity of qualitative data, Gunawan and Wahab (2015); Veal (2017) define validity as the degree to which the information researched truthfully measures the specific topic that a researcher is attempting to measure. To increase the validity of qualitative results, some researchers recommend using a three-staged approach to thematic analysis in order to generate a rich data analysis (Denton-Schneider 2016; Leitch et al. 2010; Perry et al. 2013). Johnson and Christensen (2014); Maxwell (1992) have classified the validity of qualitative data into five types: ‘descriptive validity’, ‘interpretive validity’, ‘theoretical validity’, ‘internal validity’, and ‘external validity’.

1- Descriptive validity: how the data collected is accurate;
2- Interpretive validity: how the meanings and perspectives of the study participants are accurately translated by the researcher;
3- Theoretical validity: refers to the theoretical framework based on evidential data;
4- Internal validity: degree of justification in linking causal associations or relationships; and
5- External validity: how much of the research results may be applicable to other populations with similar characteristics.

The current research findings descriptively validate what had already been found, but this is significant because practical, rather than theoretical, data was gathered through a discussion with experts in both talent management and knowledge management. In addition, this study is interpretively validated through using both manual methods and content analysis software for data analysis. Theoretically, this study is based on several theoretical underpinnings, which provide the foundation for the study to construct its conceptual model around talent management processes and knowledge management processes. For example, human capital and knowledge-based theories were used as underpinnings of talent management and knowledge management constructs respectively.

In terms of internal validity, this study used a three-staged approach to thematic analysis. This method was selected for its validity in generating rich data analysis, and providing the reader with necessary information to evaluate the quality of the research (Corbin & Strauss 2008; Denton-Schneider 2016). The qualitative findings of the current study have external validity. For instance, all brainstorming and focus group participants were from a range of different sections of the university and a range of position levels, as well as from different universities, across the individual interviews. The qualitative findings developed the study's quantitative measurement. Hence, the generalisability of these findings may be applicable to other universities across Australia and may be adapted for other sectors outside higher education. This assisted in ensuring external validity of the study.

6.4. Qualitative data analysis: The pilot study

As indicated earlier in Chapter five, two questions were used to conduct the brainstorming and focus group process. In general, all participants responded to the two questions with ease. The discussed questions did not need change or modification. Throughout the qualitative pilot study, feedback was received from the supervisory team. In brief, the researcher manually analysed the data obtained from the pilot study without the assistance of NVivo software, as the data collected could easily be managed. In simple terms, the pilot qualitative methods were administered through the researcher's experience in negotiation management. In the pilot study, the participants were able to readily understand the questions. The questions were directly related to the first research objective titled:

"*to comprehend the best processes that are currently used in managing talent and knowledge in Australian higher education".*

Overall, the pilot's qualitative results provided helpful feedback to the researcher. For example, they contributed to increasing the researcher's experience and knowledge of both negotiation-management as well as group-management. Likewise, the trial's qualitative study allowed the researcher to learn skills and strategies for managing group dynamics, interaction and discussion; focusing on active contribution and how roles could be distributed amongst group members; and identifying 'group think' or when participants were dominating group opinion.

Tactics were learned for managing a dominant group member at one of the sessions. Moreover, it reassured the researcher about the feasibility, and provided valuable training and insight for conducting the actual brainstorming session, focus group, and the one-to-one interviews effectively. In addition, the researcher gained valuable information about how to manage groups without any bias in the brainstorming and focus group sessions. For example, the researcher was careful to provide equal time to all, to improve the attention capacity and degree of sharing by participants. Thus, the pilot study was a useful tool as it enhanced the design of the actual study (Truong 2017; Vogel & Draper-Rodi 2017).

6.5. Qualitative data analysis: The actual study

For tracking themes, all transcripts and notes were analysed by using both manual methods and content analysis software (NVivo 11) to code, recode, and generate themes (Ngulube 2015; Paulus & Bennett 2017). Manual data analysis was used for the thematic analysis to inductively derive and identify phrases and words that were related to the research question (Mayer 2015; Tong et al. 2014). 'Text query search' is a technique in NVivo software to create a word cloud and comprehend the context of the words used (Chalanuchpong et al. 2017; Hatcher 2017). For each text query search, a variety of keywords and other terms were specified. For instance, the 'reward' text query search included terms such as 'rewarded', 'rewarding', and 'rewards' within the search mechanism.

Qualitative content analysis is an accepted technique of textual analysis, especially in the area of large-scale communications (Drisko & Maschi 2015; Elo & Kyngäs 2008; Hatcher 2017; Mayer 2015; Silverman 2014; Zikmund et al. 2013). This technique systematically analyses the content of a body of communication, (Saberiyan 2015; Tharenou et al. 2007; Zikmund et al. 2013), 'written (i.e. open-ended surveys, personal communications, letters, diaries, short stories, newspapers or magazines, and theoretical or methodological trends in journal papers), verbal (i.e. interviews, focus groups, radio programs, and folk songs), or visual (i.e. films, videos, and TV programs)' (Hamad et al. 2016, p. 2; Ozuem et al. 2016; Tharenou et al. 2007). It was selected for this study for the following three reasons:

(1) This technique can create nodes, themes and other formations for sorting, classifying and analysing the data (Venkatesh et al. 2013; Wahyuni 2012). This can be helpful in the use of structures for exploring mutual relations and determining the strength of themes (Gururajan et al. 2016).

(2) The content analysis allows a researcher to have a deeper understanding of the target population (Cheong et al. 2014).

(3) It is considered one of the most effective methods of analysing written material (Elo et al. 2014).

In brief, this section can be divided into four integrated parts. The first part relates to qualitative data analysis for identifying talent management processes in the higher education environment. The second part is a validity check for thematic analysis: talent management processes. This is followed by qualitative data analysis to identify knowledge management processes used in the higher education environment. The fourth and final part is a validity check for thematic analysis: knowledge management processes.

6.5.1 Qualitative data analysis to identify talent management processes

Talent management has been identified through a number of processes while using qualitative methods. Table 6.1 summarises the results of the qualitative phase in regards to talent management processes.

Table 6.1: A summary of selected talent management processes mentioned via participants in the qualitative phase

No.	Themes and subthemes	Participants																						Total	%
		Brainstorming session						Focus group session											Individual interviews							
		1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	23	
1	**Retaining talent:**																								**22**	**95.6**
	• Competitive compensation and benchmarking	✓															✓		✓	✓		✓	✓	✓		
	• Employee motivation	✓	✓	✓		✓		✓			✓	✓	✓			✓	✓	✓	✓	✓	✓					
	• Employees empowerment				✓		✓	✓		✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		
2	**Attracting talent:**																								**20**	**86.9**
	• Career advancement	✓	✓		✓			✓		✓	✓		✓		✓				✓	✓	✓	✓	✓	✓		
	• Work-life balance								✓					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		
	• Work environment and conditions	✓	✓	✓						✓									✓	✓	✓			✓		
3	**Developing talent:**																								**20**	**86.9**
	• Training need identification		✓	✓				✓	✓		✓	✓							✓	✓	✓	✓	✓	✓		
	• Skill gaps analysis			✓													✓		✓		✓	✓	✓			
	• Appropriate development strategies						✓									✓			✓	✓	✓	✓	✓	✓		
	• Coaching talent	✓			✓		✓	✓		✓	✓	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓		
	• Leadership development						✓			✓		✓				✓			✓	✓	✓		✓	✓		
	• Succession planning	✓					✓												✓					✓		
4	**Performance management**									✓			✓	✓			✓		✓	✓	✓	✓	✓	✓	**10**	**43.4**
5	**Talent acquisition**								✓					✓		✓									**8**	**34.7**
	• Building talent	✓		✓								✓					✓						✓			

These results include two steps: the first one being a brainstorming session and a focus group session, and the second step consisting of individual interviews. In step one, participants mentioned a number of key themes around talent management that are used in Australian higher education. Step two then developed the protocol for the individual interviews of talent management processes.

6.5.1.1 Step one

6.5.1.1.1 The brainstorming session

In this data analysis, it was found that participants provided valuable ideas about the talent management processes which are used in Australian higher education. The brainstorming session identified eleven sub-themes of talent management. These were grouped into four key themes (Mohammed, Hafeez-Baig, et al. 2018): talent retention, talent development, talent attraction, and talent acquisition. Each of these themes and sub-themes was summarised, and the thematic analysis described. The results are detailed below, using abbreviation to preserve participant anonymity. For example, B1P2 means brainstorming one, participant two. Table 6.2 below summarises the data analysis of the brainstorming session for talent management processes.

Table 6.2: Talent management processes used in Australian higher education based on the brainstorming data

No.	Themes	Participants mentioned in the brainstorming session						∑	%
		1	2	3	4	5	6		
1	**Retaining talent:**							6	100
	• *Competitive compensation*	✓							
	• *Employee motivation*	✓	✓	✓		✓			
	• *Employee empowerment*				✓		✓		
2	**Developing talent:**							5	83.3
	• *Coaching talent*	✓			✓				
	• *training needs*		✓	✓					
	• *Appropriate development strategies*						✓		
	• *Skills gap analysis*			✓					
	• *Succession planning*	✓					✓		
3	**Attracting talent:**							4	66.6
	• *Work conditions*	✓	✓	✓					
	• *Career advancement*	✓	✓		✓				
4	**Talent acquisition:**							2	33.3
	• *Building talents*	✓		✓					

1. Talent retention

As can be seen in Table 6.2, all respondents agreed that Australian educational institutions have a desire to retain talented staff. This is because talent retention plays a key role in achieving institutional growth. Participants mentioned a number of a specific key words such as "money"and "reward". They also mentioned some other phrases that point to talent retention process. Text query searches in Figures 6.2 and 6.3 indicate that talent retention as a talent management process is widely used in educational institutions. The views of participants can be divided into three sub-themes: (i) competitive compensation; (ii) employee motivation; and (iii) employee empowerment.

(i) ***Competitive compensation***

One out of six participants indicated that competitive compensation was an essential element of success in retaining highly qualified individuals within an organisation. Nonetheless, the university may not be very concerned with this as an essential element of talent retention due to the regional position of the university. The comment below illustrates this:

> *But I guess, overall, at [the university], we're probably lucky insofar as we do have probably on average, people do stay here longer than some places. There's probably less competition in Toowoomba, but of course, Brisbane's just down the road, if people want to go there.* (B1P1)

This means that there are fewer employment opportunities within the region, and comparable employment opportunities are likely to be a considerable distance away.

(ii) Employee empowerment

Participants mentioned that the empowerment of employees was an essential process in assisting educational institutions to retain their talented staff through increasing productive time, as well as encouraging new ideas and engagement among individuals. However, even if employees are empowered they may still leave the university at any time. Two informants reported for example that:

> *"For individual or a team, to allow them to bring ideas back to organisation, encourage ideas in different ways of thinking. Rather than just doing what's been done in the past, so just keep going. Encourage new things, new development"*. (B1P4)

> *"I guess, to retain staff, I mean, at the end of the day, they've got to do what's right for them too. Like you can't force them to want to stay. And no matter what their talent is, if their desires are not".* (B1P6)

(iii) Employee motivation

Participants' brainstorming showed that reward as a process of talent retention was very important. This can be achieved through the ability of the university to employ a variety of methods for rewarding and satisfying its employees. In general, motivational and valued work, professional advancement, and a supportive learning environment appear to be the key to retaining talented employees. Educational institutions should thus ensure that talented individuals are satisfied and motivated through appropriate remuneration in all instances. Text query searches in Figures 6.2a and 6.2b indicate that talent retention is actively used within Australian educational institutions.

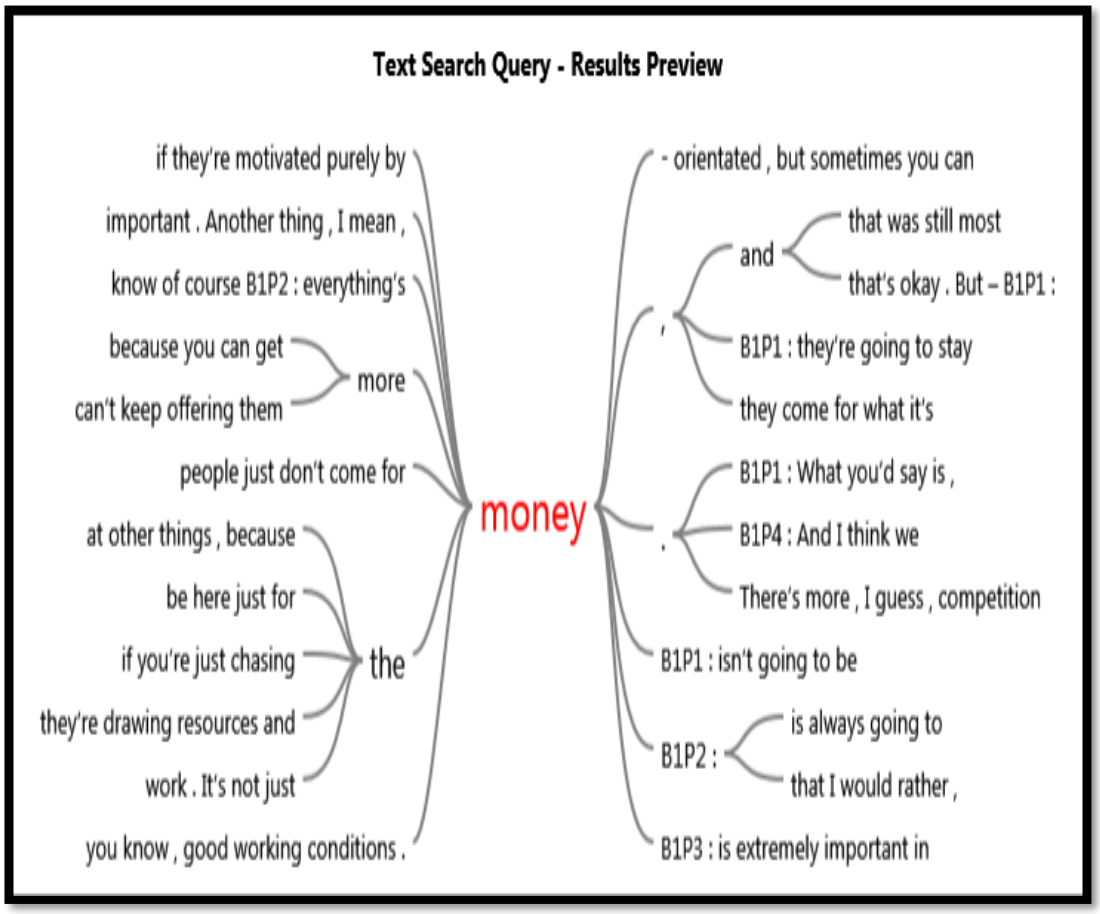


Figure 6.2a: Text search query for the Talent Retention theme (*Employee motivation*)

Source: Nvivo output

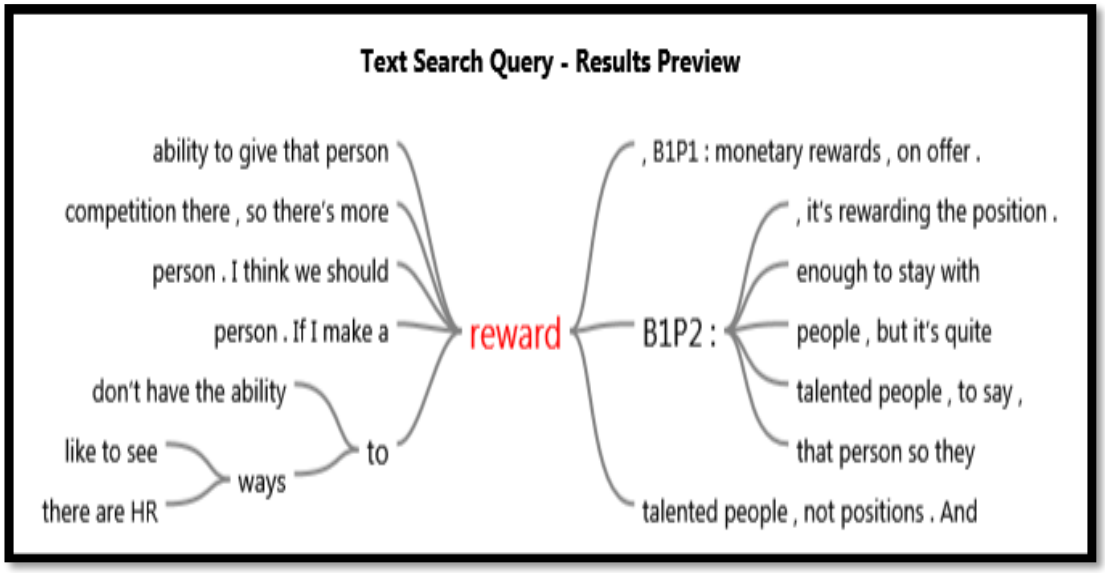


Figure 6.2b: Text search query for the Talent Retention theme (*Employee motivation*)

Source: Nvivo output

Overall, as shown in the content analysis above, all six participants emphasised that talent retention is used in Australian higher education. They indicated that competitive compensation, the empowerment of employees, and employee motivation were essential to retain talented individuals. The next explored theme in the brainstorming session was talent development.

2. Talent development

It can be seen from Table 6.2 that the majority of the respondents stated that educational institutions had an enthusiasm for developing their talent. The participants identified five sub-themes in this respect: (i) coaching talent; (ii) training needs; (iii) appropriate development strategies; (iv) skills gap analysis; and (v) succession planning. It was observed that both personal and functional development in the educational institutions were significant factors for achieving high talent development through learning skills. Participants also mentioned that the ability of an organisation to introduce enough opportunities to develop talented individuals and increase the level of knowledge were significant factors. Participants mentioned that educational institutions identified job description, learning content systems and competency

models depending on the required training of its talented staff. For instance, as one participant said:

> *"As manager, you generally can see where the gaps are going or you have an idea where people need some skill sets, for someone to do that job".*(B1P3).

Participants also mentioned the succession planning process. They indicated that their university faced some issues in selecting talented individuals, like identifying the right candidates for a leadership position. For example, two participants said:

> *"And I guess, some of the challenges and things that, just from some of the stuff that people have been talking about with that talent too, is that we find succession planning".*(B1P1)

> *"(…) But I guess too, nurturing, when you do see those talented people, I guess, trying to help nurture those skills as well. Some of the things for us, it's around leadership skills".*(B1P6)

In general, by using the content analysis shown below, five out of six participants (83.3%) commented that coaching talent, training needs identification, and appropriate development strategies were important to develop talented individuals in educational institutions. Moreover, participants also mentioned the ability of the university to identify competencies needed to develop key talents. Text query searches in Figures 6.3a, 6.3b, and 6.3c indicate that talent development is used within Australian educational institutions.

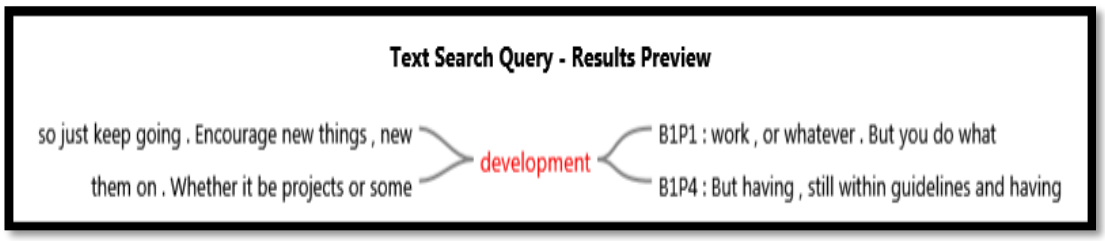


Figure 6.3a: Text search query for the Talent Development theme

Source: Nvivo output

Figure 6.3b: Text search query for the Talent Development theme

Source: Nvivo output

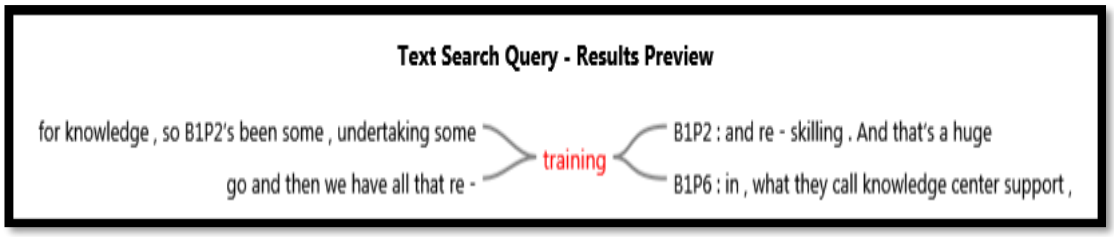


Figure 6.3c: Text search query for the Talent Development theme

Source: Nvivo output

3. Talent attraction

In this thematic analysis, participants provided valuable ideas of the talent a***ttraction process*** used in Australian higher education for engaging talented individuals. As shown in Table 6.2, four out of six participants emphasised that this process is used in Australian higher education. The results confirmed that Australian educational institutions, such as the universities in this study, are interested in attracting the rare talent to work because that talent has a great impact on achieving goals, success, and institutional growth in a dynamic industry environment. This theme includes two sub-themes that participants mentioned: (i) work conditions; and (ii) career advancement. For instance, two participants said:

> *"And people just don't come for money, they come for what it's like to work in. And the problem is people every day, are looking for somewhere else to work. It's not just the money".* (B1P2)

> *"I agree with all, but insofar as yeah, I've worked in a few different places before coming to [the university]. I've been here a fair while now. And the reason for that is, I guess, because [the university] does offer a pretty good balance in that... I'm a country person, so I'm not really attracted to the city".* (B1P1)

Software data analysis, text query searches in Figures 6.4a, 6.4b and 6.4c indicate that talent attraction as a talent management process is used in educational institutions.

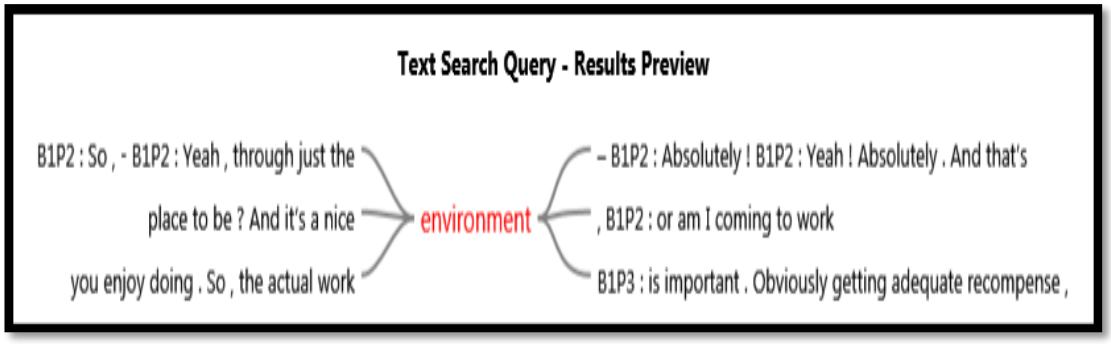


Figure 6.4a: Text search query for the Talent Attraction theme (*Work environment*)

Source: Nvivo output

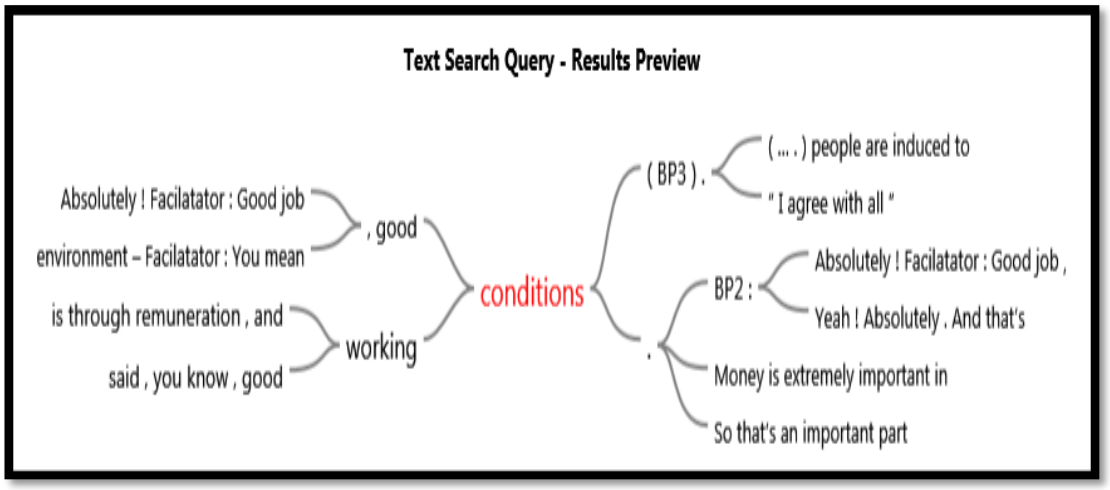


Figure 6.4b: Text search query for the Talent Attraction theme (*Work-life balance*)

Source: Nvivo output

Furthermore, participants also indicated that job enrichment as representative of career advancement is important to attract talented individuals.

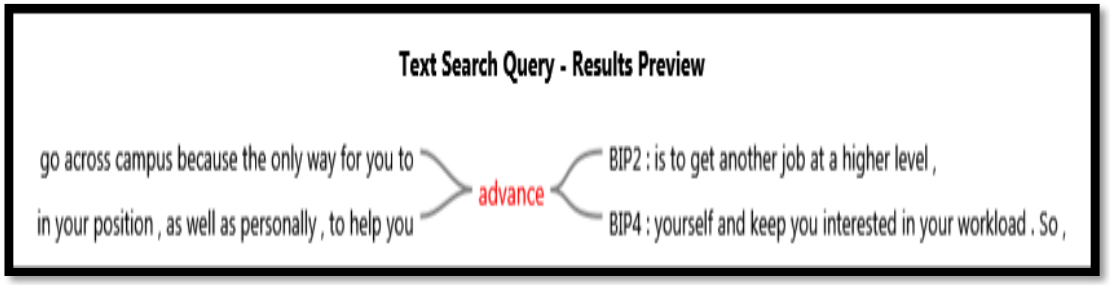


Figure 6.4c: Text search query for theTalent Attraction theme (*Career advancement*)

Source: Nvivo output

Overall, the content analysis above shows that two-thirds of participants emphasises that talent attraction as a talent management process was used in Australian higher education. They indicated that good work conditions representing a work-life balance, and job enrichment representing career advancement, are both important for attracting talented individuals.

4. Talent acquisition

As can be seen from Table 6.1, two participants indicated that acquiring skilled talented individuals is a complex process within Australian educational institutions' requirements. They highlighted different levels of employee skills in terms of talent asquisition:

> *"Some of those people are coming in with a fair bit of talent straight up, others you're building that talent, (.....).* (B1P1)

> *"We've supported movements within our organisation, so people build up their skills. The talented ones tend to get poached by these characters and they get moved further into the organisation. (...)okay, as an opportunity comes up you can help someone to at least, to just say, try and do something like that or try to build their skills".* (B1P3)

6.5.1.1.2 The focus group session

Data analysis of the focus group session often assisted in confirming the brainstorming results and defining the scope of the individual interviews by exploring extensive themes. Within the focus group session sixteen subthemes of talent management could be identified. These were grouped into six key themes: talent retention, talent attraction, talent development, talent acquisition, performance management, and leadership development. Some of the findings were similar to the results of the brainstorming approach; however, they were additional significant findings and included performance management and leadership development. Each of these themes and sub-themes has been summarised, and the thematic analysis described. The results are detailed below, using abbreviations to preserve participant anonymity. For example, F1P2 means focus group session one, participant two. Table 6.3 below summarises the data analysis of the focus group session for talent management processes.

Table 6.3: Talent management processes used in Australian higher education

No.	Themes	Participants of the focus group session											Σ	%
		1	2	3	4	5	6	7	8	9	10	11		
1	**Retaining talent:**												10	90.9
	• *Competitive benchmarking*										✓			
	• *Employee empowerment*	✓		✓	✓	✓		✓	✓		✓	✓		
	• *Employee motivation*	✓			✓	✓	✓			✓	✓	✓		
2	**Attracting talent:**												10	90.9
	• *Work environment*			✓										
	• *Career advancement*	✓		✓	✓		✓		✓					
	• *Work-life balance*		✓					✓		✓	✓	✓		
3	**Developing talent:**												9	81.8
	• *Coaching talent*	✓		✓	✓	✓				✓		✓		
	• *Training need identification*	✓	✓		✓	✓								
	• *Opportunities for talented development*					✓						✓		
	• *Training and support*	✓							✓					
	• *Proper development strategies*									✓				
	• *Skills gap analysis*										✓			
4	**Talent acquisition**		✓					✓		✓			5	45.4
	Building talents					✓					✓			
5	**Performance management**			✓			✓	✓			✓		4	36.3
6	**Leadership development:**												3	27.2
	Role-assignment			✓										
	Outcomes of leadership development									✓				
	Requirement of leadership					✓								

1. Talent retention

It can be seen from Table 6.3 that the majority of the respondents (90.14%) expressed the desire of the university to maintain unique talent as represented by both academic and professional individuals. This is due to the performance provided by those individuals and their strategic roles in achieving organisational success. Software data analysis, in the form of text query searches are shown in Figures 6.5a, 6.5b, and 6.5c. Participants of the focus group mentioned "enrich, "money", "reward" and "motivate". Manual thematic analysis in Figure 6.5d indicates that talent retention as a talent management process is used within Australian educational institutions. This Figure provides a clear summary of employee motivation and employee empowerment as

core elements of retaining talent. According to the opinions of the participants, there is an additional element of competitive benchmarking. These practices are essential to retain talented individuals.

(i) Competitive benchmarking

One out of eleven participants indicated that it was difficult for a regional university to retain and attract talented staff, because of competition with large universities in urban centers. The comment below illustrates this:

> *"Where we'd actually attracted staff from all over Australia particularly Melbourne that we'd managed to get to regional New South Wales, which was quite a feat. Fantastic staff. All of those left in the restructure; they never kept one of the staff"*. (F1P10)

Contrary to the result of the brainstorming session, there is always a possibility that talented staff may actually leave the university. Even though they are fewer employment opportunities within the region, staff may be willing to consider more options or alternative opportunities even if these are a considerable distance away.

(ii) Employee empowerment

Participants mentioned that non-monetary rewards were an essential process in assisting educational institutions to retain their talented staff through increasing productive time, supporting and encouraging employees, as well as enhancing skills. Valued work, professional advancement, and a supportive learning environment prove to be key elements for retaining talented employees. In Figure 6.5a, focuus group participants' responses indicate that job enrichment is an essential factor for retaining talented individuals.

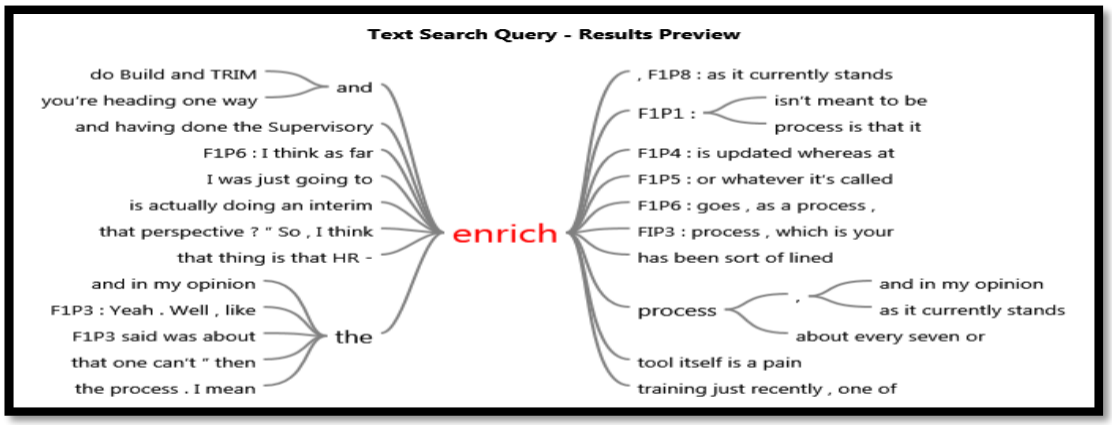


Figure 6.5a: Text search query for the Talent Retention theme (Employee empowerment)
Source: Nvivo output

(iii) Employee motivation

The focus group participants mentioned that rewards were very important to retain staff members through an emphasis on the ability of educational institutions to employ a variety of methods for managing employees effectively, such as monetary rewards. This is indicated in Figures 6.5b and 6.5c.

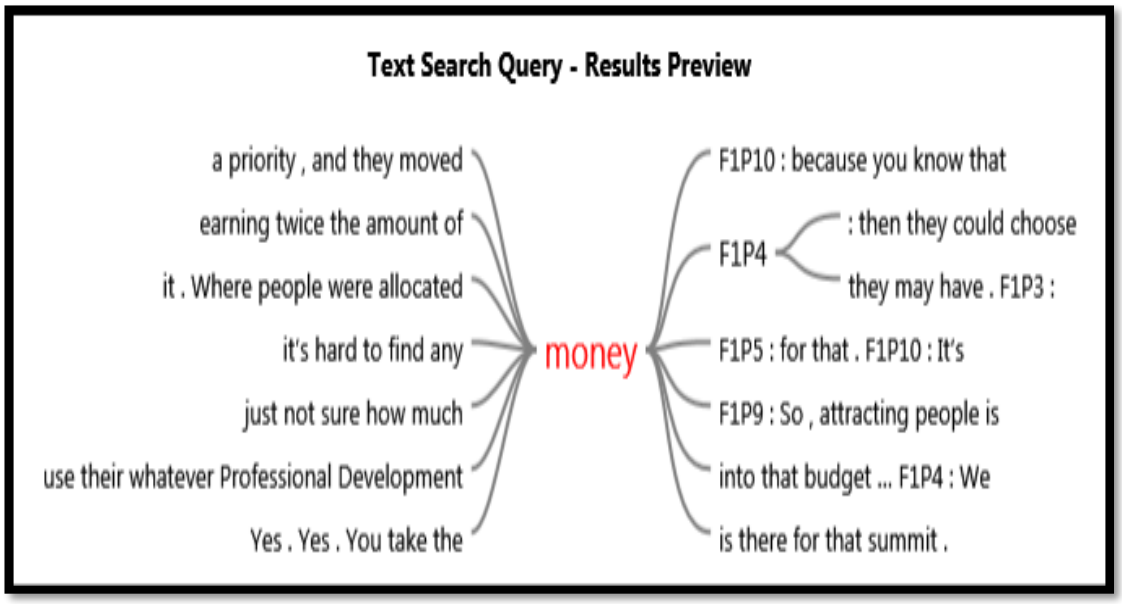


Figure 6.5b: Text search query for the Talent Retention theme (*Employee motivation*)

Source: Nvivo output

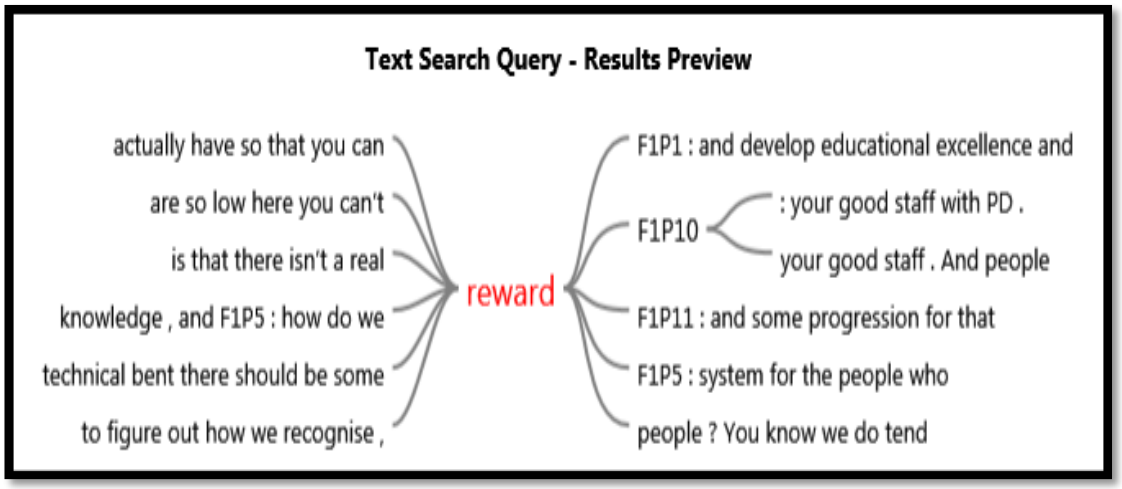


Figure 6.5c: Text search query for the Talent Retention theme (*Employee motivation*)

Source: Nvivo output

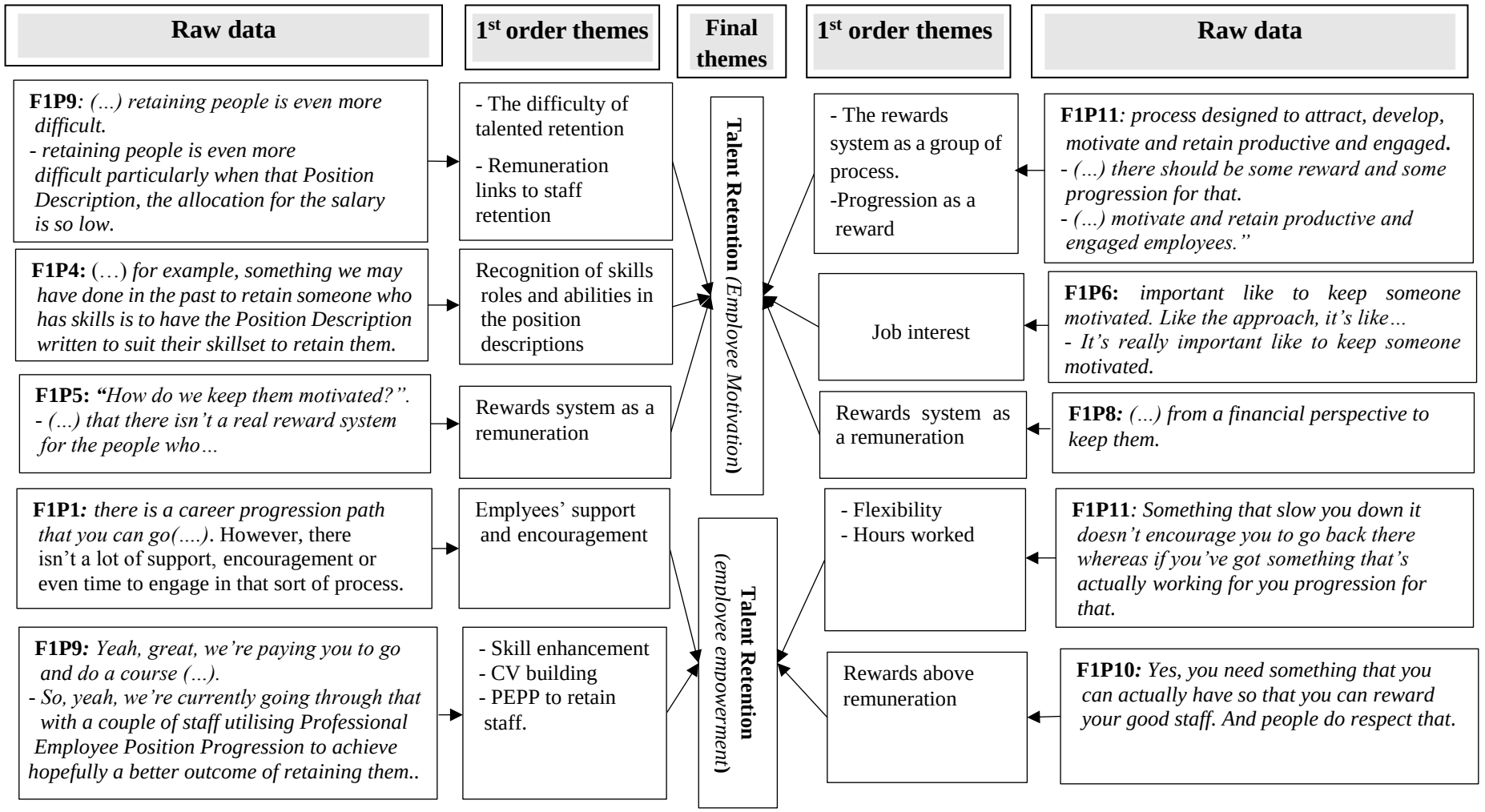


Figure 6.5d: Data structure for the Talent Retention theme (*Employee motivation and employee empowerment*)

2. Talent attraction

The outcomes emphasised that the university is interested in attracting talented individuals to careers because those individuals have a significant impact on achieving its aims, growth, and organisational success. As can be seen in Table 6.3 above, ten out of eleven participants emphasised that this process is used in Australian higher education. This theme includes three sub-themes that participants mentioned namely (i) work-life balance; (ii) work environment; and (iii) career advancement. The findings show that the university has an optimal career progression system, a nice environment and locality for attracting talented employees. For instance, one out of eleven participants mentioned that the actual work environment is important for attracting talented employees. The comment below illustrates this:

"I suppose the work you're doing, it's important to have good quality work that you enjoy doing. So, the actual work environment is important".(F1P3)

However, there are some limitations for attracting those individuals to the university. For example, the university is a relatively small sized university, and talented individuals may choose to get a job elsewhere. Overall, both the content analysis and manual analysis that are outlined in Figures 6.6a, 6.6b, and 6.6c below, indicate that good work conditions representing the work-life balance, and job enrichment representing career advancement are important in attracting talented individuals and are used in educational institutions in Australia.

Figure 6.6a: Text search query for the Talent Attraction theme

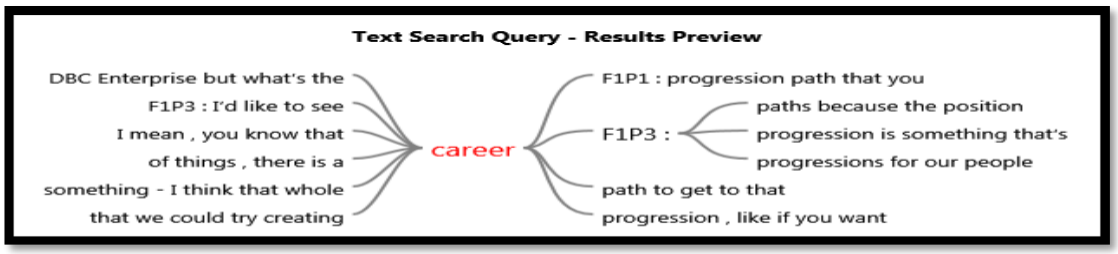


Figure 6.6b: Text search query for the Talent Attraction theme

Source: Nvivo output

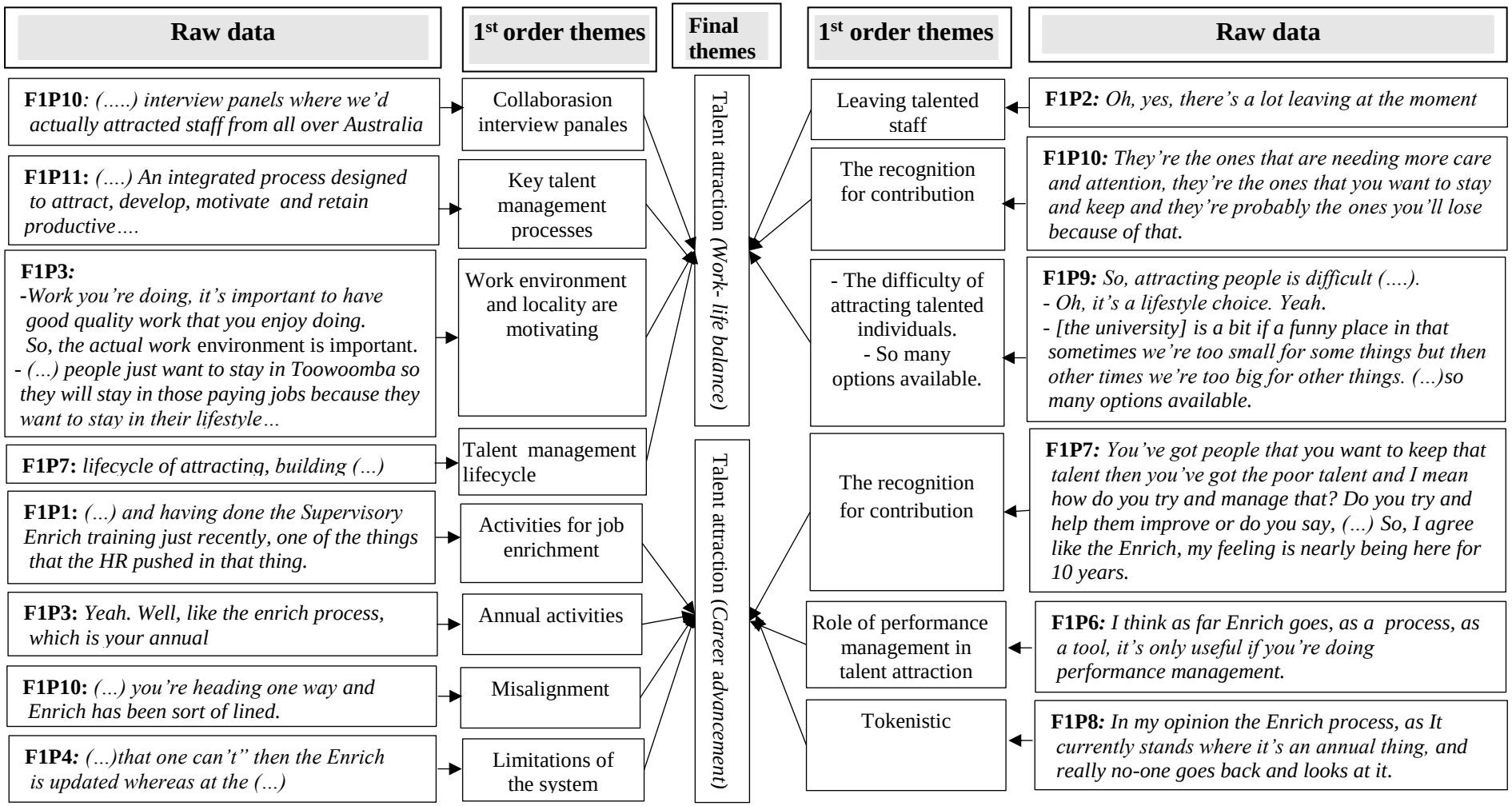


Figure 6.6c: Data Structure for the Talent Attraction theme *(Work-life balance and career advancement)*

3. Talent development

As shown in Table 6.3 above, the majority of the respondents (81.8%) expressed the willingness of the university to make talented employees learn tasks at ever-increasing levels to enable them to become more rapidly productive. It was observed that both the personal and functional development in the university were significant to achieve high talent development through training, education and learning skills. The university supports academic staff through providing suitable development opportunities to gain required knowledge and skills. As one participant said:

> *"Well, yeah, where is that gap; who's going to actually get the people trained-upon using the technology for the way they want to teach?".*(F1P10)

This means that the university identifies job descriptions, learning content systems and competency models depending on the required training of its talented staff. However, there are some challenges which may obstruct talent development such as availability of experts in talent management. In general, software and manual data analysis, text query searches in Figures 6.7a and 6.7b and manual thematic analysis in Figure 6. 7c indicate that talent development as a talent management process is widely used in Australian higher education institutions.

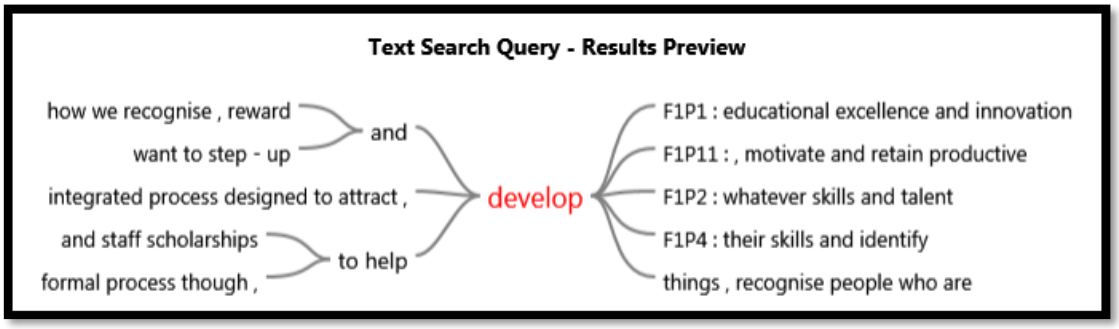


Figure 6.7a: Text search query for the Talent Development theme *(General)*

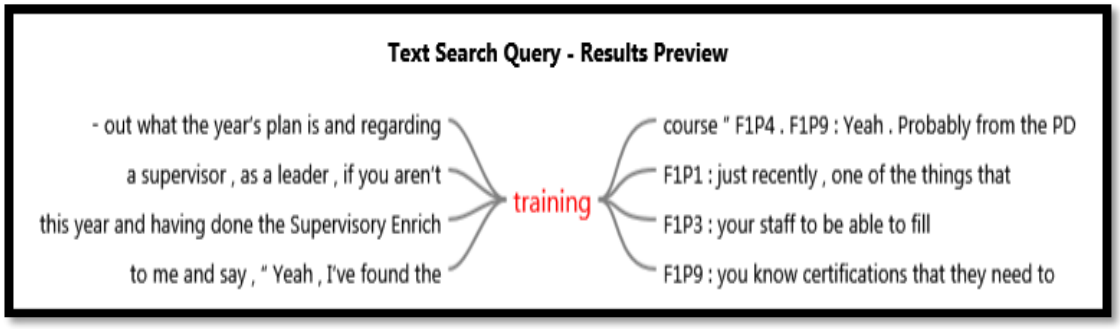


Figure 6.7b: Text search query for the Talent Development theme *(Coaching talents*)
Source: Nvivo output

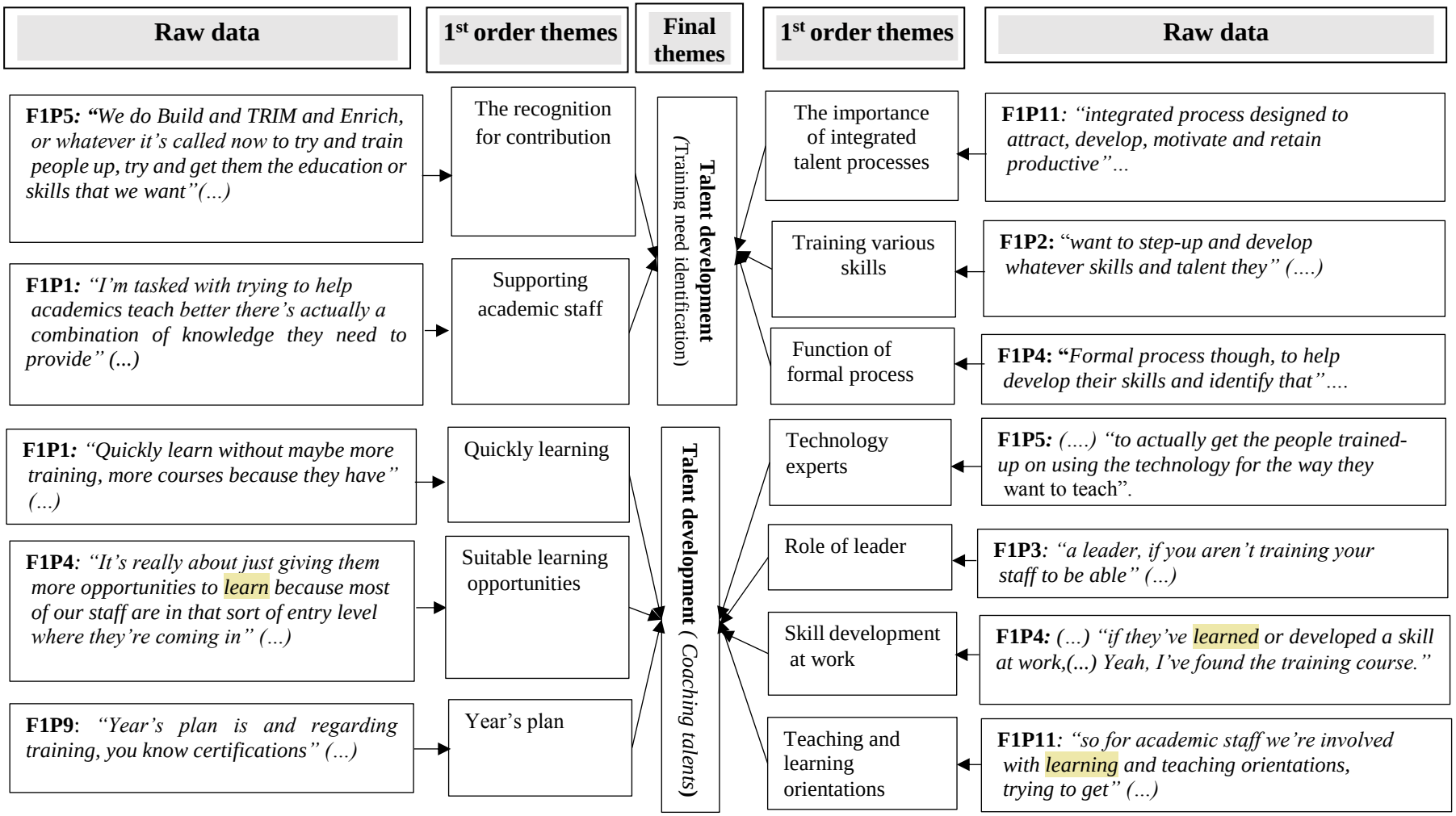


Figure 6.7c: Data Structure for the Talent Development theme (*training need identification and coaching talents*)

In total, by using the content analysis indicated above, nine out of eleven participants (81.81%) emphasised that this process is utilised in Australian higher education. They indicated that coaching talent, training need identifications, opportunities for talent development, training and support, appropriate development strategies, and skills gap analysis were important in developing talented individuals.

4. Talent acquisition

As presented in Table 6.3 above, five participants indicated that acquiring skilled talented individuals is needed to meet the university's requirements. Text query searches in Figure 6.8a and manual thematic analysis in Figure 6.8b below, indicate that talent acquisition is employed in educational institutions in Australia.

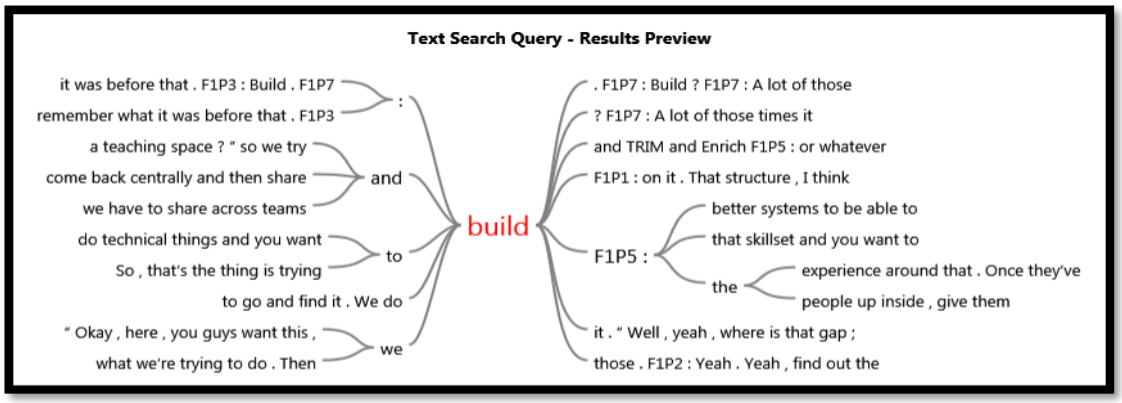


Figure 6.8a: Text search query for the Talent Acquisition theme
Source: Nvivo output

5. Performance management

As can be seen from Table 6.3 above, four participants discussed the necessity of a performance management process within talent management processes in educational institutions in Australia. They indicated that although the performance management system was complex, it could be an actual tool for achieving job satisfaction for the university's employees through applying a job enrichment strategy. This is shown in Figure 6.9a and 6.9b below:

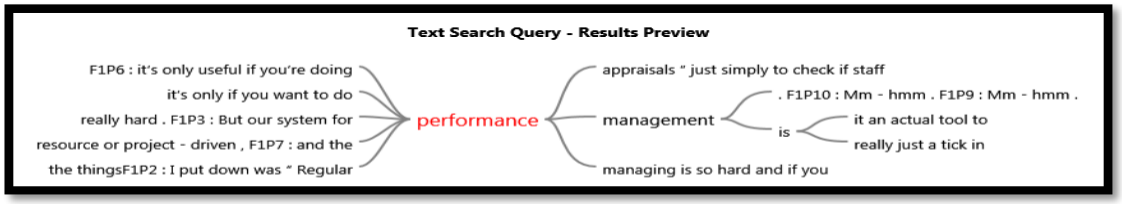


Figure 6.9a: Text search query for the Performance Management theme
Source: Nvivo output

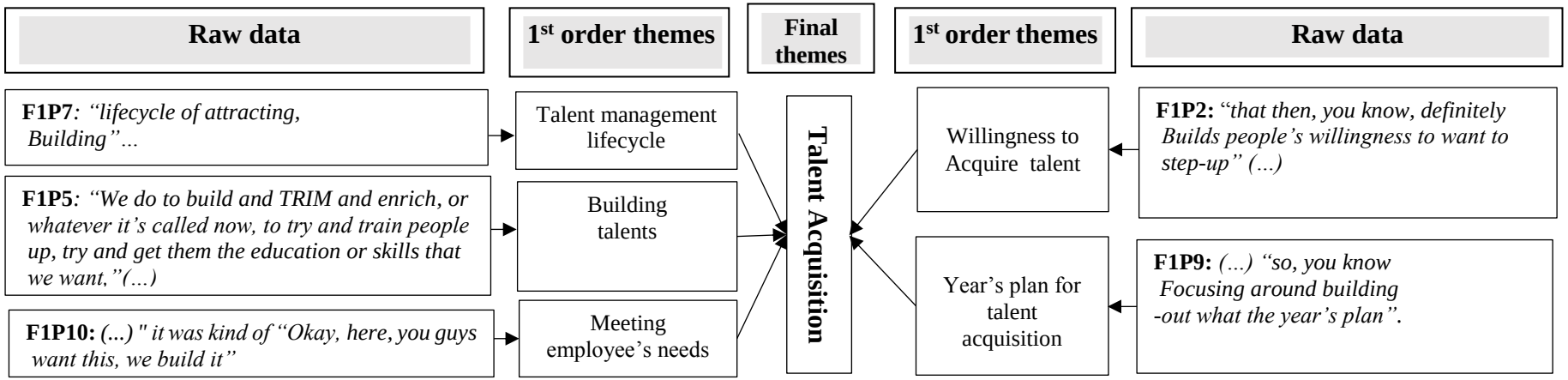


Figure 6.8b: Data structure for the Talent Acquisition Theme

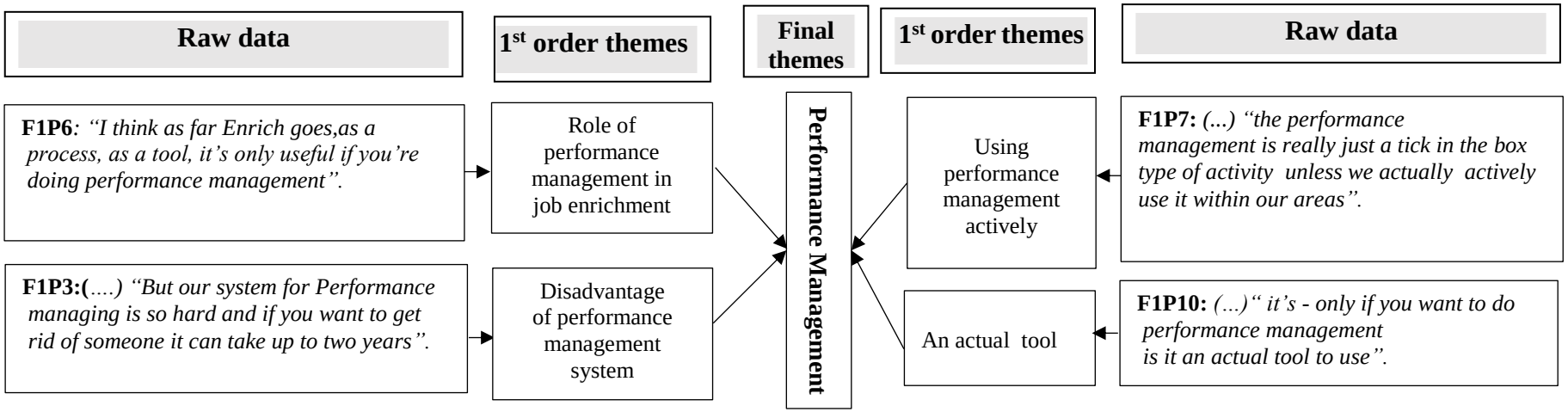


Figure 6.9b: Data structure for the Performance Management theme

6. Leadership development

Looking at Table 6.3 above, three participants mentioned that the leadership development process is used in Australian higher education institutions. This theme can be understood in terms of role-assignment, outcomes of leadership development, and requirement of leadership. Software data analysis, text query searches in Figures 6.10a and manual thematic analysis in Figure 6.10b indicate that leadership development as a talent management process is used in the university.

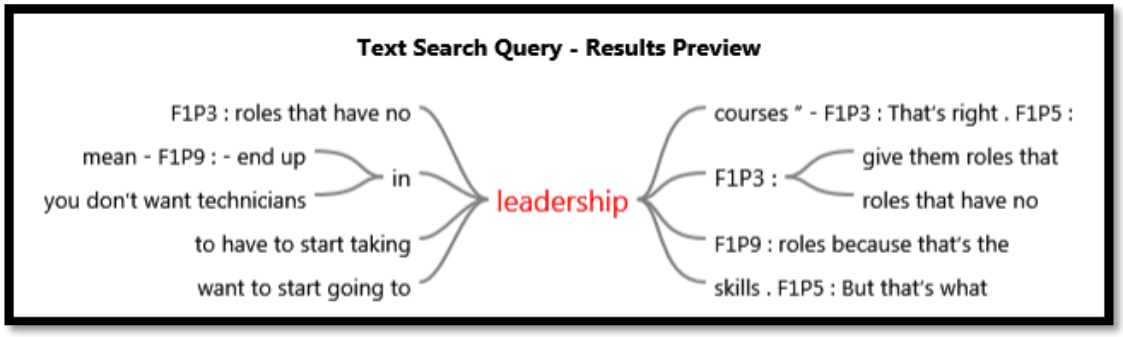


Figure 6.10a: Text search query for the Leadership Development theme

Source: Nvivo output

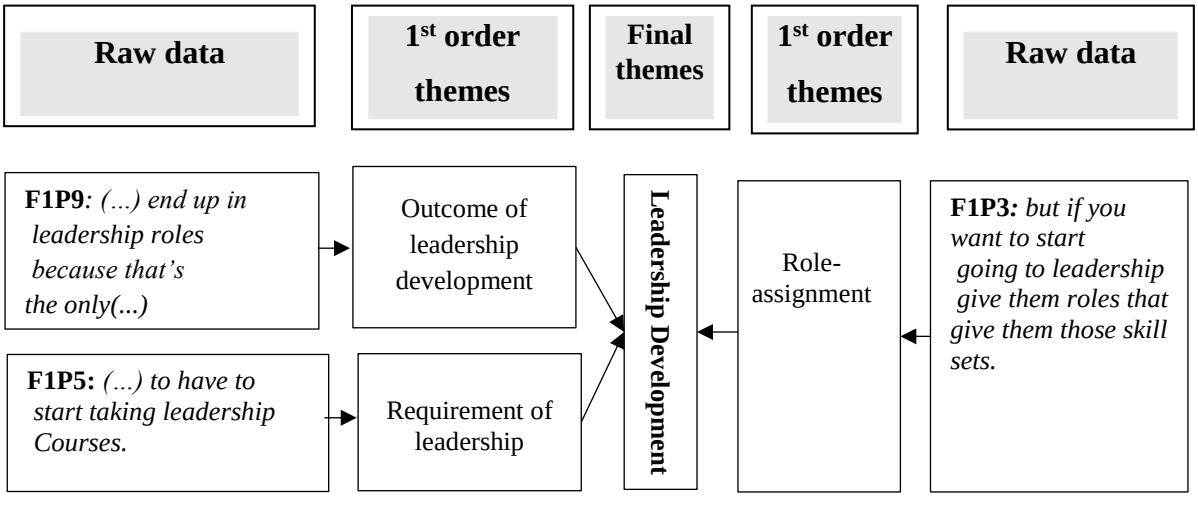


Figure 6.10b: Data structure for the Leadership Development theme

In conclusion, the combined talent management outcomes of the brainstorming data analysis and the focus group data analysis, is summarised in Table 6.4.

Table 6.4: A summary of selected talent management processes via participants in the brainstorming session and the focus group session

No.	Themes and subthemes	Participants																Total	%
		A brainstorming session						A focus group session											
		1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10	11	17	
1	**Talent retention:**																		16	94.11
	• *Competitive compensation*	✓															✓			
	• *Employee motivation*	✓	✓	✓		✓		✓			✓	✓	✓			✓	✓	✓		
	• *Employee empowerment*				✓		✓	✓		✓	✓	✓		✓	✓		✓	✓		
2	**Talent attraction:**																		14	82.35
	• *Work-life balance*								✓					✓		✓	✓	✓		
	• *Work environment and conditions*	✓	✓	✓						✓										
	• *Career advancement*	✓	✓		✓			✓		✓	✓		✓		✓					
3	**Talent development:**																		14	82.35
	• *Coaching talent*	✓			✓			✓		✓	✓	✓				✓		✓		
	• *Training need identification*		✓	✓				✓	✓		✓	✓								
	• *Opportunities for talented development*											✓						✓		
	• *Training and support processes*	✓						✓							✓					
	• *Appropriate development strategies*						✓									✓				
	• *Skills gap analysis*			✓													✓			
	• *Succession planning*	✓					✓													
4	**Talent acquisition**								✓					✓		✓			7	41.17
	• *Building talents*	✓		✓								✓					✓			
5	**Performance management**									✓			✓	✓			✓		4	23.52
6	**Leadership development:**																		3	17.64
	• *Role-assignment*									✓										
	• *Outcome of leadership development*															✓				
	• Requirement of leadership											✓								

As can be seen from Table 6.4, the majority of participants (94.11%) discussed talent retention, followed by talent attraction and talent development (82.35%). The subsequent, but less frequently, discussed processes were talent acquisition (41.17%), performance management (23.52%), and leadership development (17.64). Relatively minor attention was paid to leadership development (17.64%). Thus, the three dominant themes emerging in step one (the brainstorming session and the focus group session) were talent retention, talent attraction and talent development. Because of their importance, they were then used in developing the individual interviews' protocol (step two).

6.5.1.2 Step two

6.5.1.2.1 Individual interviews

The individual interview-protocol of the talent management processes was developed from the results of both the brainstorming session and the focus group session. Prior to the data analysis, it was essential to address two considerations. First of all, a copy of the individual interview transcript was made available to interviewees (upon request only). Secondly, all talented individuals were provided with a time frame to review the transcript and request any editable changes prior to inclusion in the final data set.

One-to-one interviews assisted in developing the quantitative survey questionnaire of this research by exploring the talent management themes. Table 6.5 below, summarises the data analysis of the individual interviews for talent management processes. Individual interviews highlighted eleven subthemes of talent management processes. These were grouped into four key themes: talent attraction, talent development, talent retention, and talent acquisition. Each of these themes was summarised, and the thematic analysis described. The results are detailed below, using abbreviations to preserve participant anonymity. For example, IR3 means third individual interview.

Table 6.5: Talent management processes used in the Australian higher education sector according to individual interview data

No.	Themes	Participants of individual interviews					
		1	2	3	4	5	6
1	**Retaining talent:**						
1-A	*Benchmarking and competitive compensation*	✓	✓	✓	✓	✓	✓
1-B	*Non-financial rewards*	✓	✓	✓		✓	✓
1-C	*Job satisfaction*	✓	✓	✓	✓	✓	
1-D	*Employee empowerment*	✓	✓	✓	✓	✓	
1-E	*Employee motivation*	✓	✓	✓	✓	✓	
2	**Developing talent:**						
2-A	*Performance management*	✓	✓	✓	✓	✓	✓
2-B	*Coaching talent*		✓	✓	✓	✓	
2-C	*Leadership development*	✓	✓	✓		✓	✓
3	**Attracting talent:**						
3-A	*Financial drivers*			✓	✓		✓
3-B	*Social domain*	✓	✓	✓	✓	✓	✓
3-C	*Organisational excellence*	✓	✓	✓	✓	✓	✓
4	**Talent acquisition**					✓	

1. Talent retention

In this study, the procedural definition for talent retention was defined as a process whereby an organisation is responsible for retaining talent, and for them remaining within an organisation (Abdul Hamid et al. 2011; AlKerdawy 2016). To dissect this concept, the researcher asked the participants "How does your organisation retain talented staff ?" Interviewees provided different opinions from various perspectives. Some common and uncommon patterns were observed in their views. As shown in Table, 6.5, five subthemes emerged from this question during the data analysis:

i. benchmarking and competitive compensation;
ii. non-financial rewards which involve supporting healthcare and safety issues, family matters and acknowledging staff;
iii. job satisfaction;
iv. employee empowerment; and
v. employee motivation which covers research funds and financial rewards.

For instance, all the interviewees indicated "support" while half of the interviewees stated "motivate", "motivation", and "rewards" within the description of talent retention methods. Software data analysis, represented in Figures 6.11a, 6.11b, and 6.11c, shows the sub-themes of the talent retention concept.

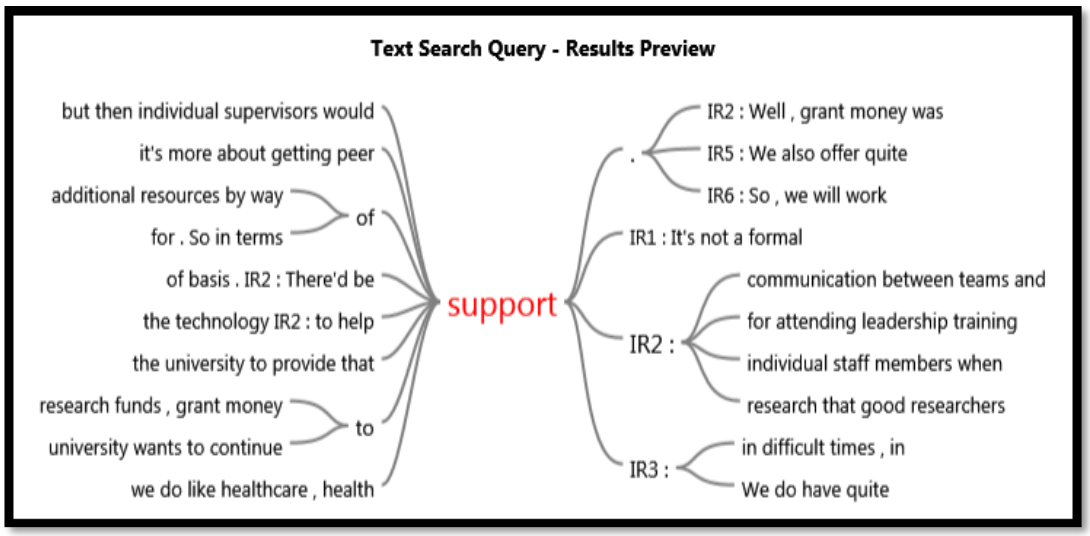


Figure 6.11a: Text search query for the Talent Retention theme

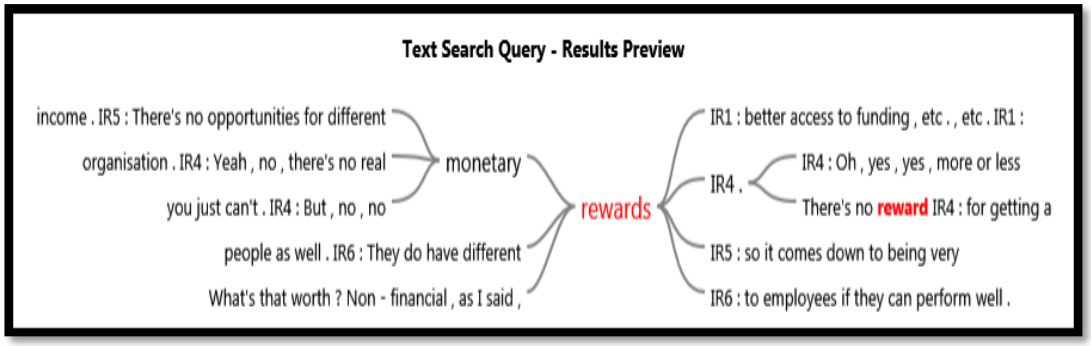


Figure 6.11b: Text search query for the Talent Retention theme

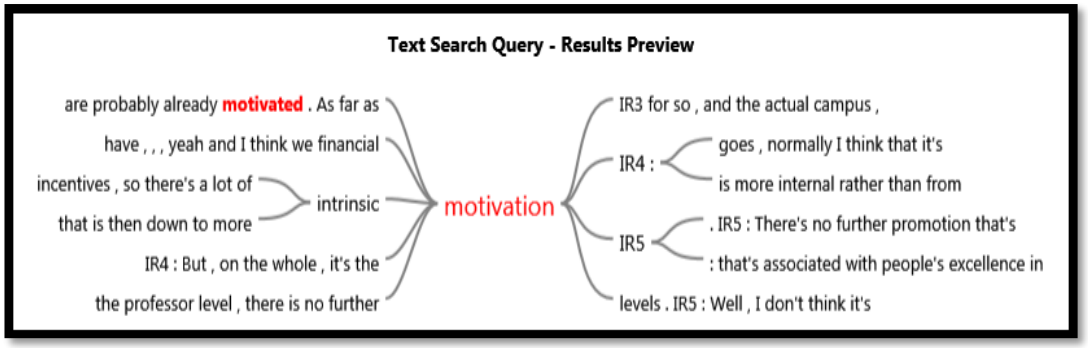


Figure 6.11c: Text search query for the Talent Retention theme

Source: Nvivo output

2. Talent development

Talent development is focused on achieving and maintaining an organisation's human capital through learning that changes behaviour in the organisation and in its talented employees (Lyria 2014). The key interview question that specifically addressed sub-themes around this concept was: "How are talented staff developed in your organisation?". Table 6.5 shows that there was a sense of talent development amongst interviewees. This presented three key sub-themes:

i. *performance management* which includes training needs identification, skill gaps analysis, succession planning and appropriate development strategies;
ii. *coaching talent* which includes providing sufficient coaching time, training and mentoring through job rotations, and opportunities for talent development; and
iii. *leadership development* such as leadership workshops to develop future leaders, and role-assignment programs.

Many terms have been utilised to explain talent development, such as "develop", "development", and "training". For example, four out of six participants mentioned "leadership" and "coaching"; all six interviewees mentioned "training" during the discussion. Given the evidence, text query searches in NVivo led to the following supporting data outlined in Figures 6.12a, 6.12b, and 6.12c.

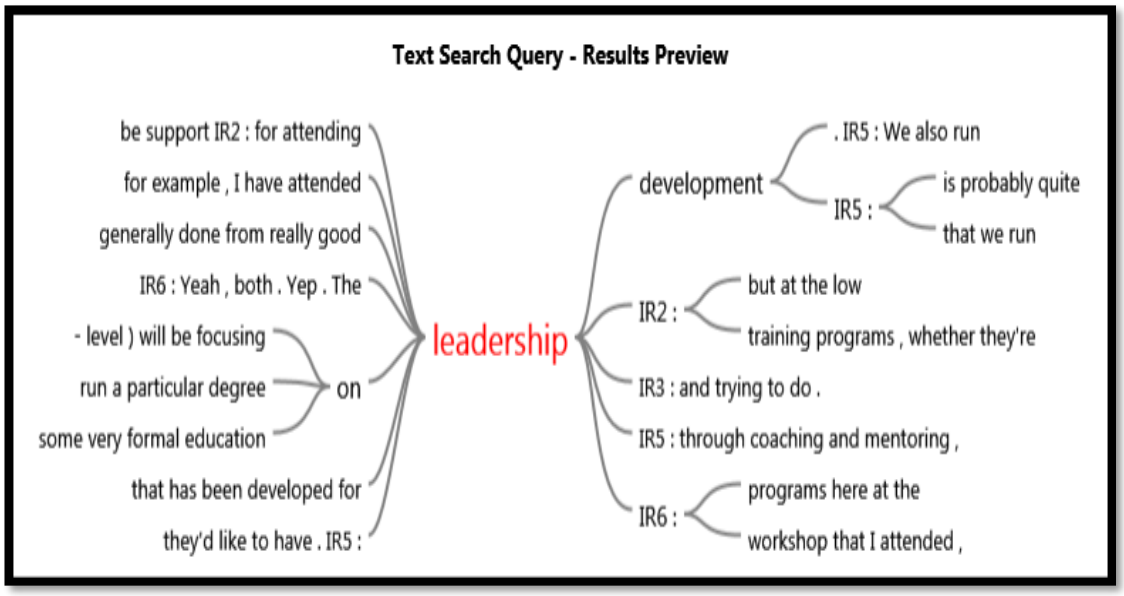


Figure 6.12a: Text search query for the Talent Development theme *(leadership development*)

Source: Nvivo output

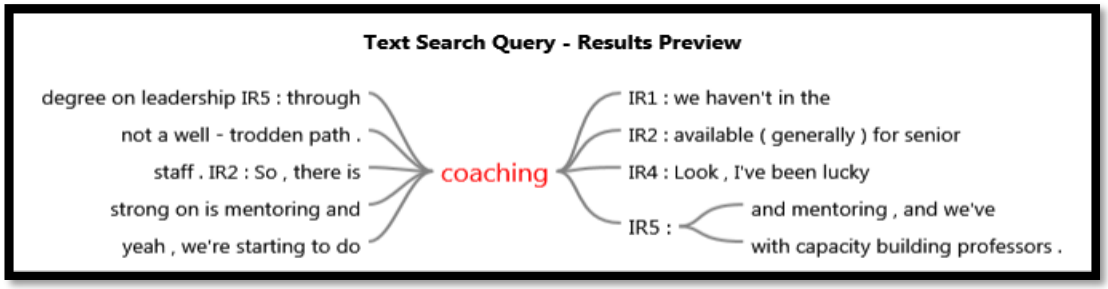


Figure 6.12b: Text search query for the Talent Development theme *(Coaching talent*)

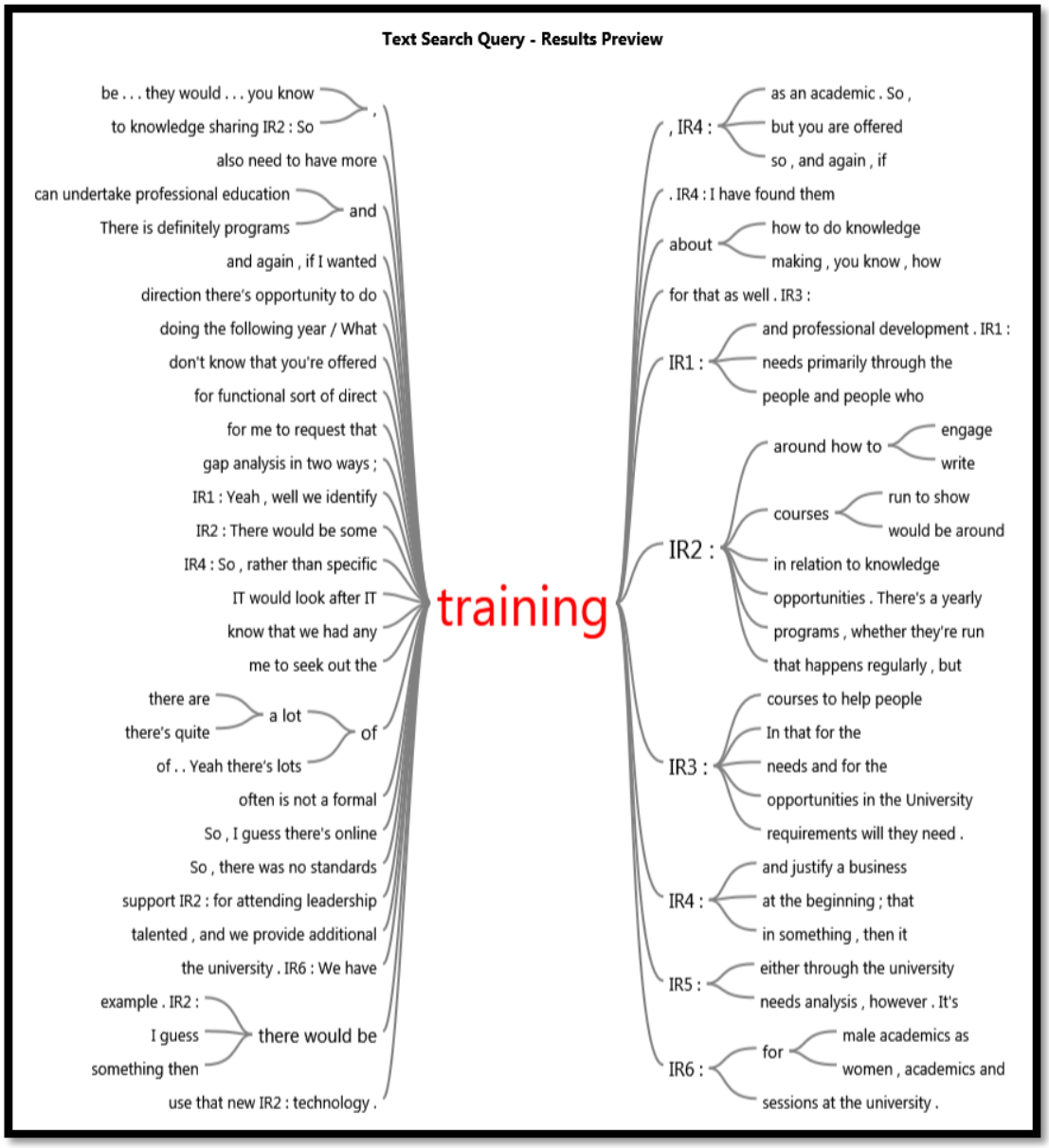


Figure 6.12c: Text search query for the Talent Development theme *(Coaching talent*)

Source: Nvivo output

3.Talent attraction

Talent attraction is primarily aimed at attracting talented candidates from the internal or external labour market (AlKerdawy 2016). To scrutinise this concept, the researcher asked the interviewees *"How would your organisation attract talented individuals?"*. They provided different opinions from different perspectives. Some common and uncommon patterns were observed in their views. Looking at Table 6.5 above, the researcher has divided their views of talent attraction into the following three different sub-themes:

i. *financial drivers*, which include high remuneration and salary;
ii. *organisational excellence*, which encompasses career advancement, the reputation of the organisation, talent branding, organisational culture, organisational climate and work environment and conditions; and
iii. *social domain*, which comprises support in difficult times, social innovation, and work-life balance.

For example, four out of six experts mentioned "advance" or "advancement" within the description of talented attraction practices. The majority of participants (five out of six) talked about work-life balance. Software data analysis and text query searches shown in the figures below present the sub-themes of the talent attraction theme.

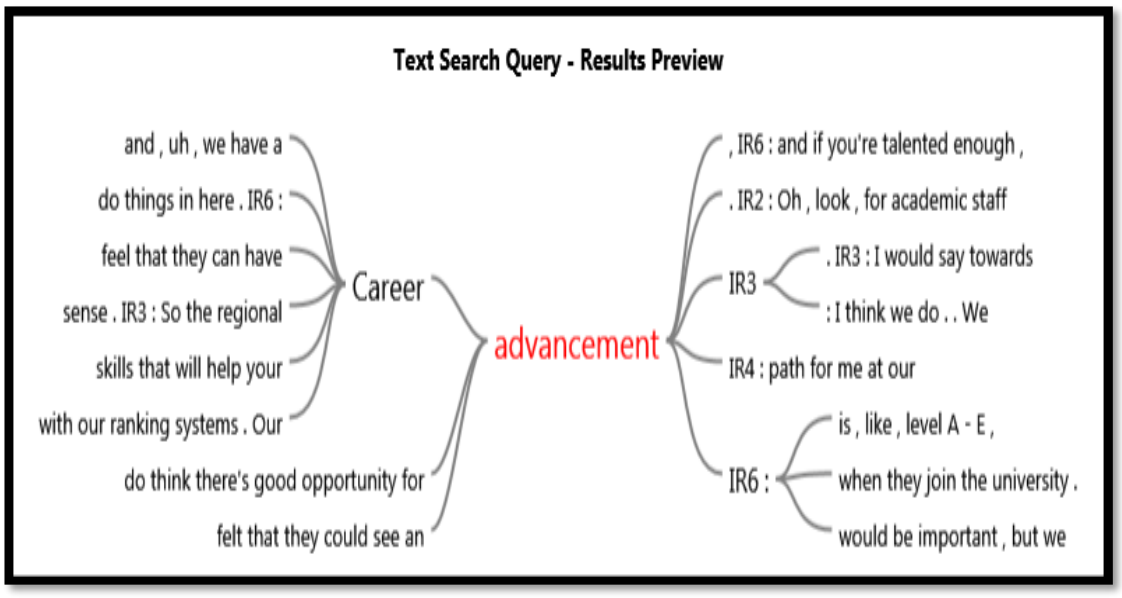


Figure 6.13a: Text search query for the Talent Attraction theme (*Organisational excellence*)

Source: Nvivo output

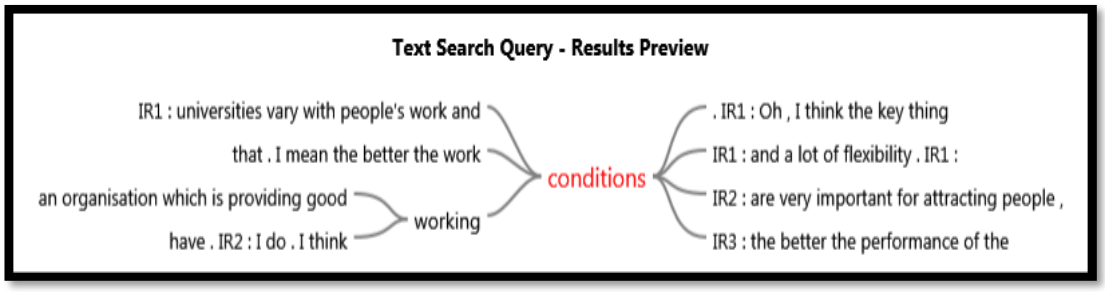


Figure 6.13b: Text search query for the Talent Attraction theme (*Organisational excellence*)

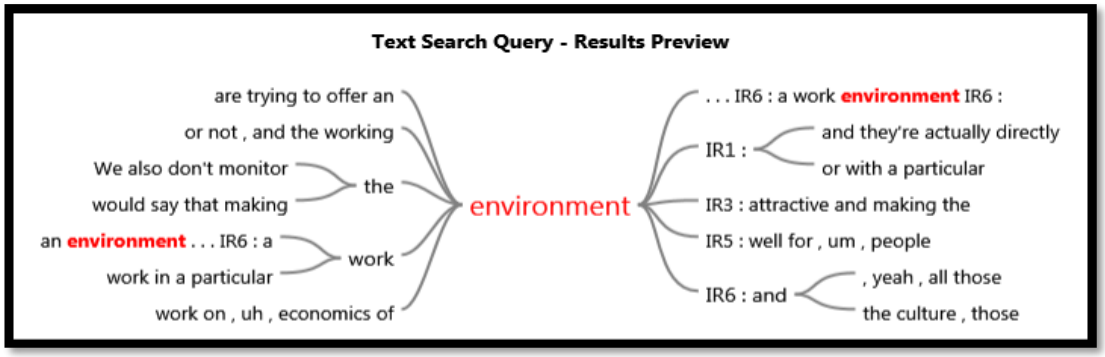


Figure 6.13c: Text search query for the Talent Attraction theme (*Organisational excellence*)

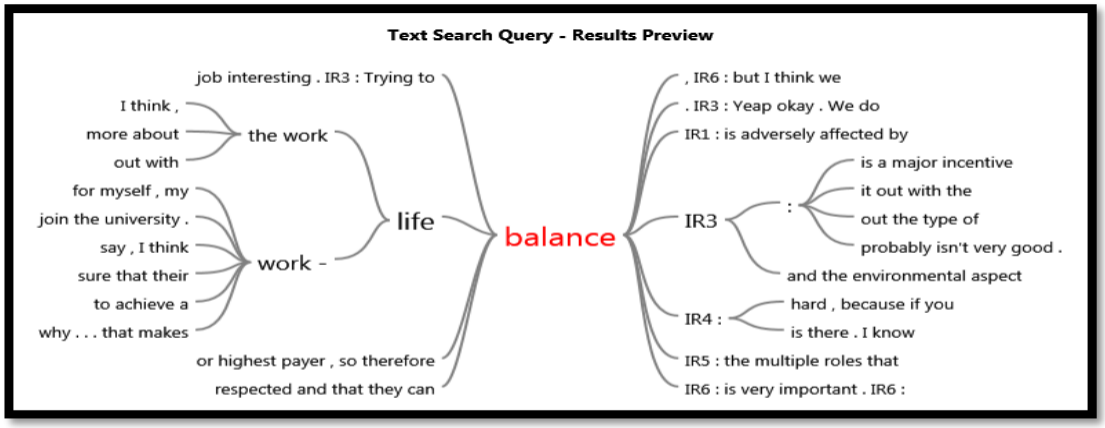


Figure 6.13d: Text search query for the Talent Attraction theme (*Social domain*)

Source: Nvivo output

Although the individual interview questions about talent management were utilised to guide the process, the researcher still allowed interviewees to open new subjects. For instance, as one interviewee put it:

> "*Inter-disciplinary teams with capacity building professors that are engaged with external industries and research studies so that they can develop their skills in attracting research funding….*". (IR5)

6.5.2 Validity check for thematic analysis: Talent management processes

There is empirical evidence that the themes identified via at least two-thirds of participants' responses in the qualitative study should warrant inclusion in the final research framework of the study (Aldhaban 2016; Phan 2013). Based on Table 6.1 above, talent retention, talent attraction, and talent development were selected as the key themes of talent management to include in the final research model. A three-staged approach of thematic analysis was adopted in this study to increase the validity of the qualitative findings. It was also used to develop a quantitative measure of talent management processes for the higher education sector.

To analyse rich qualitative data, some researchers recommend using a three-staged approach of thematic analysis (Denton-Schneider 2016; Leitch et al. 2010; Perry et al. 2013). This approach assisted the researcher to comprehend the the discussion in context, enhanced by his depth of knowledge about the research topic, and thereby assisted in meaningful analysis. It is necessary here to clarify exactly what is meant by the three-staged approach. According to Corbin and Strauss (2008); Leitch et al. (2010) the three-staged approach is a systematic process including three stages: firstly, create a set of broad thematic items with associated descriptions; secondly, refine items into a smaller set of categories; and finally, develop categories that are relationally associated with one or more themes. The three-staged approach was selected for its validity in generating rich data analysis, and providing the reader with the necessary information to evaluate the quality of the qualitative findings (Corbin & Strauss 2008; Denton-Schneider 2016). Table 6.6 shows a brief summary of the three-staged approach for talent management processes.

Table 6.6: Summary of three data analysis stages: Talent management processes

Stage	Purpose	Results
1	To identify contributed items by reviewing each separate data analysis of qualitative techniques	Preliminary list of items
2	To identify categories by evaluating items in the context in which they appear	List of categories and items
3	To regroup categories to identify themes	List of themes

In stage one, a revision was carried out of the original texts (the transcripts of all three qualitative methods) to generate a preliminary list of items, by using both a

manual method and content analysis software (NVivo 11) (Ngulube 2015; Paulus & Bennett 2017). It was decided that the best method to adopt for this investigation was both open coding and axial coding techniques (Corbin & Strauss 2008; Leitch et al. 2010; Strauss 2003). Those techniques assist in organising data gathered 'line by line' and 'word by word' from the original texts (Leitch et al. 2010; Strauss 2003, p. 28). From this procedure, 96 preliminary items were designated to talent management in the higher education environment. Table 6.7 displays the summary of items contributing to talent management.

Table 6.7: First stage output- summary of items contributing to talent management

Items contributing to talent management		
Academic staff	High remuneration	Professional staff
Acknowledgement	High salary	Progression
Activities	Individuals	Promote
Advancement	Job rotations	Promotion
Advertised	Job satisfaction	Quality
Appropriate development strategies	Intrinsic motivation	Remuneration
Authority	Leadership	Retention
Balance	Learning and teaching orientations	Safety issues
Benchmarking	Lifestyle	Semester
Capabilities	Locations	Scholarships
Career advancement	Management	Skill gaps analysis
Career development programs	Monetary	Social domain
Characters	Mentoring	Social innovation
Certifications	Non-monetary rewards	Strategies
Coaching talent	Opportunities	Succession planning
Comparison	Organisation	Support in difficult times
Competitive	Organisational climate	Supportive learning environment
Development	Organisational culture	Talents branding
Development opportunities	Organisational excellence	Technology
Education to leaders	Package	Thinking
Employees empowerment	Performance management	Training
Emplyee motivation	Planning	Training need identification
Encourage	Positions	Treating staff
Engagement	Pretty standard	Reputation
Enrichment	Process	Research funds
Environment	Productive employees	Role-assignment programs
Experiences	Professional Advancement	Understand
Factors		Universities
Family matters		University ranking
Financial rewards		Work conditions
Funny place		Work environment
Funding		Work-life balance
Greater flexibility		
Healthcare		
High-quality research		

From Table 6.7, the researcher classified items into two parts: (1) items mentioned in the talent management literature; and (2), items not mentioned in the literature. Table 6.8 and 6.9 provide a summary of this process.

Table 6.8: Talent management items from the qualitative study (mentioned in the literature)

No.	Items	Refrences
1	Advancement (Progression)	(Thompson 2013; Waithiegeni Kibui 2015)
2	Balance	(Lyria 2014; Schlechter et al. 2014)
3	Capabilities	(Ross 2013; Sparrow & Makram 2015)
4	Career advancement	(Thompson 2013; Waithiegeni Kibui 2015)
5	Career development programs	(Lyria 2014)
6	Coaching talent	(AlKerdawy 2016)
7	Comparison	(Lyria 2014)
8	Competitive compensation	(AlKerdawy 2016; Lyria 2014; Stahl et al. 2007)
9	Development opportunities	(Lyria 2014; Thompson 2013)
10	Development strategies	(Al Ariss et al. 2014; AlKerdawy 2016; Waithiegeni Kibui 2015)
11	Employee motivation	(Lyria 2014)
12	Financial rewards	(Lyria 2014)
13	Job satisfaction	(AlKerdawy 2016; Nakhate 2016)
14	Leadership	(Calo 2008; Lyria 2014; Peet et al. 2010)
15	Learning opportunities	(Lyria 2014)
16	Non-monetary rewareds	(Lyria 2014)
17	Organisational climate	(Lyria 2014; Schlechter et al. 2014; Thompson 2013)
18	Planning	(AlKerdawy 2016; Lyria 2014)
19	Productive employees	(Nakhate 2016)
20	Scholarships	(Lyria 2014)
21	Succession planning	(Lyria 2014)
22	Talent branding	(Lyria 2014; Tiwari & Lenka 2015)
23	Training need identification	(Lyria 2014)
24	Work conditions	(Lyria 2014)
25	Work environment	(Lyria 2014)
26	Work-life balance	(Lyria 2014; Schlechter et al. 2014; Thompson 2013)

Table 6.9: Talent management items from the qualitative study (not mentioned in the literature)

No.	Items	No.	Items
1	Academic staff	29	Organisational culture
2	Acknowledgement	30	Organisational excellence
3	Activities	31	Package
4	Advertised	32	Performance management
5	Authority	33	Professional advancement
6	Benchmarking	34	Pretty standard
7	Characters	35	Professional staff
8	Certifications	36	Quality
9	Education to leaders	37	Remuneration
10	Employee empowerment	38	Safety issues
11	Encourage (Promote)	39	Scholarships
12	Enrichment	40	Semester
13	Factors	41	Social innovation
14	Family matters	42	Supportive learning environment
15	Financial (Monetary)	43	Skills gaps analysis
16	Flexibility	44	Support in difficult times
17	Funny place	45	Technology
18	Funding (Research funds)	46	Thinking
19	Healthcare	47	Treating staff
20	High-quality research	48	Reputation
21	High remuneration	49	Role-assignment programs
22	High salary	50	Emplyee growth
23	Job rotations	51	Experiences
24	Intrinsic motivation	52	Social domain
25	Learning and teaching orientations	53	Understand
26	Lifestyle	54	Universities
27	Locations	55	University ranking
28	Mentoring		

During stage two, the initial list was further analysed manually by doing an intensive analysis through a process of axial coding (Corbin & Strauss 2008; Strauss 2003). The purpose of this exercise is to find interrelationships between an item and other items (Corbin & Strauss 2008). The analysis includes two integrated parts, which are noted in Tables 6.10 and 6.11 below. In Table 6.10 (step 1), categories and items were identified from stage one (based on the qualitative study mentioned in the literature), followed by categories and items identified from stage one (based on the qualitative study not mentioned in the literature) in Table 6.11 (step 2). In summary, based on the integrated output between step 1 and 2, ten categories and 39 items were explored and presented in Table 6.12 (step 3).

Table 6.10: Second stage output (step 1)- summary of talent management categories and items identified from stage one (based on the qualitative study not mentioned in the literature)

Categories	Items
Social domain	• Work-life balance
Competitive compensation	• Comparison
Organisational excellence	• Talents branding • Organisational climate • Work environment (quality)
Training and developing (Coaching talent)	• Appropriate development strategies (Capabilities) • Training need identification • Career development programs • Development opportunities (scholarships)
Leadership development	• Role-assignment programs of leadership • Succession planning • Career development programs (activities)
Job satisfaction	• Work conditions
Non-monetary rewards	• learning opportunities (further education, certifications, scholarships)
Employee motivation	• Career advancement (advancement, progression) • Financial rewards

Table 6.11: Second stage output (step 2) - summary of talent management categories and items identified from stage one (based on the qualitative study not mentioned in the literature)

Categories	Items
Social domain	• Support in difficult times • Social innovation • Work-life balance (locations, lifestyle, funny place)
Organisational excellence	• Talents branding (advertised, academic staff, professional staff, pretty standard) • The reputation of an organisation (high-quality research, university ranking) • Organisational culture
Performance management	• Skill gaps analysis (characters and technology)
Coaching talent	• Job rotations: experiences • Training and mentoring (learning and teaching orientations) • Development opportunities (further education, certifications)
Leadership development	• Education to leaders

Benchmarking	• Activities • Comparison, understand, universities • Competitive compensation
Job satisfaction	• Supportive learning environment • Treating staff
Non-monetary rewards	• Healthcare and safety issues • Personal factors e.g. family matters • Acknowledgement • Flexibility
Employee empowerment	• Encouragement, promotion • Engagement • Enrichment • Autonomy, authority
Employee motivation	• Professional advancement • High remuneration and salary (Package) • Research funds, academics • Intrinsic motivation (Productive employees, semester) • Employee growth

Table 6.12: Second stage output (step 3) - summary of talent management categories and items (based on both step 1 and step 2 output)

Categories	Items
Social domain	• Support in difficult times • Social innovation • Work-life balance (locations, lifestyle, funny place)
Organisational excellence	• Talents branding (advertised, academic staff, professional staff, pretty standard) • The reputation of an organisation (high-quality research, university ranking) • Organisational culture • Organisational climate • Work environment (quality)
Performance management	• Appropriate development strategies (Capabilities) • Training need identification • Skill gaps analysis (characters, technology)
Coaching talent	• Career development programs (job rotations: Experiences) • learning and teaching orientations • Training and mentoring • Development opportunities (further education, certifications, scholarships)

Leadership development	• Role-assignment programs of leadership • Education to leaders • Career development programs • Succession planning
Benchmarking	• Activities • Comparison, understanding other universities • Competitive compensation
Job satisfaction	• Supportive learning environment • Work conditions • Treating staff
Non-monetary rewards	• Healthcare and safety issues • Personal factors e.g. family matters • Acknowledgement • Flexibility
Employee empowerment	• Encouragement, promotion (thinking) • Engagement • Enrichment • Autonomy, authority
Employee motivation	• Career advancement (advancement, professional advancement, progression) • Financial rewards, high remuneration and salary (Package) • Research funds, academics • Intrinsic motivation (productive employees, semester) • Employee growth

At the third and final stage, the core categories identified from Table 6.12, were grouped under specific themed areas. Table 6.13 compares the summary of talent management themes with their categories, which resulted in three key themes including 10 categories of talent management processes.

Table 6.13: Third stage output - summary of talent management themes

Themes	Categories
Talent Attraction	• Social domain • Organisational excellence
Talent Development	• Performance management • Coaching talent • Leadership development
Talent Retention	• Benchmarking • Job satisfaction • Non- monetary rewards • Employee empowerment • Employee motivation

In summary, there were 51 items developed for the talent management processes part of the quantitative questionnaire. Some of these were generated through the qualitative study and some were informed by the literature. All the measurement items and their categories are listed in Chapter Eight, Section 8.4.1 of this thesis.

6.5.3 Qualitative data analysis to identify knowledge management processes

In a similar fashion to the talent management analysis, knowledge management identified a number of themes by conducting three qualitative methods. In brief, Table 6.14 summarises the results of the qualitative phase of knowledge management processes.

Table 6.14: A summary of selected knowledge management processes mentioned via participants in the qualitative phase

No.	The process	Participants																						Total	%
		Brainstorming session						Focus group session										Individual interviews							
		1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	23	
1	**Knowledge creation:**																								19	82.6
1-A	*Combination*			✓			✓								✓			✓		✓	✓	✓				
1-B	*Socialisation*		✓				✓														✓		✓	✓		
1-C	*Internalisation*	✓						✓	✓			✓	✓	✓	✓		✓			✓	✓	✓	✓	✓		
1-D	*Externalisation*		✓		✓		✓				✓						✓		✓	✓	✓		✓	✓		
2	**Knowledge transfer:**																								18	78.2
2-A	*Personalisation*	✓	✓	✓				✓		✓	✓	✓				✓			✓	✓	✓	✓	✓	✓		
2-B	*Codification*	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓				✓	✓	✓		✓		
3	**Knowledge sharing**	✓	✓					✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	16	69.5
4	**Knowledge utilisation**	✓	✓	✓		✓	✓	✓	✓						✓				✓	✓		✓	✓	✓	13	56.5
5	**Knowledge storage**	✓		✓	✓		✓			✓	✓								✓			✓			8	34.7
6	**Knowledge capture**			✓			✓	✓				✓							✓				✓		6	26
7	**Knowledge evaluation**	✓	✓		✓		✓			✓				✓											6	26
9	**Knowledge application**										✓			✓		✓			✓						4	17.3
8	**Knowledge construction**				✓															✓				✓	3	13

These results comprise two steps: the first step is the brainstorming session and the focus group session, and the second step is individual interviews. In step one, participants mentioned a number of key themes of knowledge management that are used in Australian higher education. Based on the findings of step one, the protocol for the individual interviews (step two) of knowledge management was developed.

6.5.3.1 Step one

6.5.3.1.1 The brainstorming session

The data analysis of the brainstorming session identified valuable ideas about the knowledge management processes that are used in Australian higher education. The brainstorming session led to the identification of eight key themes of knowledge management processes: knowledge creation, transfer, utilisation, storage, evaluation, capture, sharing, and construction. Each of these themes and sub-themes is summarised here, and the thematic analysis is described. Table 6.15 summarises the data analysis of the brainstorming session for knowledge management processes.

Table 6.15: Knowledge management processes used in Australian higher education

No.	Themes	Participants of a brainstorming session						∑	%
		1	2	3	4	5	6		
1	**Knowledge creation:**							5	83.3
	• *Combination*			✓			✓		
	• *Socialisation*		✓				✓		
	• *Internalisation*	✓							
	• *Externalisation*		✓		✓		✓		
2	**Knowledge transfer:**							5	83.3
	• *Personalisation*	✓	✓	✓					
	• *Codification*	✓	✓	✓		✓	✓		
3	**Knowledge utilisation**	✓	✓	✓		✓	✓	5	83.3
4	**Knowledge storage**	✓		✓	✓		✓	4	66.6
5	**Knowledge evaluation**	✓	✓		✓		✓	4	66.6
6	**Knowledge capture**			✓			✓	2	33.3
7	**Knowledge sharing:**							2	33.3
	• *The culture of knowledge sharing*	✓	✓						
8	**Knowledge construction**				✓			1	16.6

1. Knowledge creation

It can be seen from Table 6.15 that five professional participants emphasised that educational institutions generate information through internal learning processes. Explicit knowledge is created during social interaction through various formats (documents, video, electronic, audio, and visual) and in various organisational units (faculty, academics, students, and administration). Related terms include 'generation, creation, build, improvement, and learn' (Sunalai & Beyerlein 2015, p. 293), which can be seen in the followingstatements by five participants:

> *(…) "actually helping people to understand and learn it," (…). "This is a USQ focus on improving search ability of the knowledge" (...).* (B1P1*).*
>
> *"Yeah, but there is a lot that goes out, I mean, I think getting access to historical stuff, particularly information on courses four or five years old" (…).* (B1P3)
>
> *(…) "when someone creates a task, they can bring up automatic links to knowledge articles".* (B1P4)
>
> *"I guess that's our process, that's what we're building, that's what we're building our processes around, so it's our central strategy" (…).*(B1P1)
>
> *(….) "having knowledge written in a document or, is one thing, but to actually have that communication and collaboration around it, so that people work together – I guess that's what really makes it work".* (B1P1)
>
> *(…) "And so that itself will create that consistency end, search ability for one place to be able to get that kind of information".*(B1P4)
>
> *"So any knowledge articles that people have access to, they can give feedback on it, and actually say, "This is incorrect" and then we do something about it. So that it helps with that constant updating".* (B1P2)
>
> *"Create a technical knowledge article. So that we can reuse that information to help solve the next issue that comes" (…).*(B1P5)
>
> *"will create knowledge from that problem. (….)The benefit for our staff being able to access knowledge".* (B1P6)

Moreover, text query searches in Figure 6.14a, 6.14b, and 6.14c indicate that knowledge creation is widely used in educational institutions in Australia.

Figure 6.14a: Text search query for the Knowledge Creation theme

Source: Nvivo output

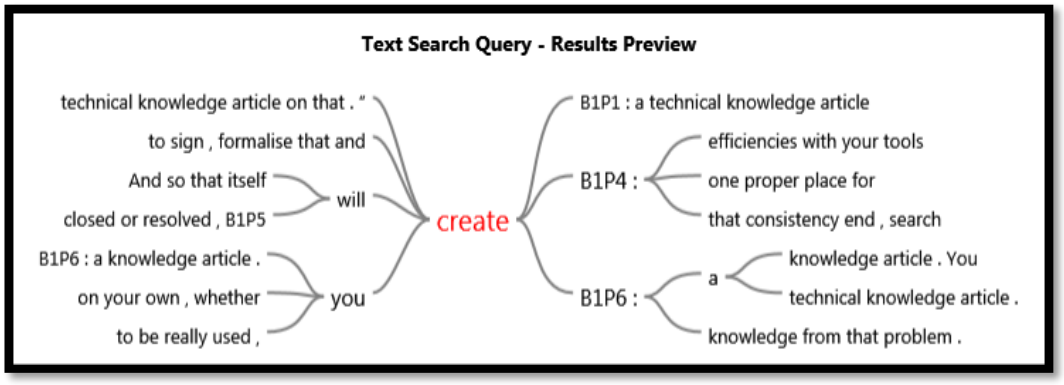


Figure 6.14b: Text search query for the Knowledge Creation theme

Source: Nvivo output

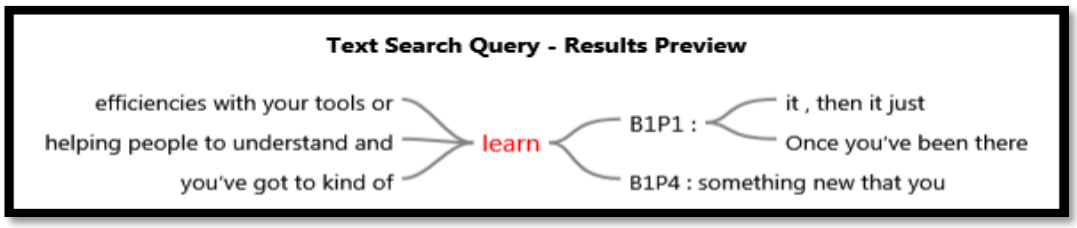


Figure 6.14c: Text search query for the Knowledge Creation theme

Source: Nvivo output

2. Knowledge transfer

There was significant recognition of the transfer of information amongst participants. As shown in Table 6.15, five out of six participants mentioned that the knowledge transfer process was widely used in educational institutions in Australia:

> *"So even when you're talking technical knowledge, and stuff like that, it's experience and things that need to come into that".* (B1P1)

> *"B1P2's been, like B1P2's our champion for knowledge, so she's been some, undertaking some training in, what they call knowledge center support, KCS. So that's what we're using to try and help us with this".*(B1P6)

> *"(…) So if we can prevent calls actually coming into us that costs us nothing, other than the cost of producing the document (…)".*(B1P5)

> *"I'm valuable if I'm the only one who knows how to do it. Without me, you can't do it." And that's what the university's got to stop, because that knowledge is a university asset, if you want to look at it that way, as well as that person's abilities".*(B1P2)

> *"It's very variable, we have staff members' accounts on there. And someone come and try and teach your course and they want to know what they've taught (…)".*(B1P3*)*

Thus, the above quotations indicate that information can be transferred in the form of both explicit and tacit knowledge. This means that some information is transferred by a system or process, and other transferred information relies on interpersonal communication. This theme includes two sub-themes: (i) codification knowledge transfer; and (ii) personalisation knowledge transfer. Codified knowledge transfers from a team or department to another, with technological tools used by individuals, come for example in the form of documents that enable staff to share their knowledge with other colleagues. Furthermore, participants also indicated that for them personally information is transferred to other employees through shared points and experiences in knowledge transfer, training courses, various sources of knowledge, and the perceived benefit of knowledge access. This suggests that transference of employee experiences among employees is prevalent at educational institutions in Australia.

3. Knowledge utilisation

Looking at Table 6.15 above, the majority (83.33%) of the brainstorming session's participants indicated that information utilisation in their university was through programs and courses such as a FAQ system. Synonymous terms include use, usage, or application (Sunalai & Beyerlein 2015). In the university, information is only valuable when it is used and applied properly to further improve information systems and managerial practices. This means that the university focuses on available information in order to make well-informed decisions. The participants reported that:

> *"Certainly like, to keep the information, like I said, various systems, but I suppose, trying to use like share points to keep knowledge in various repositories. And there's processes around that*". (B1P1)

> *"We also track how much the knowledge is viewed and used, …., and how it's been viewed and used.* (B1P2)
>
> *"So that the quicker, or the earlier we can resolve an issue, with the use of knowledge that's available to first respond to this, the cheaper it is".*(B1P3)
>
> *"Or you end up with so many different things in this big list, you're not sure which one, we use the current one, etc".* (B1P5)
>
> *(…) "So that's what we're using to try and help us with this".(...) "So, there is actually, like a, so you know I've asked [the university] on the portal, where students go to get help, so they can use the FAQ system".* (B1P6)

More clearly, a text search query, shown in Figure 6.15, indicates that knowledge utilisation is strongly used in educational institutions in Australia.

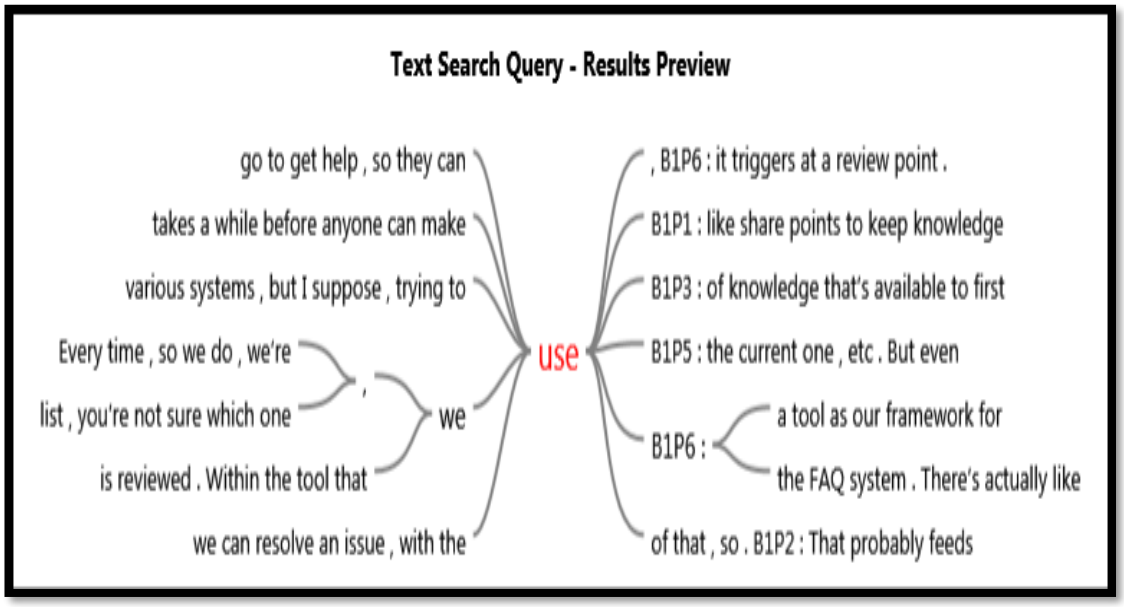


Figure 6.15: Text search query for the Knowledge Utilisation theme

Source: Nvivo output

4. Knowledge storage

As can be observed from Table 6.15, four professional participants indicated that all information resources (documents, video, electronic, audio, and visual) were adequately stored within the university's systems. Many terms were used to describe a knowledge storage process, including 'combination, codification, storage, organization, and sustain'(Sunalai & Beyerlein 2015, p. 292), as becomes clear from the following four participants' statements:

> *"Certainly like, to keep the information…. but I suppose, trying to use like share points to keep knowledge in various repositories". (…)"We certainly do notice that a lot of people do store a lot of their data on C drive". (…) "Certain teams that recommend it to be documented and stored in certain repositories".* (B1P1).
>
> *"We have some core systems which store information and knowledge about, like a client software where people store information about students. (….) Yeah. Well, store is part of it,"(…).*(B1P3)
>
> *"We store knowledge against products, system documentation etc.".* (B1P4)
>
> *"There is Queensland government regulations on how long you have to keep particular information" (…).* (B1P6)

Arguably, the text query search in Figure 6.16 confirms that knowledge storage is used in educational institutions in Australia.

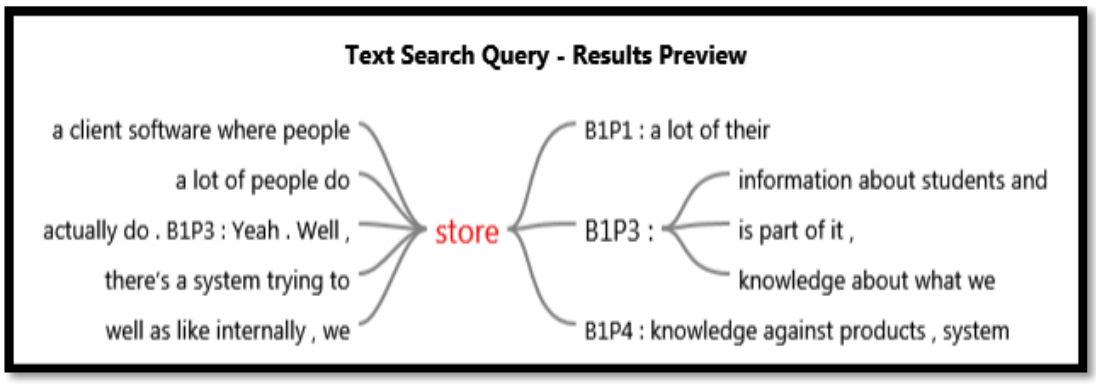


Figure 6.16: Text search query for the Knowledge Storage theme

Source: Nvivo output

5. Knowledge evaluation

As can be noted from Table 6.15, four participants indicated that six months would be needed to assess all used information and experience in the university. Many terms were utilised to describe the knowledge evaluation process such as analyse, evaluate, assess, identify, measure, and validate (Sunalai & Beyerlein 2015). These informants reported that:

> *"We default to six months. So, every six months, any knowledge that's been entered into the system, comes up for a review" (…..). "So what we've done in the last six months is really accepted that knowledge is really valuable" (….).* (B1P2)
>
> *(...) "So, agreeing with your supervisor what's appropriate and then reviewing that after 12 months, or six months, depending on the area, to measure how*

you've gone against that". (B1P4)

"So, review as well. So, we'll make sure that content is reviewed. Within the tool that we use, it triggers, at a review point". (B1P6)
(….) "so, probably only been six months". (B1P1)

The text query search in Figure 6.17 indicates that knowledge evaluation is used within educational institutions in Australia.

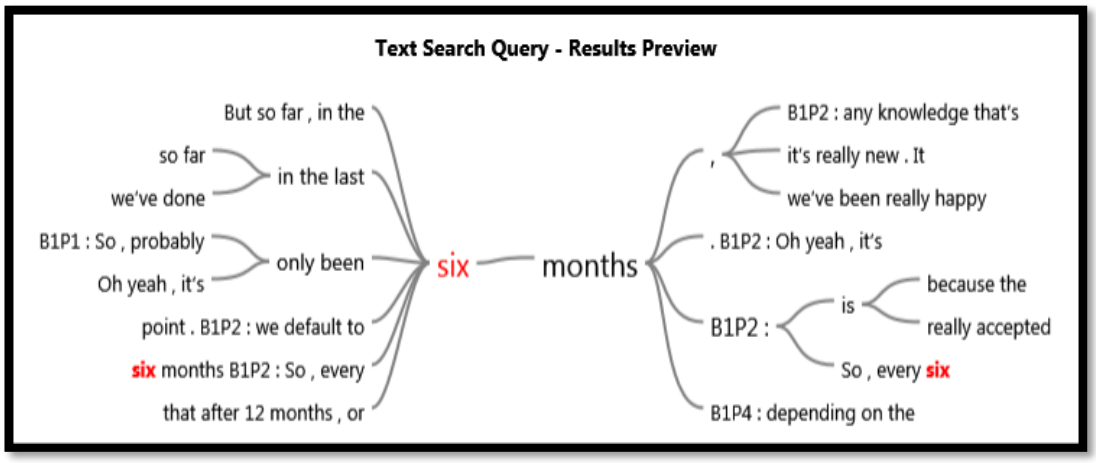


Figure 6.17: Text search query for the Knowledge Evaluation theme

Source: Nvivo output

6. Knowledge capture

As shown in Table 6.15, two professional participants noted that capturing information is a continual practice as part of learning processes within university functions. Various ways to capture all stored information were observed in educational institutions in Australia such as using students' census data. The capture category includes acquisition, buy, acquire, gain, and get (Sunalai & Beyerlein 2015), as can be seen in what two of the participants said:

"Well the faculties, I mean technically we, I mean obviously there's a lot of share points to try and capture stored information at different processes such as using census (…)". (B1P3)

"But then there's the internal knowledge that we need to make sure that we capture so that, like, when people leave, there's no gaping hole. We've got that captured". (B1P6).

A text search query in Figure 6.18 confirms that knowledge capture is used in educational institutions in Australia.

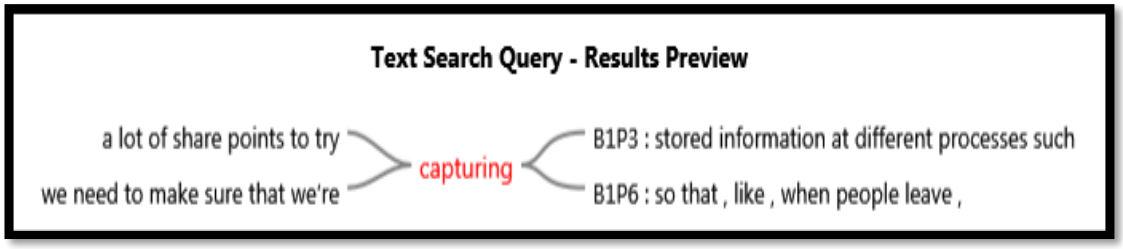


Figure 6.18: Text search query for the Knowledge Capture theme

Source: Nvivo output

7. Knowledge sharing

Two high-level participants mentioned that the university staff exchanged their information through communication. However, some of the knowledge sharing techniques were not available to the university staff. Synonymous terms include 'share, transfer, allocation, contribution, dissemination, distribution, and integration (Sunalai & Beyerlein 2015), which can be seen in what the following two participants said:

> *(….), "but if you don't have that culture around actually sharing the knowledge and communicating it and working together".* (B1P1)

> *"And it'll take us a while to get that culture of sharing knowledge and not keeping it, but documenting stuff".* (B1P2)

The text query search in Figure 6.19 indicates that knowledge sharing is used in educational institutions in Australia.

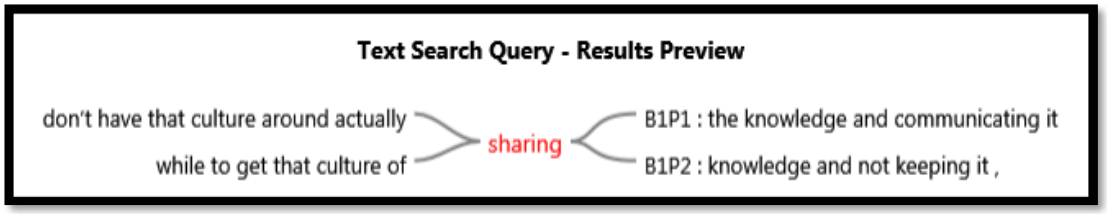


Figure 6.19: Text search query for the Knowledge Sharing theme

Source: Nvivo output

***8.* Knowledge construction**

One participant stated that acquired information is important to build working teams:

> *(…)we're wanting that knowledge that they acquire to come back and help build the team that they're in the frontline again.* (B1P4)

6.5.3.1.2 The focus group session

In the data analysis related to the focus group session, the participants provided further valuable information of the knowledge management processes that are used in Australian higher education. The focus group session led to the identification of eight key themes of knowledge management processes: creation, sharing, transfer, utilisation, application, storage, evaluation, and capture. Each of these themes and sub-themes was summarised and the thematic analysis described. Table 6.16 below, summarises the data analysis of the focus group session for knowledge management processes.

Table 6.16: Knowledge management processes used in Australian higher education

No.	Themes	Participants of the focus group session											∑	%
		1	2	3	4	5	6	7	8	9	10	11		
1	**Knowledge creation:**												9	81.8
	• *Combination*								✓			✓		
	• *Internalisation*	✓	✓			✓	✓	✓	✓		✓			
	• *Externalisation*				✓						✓			
2	**Knowledge sharing**	✓	✓	✓	✓	✓	✓	✓					8	72.7
	• *The culture of knowledge sharing*											✓		
3	**Knowledge transfer:**												7	63.6
	• *Personalisation*	✓		✓	✓	✓				✓				
	• *Codification*	✓		✓	✓	✓	✓	✓		✓				
4	**Knowledge utilisation**	✓	✓						✓				3	27.2
5	**Knowledge application**				✓			✓		✓			3	27.2
6	**Knowledge storage**			✓	✓								2	18.1
7	**Knowledge evaluation**			✓				✓					2	18.1
8	**Knowledge capture**	✓				✓							2	18.1

1. Knowledge creation

Table 6.16 shows that a significant number of participants (nine out of eleven) discussed how the university generates information through learning processes. The university is concerned with training programs, but these are not always at the required

level. This is because the adoption of the development training programs occurs mostly within the university in order to benefit from the internal expertise of the employees, as well as avoid the high cost of training courses outside the university. In general, every participant discussed individual knowledge creation. Related terms included "generate", "create", "build", "improve", and "learn" (Sunalai & Beyerlein 2015). Text query searches in Figures 6.20a and 6.20b below, and manual thematic analysis in Figure 6.20c, indicate that knowledge creation as a process of knowledge management is widely used in educational institutions in Australia.

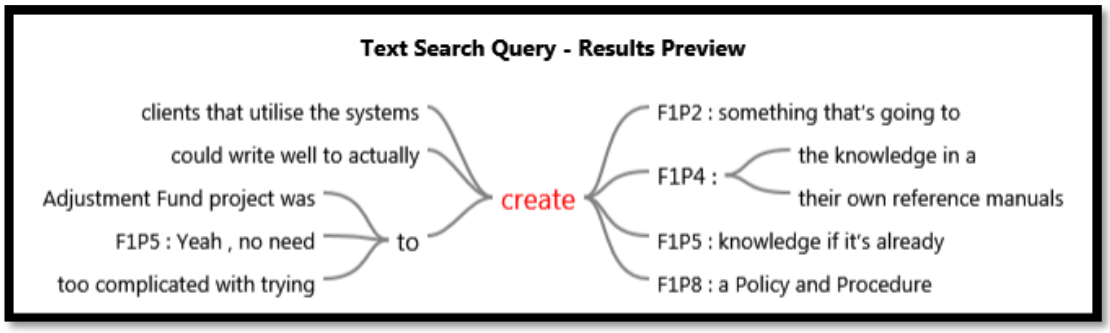


Figure 6.20a: Text search query for Theme one: Knowledge creation

Source: Nvivo output

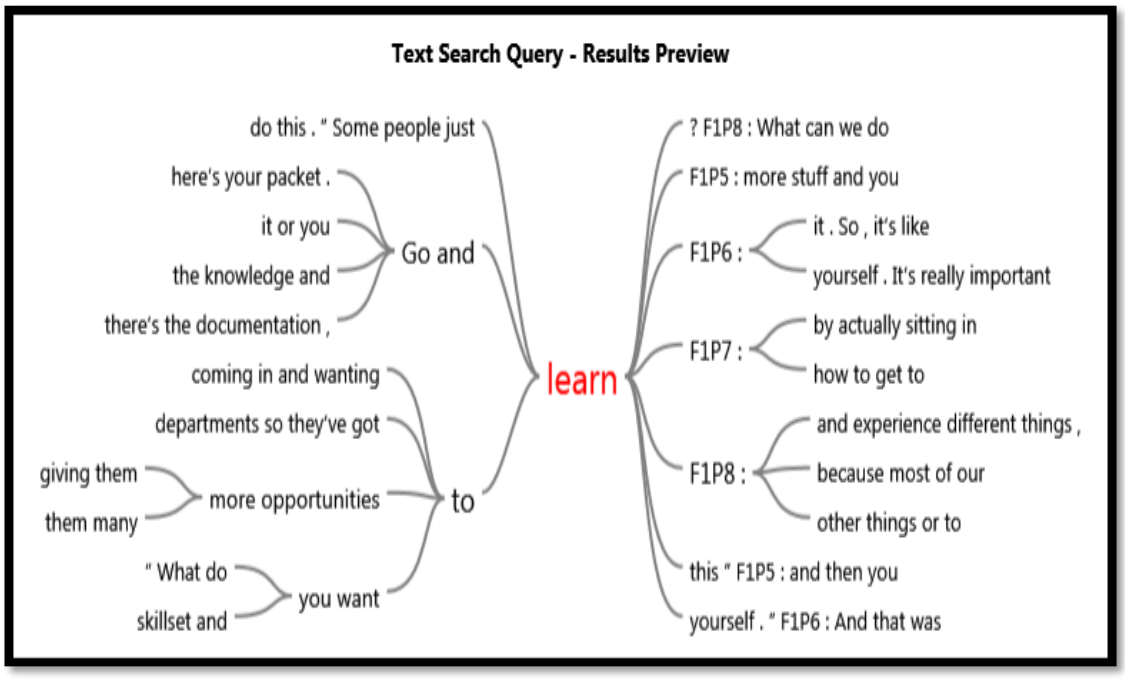


Figure 6.20b: Text search query for Theme one: Knowledge creation

Source: Nvivo output

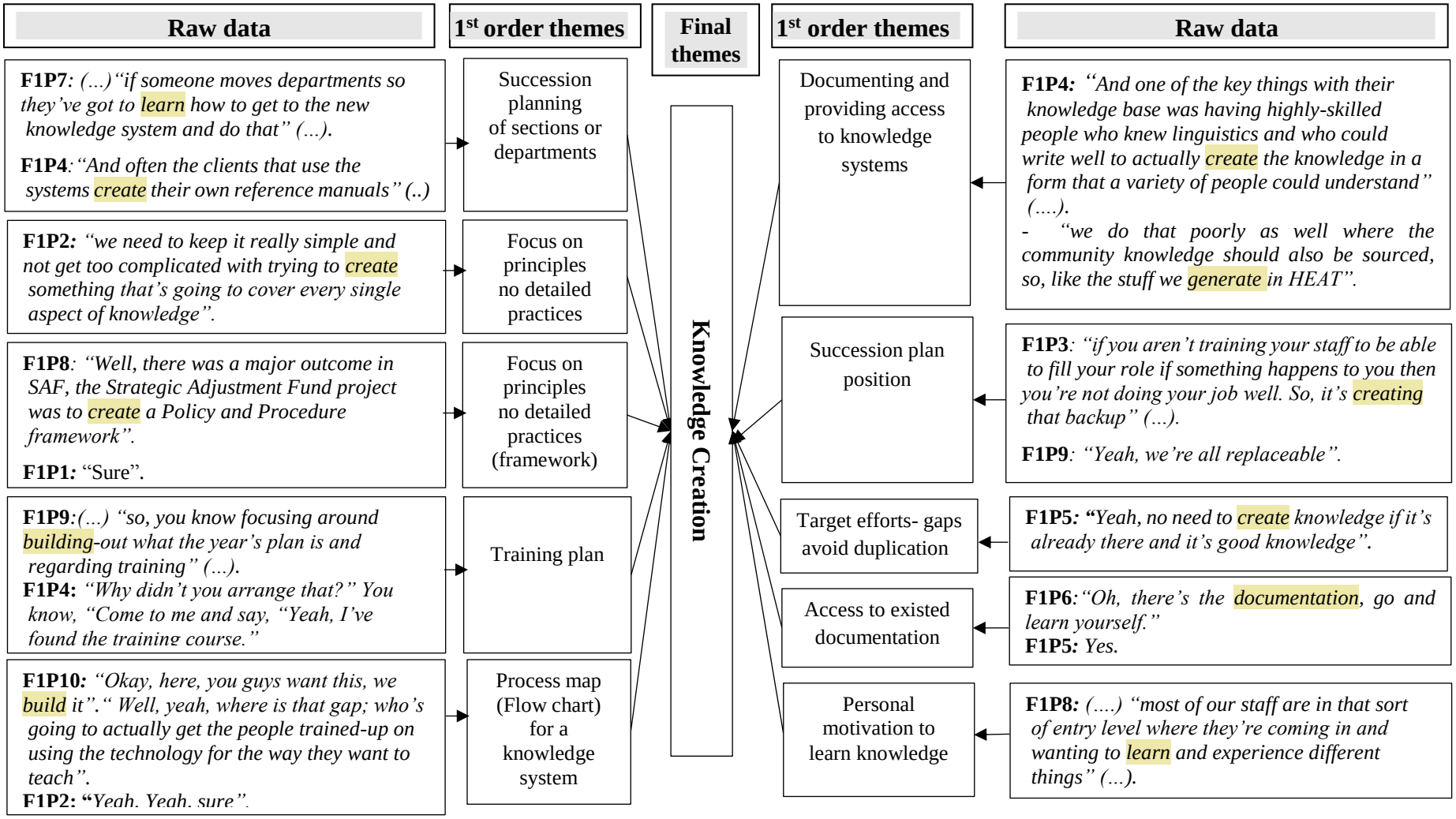


Figure 6.20c: Data structure for Theme one: Knowledge creation

2. Knowledge sharing

As shown in Table 6.16, eight high-level participants mentioned that the university's staff individually and collectively exchanged their information through the normalisation of knowledge sharing. The university promotes sharing of information among all managerial units. Synonymous terms include share, allocation, contribution, dissemination, distribution, integration, and presentation (Sunalai & Beyerlein 2015). Software data analysis of text query searches in Figures 6.21a and 6.21b, as well as manual thematic analysis in Figure 6.21b demonstrate the knowledge sharing as a process of knowledge management, which is used in Australian higher education.

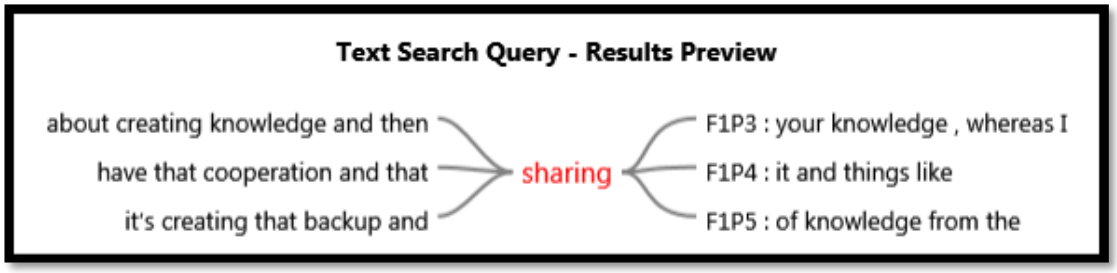


Figure 6.21a: Text search query for Theme two: Knowledge sharing

Source: Nvivo output

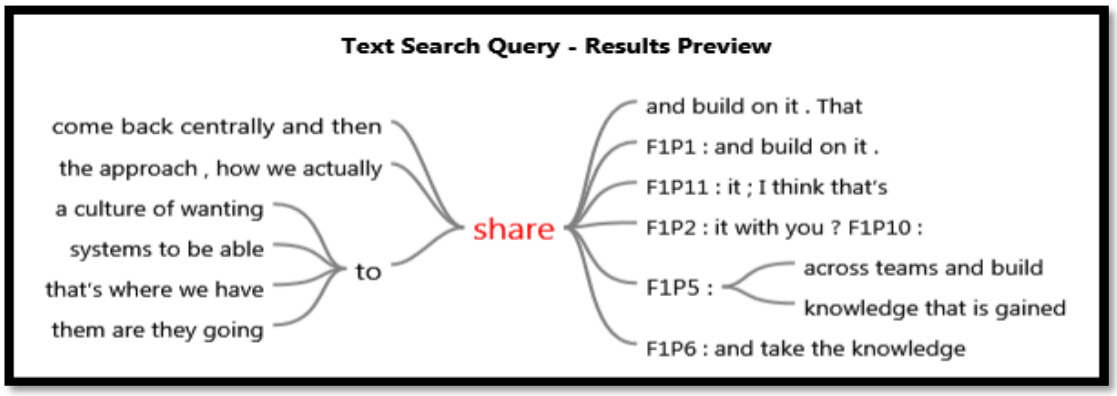


Figure 6.21b: Text search query for Theme two: Knowledge sharing

Source: Nvivo output

3. Knowledge transfer

Looking at the table above (6.16), seven professional participants mentioned that knowledge transfer as a knowledge management process is used effectively in educational institutions in Australia. This theme includes two sub-themes: (i) codification of knowledge transfer; and (ii) personalisation of knowledge transfer. Thematic analysis is provided in Figure 6.22.

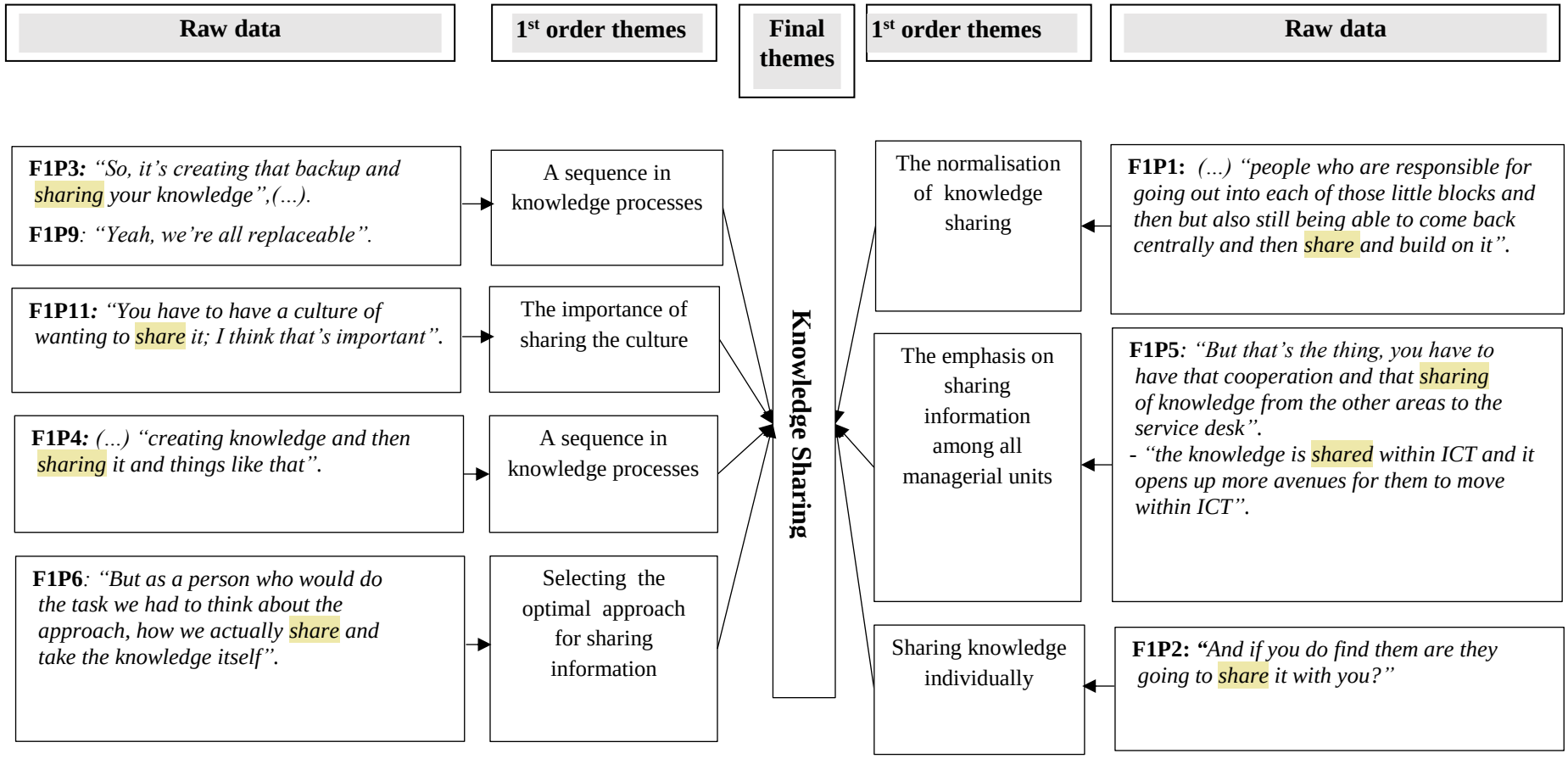


Figure 6.21c: Data Structure for Theme two: Knowledge sharing

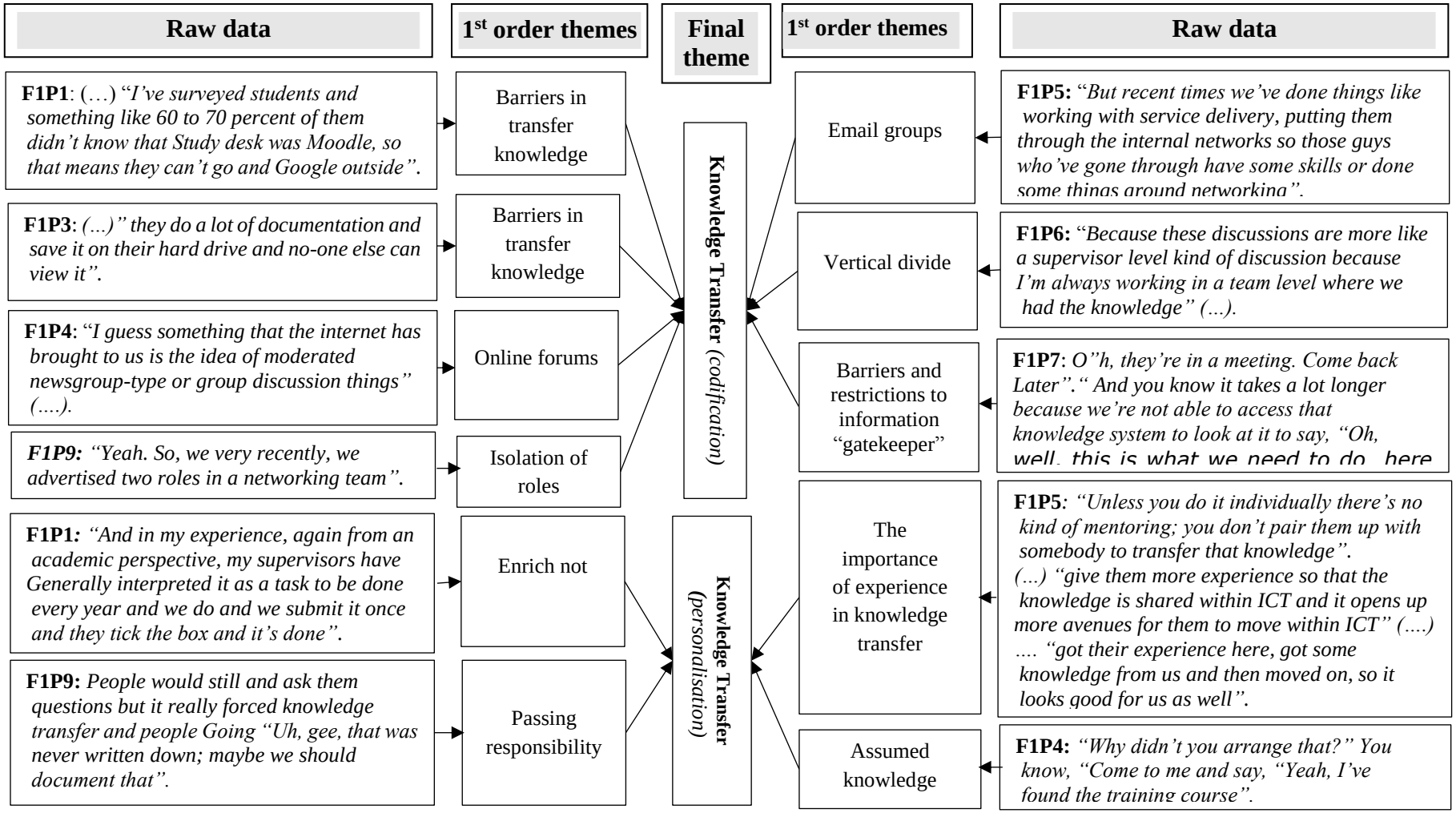


Figure 6.22: Data structure for Theme Three: Knowledge Transfer

The findings of the focus group are similar to those of the brainstorming session. At the university, codified information can be transferred in the form of both explicit and tacit knowledge. Codified knowledge transfers from one team or department to another by individuals using technological tools. In terms of personalisation of knowledge transfer, participants also indicated that for them personally, information transfers to other employees through passing on responsibility and experiences in knowledge transfer, and assumed knowledge. This means that transferral of employee experiences occurs at Australian universities.

4. Knowledge utilisation

Participants indicated that information is used in their university through programs and courses. Used information at the university includes instructions for changing teaching methods. There are many information systems that are used for the short and long-term. However, there is a difficulty in applying some information systems. As can be seen from Table 6.16, three out of eleven professional managers stated that this process is utilised in Australian higher education. See Figures 6.23a and 6.23b below:

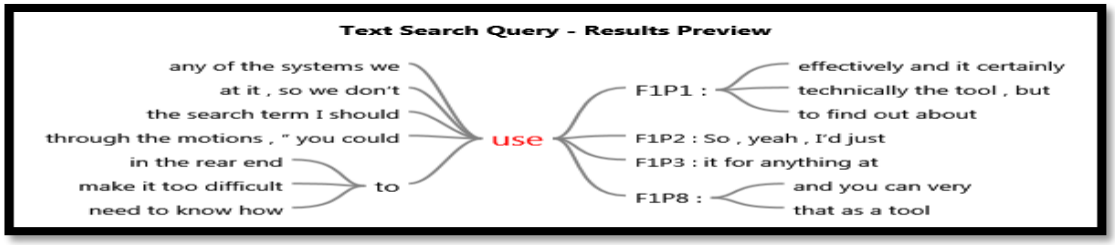


Figure 6.23a: Text search query for Theme four: Knowledge utilisation

Source: Nvivo output

5. Knowledge application

As can be observed from Table 6.16, three professional participants noted that applying information was a continual practice of knowledge management processes within the university's functions, as shown in Figure 6.24a and 6.24b below:

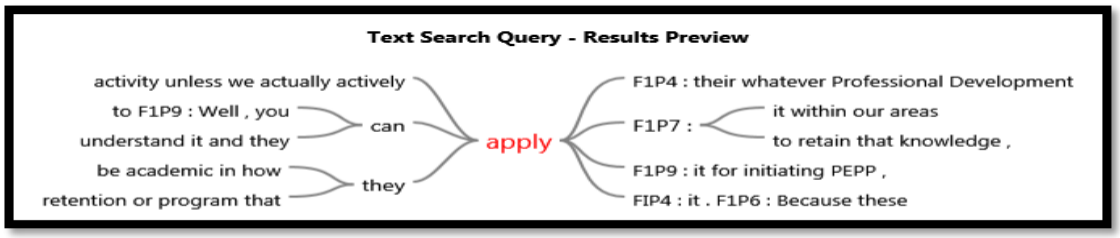


Figure 6.24a: Text search query for Theme five: Knowledge Application

Source: Nvivo output

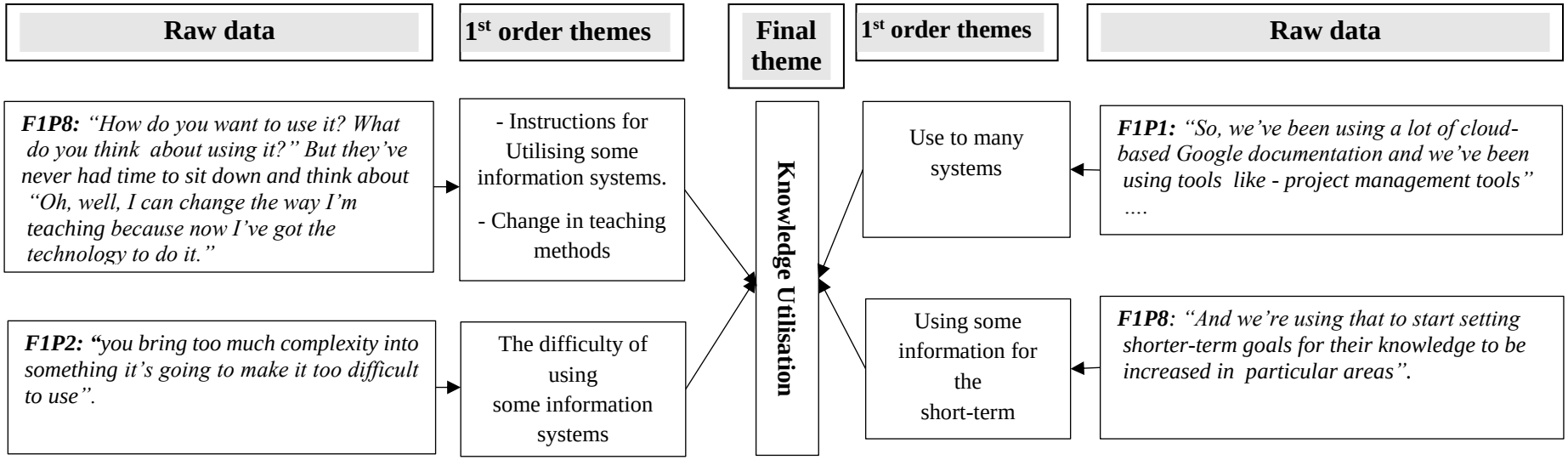


Figure 6.23b*:* Data structure for Theme four: Knowledge utilisation

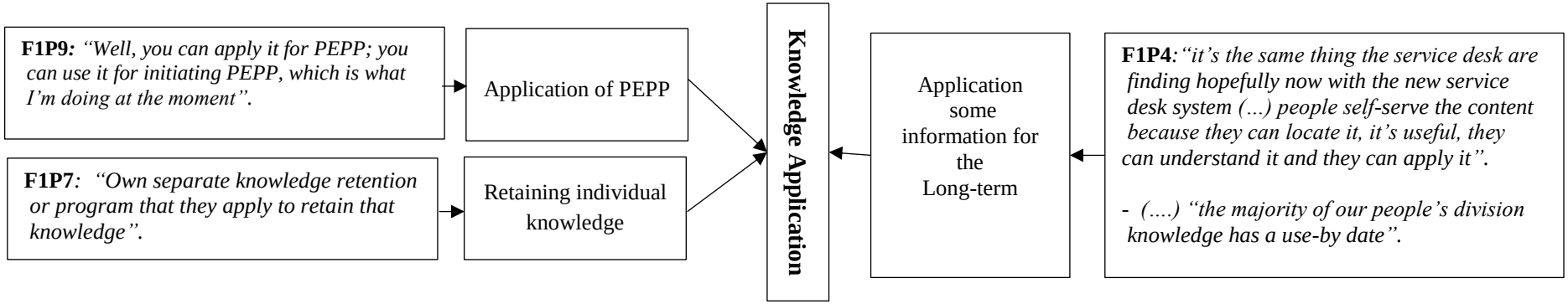


Figure 6.24b: Data structure for Theme five: Knowledge application

6. Knowledge storage

Professional participants indicated that all information resources are adequately stored within the university's systems. Commenting on knowledge storage, two participants said:

> *"So, I guess that brings out naming entities when you're saving documentation where you'd control that sort of stuff"*.(F1P3)

> *"You have to then narrow it to the domain of interest and then see if they've got knowledge stored and you can look at it"*.(F1P4)

7. Knowledge evaluation

Two expert participants observed that there was a systematic and informal evaluation between managers and their employees to assess employee performance and all of them used information in the university:

> *"You can have conversations with your staff at any time informally telling them that they're doing a good job but as a process it's not used for anything if they are doing a good job"*. (F1P3*)*

> *"Yeah, review and retire old documentation so that you don't find it anymore"*. (F1P7)

8. Knowledge capture

As can be seen from Table 6.16, two professional participants noted that capturing information is a continual practice of learning processes within the university's functions. It was observed that a lot of information systems have been captured previously such as knowledge services. Given the evidence, two participants said:

> *"There had been a lot of work done previously and a lot of that had been captured". (F1P1)*

> *"We capture some knowledge systems, products or knowledge services (...)". (F1P5)*

Both the knowledge management findings of the brainstorming data analysis, and the focus group data analysis have been combined in Table 6.17:

Table 6.17: A summary of the selected knowledge management processes via participants in the brainstorming session and the focus group session

No.	Themes and subthemes	Participants																	Total	%
		Brainstorming session						Focus group session												
		1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10	11	17	
1	**Knowledge creation:**																		14	82.35
	• *Combination*	✓		✓			✓								✓			✓		
	• *Socialisation*		✓				✓													
	• *Internalisation*	✓						✓	✓			✓	✓	✓	✓		✓			
	• *Externalisation*		✓		✓		✓				✓						✓			
2	**Knowledge transfer:**																		12	70.58
	• *Personalisation*	✓	✓	✓				✓		✓	✓	✓				✓				
	• *Codification*	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓				
3	**Knowledge sharing:**							✓	✓	✓	✓	✓	✓	✓					10	58.8
	• *The culture of knowledge sharing*	✓	✓															✓		
4	**Knowledge utilisation**	✓	✓	✓		✓	✓	✓	✓						✓				8	47.05
5	**Knowledge storage**	✓		✓	✓		✓			✓	✓								6	35.29
6	**Knowledge evaluation**	✓	✓		✓		✓			✓				✓					6	35.29
7	**Knowledge capture**			✓			✓	✓				✓							4	23.52
8	**Knowledge application**										✓			✓		✓			3	17.64
9	**Knowledge construction**				✓														*1*	5.88

As can be seen in Table 6.17, the majority of participants (82.35%) focused on knowledge creation, followed by knowledge transfer (70.58%) and knowledge sharing (58.8%). The least attention was paid to knowledge utilisation, knowledge storage and evaluation, knowledge capture, knowledge application, and knowledge construction (47.05%, 35.29%, 23.5%, 17.64, and 5.88% respectively). Hence, the three dominant themes that emerged in step one were knowledge creation, knowledge transfer, and knowledge sharing. Because of their importance, they were then utilised in developing the individual interviews' protocol (step two).

6.5.3.2 Step two

6.5.3.2.1 Individual interviews

Following the previous methodology, the individual interview protocol related to knowledge management processes was developed based on the results of both the brainstorming session and the focus group session. Table 6.18 below summarises the data analysis of the individual interviews for knowledge management processes. Four broad themes emerged from the analysis of knowledge management. Each of these themes is summarised and described. The results are detailed below, using abbreviations to preserve participant anonymity. For example, IR1 means individual interview one, participant one.

Table 6.18: Knowledge management processes used in Australian higher education

No.	Themes and subthemes	Participants of individual interviews					
		1	**2**	**3**	**4**	**5**	**6**
1	Knowledge creation:						
1-A	*Combination*		✓	✓	✓		
1-B	*Socialisation*			✓		✓	✓
1-C	*Internalisation*		✓	✓	✓	✓	✓
1-D	*Externalisation*	✓	✓	✓		✓	✓
2	Knowledge transfer:						
2-A	*Personalisation*	✓	✓	✓	✓	✓	✓
2-B	*Codification*		✓	✓	✓	✓	✓
3	Knowledge sharing	✓	✓	✓	✓	✓	✓
4	Knowledge utilisation	✓	✓		✓	✓	✓
5	Knowledge storage	✓			✓		
6	Knowledge construction		✓				✓
7	Knowledge capture	✓				✓	
8	Knowledge application	✓					

1. Knowledge creation

According to Bajwa et al. (2015); Birasnav (2014); Lee and Wong (2015), knowledge creation is defined as the conversion of knowledge from tacit to explicit knowledge, which in itself creates new knowledge, ideas, and best practices. The knowledge creation theme was explored through asking interviewees: "How is new information and knowledge created within your organisation?" They provided different opinions from different perspectives. Some common and uncommon patterns were observed in their views. For my analysis, I have divided their views into four different subthemes (Table 6.18):

(1) combination, which contains access to database, support communication, and support work technology;
(2) socialisation, which includes use of collaboration tools like confluences and creating new information collaboratively;
(3) internalisation, which is focused on developing, building, and designing the technology, and learning for staff inside or outside the university; and
(4) externalisation, which involves problem-solving based on technology, doing research, and investigation.

Four out of six participants mentioned "learn" and "new", and two participants noted "technology" in relation to created knowledge processes. Text query searches show supporting data in Figures 6.25a, 6.25b, and 6.25c.

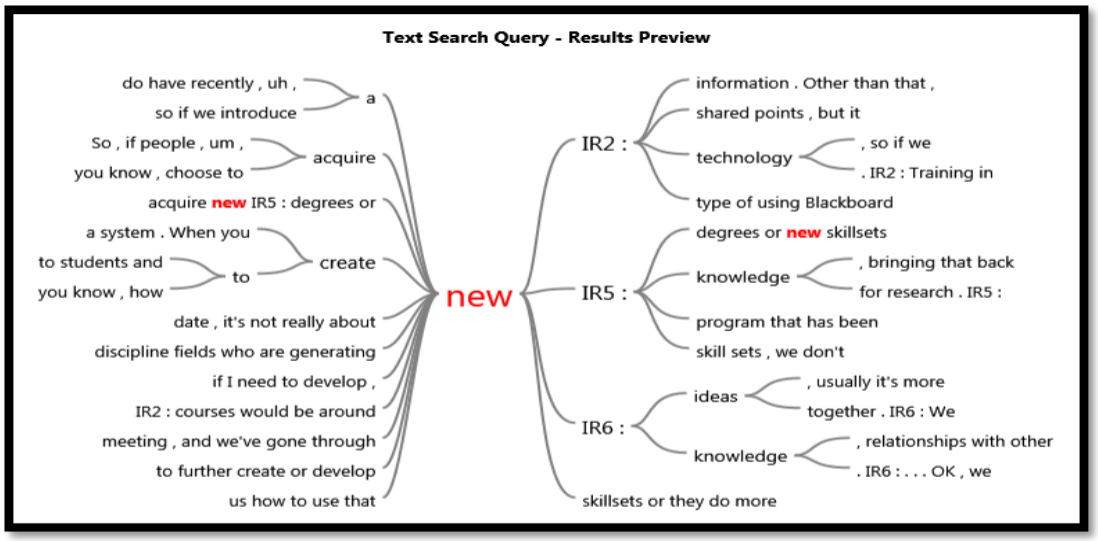


Figure 6.25a: Text search query for Knowledge Creation theme

Source: Nvivo output

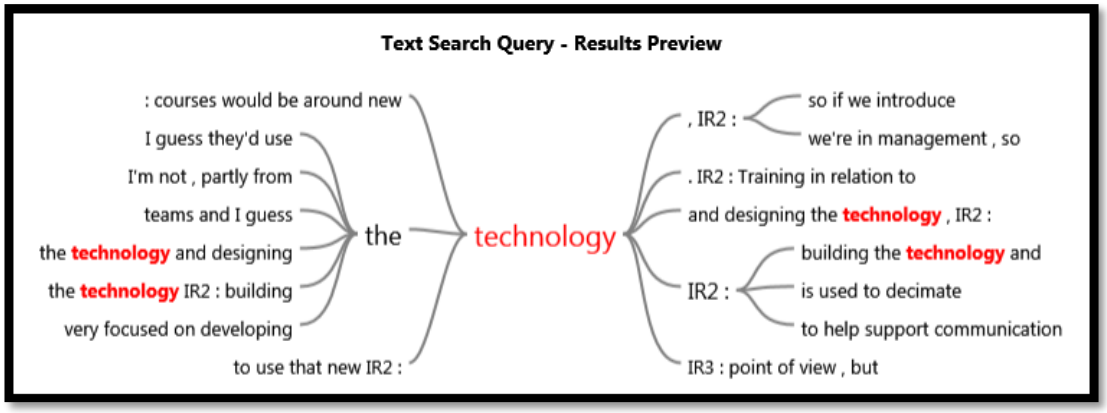


Figure 6.25b: Text search query for the Knowledge Creation theme

Source: Nvivo output

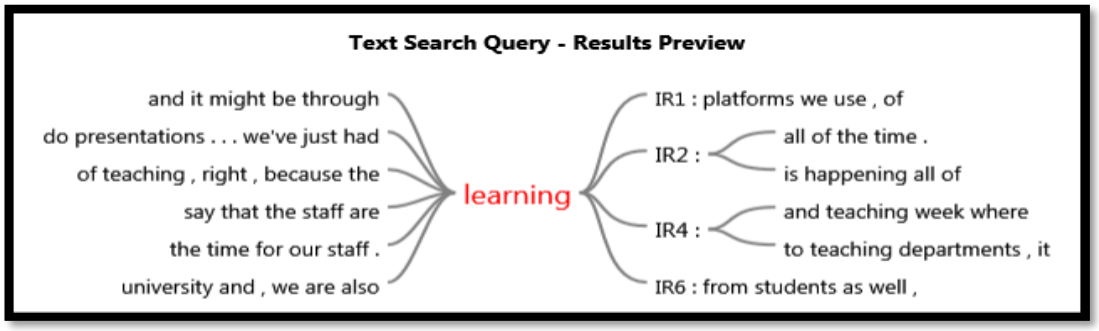


Figure 6.25c: Text search query for the Knowledge Creation theme

Source: Nvivo output

2. Knowledge transfer

In this study, knowledge transfer was defined as a process that allows employees to transfer their tacit-to-tacit and explicit-to-explicit knowledge with other employees both internal and external to their organisations (Bajwa et al. 2015; Birasnav 2014). Two interview questions were developed for this theme and its subthemes: "How is knowledge transferred from one department to another in your organisation", and "How is knowledge transferred from one staff member to another in your organisation?" Two key sub-themes emerged from these questions: firstly, personalisation, which contains information transfer by training courses, seminars, workshops and presentations, the responsibility of the delegated authority to transfer knowledge, and transferring knowledge through personal connections; and secondly, codification via a transfer of information by mails and confluences, transfer of information by staff profiles, and availability of systems and programs to all staff members.

Participants mentioned many ways of transferring information within the university, whether individually or organisationally. One interviewee said:

> *"There's research type knowledge, but the primary method is by, uh, seminars and, uh, workshops"*.(IR1)

Other responses to these questions included:

> *"I guess the main way we do that is through email and putting things on our shared database/shared Internet server"*.(IR2)

Two interviewees agreed that there is a private network available only to university staff when asked about transferring information from one department to another:

> *"As an individual, so that would be, um, like the standard, um, needs of doing that now through the Intranet, as far as, you know, something is on or, um, documents and forms and quick links, so that's all done through the Intranet now".(*IR4)

> *"We have ... let's say, for example, we have the staff profile. So, uh, we could, uh, enter applications for everybody ... open for everybody to search, and if someone like an external post-graduate student would like to do a PhD, for example, they can look at our staff profiles and see our expertise and if it would meet their research interests or if they want to study a PhD. So, uh, in a way, yes, it is transparent, and it can be transferred from here to outside, from here to another department internally"*.(IR6)

However, there are some limitations of transferring the information inside the university. Talking about this issue, one interviewee said*:*

> *"for you know, the other systems like accounting and HR[Human Resources] and those generalised systems, that's all kept centrally, so the transference of that is, again, the responsibility of the delegated authority to transfer that on"*.(IR5)

3. Knowledge sharing

Knowledge sharing is a process of sharing information, skills, expertise, and experiences among individuals, groups, or an organisation's departments (Shao et al. 2017; Tesavrita & Suryadi 2016). The knowledge sharing theme was explored through asking interviewees: "How is knowledge shared from one department to another in your organisation", and "How is knowledge shared from one staff member to another in your organisation?"

All high-level interviewees talked about the importance of sharing information inside and outside the organisation, as captured by the "share" and "sharing" within shared information practices. This suggests that sharing information is a key process of knowledge management in the higher education environment. Text query searches show supporting data in Figures 6.26a and 6.26b.

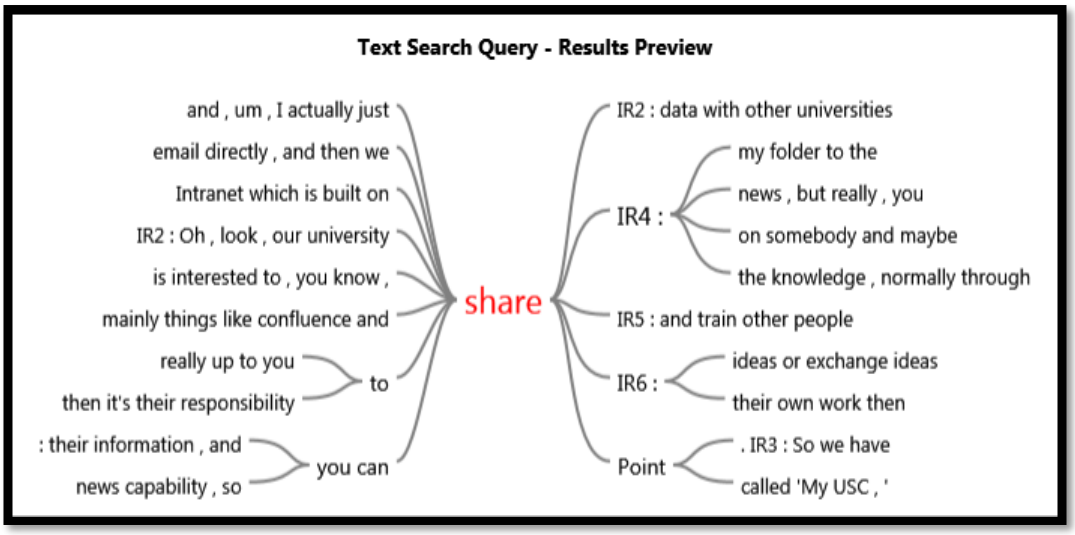


Figure 6.26a: Text search query for the Knowledge Sharing theme

Source: Nvivo output

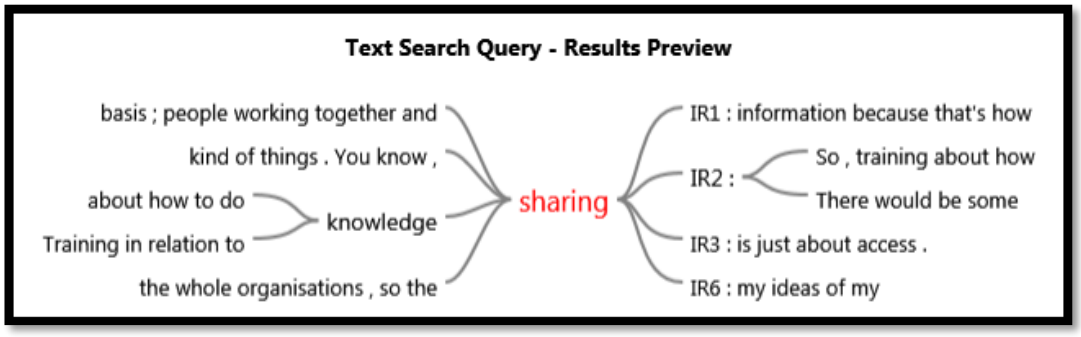


Figure 6.26b: Text search query for the Knowledge Sharing theme

Source: Nvivo output

Again, although the individual interview questions of knowledge management were utilised to guide the process, the interviewer allowed interviewees to offer up new concepts. This revealed a number of emerging processes. Figure 6.27 shows how four interviewees reported on knowledge utilisation.

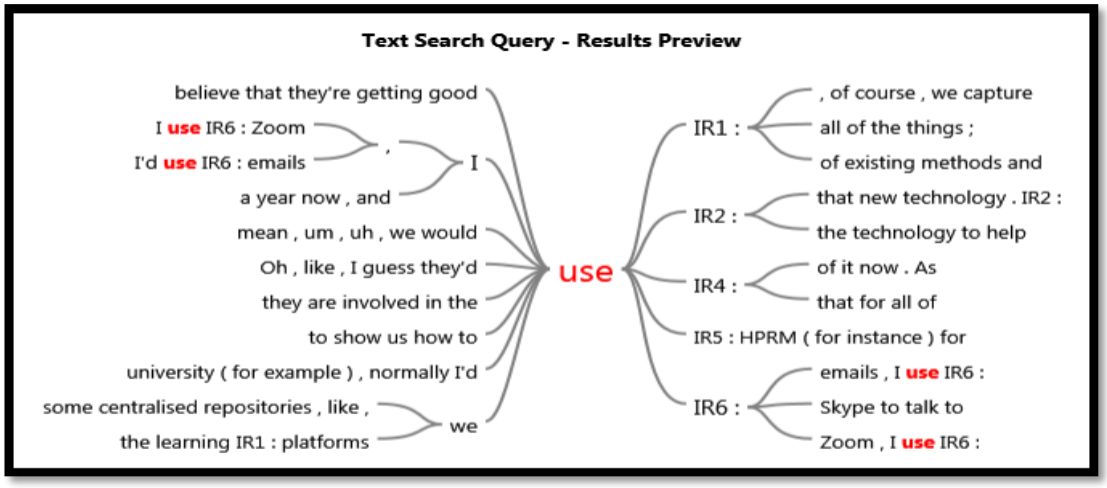


Figure 6.27: Text search query for the Knowledge Utilisation theme

Source: Nvivo output

Two informants reported on knowledge storage:

> *"It's pretty straightforward; all of our storage is electronic"*.(IR1)

> *"So I really appreciate the capabilities of storing my information, and that's been for over a year now, and I use that for all of my work information"*.(IR4)

The two comments below illustrate knowledge construction:

> *"How we actually acquire knowledge, you know, from outside and from, other experts, you know, to further create or develop new knowledge"*. (IR6)

> *"So I think, you know, building knowledge is something which is going on all of the time for our staff"*.(IR2)

Commenting on knowledge capture, two of the interviewees said:

> *"We capture information on students in the context of teaching, right, because the learning platforms we use, of course, we capture information on students because there's material there.* (IR1)

> *"We've also got different systems that capture, um, and maintain our research knowledge and the development of that, but they don't connect IR5:They're very separate information systems"*.(IR5)

For the knowledge application, one individual stated:

> "*So, the application sometimes comes with the nature of the project which has, if you like an element of consultancy about it"*.(IR1)

6.5.4 Validity check for thematic analysis: Knowledge management processes

A similar method was used for identifying talent management themes, and at least two-thirds of participants discussed themes to be addressed in the research model (Aldhaban 2016; Phan 2013). Based on Table 6.14 above, knowledge creation, knowledge transfer, and knowledge sharing met the criterion for inclusion in the theoretical research model. Similarly, in exploring the talent management themes, the three-staged approach was used to increase the validity of the qualitative data analysis of knowledge management. Therefore, the validity check using the three-staged approach of thematic data analysis was only focused on these aforementioned processes to develop the quantitative measure. In brief, to identify the categories of selected themes, a three-staged process was followed as per Table 6.19.

Table 6.19: Summary of three data analysis stages: Knowledge management processes

Stage	Purpose	Results
1	To identify contributed items by reviewing each-separate data analysis of qualitative techniques	Preliminary list of items
2	To identify categories by evaluating items in context in which they appear	List of categories
3	To regroup categories to identify themes	List of themes

In stage one, open coding and axial coding methods were used for the transcripts of three qualitative methods regarding knowledge management to create a preliminary list of items. From this process, 82 preliminary items were chosen from knowledge management in the higher education environment. Table 6.20 displays the summary of items contributing to knowledge management.

Table 6.20: First stage output- summary of items contributing to knowledge management

Items contributing to knowledge management		
Abilities	Expertise	Publication
Academic community	Exploring and understanding ideas among team members	Research
Accessibility	Experts	Researchers
Access to database	External environment	Responsibility
Activities	Externalisation	Seminars
Authority	Face-to-face discussions	Searchability
Availability of using systems, software, and programs to all staff members	Individual collaboration	Sharing ideas with other researchers outside the university
Building the technology	Information resources	Sharing information with other universities
Collaboration in sharing the information inside the organisation	Innovation	Sharing information culture
Collaborative tools	Inside	Sharepoint
Cooperative projects	Internal environment	Skills
Communication	Internalisation	Socialisation
Combination	Intranet	Specific
Conferences	Investigating things	Software
Confluences	Knowledge	Staff profiles
Contact	IT Services	Support communication
Courses and programs	Learning skills	Support work technology
Creating (acquiring) new information	Learning staff inside the organisation	Teaching practices
Designing the technology	Learning staff outside the organisation	Tools
Developing the technology	Library resources	Training courses
Documents	Mails	Training seminars
Doing papers	Meetings	Training presentations
Group interaction	Observation	Training workshops
Efficiency (efficiencies)	Online data base	Transfer individual experiences
Encouraging creativity and innovation	Outside	Workshops
Encouraging effective discussion among learning teams	Personal connections	
	Presentations	
	Policies and procedures	
	Problem solving	
	Process	
	Professional	

From Table 6.20, the researcher categorised items into two parts. The first part included items mentioned in the knowledge management literature, while the second part consisted of items not mentioned in the literature. Table 6.21 and 6.22 provide a summary of this procedure.

Table 6.21: Knowledge management items from the qualitative study (mentioned in the literature)

No.	Items	References
1	Abilities	(Kabwe 2011; Visuri 2014)
2	Access to database	(Li et al. 2009)
3	Codification knowledge transfer	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)
4	Collaboration in sharing the information inside the organisation	(Tan & Wong 2015)
5	Collaborative tools	(Li et al. 2009; Tan & Wong 2015)
6	Combination	(Li et al. 2009; Nonaka & Konno 1998)
7	Courses and programs	(Rhodes et al. 2008)
8	Create (acquire) new information	(Bajwa et al. 2015; Birasnav 2014; Lee & Wong 2015; Nonaka 1994)
9	Documents	(Nonaka & Toyama 2003)
10	Externalisation	(Li et al. 2009; Nonaka & Konno 1998)
11	Face-to-face discussions	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)(Abd Rahman et al. 2013; Rhodes et al. 2008)
12	Inside	(Bajwa et al. 2015; Birasnav 2014)
13	Internalisation	(Li et al. 2009; Nonaka & Konno 1998)
14	Intranet	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)
15	Mails	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)
16	Meetings	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)
17	Observation	(Li et al. 2009)
18	Online data base	(Li et al. 2009)
19	Outside	(Bajwa et al. 2015; Birasnav 2014)
20	Personalisation knowledge transfer	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)
21	Problem-solving	(Li et al. 2009)
22	Publication	(Rhodes et al. 2008)
23	Socialisation	(Li et al. 2009; Nonaka & Konno 1998)
24	Training courses, and presentations	(Rhodes et al. 2008)
25	Transfer individual experiences	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)

Table 6.22: Knowledge management items from the qualitative study (not mentioned in the literature)

No.	Items	No.	Items
1	Accessibility	24	Learning by practice e.g. teaching
2	Academic community	25	Learning skills
3	Availability of using systems, software, and programs to all staff members	26	Staff learning inside the university
4	Building the technology	27	Learning staff outside the university
5	Conferences	28	Library resources
6	Confluences	29	Personal connections
7	Contact	30	Policies and procedures
8	Designing the technology	31	Responsibility
9	Developing the technology	32	Seminars
10	Doing research	33	Searchability
11	Communication	34	Sharing ideas with other researchers outside the university
12	Efficiency (efficiencies)	35	Sharing information with other universities
13	Encouraging creativity and innovation	36	Sharing information culture
14	Encouraging effective discussion among learning teams	37	Sharepoint
15	Expertise	38	Software
16	Exploring and understanding ideas among team members	39	Staff profiles
17	External environment	40	Support communication
18	Group interaction	41	Support work technology
19	Individual collaboration	42	Tools
20	Information resources	43	Training seminars
21	Internal environment	44	Training workshops
22	Investigating things	45	Workshops
23	IT Services		

During stage two, the initial list was further analysed manually by doing an intensive analysis through a process of axial coding to find interrelationships between one item and other items. The analysis includes two integrated parts, as shown in Tables 6.23 and 6.24. In Table 6.23 (step 1), categories and items were identified from stage one (based on the qualitative study mentioned in the literature), followed by categories and items identified from stage one (based on the qualitative study not mentioned in the literature) in Table 6.24 (step 2). In brief, 7 categories and 27 items were explored and

presented in Table 6.25 (step 3), which is based on the integrated output between step1 and step 2.

Table 6.23: Second stage output (step 1) - summary of knowledge management categories and items identified from stage one (based on the qualitative study mentioned in the literature)

Categories	Items
Combination	• Access to online database
Socialisation	• Learning skills, e.g. by observation
Internalisation	• Staff learning inside the university • Learning by doing
Externalisation	• Problem-solving based on technology • The efficiency of using collaborative tools e.g. meetings or other tools • Create new information
Personalisation knowledge transfer	• Transfer individual experiences to other staff memebers • Transfer effective information to academic community through training courses, seminars, workshops and presentations • Transfer knowledge through personal connections e.g. face-to-face discussions
Codification knowledge transfer	• Transfer information resources by mails • Transfer information by staff profiles and intranet • Availability of using systems, software, and programs to all staff members
Sharing information	• Collaboration in sharing information among staff members

Table 6.24: Second stage output (step 2) - summary of knowledge management categories and items identified from stage one (based on the qualitative study not mentioned in the literature)

Categories	Items
Combination	• Support communication (contact) • Support work technology
Socialisation	• Encouraging creativity and innovation • Encouraging effective discussion among staff members • Exploring and understanding ideas among team members
Internalisation	• Focused on developing, building, and designing the technology • Tools for creating learning policies and procedures • Learning by practice e.g. teaching, courses
Externalisation	• Problem-solving through searchability, accessibility, and IT Services • The efficiency of using collaborative tools e.g. confluences, conferences, seminars and sharepoint • Create (acquire) new information, e.g. by doing research (publication, documents) • Staff learning outside the university • Investigating things
Personalisation knowledge transfer	• Transfer effective information to academic community through training seminars and workshops • Transfer knowledge through personal connections e.g. face-to-face discussions • The responsibility of the delegated authority to transfer knowledge
Sharing information	• Sharing information (expertise) with other universities • Information sharing culture • Sharing ideas with other researchers outside the university (external environment) • Group interaction, individual collaboration library resources

Table 6.25: Second stage output (step 3) - summary of knowledge management categories and items identified from stage one (based on both step1 and step 2 output)

Categories	Items
Combination	• Access to online database • Support communication (contact) • Support work technology
Socialisation	• Encouraging creativity and innovation • Encouraging effective discussion among learning teams • Learning skills, e.g. through observation • Exploring and understanding ideas among team members
Internalisation knowledge creation	• Focused on developing, building, and designing the technology • Tools for creating learning policies and procedures • Staff learning inside the university • Learning by practice e.g. teaching, courses
Externalisation knowledge creation	• Problem-solving based on technology (searchability, accessibility, IT Services) • The efficiency of using collaborative tools e.g. meetings, confluences, conferences, seminars and sharepoint • Create (acquire) new information e.g. doing research (publication, documents) • Staff learning outside the university • Investigating things
Personalisation knowledge transfer	• Transfer individual experiences (abilities) to other staff memebers • Transfer effective information to academic community through training courses, seminars, workshops and presentations • Transfer knowledge through personal connections e.g. face-to-face discussions • The responsibility of the delegated authority to transfer knowledge
Codification knowledge transfer	• Transfer information resources by mail or confluences • Transfer information through staff profiles and intranet • Availability of using systems, software, and programs to all staff members
Sharing information	• Collaboration in sharing information among staff members (academic community, internal environment) • Sharing information (expertise) with other universities • Information sharing culture • Sharing ideas with other researchers outside the university (external environment) • Group interaction, individual collaboration library resources

At the third and final stage, the core categories identified in Table 6.25 were grouped under specific theme areas. Table 6.26 compares the summary of knowledge management themes with their categories, which resulted in three key themes, including seven categories of knowledge management processes.

Table 6.26: Third stage output-summary of knowledge management themes

Themes	Categories
Knowledge Creation	• Combination • Socialisation • Internalisation • Externalisation
Knowledge Transfer	• Personalisation • Codification
Knowledge Sharing	• Sharing information

In conclusion, there were 35 items developed for the knowledge management processes variable of the quantitative questionnaire. Some of these were produced through the qualitative study and some were informed by the literature. All the measurement items and their categories are listed in Chapter eight, Section 8.4.1 of this thesis.

6.6. Summary

This chapter has provided the outcomes of three multi-method studies in regard to research objective 1. It has highlighted outcomes of the qualitative data analysis. These outcomes were utilised to develop the survey statement covered in the next chapter. This is based on refined concepts of the initial research model. This chapter has reviewed the qualitative data analysis in six sections. Section one started by presenting an overview of this chapter. In Section two, a general introduction was provided about the qualitative data analyses. Reliability and validity of qualitative data were addressed in Section three. The next section dealt with a pilot of the qualitative data analysis. Section five presented the results of the qualitative data analysis, divided into (i) qualitative data analysis to identify talent management processes used in Australian higher education, and (ii) qualitative data analysis to identify knowledge management processes in Australian higher education. Three key themes and ten sub-themes of

talent management processes were explored, including: (1) talent attraction (social domain, and organisational excellence); (2) talent development (performance management, coaching talent, and leadership development); and (3) talent retention (benchmarking, employee motivation, employee empowerment, non-monetary rewards, and job satisfaction). In a similar fashion to the talent management analysis, three key themes and seven sub-themes of knowledge management processes were explored, including: (1) knowledge creation (combination, socialisation, internalisation and externalisation); (2) knowledge transfer (personalisation knowledge transfer and codification knowledge transfer); and (3) knowledge sharing (sharing information). Finally, section six has provided a summary of the chapter.

CHAPTER 7: CONCEPTUAL MODEL DEVELOPMENT

7.1. Chapter overview

In the previous chapter, qualitative data analysis was explained and a number of emerging themes of both talent management and knowledge management discussed. Evidence was presented to explain that the key themes identified by at least two-thirds of the qualitative participants' data should be what the research model is comprised of. It has therefore been modified accordingly (Aldhaban 2016; Phan 2013).

This chapter reviews the conceptual model development for this study based on the research objectives and the research questions of this study. The review of the conceptual model development covers six sections. Section 7.1 presents an overview of this chapter. The next section (7.2) provides an introduction to this chapter, which is followed by a discussion of the refined research model in greater detail (7.3). Definitions of factors used in the initial framework are provided in section 7.4. To address the research questions the research hypotheses are presented in section 7.5. The final section (7.6) summarises the conclusions of this chapter. This chapter thus covers six sections which are presented in the following graphical layout.

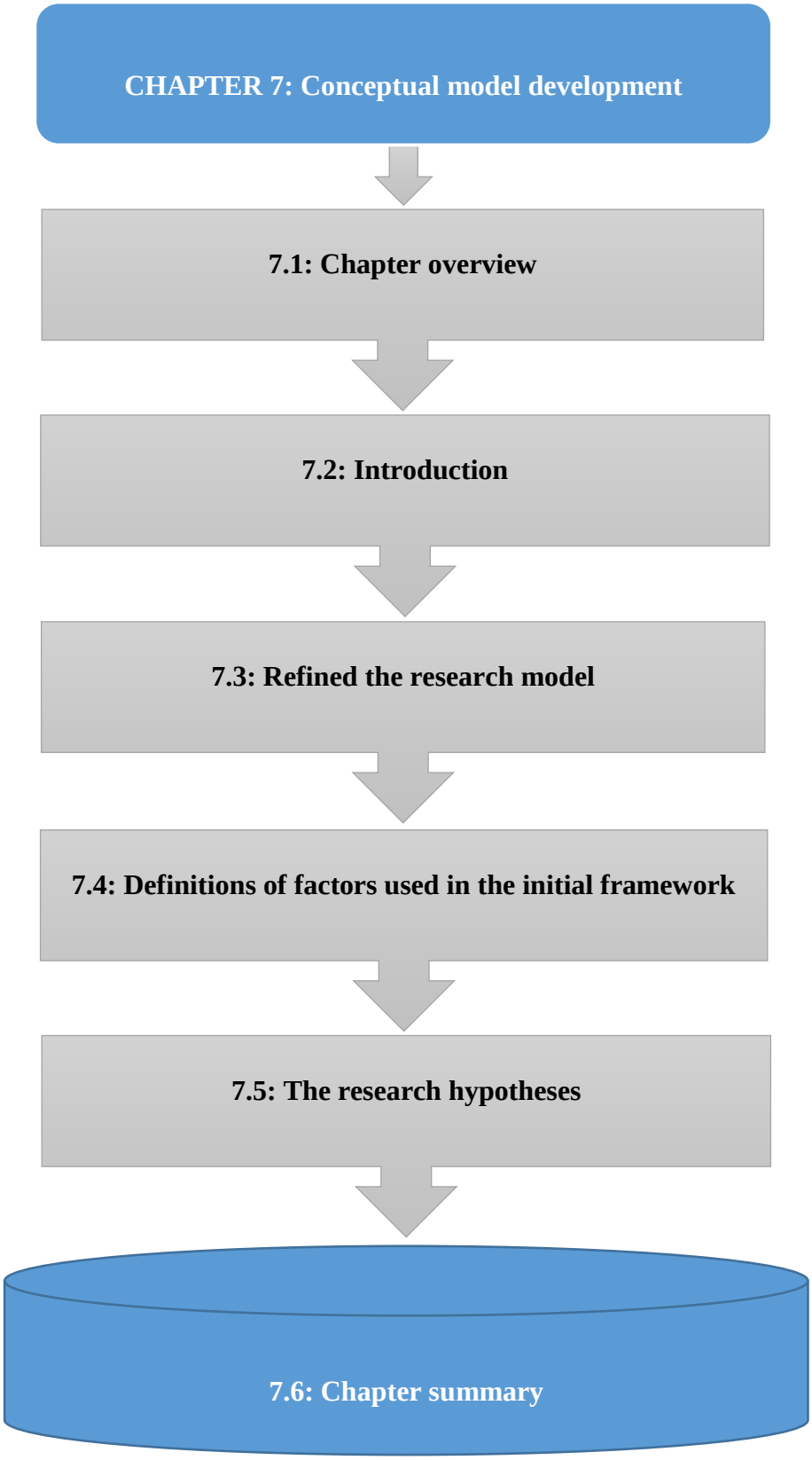


Figure 7.1: A graphical layout for Chapter 7

Source: Prepared by the researcher.

7.2. Introduction

The second research objective of this study is to investigate the relationship between talent management processes and knowledge management processes. To achieve this aim, the initial research model of this research was developed. This model was constructed based on the literature related to talent management processes and knowledge management processes and their associated theoretical underpinnings. As mentioned earlier in chapter 3: Theoretical underpinnings, the researcher has utilised several theoretical underpinnings that provide a foundation to this study to aid in constructing the conceptual model. These theoretical underpinnings include the following theories: talent-management theory, Maslow's theory of Hierarchy of Needs on talent attraction, equity theory and Herzberg's theory, two-factor theories of motivation on talent retention, knowledge-based theory, and organisational knowledge creation theory.

A comprehensive review of the specialised literature of both talent management and knowledge management was conducted. This review resulted in the development of a measure involving five constructs of both talent management processes and knowledge management processes (Appendix E): talent attraction, talent development, talent retention, knowledge transfer, and knowledge creation. An explanatory (independent) variable was represented as talent management processes. At the same time, an effector (dependent) variable was represented as knowledge management processes.

However, the initial research model was refined according to the outcomes of the qualitative study. The refined research model includes six constructs that are equally distributed between talent management processes and knowledge management processes. The qualitative procedures were based on a three-stage method of thematic analysis. The qualitative findings were employed to develop the quantitative questionnaire statement. Thus, to fully achieve this objective, the study formulates nine hypotheses from the refined research model to answer the nine principal research questions of the study. The rationale for this approach is to assist the researcher to test the relationship that may exist between the variables of this study.

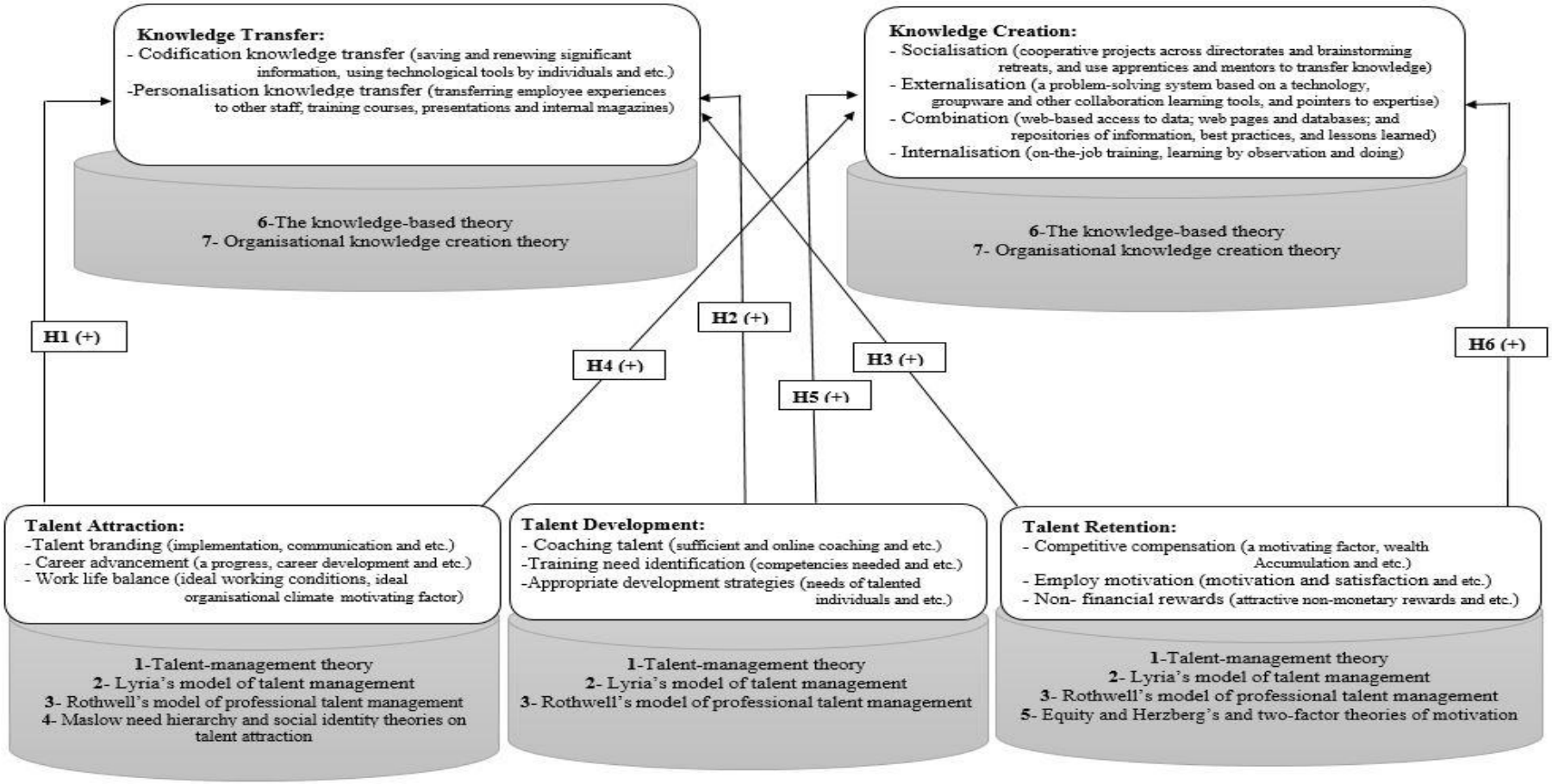
7.3. Refined the research model

Figure 7.2 shows the initial conceptual model with supported theories and models (developed from literature) before the qualitative study was carried out. The initial conceptual model was based on the efficacy of the following three specific talent management processes as independent variables: talent attraction, talent development, and talent retention (AlKerdawy 2016; Lyria 2014; Pimapunsri 2013; Powell et al. 2013; Rothwell et al. 2014). These processes possibly have a positive influence on specific knowledge management processes: knowledge transfer and creation (Gateau & Simon 2016; Sparrow & Makram 2015; Vaiman et al. 2015) as dependent variables in Australian higher education. The initial quantitative questionnaire instrument consisted of 15 categories (3 questions each category) measuring five constructs. For example, talent attraction (Q1-Q8), talent development (Q10- Q18), talent retention (Q19-Q27), knowledge transfer (Q28- Q33) and knowledge creation (Q34-Q45). Appendix E provides the operationalisation of constructs for the initial conceptual model.

However, after carrying out the qualitative study, the initial conceptual model (Figure 7.2) has been revised as shown in Figure 7.3. The following three key themes and ten sub-themes of talent management processes that emerged from the qualitative study in the context of Australian higher education have changed the initial conceptual model: (1) talent attraction (social domain, and organisational excellence); (2) talent development (performance management, coaching talent, and leadership development); and (3) talent retention (benchmarking, job satisfaction, non-monetary rewards, employee empowerment, and employee motivation). In a similar fashion to the talent management processes, the following three key themes and seven sub-themes of knowledge management processes that are utilised in Australian higher education have restructured the intial conceptual model: (1) knowledge transfer (personalisation and codification); (2) knowledge creation (combination, socialisation, internalisation and externalisation); and (3) knowledge sharing (sharing information).

In addition, in the revised model, Lyria's and Rothwell's models of talent management were removed, because the qualitative results of this study already provide a conceptual model for higher education institutions in regards to talent

manegement processes and knowledge manegement processes. Furthermore, knowledge sharing is included in the refined model as a new department construct for the dependent variable (knowledge management processes). Likewise, there are further changes within each construct of both talent management processes and knowledge management processes. For example, the talent retention construct in the refined model includes 25 items under five latent variables: benchmarking, job satisfaction, non-monetary rewards, employee empowerment, and employee motivation. By contrast, the talent retention construct in the initial conceptual model involved nine items under three latent variables: competitive compensation, employee motivation and non-financial rewards. Finally, there are nine research hypotheses in the refined conceptual model instead of the six in the initial conceptual model.



Note: H1, 2, 3… numbered hypotheses

Figure 7.2: The initial conceptual model with supported theories and models: Developed from literature

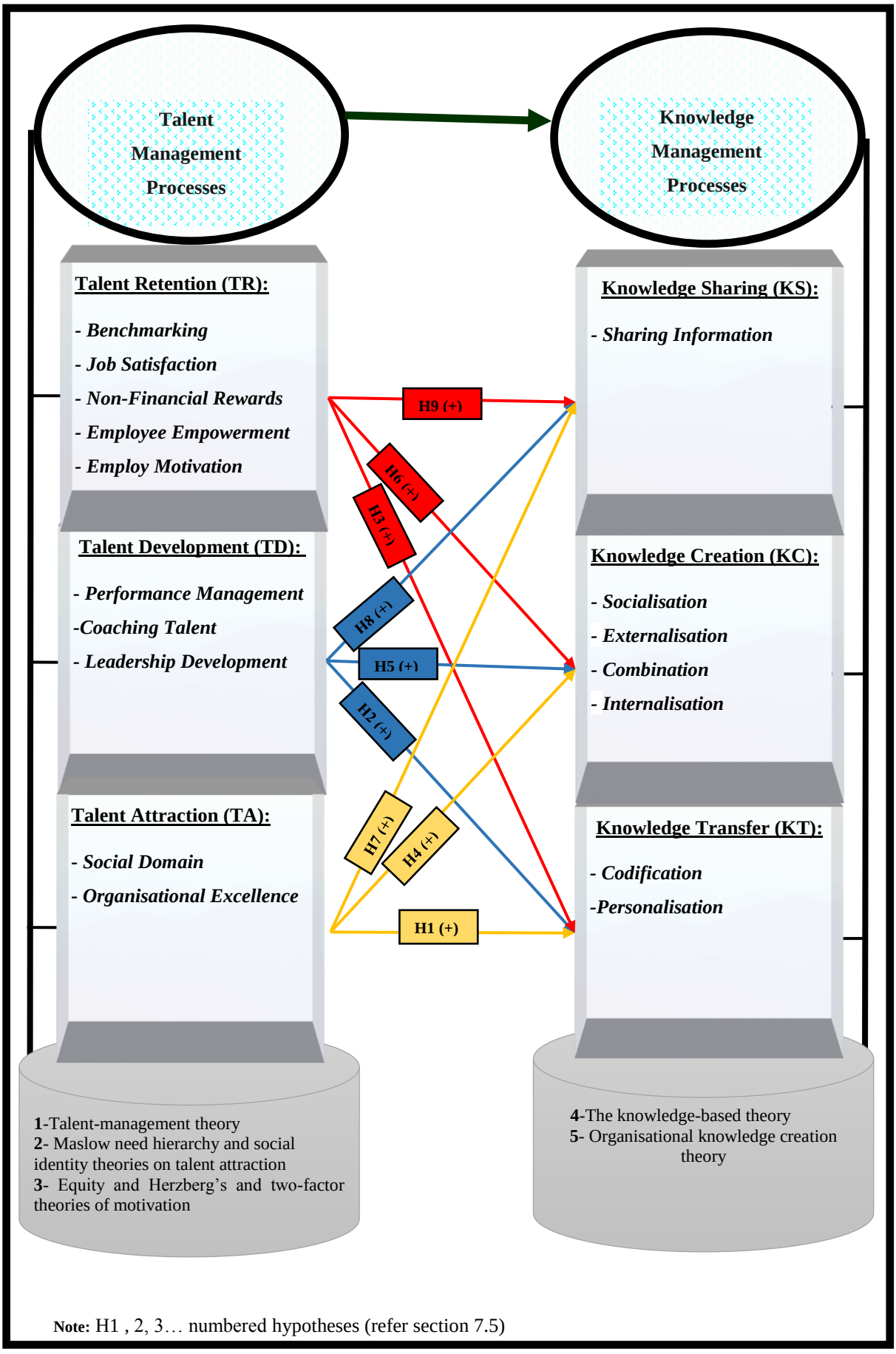


Figure 7.3: The refined conceptual model: Developed from the qualitative phase of the study

As shown in Figure 7.3, the model uses the following two key variables:

- An explanatory (independent) variable is represented as talent management processes, which involve three constructs: talent attraction, talent development, and talent retention:

1- Talent attraction includes two latent variables: social domain, and organisational excellence.

2- Talent development also contains three latent variables: performance management, coaching talent, and leadership development.

3- Talent retention involves five latent variables: benchmarking, job satisfaction, non-monetary rewards, employee empowerment, and employee motivation.

-An effector (dependent) variable is linked to knowledge management processes, which include three constructs*:* knowledge transfer, knowledge creation, and knowledge sharing:

1- Knowledge transfer contains two latent variables: codification, and personalisation.

2- Knowledge creation includes four latent variables: socialisation, externalisation, combination, and internalisation.

3- Knowledge sharing comprises one latent variable: sharing information.

The direction of arrows in the model connects the variables of this study according to the relationships among them. The direction of arrows expresses the influence of each process of talent management with each process of knowledge management.

7.4. Definitions of factors used in the initial framework

Researchers should define the terms of their research to understand individuals who are outside their field of study (Creswell 2014). Significant key concepts of the constructs developed for this research are as follows:

1- Talent attraction: is primarily geared towards attracting talented candidates from either internal or external labour markets (AlKerdawy 2016).

2- Talent development: is focussed on achieving and maintaining an organisation's competitive advantage through learning, which changes behaviour in the organisation and in its employees and stakeholders (Lyria 2014).

3- Talent retention: is a process where staff members are responsible for retaining talent (Abdul Hamid et al. 2011; AlKerdawy 2016).

4- Knowledge transfer: is a process that allows staff members to transfer their tacit and explicit knowledge to other staff members inside and outside of their organisations (Bajwa et al. 2015; Birasnav 2014).

5- Knowledge creation: is a set of processes such as discovery, knowledge production, absorption, purchase, possession, and inventions; generation and gaining processes are included in this (Badah 2012).

6- Knowledge sharing: is a process of sharing information, skills, expertise, and experiences among individuals, groups, or an organisation's departments (Shao et al. 2017; Tesavrita & Suryadi 2016).

7.5. The research hypotheses

Prior to giving the meaning of null and alternative hypotheses as specific hypotheses in this research, it is important to introduce the term hypothesis. The hypothesis can be defined as an empirically reasonably intuitive relationship among two or more elements, indicated in a shape of directional and testable information and data (Cooper & Schindler 2011; Tharenou et al. 2007; Waithiegeni Kibui 2015; Zikmund et al. 2013). The null hypothesis is a statistical 'statement about a population parameter' (Johnson & Christensen 2014, p. 560; O'Dwyer & Bernauer 2014, p. 234). Likewise, the alternative hypothesis is a statistical 'statement that the population parameter is some value other than the value stated by the null hypothesis' (Johnson & Christensen 2014, p. 560; O'Dwyer & Bernauer 2014, p. 234).[1] In this study, these hypotheses are used to investigate the relationship between talent management processes and

[1] Following standard notation H_0 (null hypothesis) and H_1 (alternative hypothesis)

knowledge management processes within Australian higher education in Queensland. Talent management processes may have a direct influence on knowledge management processes and work towards an organisation's objectives (Ali et al. 2017; Dries 2013; Jones 2008; Kim et al. 2014; Osigwelem 2017; Shabane 2017; Suryawanshi 2017; Vaiman et al. 2015). At the same time, organisations need to construct a distributed proficiency system of talent management that involves knowledge management practices that guarantee its continuing flow (Chadee & Raman 2012a; Daraei et al. 2014; Scaringella & Malaeb 2014; Sparrow & Makram 2015; Urbancová & Vnoučková 2015).

According to the refined model of this study, there are nine hypotheses that should be tested to achieve the second research objective: *to investigate the relationship between talent management processes and knowledge management processes in Australian higher education.* In this model, each one of the three talent management processes will test an effect of knowledge transfer, knowledge creation, and knowledge sharing in Australian higher education. This investigation will be based on data gathered from nine universities in Queensland, Australian.

Given the focus on the link between the three talent management processes and knowledge transfer, it has been proposed that implementing talent attraction may lead to the implementation of knowledge transfer (Kim et al. 2014; Vaiman et al. 2015). For the relationship between talent development and knowledge transfer, Li and Devos (2008); Ling (2016) have reported that an organisation can successfully develop a talent factory through establishing talent development pathways to maximise the employees' potential. This indicates that implementing organisational knowledge transfer can play an important role in optimising employees' capabilities (Egerova et al. 2013; Li & Devos 2008). In addition, skills development, coaching, and a successful utilisation of mentoring can ensure knowledge transfer (Prinsloo 2017). Also, the developed leaders support a communication process and knowledge transfer among departments of an organisation (Peet et al. 2010; Prinsloo 2017). Moving on to the relationship between talent retention and knowledge transfer, Calo (2008); Rambe and Mbeo (2017); Reilly (2008) have stated that one of the most important strategies for organisations that seek to expand greatly is talent retention, which is used to facilitate and ensure the knowledge transfer among employees within the organisation. Overall,

participation in talent management processes enables knowledge to be transferred within organisations (Cooke 2017; Ismail 2017; Urbancová & Vnoučková 2015). Therefore, this leads to the following hypotheses:

Hypothesis 1*:*

$H1_0$: There is no significant positive influence of talent attraction on knowledge transfer in a university.

$H1_1$: There is significant positive influence of talent attraction on knowledge transfer in a university.

This hypothesis aims to answer the first research question of the study: *To what extent does talent attraction influence knowledge transfer in the Australian higher education industry?* Hence, Hypothesis 1 seeks to investigate the extent to which talent attraction influences knowledge transfer in the university. The stated null hypothesis shows that there is a significant relationship between the two variables (talent attraction and knowledge transfer). Therefore, this section of the research has measured this relationship to observe whether to accept or refuse the stated null hypothesis.

Hypothesis 2:

$H2_0$: There is no significant positive impact of talent development on knowledge transfer in a university.

$H2_1$: There is significant positive impact of talent development on knowledge transfer in a university.

This hypothesis proposes to answer the second research question of the study: *To what extent does talent development affect knowledge transfer in the Australia higher education industry?* Thus, hypothesis 2 attempts to investigate the extent to which talent development affects knowledge transfer in the university. Here, the stated null hypothesis shows that there is a significant relationship between the two variables: talent development and knowledge transfer. Thus, this section of the study has evaluated this relationship to observe whether to accept or reject the stated null hypothesis.

Hypothesis 3:

$H3_0$: There is no significant positive effect of talent retention on knowledge transfer in a university.

$H3_1$: There is significant and positive effect of talent retention on knowledge transfer in a university.

This hypothesis proposes to answer the third research question of the study: *To what extent does talent retention impact knowledge transfer in the Australia higher education industry?* Thus, hypothesis 3 tries to investigate the extent to which talent retention affects knowledge transfer in the university. Here, the stated null hypothesis shows that there is a significant relationship between the two variables talent retention and knowledge transfer. This section of the study has measured this relationship to observe whether to accept or reject the stated null hypothesis.

In regard to the link between the total talent management processes and knowledge creation, Chadee and Raman (2012a); Daraei et al. (2014); Egerova et al. (2013); Whelan and Carcary (2011) state that the advancement of knowledge creation can be achieved by applying talent management programs. Likewise, Sparrow and Makram (2015) point out that talent capital can achieve indirect advantages to organisations by creating new knowledge. Although talent management requires a productive work environment that links to specific tasks that require appropriate talent (Scaringella & Malaeb 2014), talent management processes play a significant role in supporting strategies of knowledge creation such as cultivating knowledge creators and activists (Whelan & Carcary 2011).

More specifically, focusing on the connection between talent management processes and individual knowledge creation can benefit an organisation that focuses its attraction processes on the best highly qualified employees as well as on its knowledge creation practices. For instance, attracting the best talents to an organisation assists in meeting major challenges related to effectively creating individual knowledge, including the reduction of gaps among employees in an organisation's different units (Frank & Taylor 2004; Scaringella & Malaeb 2014). Furthermore, a process of talent development is an approach to building knowledge creation competencies in order to enhance and develop innovation (Gateau & Simon

2017; Ling 2016; Scaringella & Malaeb 2014). Moreover, a process of talent retention can be enhanced by creating new knowledge and learning on an ongoing basis (Brockbank 1999; Kong et al. 2013). Overall, based on the literature and this research project's conceptual model, the following hypotheses have been tested to show the relationship between talent management processes and knowledge creation:

Hypothesis 4:

$H4_0$: There is no significant positive influence of talent attraction on knowledge creation in a university.

$H4_1$: There is significant positive influence of talent attraction on knowledge creation in a university.

This hypothesis is designed to address the fourth research question of the study: *To what extent does talent attraction influence knowledge creation in the Australia higher education industry?* Thus, hypothesis 4 attempts to investigate the extent to which talent attraction influences knowledge creation in the university. Here, the stated null hypothesis shows that there is a significant relationship between the two variables talent attraction and knowledge creation. This section of the study has therefore measured this relationship to view whether to accept or reject the stated null hypothesis.

Hypothesis 5:

$H5_0$: There is no significant and positive impact of talent development on knowledge creation in a university.

$H5_1$: There is significant and positive impact of talent development on knowledge creation in a university.

This hypothesis attempts to answer the fifth research question of the study: *To what extent does talent development impact knowledge creation in the Australia higher education industry?* Thus, hypothesis 5 seeks to investigate the extent to which talent development impacts on knowledge creation in the university. The stated null hypothesis H_0 shows that there is a significant relationship between the two variables talent development and knowledge creation. Therefore, this section of the research has

measured this relationship to observe whether to accept or reject the stated null hypothesis.

Hypothesis 6:

$H6_0$: There is no significant positive impact of talent retention on knowledge creation in a university.

$H6_1$: There is significant positive impact of talent retention on knowledge creation in a university.

This hypothesis aims to answer the sixth research question of the study: *To what extent does talent retention affect knowledge creation in the Australia higher education industry?* Thus, hypothesis 6 attempts to investigate the extent to which talent retention affects knowledge creation in the university. Here, the stated null hypothesis shows that there is a significant relationship between the two variables talent retention and knowledge creation. Therefore, this section of the thesis has evaluated this relationship to ascertain whether to accept or refuse the stated null hypothesis.

In regard to the relationship between the complete talent management processes and knowledge sharing, the focused parts of study examine the importance of these relationships. Previous r by Chadee and Raman (2012a); Daraei et al. (2014); Whelan and Carcary (2011) have identified that the advancement of knowledge sharing can be achieved by applying talent management processes. Similarly, Al-Awamleh (2009); Ali et al. (2017); Cooke (2017); Egerova et al. (2013); Li and Devos (2008) have highlighted that the efficiency of knowledge sharing improves talent management processes through the creation of a proper environment for effective collaboration among staff members, which is then transformed into high performance.

In terms of the link between knowledge sharing and independent talent management processes, knowledge sharing externally may be a form of organisational promotion that also serves to attract interested talent (Kim et al. 2014; Lai et al. 2014; Li & Devos 2008; Zhu 2017), in the form of lessons-learned databases, knowledge libraries, research publications, or conference presentations. In this case, knowledge sharing may have a significant effect on talent attraction (Lai et al. 2014).

Researchers point out in another instance that encouraging collaboration through sharing information among individuals, groups, and at different organisational levels can develop talent with tailored training programs and facilitating on-the-job learning (Beyerlein et al. 2017; Cooke 2017; Gateau & Simon 2017; Li & Devos 2008; Naim et al. 2017; Zhu 2017). As another example, tools of knowledge sharing can also be effective in retaining talent through making work tasks easier by sharing best practices and through a supportive collegial environment of mutual assistance (Li & Devos 2008; Zhu 2017). Overall, based on the literature and this research project's conceptual model, the following hypotheses have been tested to investigate the relationship between talent management processes and knowledge sharing:

Hypothesis 7:

$H7_0$**:** There is no significant positive influence of talent attraction on knowledge sharing in a university.

$H7_1$: There is significant positive influence of talent attraction on knowledge sharing in a university.

This hypothesis aims to answer the seventh research question of the study: *To what extent does talent attraction influence knowledge sharing in the Australia higher education industry?* Thus, hypothesis 7 attempts to investigate the extent to which talent attraction influences knowledge sharing in the university. Here, the stated null hypothesis shows that there is a significant relationship between the two variables talent attraction and knowledge sharing. This section of the study has therefore measured this relationship to observe whether to accept or reject the stated null hypothesis.

Hypothesis 8:

$H8_0$: There is no significant and positive impact of talent development on knowledge sharing in a university.

$H8_1$: There is significant and positive impact of talent development on knowledge sharing in a university.

This hypothesis intends to answer the eighth research question of the study: *To what extent does talent development impact knowledge sharing in the Australia higher education industry?* Thus, hypothesis 8 seeks to investigate the extent to which talent development impacts on knowledge sharing in the university. The stated null hypothesis H_0 shows that there is a significant relationship between the two variables talent development and knowledge sharing. Therefore, this section of the research has measured this relationship to ascertain whether to accept or reject the stated null hypothesis.

Hypothesis 9:

$H9_0$: There is no significant positive impact of talent retention on knowledge sharing in a university.

$H9_1$: There is significant positive impact of talent retention on knowledge sharing in a university.

This hypothesis aims to answer the ninth and final research question of the study: *To what extent does talent retention affect knowledge sharing in the Australia higher education industry?* Thus, hypothesis 9 attempts to investigate the extent to which talent retention does affect knowledge sharing in the university. Here, the stated null hypothesis shows that there is a significant relationship between the two variables talent retention and knowledge sharing. Therefore, this section of the thesis has evaluated this relationship to identify whether to accept or refuse the stated null hypothesis.

7.6. Summary

This chapter has focused on the conceptual model development of this research project in six sections. Section one started by presenting an overview of this chapter. Section two provided an introductory overview of this chapter. The third section outlined the refined research model in greater detail. It removed two models of talent management processes (the independent variable), and adopted knowledge sharing as a new construct to the dependent variable (knowledge management processes). Definitions of factors used in the initial framework were highlighted in section four. Section five

addressed the research hypotheses. Nine hypotheses were outlined that have been used to achieve the second research objective. Finally, the summary in section six has concluded this chapter.

CHAPTER 8: QUANTITATIVE DATA COLLECTION

8.1. Chapter overview

Quantitative research is a procedure that examines objective theories through testing the relationships among variables (Creswell 2014; Kothari 2004; Sarantakos 2013). In this study, it has confirmed the modified model after refining and developing it using the results of the qualitative study. In chapter seven, the conceptual model development was reviewed. This chapter focuses on the quantitative data collection.

This review of quantitative data collection chapter (chapter 8) is divided into nine sections. The chapter starts by presenting an overview in this first section. The next section (8.2) provides the introduction to the chapter. The third section provides an explanation and justification of the quantitative approach, which is then followed by a discussion of the development of an instrument (8.4). Section 8.5 reviews the pilot study, while the subsequent section (8.6) is about the research administration of the quantitative data collection. Methods of quantitative data analysis are outlined in Section 8.7. The difficulties and challenges involved in using a quantitative approach, followed by a discussion about the strategies to overcome and control these issues, are addressed in Section 8.8. Finally, the summary of this chapter concludes Section 8.9. This chapter thus includes nine sections, which are shown in the following graphical layout.

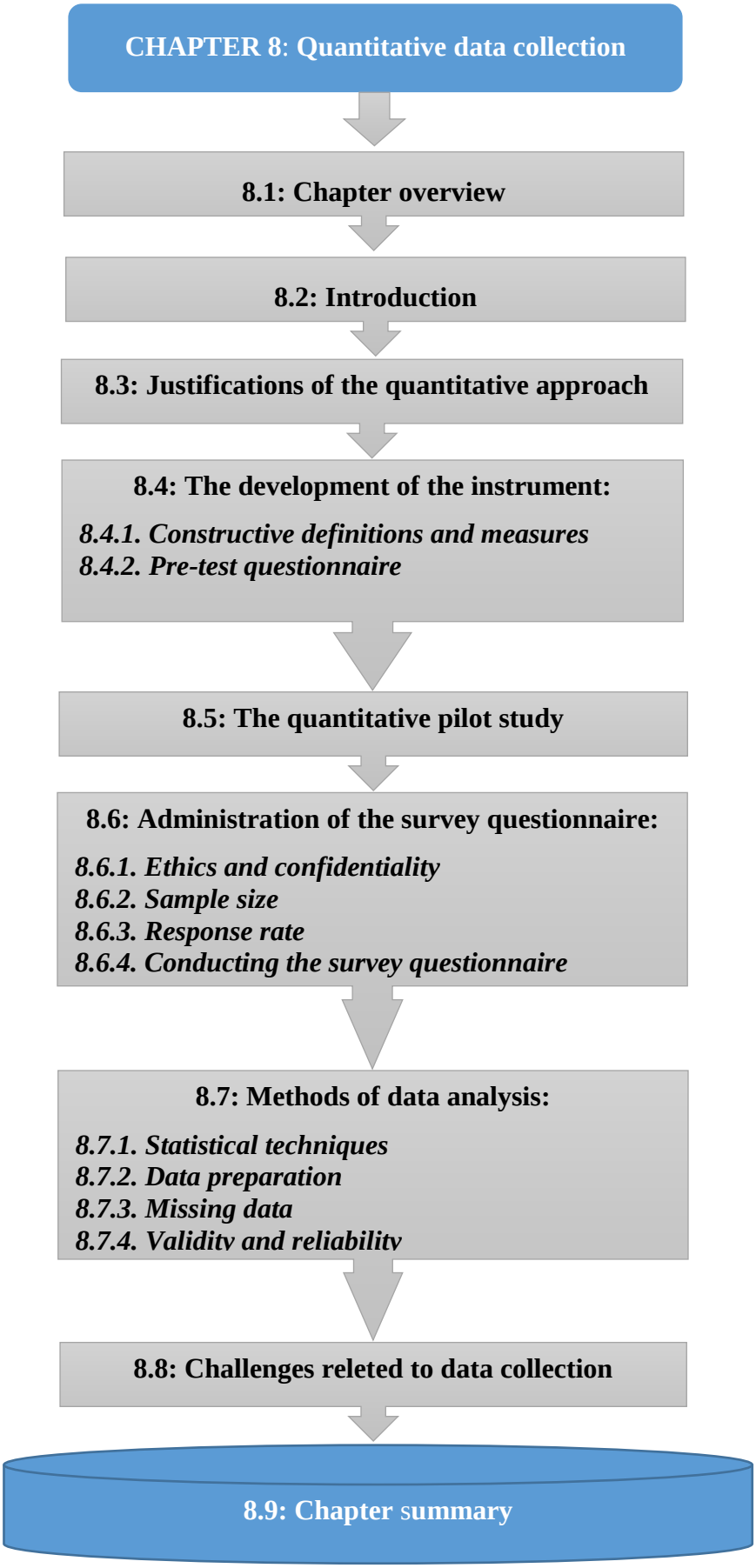


Figure 8.1: A graphical layout for Chapter 8

Source: Prepared by the researcher.

8.2. Introduction

The second key research objective of the study is *to investigate the relationship between talent management processes and knowledge management processes in Australian higher education.* This objective was achieved by conducting survey questionnaires, which are universally used in empirical quantitative research (Bryman & Bell 2015; Creswell 2014; Leicester 2009; Tharenou et al. 2007). This research phase aims to generalise knowledge claims that have been described as unsatisfactory and problematic (Zachariadis et al. 2013). It can be particularly useful in answering questions of when, where, who, what, and how in order to test the relationship between specific variables (Frels & Onwuegbuzie 2013). Tharenou et al. (2007); Venkatesh et al. (2013) outline the function of the quantitative survey questionnaire as a key data collection approach. The quantitative questionnaire is an instrument completed by the respondents themselves (Tharenou et al. 2007).

The development of the instrument was progressed iteratively since the literature review identified drivers for investigating the relationship between talent management processes and knowledge management processes in the Australian higher education sector. Qualitative data were analysed utilising both manual methods and NVivo 11 software to code, recode and generate themes. The qualitative procedures were based on a three-stage method of thematic analysis in order to develop a quantitative questionnaire instrument.

There were 51 items in the talent management processes part of the quantitative questionnaire. Some of these were generated through the qualitative study and some were informed by the literature. Similarly, there were 35 items in the knowledge management processes variable of the quantitative questionnaire. Some of these were produced through the qualitative study and some were informed by the literature. All the measurement items and their categories are listed in Section 8.4.1 of this chapter.

Chapter 7 has provided detailed information on how the items and categories were developed. The analysis of qualitative data assisted in refining the framework and developing the survey questionnaire instrument, with the aim of better investigating the relationship between talent management processes and knowledge management processes in Australian higher education. This investigation was based on data

gathered from nine public and private universities in Queensland. This study targeted academic and professional staff with five years of experience in the fields of human resources management, talent management, and knowledge management to participate. In addition, academic and professional staff who are in the top and middle managerial levels due to having the responsibility of managing action plans related to talent management and knowledge management in their universities, were also targeted, as were academic and professional staff who have technical knowledge in computing such as professionals in IT.

In this research project, the aim of the quantitative research phase was to investigate the relationship between talent management processes and knowledge management processes in Australian higher education. Therefore, the quantitative study was conducted through a survey questionnaire, which is an instrument completed by the respondents themselves (Tharenou et al. 2007). The next section provides justifications for the use of this approach.

8.3. Justifications of the quantitative approach

Over the last two decades, quantitative research in business and management has become increasingly accurate and flexible (Zikmund et al. 2013). The benefits of a quantitative research approach are that it is quick, cost-effective, inexpensive, and it provides efficient and accurate information about a population while eliminating bias (Alreck & Settle 2004; Chaula 2015; Cooper & Schindler 2011; Vogt et al. 2014; Walter 2006; Zikmund et al. 2013). Quantitative researchers can collect sizable data from a great number of individuals at a relatively low cost and in a limited time (Dang 2015; Johnson & Christensen 2014; Learning 2009; Olsen 2012). Thus, survey questionnaires can be seen as more trustworthy and objective than other research approaches, as statistics are used to make generalisations about the outcomes. In addition, they allow for a decrease in the restructuring of complex instruments using a limited number of variables, and they can assist in creating new theories, as well as testing research hypotheses (Bryman & Bell 2015; Creswell 2014; Learning 2009; Tharenou et al. 2007).

As indicated earlier in Chapter four: The research methodology, this research project has adopted a sequential exploratory strategy as a specific mixed-methods design. In line with to this strategy, a qualitative study has captured talented individuals' opinions about the selection of the most important talent management processes and knowledge management processes, in order to build a conceptual framework that can be suitable for the Australian higher education environment. The qualitative phase is followed by the quantitative research phase, which was developed by using the results of the qualitative study. In general, the purpose of the quantitative research is to collect primary data in certain quantities (Kothari 2004; Zikmund et al. 2013). The principal aim of conducting the quantitative study was thus to achieve the second research objective of this study (*to investigate the relationship between talent management processes and knowledge management processes in the Australian higher education sector*).

8.4. The development of the instrument

After completing the qualitative data analyses, the researcher proceeded to the quantitative phase of this research project. Quantitative research is an empirical and systematic method, which includes data in the form of measurements or numbers (Clarke & Collier 2015; Punch 2014). In this case, the survey was developed and employed by higher education organisations. To investigate the relationship between the study variables, required data were gathered through a questionnaire. Arguably, administering quantitative data collection research can be divided into two significant procedures: (1) questionnaire design (operationalisation of constructs), and (2) pre-test questionnaire.

8.4.1. Questionnaire design (operationalisation of constructs)

Measurement in research is a process of describing empirical events, and it consists of assigning numbers using a reliable and valid method (Cooper & Schindler 2011; O'Dwyer & Bernauer 2014; Zikmund et al. 2013). This research has depended on a questionnaire as the main quantitative tool in collecting data. In quantitative research, the questionnaire is a common measurement for asking respondents questions

(O'Dwyer & Bernauer 2014; Zikmund et al. 2013). Within this instrument, 'a construct is a term used to refer to concepts measured with multiple variables' (Zikmund et al. 2013, p. 293).

In this research, the survey questionnaire consisted of six overarching constructs. Each construct operated across various sub-costructs. Firstly, the variable of talent management processes consisted of ten categories, and secondly, the knowledge management processes variable had another seven categories. Questions (items) in the questionnaire were designed to assist the researcher in testing his hypotheses (Leavy 2017). There were five questions per category, except the category of organisational excellence, which involved six questions.

The upper constructs that were matched to the final questions were: talent attraction (Q1-Q11), talent development (Q12-Q26), talent retention (Q27-Q51), knowledge transfer (Q52-Q61), knowledge creation (Q62-Q81), and knowledge sharing (Q82-Q86). A five-point[2] Likert scale was used in this questionnaire(Clason & Dormody 1994; Dimitrov 2012; Tharenou et al. 2007; Zikmund et al. 2013). The five-point scale was appropriate for the nature of this research, as a majority of empirical research confirms that using a 5-point scale improves reliability and validity (Dawes 2008). Also, the mean scores with a five-point scale can be higher than with a ten-point scale (Dawes 2008). Therefore, through these quantitative data, the study has measured and evaluated the relationship between talent management processes and knowledge management processes in Australian higher education. Table 8.1 provides sufficient explanation of the sourcing and coding of variables, constructs, and sub-constructs.

[2] "Five levels of agreement or disagreement with statement, where 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree". For more details see Dimitrov, (2012).

Table 8.1 : Construct measures (operationalisation of constructs)

No.	Construct and sub-constructs	Code	Questions	Sources	References
Construct 1: Talent Attraction (TA)			My university…		
1	Social Domain (SD)	TA1	Attracts more talented employees through providing them with social support in difficult times (e.g. maternity, paternity, death, and financial difficulties).	L+Q	(Nogueira Novaes Southgate & Mondo 2017); (IR3)
2		TA2	Attracts more qualified employees through having a socially progressive work environment (e.g. multicultural).	Q	(IR1)
3		TA3	Supports the staff community through involvement in social, cultural, or economic initiatives to attract more talented employees.	Q	(B1P2; IR1)
4		TA4	Provides social networking activities to employees.	L	(Lyria 2014)
5		TA5	Has a good work-life balance (e.g. socialising with colleagues, proper location and amenities, recreation or lifestyle opportunities) to attract talented individuals.	Q	(F1P9; IR3; IR6)
6	Organisational Excellence (OE)	TA6	Has effective recruitment strategies for attracting the best academics and professional staff.	Q	(IR1; IR3; IR4; IR6)
7		TA7	Has a good reputation through high-quality research, which enables the university to attract the best academic and professional staff.	Q	(IR3)
8		TA8	Has a high university ranking enabling the university to attract the best academic and professional staff.	Q	(IR3)
9		TA9	Has an innovative culture enabling it to attract more talented individuals.	Q	(B1P1; IR6)
10		TA10	Has an appropriate organisational climate in order to attract the appropriate talent (e.g. having social friendships at work).	L	(Lyria 2014)
11		TA11	Attracts more talented staff through having a high-quality working environment that encourages talented employees to realise creativity and innovation (e.g. physical aspects such as well-equipped workplaces).	Q	(IR6)

Construct and sub-constructs		Code	Questions	Sources	References
Construct 2: Talent Development (TD)			My university…		
12	Performance Management (PM)	TD1	Has effective talent development strategies aligned with its organisational strategies.	L+ Q	(AlKerdawy 2016); (IR2)
13		TD2	Determines training needs for talented individuals who have desired skills.	L+ Q	(AlKerdawy 2016); (IR5)
14		TD3	Facilitates employee performance and development with tailored training plans.	Q	(IR1)
15		TD4	Uses human resource planning to ensure effective skill utilisation and development.	L	(AlKerdawy 2016)
16		TD5	Identifies areas needed for employee's personal development (e.g. skills gap analysis).	Q	(B1P3)
17	Coaching Talent (CT)	TD6	Facilitates internal job rotation to strengthen talented employees' experiences and development in different faculties, departments, and divisions.	Q	(IR5)
18		TD7	Develops academic staff through sessions with learning and teaching training.	Q	(F1P11)
19		TD8	Develops professional and academic staff with training and mentoring programs.	Q	(IR5)
20		TD9	Develops its own online training materials for talented staff to gain required knowledge and skills.	L+ Q	(AlKerdawy 2016); (IR2)
21		TD10	Provides staff with career development opportunities (e.g. further education, certifications, scholarships, etc.).	Q	(F1P11; F1P9; IR5)
22	Leadership Development (LD)	TD11	Includes leaders' development in the design of all job roles.	Q	(F1P3)
23		TD12	Develops leaders through further education.	Q	(IR5)
24		TD13	Supports high potential employees to become leaders, in order to build a strong talent pool.	L	(Chami-Malaeb & Garavan 2013)
25		TD14	Assists leaders to be professionals through career development programs.	Q	(IR5)
26		TD15	Develops succession planning, and identifies alternative talented employees for leadership positions.	Q	(B1P1)

Construct and sub-constructs		Code	Questions	Sources	References
Construct 3: Talent Retention (TR)			My university…		
27	Benchmarking (B)	TR1	Determines which talent retention strategies are most effective.	Q	(IR3; IR5; IR6)
28		TR2	Benchmarks other universities inside Australia to evaluate talent retention strategies.	Q	(IR3; IR5; IR6)
29		TR3	Benchmarks other universities outside Australia to evaluate talent retention strategies.	Q	(IR3; IR5; IR6)
30		TR4	Has a competitive compensation system which is a motivating factor to retain our talented employees.	L	(Lyria 2014)
31		TR5	Provides a highly competitive compensation system for long-term retention of talent.	L	(Stahl et al. 2007)
32	Job Satisfaction (JS)	TR6	Has a supportive learning environment which promotes employee job satisfaction to retain qualified employees.	Q	(F1P8; IR2)
33		TR7	Has high-quality working conditions to retain highly qualified talent.	Q	(IR2)
34		TR8	Managers treat employees well through relationship building to retain talent.	Q	(IR2)
35		TR9	Promotes equal opportunity to retain its qualified employees.	Q	(IR6)
36		TR10	Ensures talented employees are satisfied.	L	(Lyria 2014)
37	Non-Financial Rewards (NFR)	TR11	Provides assistance with healthcare and safety issues to retain its qualified employees.	Q	(IR3)
38		TR12	Accounts for personal factors and life events (e.g. family responsibilities) to encourage its talented staff.	Q	(IR6)
39		TR13	Provides fair acknowledgement of employee work efforts and achievements to better keep employees.	Q	(IR2)
40		TR14	Provides flexibility for work hours, roles, and tasks (e.g. for care of young children) to retain its qualified employees.	Q	(IR1)
41		TR15	Has a good system of non-financial rewards to retain talented staff.	L	(Lyria 2014)
42		TR16	Encourages innovative thinking, and promotes creative ideas from talented employees.	Q	(IR5)

43	Employee Empowerment (EE)	TR17	Keeps employees engaged and motivated to retain talented staff.	Q	(F1P11)
44		TR18	Adopts management by career enrichment programs to increase talented employees' confidence in themselves.	Q	(F1P8; F1P1)
45		TR19	Retains its qualified employees by providing them with sufficient freedom to actively perform their jobs.	Q	(IR2; F1P4)
46		TR20	Retains its talented staff by providing them with enough authority to complete their work efficiently.	Q	(F1P4; IR2)
47	Employee Motivation (EM)	TR21	Retains its qualified employees by providing them with opportunities to develop their careers.	Q	(IR2; IR3; IR4; IR6)
48		TR22	Retains its talented staff with financial rewards, high salaries or remuneration.	Q	(IR2; IR3; IR6)
49		TR23	Retains its qualified employees through providing them with individual funding for academic research.	Q	(IR2; IR5)
50		TR24	Monitors performance and suggests advice regularly (e.g. per semester) in an encouraging manner to retain its talented staff.	Q	(IR2; IR4)
51		TR25	Utilises an employee growth program for the development of motivation and engagement to retain its qualified employees.	Q	(IR5)
Construct and sub-constructs		**Code**	**Questions**	**Sources**	**References**
Construct 4: Knowledge Transfer (KT)			In my university/ (My university)…		
52	Codification Knowledge Transfer (CKT)	KT1	My university effectively transfers information using e-mail, meetings, discussions and internal networks.	Q	(IR2; IR3)
53		KT2	My university effectively transfers information using the intranet and databases (e.g. staff profiles).	Q	(IR4; IR6)
54		KT3	All employees can access appropriate knowledge systems and software for transferring information.	Q	(B1P6; F1P7; IR1)
55		KT4	It is easy for my colleagues using a university social network (electronic) to seek information.	L	(Cao et al. 2012; Offong & Costello 2017)
56		KT5	My university saves and renews important information accessed through a computer for easy browsing.	L	(Rhodes et al. 2008)
57		KT6	Employees at my university are effective at transferring experiences or abilities to other employees.	Q	(F1P8)

58	Personalisation Knowledge Transfer (PKT)	KT7	My university transfers useful knowledge through-out the academic workforce through training courses, seminars, workshops, and presentations.	Q	(IR3; IR4)
59		KT8	Knowledge is transferred through informal mechanisms for use by individual employees (e.g. face-to-face discussions).	Q	(IR6)
60		KT9	My university has responsible managers who ensure communication strategies are working well with appropriate information content.	Q	(IR2)
61		KT10	Managerial techniques are effectively learned from colleagues.	L	(Cao et al. 2012; Offong & Costello 2017)
Construct and sub-constructs		**Code**	**Questions**	**Sources**	**References**
Construct 5: Knowledge Creation (KC)			In my university/ (My university)…		
62	Socialisation (S)	KC1	The technology enables creativity and innovation through collaboration.	Q	(IR6)
63		KC2	The technology facilitates creative discussion through the learning process (e.g. exploring and understanding ideas).	Q	(IR6)
64		KC3	The technology facilitates skills development (e.g. learning by observation).	Q	(IR1)
65		KC4	Encourages social learning through employees' discussion (e.g. social spaces such as dining rooms).	Q	(IR2; IR6)
66		KC5	Knowledge about how to use technology is learned effectively from colleagues.	L	(Cao et al. 2012; Offong & Costello 2017)
67	Externalisation (E)	KC6	Seeks external technology solutions for knowledge management problems (e.g. search ability or accessibility).	Q	(B1P1; B1P2; B1P4)
68		KC7	Knowledge creation with external parties is well facilitated through collaborative tools (e.g. meetings, confluences, conferences, seminars, and SharePoint).	Q	(IR3)
69		KC8	Is effective in creating new knowledge through research and publications.	Q	(IR6)
70		KC9	Employees share knowledge and best practices with staff from other organisations.	Q	(IR1)
71		KC10	Acquires new knowledge from investigation of external sources.	Q	(IR5)
72		KC11	Relevant knowledge can be accessed in online databases.	Q	(IR2)

73	Combination (C)	KC12	Has effective communication channels supported by technology to distribute knowledge.	Q	(IR2)
74		KC13	My work is supported by the university technology and IT systems, software, and equipment.	Q	(IR3; IR5)
75		KC14	The database provides employees with support and improvement to employee skills.	L	(Rhodes et al. 2008)
76		KC15	Adopts information repositories, best practices, and lessons learned.	L	(Li et al. 2009)
77	Internalisation (I)	KC16	Designs, develops, and builds appropriate technological systems and solutions.	Q	(IR2)
78		KC17	Has effective methods for creating learning policies and procedures.	Q	(IR2)
79		KC18	Is responsible for talented employees to manage and advise on learning processes.	Q	(IR5)
80		KC19	Talented employees can access support when learning by practice (e.g. for teaching or course content development).	Q	(IR5)
81		KC20	Provides on-the-job training.	L	(Li et al. 2009)
Construct and sub-constructs		**Code**	**Questions**	**Sources**	**References**
Construct 6: Knowledge Sharing (KS)			My university….		
82	Sharing Information (SI)	KS1	Has reciprocal collaboration and sharing information methods with other universities.	Q	B1P1
83		KS2	Promotes a sharing information culture.	Q	(IR5)
84		KS3	Effective collaborates and shares information with non-university researchers or knowledge holders (e.g. organisations and individuals externally).	Q	(B1P1; B1P2)
85		KS4	Supports sharing information through group interaction, individual collaboration, and library resources.	Q	(IR5)
86		KS5	Has reciprocal collaboration and sharing information methods with other universities.	Q	(IR1; IR4; IR5)

Note: Q = Qualitative methods; L = Literature; F1PX = Focus group (a session one), participant X; B1PX = Brainstorming (a session one), participant X; IRX = Individual interview, participant X

8.4.2. Pre-test questionnaire

Prior to conducting a pilot quantitative study, the researcher should ensure the quality of the data collection process through pre-testing of a questionnaire form using academic peer reviewers (Antaya & Parrish 2014; Leavy 2017; O'Dwyer & Bernauer 2014; Raj 2013; Ritchie et al. 2013). The literature has informed the development of questions in this study, further refined by a review from academic specialists and talented individuals who were not involved in the final research (Antaya & Parrish 2014; Gururajan et al. 2014; Gururajan et al. 2013). Once peer reviewers had given their opinion, a decision was made about whether to modify the questionnaire and their final acceptance was then obtained before it was piloted (Antaya & Parrish 2014; Raj 2013).

In the context of this study, the designed items from the qualitative study and the literature review were sent to academic peer reviewers to explore the clarity of each statement and measure the suitability of questionnaire items. The researcher organised a special form to examine the opinions of two groups (Appendix F: Peer review-questionnaire-researchers). The first group was made up of academic experts who specialise in the fields of human resources management (talent management) and information systems (knowledge management); the second group also consisted of expert academics but they were not specialists in these mentioned fields in order to obtain a differing view on the research tools that could be incorporated into the research design. Thus, this procedure occurred with a sample for both questionnaire content validity and readability, and to determine technical issues.

The experts had no concerns about the structure of the questionnaire content. It needed minor changes where some items from the survey were further clarified in terms of meaning and grammatical content. Ten items required partial re-phrasing to make them clearer. For example, Q31 and Q32 changed from “my university provides highly competitive compensation system, particularly for long-term wealth accumulation for talent retention” and “there is a supportive learning environment which promotes employee job satisfaction to retain qualified employees”. to “my university provides a highly competitive compensation system for long-term to retain talent” and “my university has a supportive learning environment which promotes employee job satisfaction to retain qualified employees”, respectively.

Overall, questionnaire content was revised according to the comments of two groups of experts. This pre-test procedure was refined through a number of revisions with the questions in the final versions utilised in the pilot. For reliability, the revised questionnaire content was discussed again with the supervisory team prior to pilot data collection. This ensured the clarity of each scale item and its readiness for data collection in the next stage (pilot study).

8.5. The quantitative pilot study

A pilot study is an exploratory small-sample effort that uses similar procedures to those that will be used in a larger study for data collection (Pyrczak & Bruce 2016; Shader 2015; Zikmund et al. 2013). As mentioned earlier in the qualitative data analysis (Chapter six), the outcomes of three qualitative techniques were considered as a small-scale pilot study. The justification for this is that a sequential exploratory strategy allows a researcher in the qualitative phase to better comprehend the complexity of a phenomenon and consequently generate suggestions, which can then be tested on a proper sample in the questionnaire phase that follows (Bentahar & Cameron 2015; Creswell 2014; Mauceri 2014). After determining the sample size procedure, the researcher piloted the survey questionnaires with a number of talented individuals who were not involved in the actual research, with a sample size of approximately 10% of the total sample (Cooper & Schindler 2011). The purpose of using the quantitative pilot study is first to address the problems to be identified in a wide-ranging questionnaire survey (Mauceri 2014; Thompson & Wales 2015; Van Teijlingen & Hundley 2002); the second aim is to ensure questions included in the survey questionnaire are reliable; and the final aim is to improve the internal validity of a questionnaire (Al Haidari 2015; Gururajan et al. 2014).

In this regard, there are several procedures for researchers to follow whilst conducting quantitative pilot work (Peat et al. 2002, p. 123):

- administer the questionnaire to pilot subjects in exactly the same way as it will be administered in the main study;
- ask the subjects for feedback to identify ambiguities and difficult questions;
- record the time taken to complete the questionnaire and decide whether it is reasonable;

- discard all unnecessary, difficult or ambiguous questions;
- assess whether each question gives an adequate range of responses;
- establish that replies can be interpreted in terms of the information that is required;
- check that all questions are answered;
- re-word or re-scale any questions that are not answered as expected; and
- shorten, revise and, if possible pilot again.

All aspects above were addressed and highlighted by the researcher, and the pilot study was administrated and conducted with a number of talented individuals. The pilot survey questionnaire was sent to 30 talented individuals to evaluate feasibility; 29 questionnaires were received from the respondents but only 27 were properly completed and used for further analysis. The 27 individuals supplied information about time required, any questions that were not clear, and the suitability of the general format and introductory survey explanation. Throughout the quantitative pilot study, feedback was also received from the supervisory team. This feedback was collected, analysed, and used for any needed improvements in the validity, format, wording, and method of delivery of the survey instrument. Thus, there a range of amendments was applied to the survey questionnaire tool, such as the following:

- some formating changes to enhance readability,
- some replication was removed,
- some questions were revised,
- rearranged some sequences, and
- the length of survey instrument was reduced to four pages.

Thus, the pilot study was a useful tool in enhancing the design of the actual study (Truong 2017; Vogel & Draper-Rodi 2017). Subsequently, the questionnaire survey could be tested on a larger sample at public and private universities in Australia. Appendix G shows the final version of the survey questionnaire.

8.6. Administration of the survey questionnaire

The survey questionnaire was administered firstly in the pilot study, to evaluate content validity and reliability, and secondly in the actual research, to test hypotheses with the same targeted population but with independent groups of participants. Different approaches were adopted for administrating the survey questionnaire such as email, personal contacts, telephone, or internal email . This section discusses four administration aspects: ethics and confidentiality, sample size, response rate, and conducting the survey questionnaire.

8.6.1 Ethics and confidentiality

Confidentiality is a moral and legal requirement that necessitates consideration to maintaining professional borders between a researcher and participants (Banks et al. 2013; Fisher 2013; Wilson et al. 2018). In this respect, participants in the actual study were provided with a sheet explaining the background and contact information of the investigator and the investigator's supervisory team, as well as confidentiality, and the treatment of sensitive information. Appendix D provides the information sheet used in the current study.

8.6.2 Sample size

As mentioned earlier in chapter four, a sample is drawn as a portion of a population. Determining the sample size for Structural Equation Modeling (SEM) has been described as problematic in terms of generalised guidelines (Wolf et al. 2013). In choosing an appropriate sample size, the researcher has used different strategies to select a suitable sample size for the quantitative phase. Here, the sample guidelines were selected from large-scale surveys as they were seen as providing a better representation of the target population (Kelle 2006; Kelley et al. 2003; Tharenou et al. 2007). It has been observed that authors and researchers differ in determining the required sample size from the SEM technique. Roscope (1975) suggested that a sample size of 30 participants for each construct should be sufficient if the research is multivariate (Baig 2010). Nunnally (1967) determined an appropriate number for a sample size to be 10 individuals as an estimated minimum for each variable (Wolf et al. 2013). Wolf et al. (2013, p. 925) recommend that the needed sample size for SEM

should range between '30 cases (for the one-factor [confirmatory factor analysis] with four indicators loading at .80) to 460 (for the two-factor [confirmatory factor analysis] with three indicators loading at .50)'. However, Hair et al. (2010); Ullman (2007) have indicated that the required sample size depends on the number of latent variables and items as shown in Table 8.2 (Rahim 2015).

Table 8.2: Required sample size in SEM

Model characteristics (Number of latent variables and items)	Minimum sample required
Five or less latent constructs. Each latent construct has more than three items.	100
Seven or less latent constructs. Each latent construct has more than three items.	150
Seven or less latent constructs. Some latent constructs have less than three items.	300
More than seven latent constructs. Some latent constructs have less than three items.	500

Source: (Rahim 2015, p. 1336).

Still, there is empirical evidence advising that the required sample size for SEM in quantitative research should be equal or greater than 200 respondents to be considered adequate (Ekermans et al. 2011; Igundunasse 2016; Kuo & Yang ; Siddiqui et al. 2015). As such, Jöreskog and Sörbom (1996); Wheaton et al. (1977); Zainudin (2011) believe that to achieve the index of absolute fit, which is sensitive to the sample size for SEM, it should contain more than 200 respondents (Rahman et al. 2017). Similarly, Byrne (2016); Fabrigar et al. (2010); Hoe (2008); Hooper et al. (2008); Lei and Wu (2007); McCoach (2003); Nokelainen (2007) have all recommended that to obtain accurate data in survey questionnaire research, the minimum sample size should not be less than 200 individuals for SEM. Nonetheless, there are a number of factors that determine the required sample size, such as 'the size of the model, distribution of the variables, amount of missing data, the reliability of the variables, and strength of the relations among the variables' (Muthén & Muthén 2002, pp. 599-600).

There is in fact a statistical website[3] to help calculate the required sample size for SEM. Its basic measure is based on the following five parameters:

1- Effect size: a basic quantitative measure of the difference between two group sizes, which conveys more benefits than sole statistical significance (Coe 2002). Mizutani et al. (2015) draw on the work of Cohen (1988) who suggested an effect size 0.1-0.3 is small, 0.3-0.5 moderate, and above 0.5 is large. Accordingly, this research has used an effect of 0.3 as moderate.

2- Statistical power: detecting and rejecting a low-quality model is a particularly critical aspect of SEM analysis (Chin 1998a). Adequate statistical power is recommended in order to observe proper relationships in the data (Wolf et al. 2013). This is commonly utilised to assist in research planning through a variety of statistical methods (MacCallum et al. 2010). There is empirical evidence advising that statistical power for using SEM in business research should be at least 0.8 (McQuitty 2004). Cohen (1988) also recommended that the statistical power should be at 0.8, and 0.05 for the significance level in social management studies. Determining statistical power is important for SEM because 'it concerns the ability of a test to differentiate between good and bad models'(McQuitty 2004, p. 175).

3- Number of latent variables of a study;

4- Number of items of a study; and

5- Probability level.

In this data set, there were six constructs underlying 17 latent variables with 86 observed items (survey questions). Utilising 0.8 power and 0.3 effects size, with a level of significance of 0.05, a minimum sample size of 218 for the model structure was needed. This calculation is shown in Figure 8.2.

[3] (http://www.danielsoper.com/statcalc/calculator.aspx?id=89)

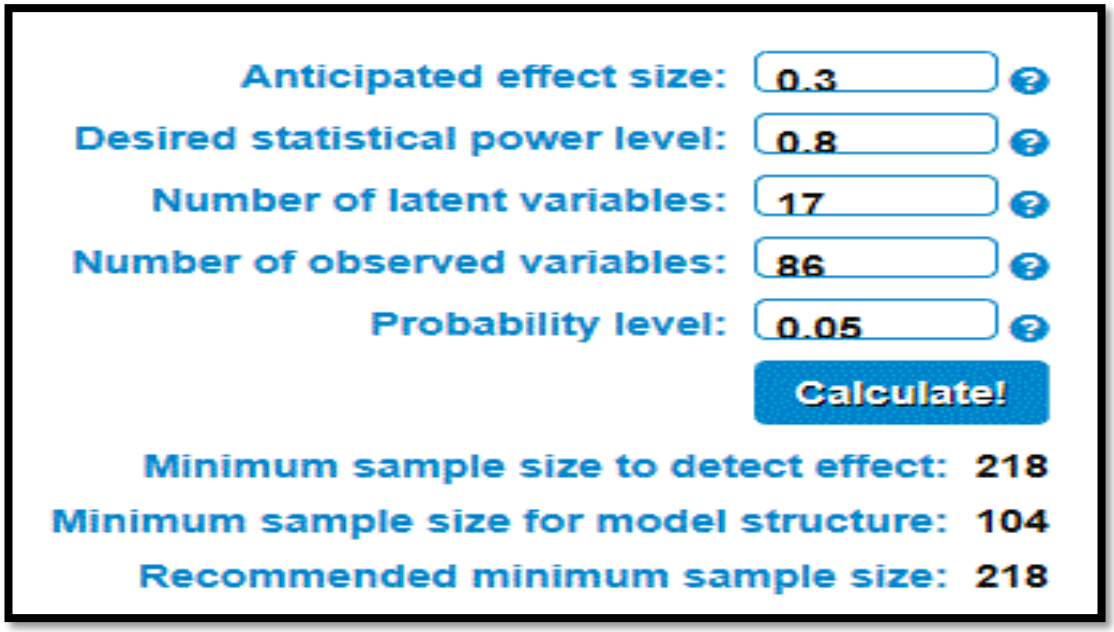


Figure 8.2: Estimation of sample size in SEM

As mentioned in Chapter Four, the criteria for talented individuals include education level, experience level, technical qualifications, and analytical level. Participants of nine public and private universities in Queensland were selected. The sample size of this phase of research was 286 respondents who could be progressed utilising statistical techniques within SPSS 25 and AMOS 25 software to achieve the second research objective.

8.6.3. Response rate

A response rate is the percentage of participants of a sample who return or complete a questionnaire (Tharenou et al. 2007; Zikmund et al. 2013). Thus, any empirical research should address and report the response rate with its final outcomes (Kelley et al. 2003). A sufficient response rate is critical to any quantitative research (Contreras 2016; Minichiello et al. 2004). Kelley et al. (2003) suggest that the response rate should be about 65%, while Mugenda and Mugenda (2003) Mugenda and Mugenda (2003) argue that the response rate should be more than 50%.

However, questionnaires commonly have low response rates in most quantitative studies (Alreck & Settle 2004; Cooper & Schindler 2011; Fan & Yan 2010; Walter 2006). A number of techniques were used in this study to increase the questionnaire response rates such as pre-paid return-addressed envelopes, follow-up emails, follow-

up letters (Walter 2006; Zikmund et al. 2013), and a vareity of contact delivery modes (e.g. pre-notification, e-mail invitations, and e-mail reminders) (Fan & Yan 2010). All nine Queensland universities agreed to participate in the study. Therefore, the researcher initially distributed the survey both in person and through online approaches to between 900 and 1100 individuals amongst the nine public and private universities in Queensland. 357 questionnaires were received but only 286 were correctly completed and utilised for further analysis. Table 8.3 shows a summary of respondents by university. Thus, the overall response rate of this study is about 32%. Even though this rate is relatively low, it meets the minimum required sample size for SEM (218).

Table 8.3: Distribution of respondents by the university

No.	The University[4]	Number of respondents to the questionnaire	Number of completed questionnaires
1	**QU1**	16	15
2	**QU2**	35	27
3	**QU3**	39	34
4	**QU4**	34	29
5	**QU5**	36	23
6	**QU6**	33	26
7	**QU7**	58	40
8	**QU8**	68	58
9	**QU9**	38	34
The total		**357**	**286**

8.6.4. Conducting the survey questionnaire

Composing data from the survey questionnaire took approximately 79 days, from the 10th of January to the 30th of March 2018. Self-administered questionnaires were administered through various forms of distribution such as paper, email, in person, telephone, or internal mail (Creswell 2014; Saunders et al. 2016; Zikmund et al. 2013). Prior to sending the survey to participants through email, the participants received an explanation of the research topic in the form of an information sheet. This ensured participants were fully informed about the nature of the research before being involved in the survey questionnaire.

[4] According to the Australian human ethics, names and identifiers linked to the participants and their universities were removed to insure anonymity.

As mentioned above, different approaches were taken. For example, it was distributed to participants in person either by hand or by email. Once they agreed to participate, further details were provided. The first approach to data collection was in person. Survey questionnaires were distributed to talented individuals who were academic and professional staff. Primarily, the researcher distributed survey questionnaires amongst respondents during a two-week period. The return survey process was also by email, in person, or through internal mail. The survey was conducted by participants in their own time, and at their convenience, as well as at a location of their choice. Even though the survey took around 10-15 minutes to complete, the researcher gave participants two weeks to respond and complete it.

Another approach for the quantitative data collection was an online survey. For the anonymous online survey, Lime Survey was used and uploaded to a website and made available to the participants through a web link[5]. The researcher selected the targeted participants based on the academic and professional staff who met the participant criteria at the nine Queensland universities. The researcher already had details (i.e. email addresses and phone numbers) of approximately 750 to 800 academic and professional staff obtained from the official websites of these universities. Again, all the participants' information (i.e. the contact details) was kept confidential and was only shared with the supervisory team to approve participation in the study via email, and for the subsequent provision of the link to access the questionnaire. In the survey, participants read the questions, clicked their responses and finally pressed a submit button. All the survey responses were non-identifiable data. To clarify, when the researcher logged on to LimeSurvey, he did not collect the participants' email addresses, nor collect their personal data that would identify them. In addition, when looking at the survey responses, although the researcher could see the responses provided by survey participants on the computer, he could not outline who owned that response. Furthermore, responses to this survey were not anonymised, which means that the researcher could observe the responses provided by survey participants without identifying who the participant was who answered the survey. These strategies ensured the anonymity of the respondents.

[5] (http://eresearch-surveys.usq.edu.au/index.php/986432/lang/en/newtest/Y).

8.7. Methods of data analysis

This study conducted several quantitative analysis techniques. These methods are within SPSS and AMOS softaware. To highlight on the methods of quantitative data analysis, this section can be divided into four subsections as follows:

8.7.1. Statistical techniques

In this research, a number of statistical techniques were utilised which included the following key techniques:

1- *Descriptive statistics*: to summarise and describe the collected data in a way that could be understood (Collis & Hussey 2013; Cooper & Schindler 2011; Leavy 2017; O'Dwyer & Bernauer 2014; Zikmund et al. 2013). In this respect, the descriptive data was evaluated using the mean score and standard deviation score within SPSS 25;

2- *Compare means*: to compare variance between two groups or more of personal characteristics (independent) in their responses on the dependent variable using the F-test (Hair et al. 2010; Saunders et al. 2016). In this respect, one-way ANOVA was used within SPSS 25;

3- *Exploratory construct validity:* to identify the valid items to be included at this scale, and to condense contained information of original variables from a larger number of factors into a smaller number without missing information (Osborne & Costello 2009; Tharenou et al. 2007; Yong & Pearce 2013; Zikmund et al. 2013). In this regard, the numerical data was analysed using SPSS 25;

4- *Correlation analysis:* to assess the level of association between two variables (Collis & Hussey 2013; Field 2018; Remenyi et al. 1998) using SPSS 25;

5- *Cronbach's alpha test*: to measure internal constancy (Field 2018; Hair et al. 2010; Peters 2014; Zikmund et al. 2013) using SPSS 25;

6- *Simple regression analysis*: to test the research hypotheses (Hair et al. 2010) using SPSS 25;

7- *Confirmatory factor analysis*: to ensure the measurement model quality (Awang et al. 2015) using AMOS V25; and

8- *SEM:* to test and validate research hypotheses and a conceptual research framework (Ardasheva 2016; Byrne 2016; Lau et al. 2016; Othman & Naintin

2016; Winke 2014; Zhou 2016) using AMOS. Here, the quantitative data collected were analysed using AMOS 25 software.

Overall, with a full analysis, the procedures of statistical techniques above occur in Chapter Nine: quantitative data analysis, part A, and in Chapter Ten: quantitative data analysis, part B of this study.

8.7.2. Data preparation

A researcher should carefully prepare a number of activities including editing, coding, and data entry in order to ensure the accuracy and validity of the data analysis (Cooper & Schindler 2011; Leavy 2017; Saunders et al. 2016). Editing raw data if necessary is the first step in analysis and presentation of data to ensure accurately arranged (to simplify coding), uniformly entered, and complete data (Cooper & Schindler 2011; Saunders et al. 2016). The second activity of data preparations is coding. It is used to classify data into a limited number of categories (Cooper & Schindler 2011; Creswell 2014). Data entry is a way of making data gathered from primary and secondary sources usuable in computers (Cooper & Schindler 2011; Tharenou et al. 2007; Zikmund et al. 2013). In this study, the survey questionnaire is the main primary source of data. As can be seen in Table 8.1 above, the data were coded. Prior to data entry into SPSS, it was important to ensure their accuracy and quality (Saunders et al. 2016; Tharenou et al. 2007). In this regard, Saunders et al. (2016) has recommend using a number of ways to check data for errors such as looking for illegitimate codes, looking for illogical relations, and checking that basics in filter questions are followed. The numerical data collected were entered into the computer through converting a Microsoft Excel spreadsheet to SPSS software. The statistical analysis used SPSS 25 combined with AMOS 25 software.

8.7.3. Missing data and data normality

The response rate of a survey questionnaire is uncontrolled (Domnich et al. 2015). To ensure high-quality data, it is important to decrease missing values, which occur when respondents have not answered one or more questions in the survey questionnaire (Bryman & Bell 2015; Cooper & Schindler 2011; Hair et al. 2010). In this case, a missing value analysis routine in SPSS was used to exclude missing data, and identify

data collection issues, entry errors, or any other contrary action on the part of the respondent (Field 2018; Hair et al. 2010; Pallant 2013). In terms of data normality, the mahalanobis distance technique within SPSS was used to detect and clean outliers (De Maesschalck et al. 2000; Hair et al. 2010; Mertler & Reinhart 2017). Mahalanobis distance is a measurement used in a multivariate evaluation of each observation across a number of variables (Hair et al. 2010).

In this study, a total of 71 survey questionnaires were excluded from further data analysis, because they included missing data, and did not fit the sampling criteria. For example, when conducting the survey in person, there were a number of participants whose expertise was under five years. These were excluded. The remaining number was 286 questionnaires. The numerical data collected was entered into the computer by converting a spreadsheet from Microsoft Excel to SPSS software.

8.7.4. Validity and reliability

The literature on appropriate scales and measures of research indicates that there are two key criteria: validity and reliability to assess a study measurement (Leavy 2017; O'Dwyer & Bernauer 2014; Pallant 2013; Zikmund et al. 2013). These scales are very important to ensure the quality of the data collection process. (Leavy 2017; O'Dwyer & Bernauer 2014; Zikmund et al. 2013). Therefore, this subsection is divided into two components: firstly validity, and secondly reliability.

8.7.4.1 Validity

In broad terms, validity can be defined as the truthfulness of research conclusions that are made from the research results (Hair et al. 2010; Johnson & Christensen 2014). It is critical to validate the research instrument, as it functions to identify attitudes of people (Fink 2003). Content and constructs are used to establish the validity of results and data (Bryman & Bell 2015; Cooper & Schindler 2011; Fink 2003; Nguyen Hong 2016; Pallant 2013; Ritchie et al. 2013; Tharenou et al. 2007; Zikmund et al. 2013). Given the focus on the valid measurement of this research, several approaches were used to establish the validity of results and data, such as content and construct validity (Bryman & Bell 2015; Cooper & Schindler 2011; Fink 2003; Nguyen Hong 2016; Ritchie et al. 2013; Tharenou et al. 2007; Zikmund et al. 2013). An exploratory

construct validity method was used to measure the validity of the questionnaire instrument (Aladwani 2014; Hajian et al. 2016; Olufadi 2015, 2017). The data analysis related to establishing validity is provided in the next chapter.

8.7.4.2 Reliability

The reliability of a questionnaire instrument is a statistical measure of internal dependability (Creswell 2014; Leavy 2017; Mugenda & Mugenda 2003; Zikmund et al. 2013). The reliability of the quantitative data gathered for this study was examined using Cronbach's alpha test to measure internal constancy (Field 2018; Hair et al. 2010; Zikmund et al. 2013); this test is the most commonly used in quantitative research (Zikmund et al. 2013). Bryman and Bell (2015) define the reliability as an estimation of the grade of consistency (repeatability) of the research results obtained over different periods (Kabwe 2011; Nguyen Hong 2016; Ritchie et al. 2013; Zikmund et al. 2013). The aim of reliability testing is to ensure that one or more variables are consistently measured (Hair et al. 2010; Zikmund et al. 2013). Data analysis related to establishing reliability is provided in the next chapter. As part of the reliability of the quantitative study, part A was examined using both Cronbach's alpha and interclass correlation coefficient, which test correlation coefficients for the questionnaire instrument. The value of Cronbach's alpha should be at least 0.70 to be acceptable (Hair et al. 2010; Peters 2014). Zikmund et al. (2013) classify scales of reliability per the following:

- cofficient α between 0.85 and 0.95: very good reliability;
- cofficient α between 0.70 and 0.80: good reliability;
- cofficient α between 0.60 and 0.70: fair reliability; and
- cofficient α below 0.60: poor reliability.

Thus, the results of Cronbach's alpha and ICC techniques are discussed in Chapter 9 of this thesis. At the same time, reliability of the quantitative study (part B) was tested using Average Variance Extracted (AVE) and Composite Reliability (CR), which are considered common measures for measuring validity and reliability of the measurement model (Hair et al. 2010). The results of AVE and CR are discussed in Chapter 10 of this thesis.

8.8. Difficulties, challenges and strategies to minimise the impacts of quantitative data collection

Low response rates are a major issue of questionnaires in most quantitative studies (Cooper & Schindler 2011; Fan & Yan 2010). Questionnaires tend to witness high rates of incomplete and incorrect surveys (Cooper & Schindler 2011; Walter 2006). Concerns around the return rates of survey questionnaires is a key limitation of quantitative date collection. The reasons behind low response rates are difficulties in collecting data from academic and proffesional staff due to the pressure of their jobs. Even though the questionnaire might be administrated in several ways, such as by email, in person, or via telephone, a majority of them were initially planned to be conducted in person in this study to increase the response rate. It was not possible for the researcher to travel to some universities in person as they are quite far from Toowoomba.

In addition, initial attempts of in person approaches in effect did not prove satisfactory, both in terms of participant willingness and the researcher's time investment. The researcher went to five Australian universities over two days, approching approximately 180 participants, with only 78 agreeing to take part. A referral from one of the universities to the research ethics committee prompted a delay in data collection recommencing until the researcher had improved the Human Research Ethics application. Other challenges included the following:

1- some academic and professional staff members of five of the universities were uncomfortable being approached without advance warning;
2- staff members felt that management approval was required;
3- delays in permission, or lack of response from universities leading to weeks of waiting; and
4- identifying suitable employees who fitted the criteria of 5 years experience. Some of those people had a number of different managers to request access from, so there was a need to deeply review university charts.

However, to overcome such challenges and difficulties, a number of strategies were adopted. For example, an internet-mediated questionnaire approach by e-mail was used to recruit targeted participants (Saunders et al. 2016). Henningsson (2004) has

pointed out that this approach is more adequate and less burdensome than other approaches (Pratomo & Chelong 2016). This method is reasonable as it saves time and reduces costs, accesses varied and larger samples, as well as decreases data entry errors (Pratomo & Chelong 2016; Tuncer 2017). The researcher already had contact details (i.e. email addresses and phone numbers) of about 750 to 800 academic and professional staff obtained from the official websites of those universities.

The benefits of the approach included the researcher not having to travel from Toowoomba, elimination of an in-person (with risk of perceived coercion) request to participate method, and appropriate access and approval processes being able to be elicited. Subsequently, new ways of meeting the required responses solely by email and phone approaches were developed. This included planned approaches to each university, and in turn navigating gatekeepers and varied staff contact channels. The key was to communicate effectively the benefits of the research, including to participants in the talent management and knowledge management areas. To conclude this section, difficulties, challenges and strategies to reduce the negative effects of quantitative data collection have been outlined.

8.9. Summary

This chapter has focused on qualitative data collection in nine sections. Section one started by presenting an overview of this chapter. In section two, a general introduction explained the quantitative data analyses. The third section provided an understanding of the rationale behind the selection of the survey questionnaire method to collect the quantitative data. The development of the questionnaire tool was presented in the fourth section, while the pilot study was outlined in section five. The administration of the quantitative data collection was dealt with in section six. Methods of data analysis were discussed in section seven. The difficulties and challenges in using each qualitative technique were addressed in section eight. In the same section, the strategies to overcome and control these issues were discussed. The ninth and final section has summarised the practices, justifications, and proceedings for the quantitative methods utilised in this research.

CHAPTER 9: QUANTITATIVE DATA ANALYSIS, PART A

9.1. Chapter overview

In the previous chapter the quantitative data collection was presented. This chapter discusses quantitative data analysis using SPSS 25 software, which includes construct validity, reliability, descriptive and interpretive statistics, factor analysis, correlation analysis, and regression analysis. This chapter discusses all procedures and processes related to how the analysis has been conducted.

The analysis of the quantitative data is organised into seven sections. Section 9.1 is an overview of the chapter. Section 9.2 provides the introduction of the chapter, which is then followed by a discussion of validity and reliability in Section 9.3. The descriptive statistical analysis is addressed in Section 9.4. Exploratory factor analysis is emphasised in Section 9.5, while the subsequent section highlights regression analysis to test the research hypotheses. Finally, the summary of this chapter is outlined in Section 9.7. This chapter includes seven sections which are presented in the following graphical layout.

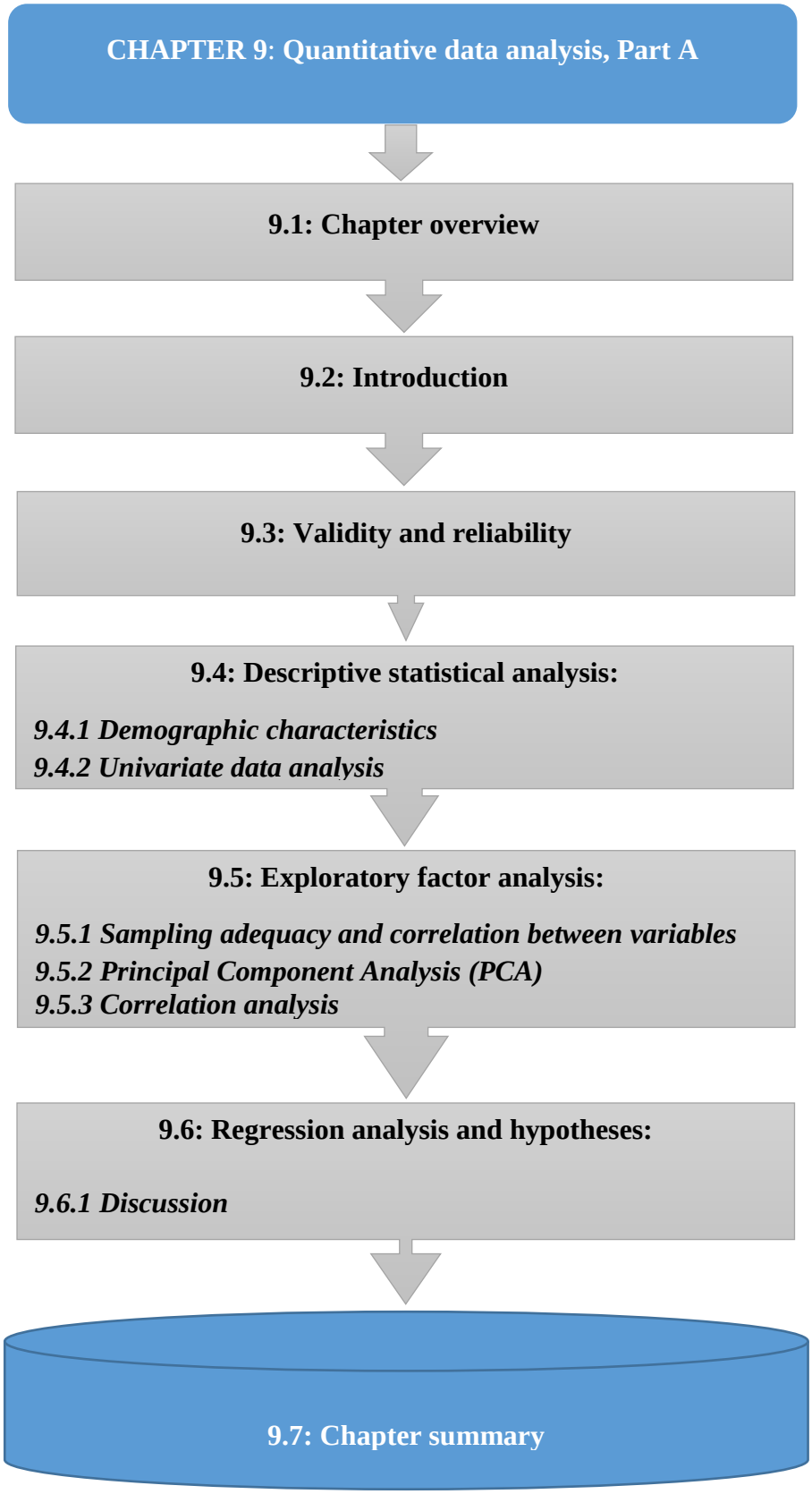


Figure 9.1: A graphical layout for Chapter 9

Source: Prepared by the researcher.

9.2. Introduction

The second key objective of this study is to investigate the relationship between talent management processes and knowledge management processes in the higher education sector in Australia. This objective has been addressed through hypotheses testing, which is a subdivision 'of inferential statistics that is concerned with how well the sample data support a null hypothesis and when the null hypothesis can be rejected' (Johnson & Christensen 2014, p. 559). Prior to analysing the quantitative data using descriptive statistics, the missing data should first be excluded. As mentioned in Chapter eight, 357 questionnaires were received. A total of 71 survey questionnaires were ignored for further data analysis as they included missing data, and did not fit the sampling criteria. The remaing number was 286 questionnaires. The numerical data collected was entered into the computer by importing a spreadsheet from Microsoft Excel to SPSS software.

Following this treatment, utilising SPSS, a range of descriptive statistics was used for all the questionnaire content. One way analysis of frequencies was utilised to test variance according to demographic features of respondents and thus employ their demographic information. Then, measures of the central tendency, such as mean and standard deviation, were used. Mean was used to describe the normal score in a distribution of raw scores, and standard deviation was used to describe the amount of variability in a distribution of raw scores.

Subsequently, validity and reliability tests were conducted to examine construct-items correlation, and to validate the research framework. The validity test includes two criteria: content validity, which measures the suitability of questionnaire items, and Exploratory Construct Validity (ECV), a method utilised to measure the validity of the questionnaire instrument. According to the results of the validity test (exploratory factor analysis) and the reliability test (Cronbach's alpha and interclass correlation coefficient), the conceptual research model needed revision in this study.

Then, correlation, simple regression, and SEM analyses were used to identify any significant relationship between talent management processes and knowledge management processes. Correlation and regression analyses were used in the first instance as the first generation analysis technique to comprehend the nature of the

relationship level between talent management processes and knowledge management processes. Then, SEM was used as the second generation analysis technique to provide an enhanced understanding and a progressive level of statistical analysis. SEM was also used to confirm the outcomes that were obtained by correlation and regression analyses by providing further investigation into the relationship between talent management processes and knowledge management processes in Australian higher education. SEM identifies the associated errors among measured items by using the measurement model and investigating the hypothesised structural relationships among variables, as well as between each variable and its items (Baig 2010; Chin 1998a).

9.3. Validity and reliability

Content validity is a method to confirm the strength and suitability of questionnaire items (Cooper & Schindler 2011; Creswell 2014; Fink 2003; Nguyen Hong 2016; Ritchie et al. 2013; Zikmund et al. 2013). In this regard, the researcher prepared a special form to examine opinions of twelve academic experts who were specialised in the fields of information systems and human resources management. The clarity of each statement in terms of meaningful and grammatical content were the basis to correct what should be corrected, with the addition or deletion of the arbitrator's words in each of the instrument's questions. All experts subsequently agreed that the new questionnaire instrument was appropriate. Thus, the researcher modified and drafted some of the terms that the arbitrators thought should be re-drafted for clarity. Following a pre-test of the questionnaire, a quantitative pilot study was used to improve the internal validity of the survey questionnaire. The findings of the quantitative pilot study revealed similar themes as the findings of the actual study.

As indicated earlier in Chapter eight: "Quantitative data collection", the reliability of the quantitative data gathered for this study was examined using Cronbach's alpha test to examine construct-items' correlations (Cronbach 1951; Nunnally & Bernstein 1994). The acceptable rate of the correlation coefficient should be at least 0.70 (Gefen et al. 2000; Hair et al. 2010; Peters 2014). Tables 9.1 and 9.2 show the reliability coefficients for the non-demographic variables and their items that were included in the questionnaire instrument of this study.

Table 9.1: Summary of the reliability test for all Likert scale items (N=286)

Non-demographic variables	No. of items	Cronbach 's alpha
Talent attraction, talent development, talent retention, knowledge transfer, knowledge creation, and knowledge sharing	86	0.984

As can be seen in Table 9.1, the value of Cronbach Alpha for all Likert scale items in the questionnaire instrument is 0.984. This indicates that the instrument of the study has a high internal constancy, because the value of Cronbach Alpha is greater than 0.70.

Table 9.2: Summary of the reliability test for the non-demographic variables (N=286)

No.	Non-dempgraphic variables	Items	No. of items	Cronbach' s alpha
1	Talent attraction	TA1, TA2, TA3, TA4, TA5, TA6, TA7, TA8, TA9, TA10, TA11, &TA12	11	0.893
2	Talent development	TD1, TD2, TD3, TD4, TD5, TD6, TD7, TD8, TD9, TD10, TD11, TD12, TD13, TD14, &TD15	15	0.934
3	Talent retention	TR1, TR2, TR3,TR4, TR5, TR6, TR7, TR8, TR9, TR10, TR11, TR12, TR13, TR14, TR15, TR16, TR17, TR18, TR19, TR20, TR21, TR22, TR23, TR24, & TR25	25	0.955
4	Knowledge transfer	KT1, KT2, KT4, KT5, KT6, KT7, KT8, KT9, & KT10	10	0.914
5	Knowledge creation	KC1, KC2, KC3, KC4, KC5, KC6, KC7, KC8, KC9, KC10, KC11, KC12, KC13, KC14, KC15, KC16, KC17, KC18, KC19, & KC20	20	0.948
6	Knowledge sharing	KS1, KS2, KS3, KS4, & KS5	5	0.870

Looking at Table 9.2, non-demographic variables ranged between 0.870-0.955 (> 0.70). These indicate that all values are statistically acceptable, because their values are greater than 0.70. Thus, these results confirm the reliability for the whole survey questionnaire instrument. For more details, SPSS actual outputs for the reliability test are shown in Appendix H, Table A.

9.4. Descriptive statistics

Descriptive statistics is a critical base for any quantitative data analysis, in terms of describing and summarising the data (Leavy 2017; O'Dwyer & Bernauer 2014). It is an initial test conducted on numerical data to examine data properties, analysis techniques, and to obtain sample description data (Tharenou et al. 2007). In this study, descriptive statistics were utilised: (1) to describe the demographic characteristics of the study sample; and (2) to calculate the degree of correlation intensity of the data by using mean and standard deviation (Argyrous 2005; Chen & Liu 2017; Leavy 2017).

9.4.1. Mean variances via respondent characteristics

The aim of conducting the test of mean variances is to verify if there are significant differences between corresponding populations. In this regard, Analysis of Variance (ANOVA) was used to test variance by demographic features of respondents (Field 2018; Remenyi et al. 1998). One-way analysis of variance is a statistical tool within SPSS (Black et al. 2013; Field 2018; George & Mallery 2011). It supposes that 'if the dependent variable is normally distributed, the groups are independent in their responces on the dependent variable, and variances are equal for all treatment groups' (Hair et al. 2010, p. 458). In other words, One-Way ANOVA compares the variance between two groups or more in relation to demographic characteristics (independent variable) in their responses on the dependent variable. It assists in demonstrating whether there are significant differences between groups within the category or not by using an F- test (Black et al. 2013; George & Mallery 2011; Saunders et al. 2016). If the P-value for F-calculated is equal or higher than 0.05, there is no equal variance between the means of the treatment levels (Black et al. 2013; Field 2018; George & Mallery 2011; Saunders et al. 2016).

In this study, demographic features are the independent variable, and both talent management processes and knowledge management processes are the dependent variables. Table 9.3 shows a summary of demographic features, and compares means using one-way analysis for talent management processes between the groups of demographic features. Table 9.4 provides a brief of demographic features, and compares means using one-way analysis for knowledge management processes between the groups of demographic features.

Table 9.3: Demographic features, and comparison of talent management processes by respondent characteristics (N = 286)

Characteristics		Frequency	(%)	Mean	Std. Deviation	95% Confidence Interval for Mean		F-value	P-value
						Lower Bound	Upper Bound		
The university	**QU1**	15	5.2	3.529	0.639	3.175	3.883	1.413	0.191
	QU2	27	9.4	3.646	0.598	3.409	3.8830		
	QU3	34	11.9	3.576	0.580	3.373	3.778		
	QU4	29	10.1	3.436	0.543	3.229	3.643		
	QU5	23	8.0	3.614	0.535	3.382	3.845		
	QU6	26	9.1	3.525	0.623	3.273	3.776		
	QU7	40	14.0	3.288	0.689	3.068	3.509		
	QU8	58	20.3	3.530	0.439	3.414	3.645		
	QU9	34	11.9	3.644	0.506	3.467	3.821		
	Total	**286**	**100**	**3.523**	**0.568**	**3.457**	**3.589**		
Gender	**Male**	154	53.7	3.530	0.596	3.435	3.625	1.236	0.292
	Female	123	43.0	3.535	0.528	3.440	3.629		
	Do not want to disclose	9	3.1	3.230	0.595	2.772	3.687		
	Total	**286**	**100**	**3.523**	**0.568**	**3.457**	**3.589**		
Age of respondents	**≤ 29 years**	28	9.8	3.637	0.668	3.377	3.896	2.478	0.044
	30 – 39 years	78	27.3	3.584	0.485	3.475	3.694		
	40 – 49 years	89	31.1	3.526	0.507	3.419	3.633		

	50 – 59 years	69	24.1	3.510	0.637	3.357	3.663		
	≥ 60 years	22	7.7	3.188	0.634	2.906	3.469		
	Total	**286**	**100**	**3.523**	**0.568**	**3.457**	**3.589**		
The number of expertise years	**5-10**	122	42.7	3.596	0.528	3.501	3.691	2.895	0.036
	11-15	66	23.1	3.575	0.456	3.463	3.687		
	16-20	40	14	3.468	0.676	3.252	3.685		
	> 20 years	58	20.2	3.347	0.652	3.175	3.518		
	Total	**286**	**100**	**3.523**	**0.568**	**3.457**	**3.589**		
Academic qualification	**Doctorate**	141	49.3	3.420	0.657	3.311	3.530	3.513	0.016
	Master	54	18.9	3.558	0.535	3.411	3.704		
	Bachelor	76	26.6	3.669	0.382	3.581	3.756		
	Diploma	15	5.2	3.622	0.389	3.406	3.837		
	Total	**286**	**100**	**3.523**	**0.568**	**3.457**	**3.589**		
Current position	**Professor**	20	7	3.431	0.529	3.183	3.679	1.491	0.217
	Associate Professor	31	10.8	3.399	0.715	3.136	3.662		
	Senior Lecturer / Lecturer	84	28.8	3.476	0.628	3.339	3.612		
	Others	151	52.8	3.586	0.497	3.506	3.666		
	Total	**286**	**100**	**3.523**	**0.568**	**3.457**	**3.589**		

The results in Table 9.3 show that the majority of respondents were from QU8 (20.3%) and QU7 (14%). The mean scale for talent management processes in descending order is: QU2 (3.646 ± 0.598), QU9 (3.644 ± 0.506), QU5 (3.614 ± 0.535), QU3 (3.576 ± 0.580), QU8 (3.530 ± 0.439), QU1 (3.529 ± 0.639), QU6 (3.525 ± 0.623), QU4 (3.436 ± 0.543), and QU7 (3.288 ± 0.689) group. Based on the one way analysis, the value of (F) was (1.413), and P-value was (0.191), which was higher than 0.05. This outcome indicates that there were no significant differences for talent management processes within the university group.

In terms of gender, the majority of respondents in the current research were male, at 53.7%. The mean scale for talent management processes decreased from Female (3.535 ± 0.528), to Male (3.530 ± 0.596), and to the Do not want to disclose (3.230 ± 0.755) group. According to a one-way analysis of variance, the value of (F) was (1.236), and P-value was (0.292), which was greater than 0.05. This result indicates that there were no significant differences for talent management processes within the gender group.

In regards to age, 40- 49 years was the highest percentage of the sample (31.1%). As can be seen in the table above, the mean scale for talent management processes of highly qualified employees, listed in descending order, is as follows: ≤ 29 years (3.637 ± 0.668), 30 – 39 years (3.584 ± 0.485), 40 – 49 years (3.526 ± 0.507), 50 – 59 years (3.510 ± 0.637), and ≥ 60 years (3.188 ± 0.634). Based on the one way analysis, the value of (F) was (2.478), and P-value was (0.044), which was lower than the significant level (0.05). This finding confirms that there were significant differences for talent management processes between the respondents'age groups.

As illustrated in Table 9.3, five-ten years of expertise was the highest percentage of the sample (42.7%). The mean scale for talent management processes of talented individuals in descending order is: 5-10 ten years expertise (3.596 ± 0.528), 11-15 (3.575 ± 0.456), 16-20 (3.468 ± 0.676), and > 20 years (3.347 ± 0.652). According to one-way analysis, the value of (F) was (2.895), and P-value was (0.036), which was less than the significant level (0.05). This result indicates that there were significant differences for talent management processes within the different years of expertise groups.

The academic qualification 'Doctorate' was the dominant sample with 49.3%. The mean scale for talent management processes in descending order is: Bachelor (3.669 ± 0.382), Diploma (3.622 ± 0.389), Master (3.558 ± 0.535), and Doctorate (3.420 ± 0.657) group. Based on the one-way analysis of variance, the value of (F) was (3.513), and P-value was (0.016), which was lower than the significant level (0.05). This outcome indicates that there were significant differences for talent management processes within the academic qualifications group.

Finally, professional staff members constituted the majority of talented individuals (52.8%) participating in this research. As shown in Table 9.3, the mean scale for talent management processes of talented individuals, listed in descending order is as follows: professional staff (others) (3.586 ± 0.497), academic staff (Senior Lecturer/Lecturer) (3.476 ± 0.628), academic staff (Associate Professor) (3.431 ± 0.529), and academic staff (Professor) (3.431 ± 0.529) group. According to the one-way analysis of variance, the value of (F) was (1.491), and P-value was (0.217), which was greater than the significant level (0.05). This result indicates that there were no significant differences for talent management processes within the current position group.

Table 9.4: Demographic features, and comparison of knowledge management processes by respondent characteristics (N = 286)

Characteristics		Frequency	(%)	Mean	Std. Deviation	95% Confidence Interval for Mean		F-value	P-value
						Lower Bound	Upper Bound		
The university	**QU1**	15	5.2	3.720	0.592	3.391	4.048	2.137	0.033
	QU2	27	9.4	3.725	0.621	3.480	3.971		
	QU3	34	11.9	3.687	0.565	3.490	3.884		
	QU4	29	10.1	3.574	0.513	3.378	3.769		
	QU5	23	8.0	3.758	0.414	3.578	3.937		
	QU6	26	9.1	3.514	0.712	3.226	3.801		
	QU7	40	14.0	3.330	0.711	3.102	3.558		
	QU8	58	20.3	3.527	0.545	3.383	3.670		
	QU9	34	11.9	3.748	0.405	3.607	3.890		
	Total	**286**	**100**	**3.596**	**0.583**	**3.528**	**3.663**		
Gender	**Male**	154	53.7	3.608	0.601	3.512	3.704	2.840	0.060
	Female	123	43.0	3.613	0.537	3.517	3.709		
	Do not want to disclose	9	3.1	3.142	0.755	2.562	3.723		
	Total	**286**	**100**	**3.596**	**0.583**	**3.528**	**3.663**		
Age of respondents	**≤ 29 years**	28	9.8	3.775	0.688	3.508	4.042	2.995	0.019
	30 – 39 years	78	27.3	3.654	0.516	3.538	3.771		
	40 – 49 years	89	31.1	3.616	0.537	3.503	3.729		

	50 – 59 years	69	24.1	3.539	0.635	3.387	3.692		
	≥ 60 years	22	7.7	3.255	0.577	2.999	3.511		
	Total	**286**	**100**	**3.596**	**0.583**	**3.528**	**3.663**		
The number of expertise years	**5-10**	122	42.7	3.695	0.548	3.597	3.794	3.574	0.014
	11-15	66	23.1	3.614	0.474	3.497	3.731		
	16-20	40	14	3.544	0.649	3.336	3.752		
	> 20 years	58	20.2	3.400	0.676	3.222	3.578		
	Total	**286**	**100**	**3.596**	**0.583**	**3.528**	**3.663**		
Academic qualification	**Doctorate**	141	49.3	3.457	0.657	3.347	3.566	6.530	0.000
	Master	54	18.9	3.672	0.536	3.526	3.819		
	Bachelor	76	26.6	3.803	0.373	3.718	3.888		
	Diploma	15	5.2	3.571	0.571	3.254	3.887		
	Total	**286**	**100**	**3.596**	**0.583**	**3.528**	**3.663**		
Current position	**Professor**	20	7	3.391	0.560	3.129	3.364	2.918	0.035
	Associate Professor	31	10.8	3.438	0.728	3.171	3.706		
	Senior Lecturer / Lecturer	84	28.8	3.547	0.609	3.415	3.679		
	Others	151	52.8	3.682	0.525	3.597	3.766		
	Total	**286**	**100**	**3.596**	**0.583**	**3.528**	**3.663**		

Looking at Table 9.4, the mean scale for knowledge management processes in descending order is: QU5 (3.758 ± 0.414), QU9 (3.748 ± 0.405), QU2 (3.725 ± 0.621), QU1 (3.720 ± 0.592), QU3 (3.687 ± 0.565), QU4 (3.574 ± 0.513), QU8 (3.527 ± 0.545), QU6 (3.514 ± 0.712), and QU7 (3.330 ± 0.711) group. Based on the one-way analysis of variance, the value of (F) was (2.137), and P-value was (0.033), which was less than 0.05. This finding demonstrates that there were significant differences for knowledge management processes within the university group.

In terms of gender, the mean scale for knowledge management processes decreased from Female (3.613 ± 0.601), to Male (3.608 ± 0.601), and then to the Do not want to disclose (3.142 ± 0.755) group. According to one-way analysis of variance, the value of (F) was (2.840), and P-value was (0.060), which was higher than 0.05. This result indicates that there were no significant differences for knowledge management processes within the gender group.

As can be seen from the table above, the mean scale for knowledge management processes of highly qualified employees, listed in descending order is as follows: ≤ 29 years (3.775 ± 0.688), 30–39 years (3.654 ± 0.516), 40–49 years (3.616 ± 0.537), 50–59 years (3.539 ± 0.635), and ≥ 60 years (3.255 ± 0.577). Based on the one-way analysis of variance, the value of (F) was (2.995), and P-value was (0.019), which was lower than the significant level (0.05). This outcome shows that there were significant differences for knowledge management processes within the respondents age group.

Looking carefuly at Table 9.4, the mean scale for knowledge management processes related to years of expertise in descending order is: 5-10 ten years expertise (3.695 ± 0.548), 11-15 (3.614 ± 0.474), 16-20 (3.544 ± 0.649), and > 20 years (3.400 ± 0.676). According to one-way analysis of variance, the value of (F) was (3.574), and P-value was (0.014), which was less than the significant level (0.05). This outcome indicates that there were significant differences for knowledge management processes within the number of years of expertise group.

In terms of educational qualifications, the mean scale for knowledge management processes in descending order is: Bachelor (3.803 ± 0.373), Master (3.672 ± 0.536), Diploma (3.571 ± 0.571), and Doctorate (3.457 ± 0.657) group. Based on the one-way analysis of variance, the value of (F) was (6.530), and P-value was (0.000), which was

lower than the significant level (0.05). This finding demonstrates that there were significant differences for knowledge management processes within the academic qualifications group.

Lastly, the mean scale for knowledge management processes of talented individuals, listed in descending order is as follows: professional staff (others) (3.682 ± 0.525), academic staff (Senior Lecturer/Lecturer) (3.547 ± 0.609), academic staff (Associate Professor) (3.438 ± 0.728), and academic staff (Professor) (3.391 ± 0.560) group. According to the one-way analysis of variance, the value of (F) was (2.918), and P-value was (0.035), which was smaller than the significant level (0.05). This result confirms that there were significant differences for knowledge management processes within the current position group.

9.4.2. Univariate data analysis

The study determined the level of responses in terms of mean and standard deviation according to the category they belonged to. There were six composite variables tested in the study: talent attraction, talent development, talent retention, knowledge transfer, knowledge creation, and knowledge sharing. Statistical analyses separately described items for all the research constructs by reporting measures of the central tendency (mean), variability (standard deviation) (Argyrous 2005; Black et al. 2013; Leavy 2017; Mertler & Reinhart 2017; O'Dwyer & Bernauer 2014), and relative importance.

9.4.2.1. Talent attraction

Talent attraction included eleven items which underlined two categories: social domain (five items) and organisational excellence (six items). Talented individuals indicated their views of this construct utilising a five-point Likert scale. Table 9.5 displays the summary statistics of the central tendency measures for the talent attraction construct.

Table 9.5: Descriptive statistics of the talent attraction construct (N = 286)

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
		Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%			
Social Domain (SD)	**1-** My university attracts more talented employees through providing them with social support in difficult times (e.g. maternity, paternity, death, and financial difficulties).	5	1.7	16	5.6	75	26.2	148	51.7	42	14.7	**3.720**	**0.845**	**2**
	2- My university attracts more talented employees through having a socially progressive work environment (e.g. multicultural).	9	3.1	13	4.5	78	27.3	160	55.9	26	9.1	**3.632**	**0.834**	**4**
	3- My university supports the staff community through involvement in social, cultural, or economic initiatives to attract more talented employees.	7	2.4	32	11.2	68	23.8	159	55.6	20	7	**3.535**	**0.872**	**5**
	4- My university provides social networking activities to employees.	8	2.8	20	7	50	17.5	168	58.7	40	14	**3.741**	**0.884**	**1**
	5- My university has a good work-life balance (e.g. socialising with colleagues, proper location and amenities, recreation or lifestyle opportunities) to attract talented individuals.	7	2.4	28	9.8	57	19.9	156	54.5	38	13.3	**3.664**	**0.914**	**3**
The overall rate												**3.658**	**0.689**	**1**
Organisational Excellence (OE)	**1-** My university has effective recruitment strategies for attracting the best academics and professional staff.	6	2.1	23	8	81	28.3	147	51.4	29	10.1	**3.594**	**0.856**	**2**
	2- My university has a good reputation through high-quality research which enables the university to attract the best academic and professional staff	4	1.4	19	6.6	103	36	123	43	37	12.9	**3.594**	**0.848**	**3**

	3- My university has a high university ranking enabling the university to attract the best academic and professional staff.	3	1	36	12.6	107	37.4	103	36	37	12.9	**3.472**	**0.908**	**6**
	4- My university has an innovative culture enabling it to attract more talented individuals.	10	3.5	26	9.1	80	28	152	53.1	18	6.3	**3.496**	**0.877**	**5**
	5- My university has an appropriate organisational climate in order to attract the appropriate talents (e.g. having social friendships at work).	7	2.4	22	7.7	70	24.5	163	57	24	8.4	**3.611**	**0.841**	**1**
	6- My university attracts more talented staff through having a high-quality working environment that encourages talented employees to realise creativity and innovation (e.g. physical aspects such as well-equipped workplaces).	10	3.5	30	10.5	62	21.7	157	54.9	27	9.4	**3.562**	**0.925**	**4**
The overall rate												**3.555**	**0.642**	**2**
The general rate of the talent attraction construct												**3.602**	**0.607**	**1**

Note:
Fre = Frequency
Relative Importance = R.I

As can be seen from the table above, the general mean of this construct is 3.602, which is greater than the standard mean 3[6], with a high consistency in the answers towards this construct through the value of standard deviation 0.607. The relative importance of this construct is that it was the first among the talent management constructs. The means of talent attraction items were between 3.535-3.741 for social domain, and 3.472-3.611 for organisational excellence.

In regards to social domain, talented individuals were interested in 'providing social networking activities to employees' as a motivation for attracting talent, with a mean and standard deviation of 3.7404 and 0.885 respectively. However, there was less agreement on 'supporting the staff community through involvement in social, cultural, or economic initiatives', with a mean and standard deviation of 3.533 and 0.873 respectively. In general, the overall mean of this category is 3.657, which is greater than the standard mean 3, with a high consistency in the answers towards this construct through the value of standard deviation 0.690. The relative importance of social domain was the first among the talent attraction variables.

In terms of organisational excellence, the overall mean of this category is 3.550 with consistent responses towards this construct through the value of standard deviation 0.637. Highly qualified individuals indicated most agreement (3.607) with 'having social friendships at work' to attract more talent. On the other hand, 'having a high university ranking' was the least agreed upon (3.466), with variations between the responses confirmed by the standard deviation (0.905). The relative importance of organisational excellence was the second among the talent attraction variables.

9.4.2.2. Talent development

The table below (9.6) illustrates means, standard deviation of responses, and relative importance of the study sample for the talent development construct. It contains fifteen items, which underline three categories: performance management, coaching talent, and leadership development, each of which involves five items.

[6] To calculate the standard mean: (1+2+3+4+5)/5= 3

Table 9.6: Descriptive statistics of the talent development construct (N = 286)

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
		Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%			
Performance Management (PM)	1- My university has effective talent development strategies aligned with its organisational strategies.	8	2.8	27	9.4	71	24.8	164	57.3	16	5.6	**3.535**	**0.848**	**2**
	2- My university determines training needs for talented individuals who have desired skills.	8	2.8	30	10.5	56	19.6	178	62.2	14	4.9	**3.559**	**0.851**	**1**
	3- My university facilitates employee performance and development with tailored training plans.	11	3.8	37	12.9	71	24.8	156	54.5	11	3.8	**3.416**	**0.901**	**4**
	4- My university uses human resource planning to ensure effective skill utilisation and development.	12	4.2	36	12.6	96	33.6	131	45.8	11	3.8	**3.325**	**0.895**	**5**
	5- My university identifies areas needed for employee's personal development (e.g. skills gap analysis).	8	2.8	43	15	72	25.2	145	50.7	18	6.3	**3.426**	**0.917**	**3**
The overall rate												**3.452**	**0.709**	**2**
Coaching Talent (CT)	1- My university facilitates internal job rotation to strengthen talented employees' experiences and development in different faculties, departments, and divisions.	18	6.3	57	19.9	79	27.6	122	42.7	10	3.5	**3.171**	**0.995**	**5**
	2- My university develops academic staff through sessions with learning and teaching training.	3	1	15	5.2	78	27.3	166	58	24	8.4	**3.674**	**0.746**	**3**
	3- My university develops professional and academic staff with training and mentoring programs.	5	1.7	22	7.7	51	17.8	189	66.1	19	6.6	**3.681**	**0.781**	**1**
	4- My university develops its own online training materials for talented staff to gain required knowledge and skills.	5	1.7	22	7.7	51	17.8	189	66.1	19	6.6	**3.583**	**0.832**	**4**
	5- My university provides the staff with career development opportunities (e.g. further education, certifications, scholarships, etc.).	5	1.7	19	6.6	66	23.1	168	58.7	28	9.8	**3.681**	**0.807**	**2**
The overall rate												**3.558**	**0.610**	**1**

Leadership Development (LD)	1- My university includes leaders' development in the design of all job roles.	11	3.8	38	13.3	89	31.1	134	46.9	14	4.9	**3.356**	**0.909**	**4**
	2- My university develops leaders through further education.	9	3.1	35	12.2	82	28.7	145	50.7	15	5.2	**3.426**	**0.886**	**3**
	3- My university supports high potential employees to become leaders, in order to build a strong talent pool.	11	3.8	30	10.5	70	24.5	158	55.2	17	5.9	**3.489**	**0.901**	**2**
	4- My university assists leaders to be professionals through career development programs.	7	2.4	24	8.4	78	27.3	165	57.7	12	4.2	**3.528**	**0.806**	**1**
	5- My university develops succession planning, and identifies alternative talented employees for leadership positions.	16	5.6	32	11.2	93	32.5	140	49	5	1.7	**3.300**	**0.898**	**5**
The overall rate												**3.420**	**0.734**	**3**
The general rate of the talent development construct												**3.477**	**0.626**	**3**

As shown in Table 9.6, the general mean of the talent development construct is 3.477, which is greater than the standard mean 3, with a high consistency in the answers towards this construct through the value of standard deviation 0.626. The relative importance of this construct is the third and last among the talent management constructs. The means of talent development items were between 3.325-3.559 for performance management, 3.171-3.681 for coaching talent, and 3.300-3.528 for leadership development. The overall mean of performance management was 3.452 with consistent answers within this category through the value of standard deviation 0.711. According to Table 9.6, respondents were moderately interested (mean 3.564) in 'determining training needs for talented individuals' as a preferred practice for performance management; but they were less interested (3.326) in 'using human resource planning to ensure effective skill utilisation and development'. The relative importance of performance management was the second among the talent development variables. In terms of coaching talent, the overall mean of this category was 3.562 with a great consistency in the answers to this construct through the value of standard deviation 0.608. The highest mean was for the third item 'developing professional and academic staff with training and mentoring programs' 3.681. In contrast, the lest attention of respondents (3.171) was the first item 'facilitating internal job rotation to strengthen talented employees' experiences and development in different faculties, departments, and divisions'. The relative importance of coaching talent was first among talent development variables. In regards to leadership development, talented individuals slightly agreed (3.526) that 'the university assists leaders to be professionals through career development programs'. Yet, there was less agreement (3.298) on 'developing succession planning, and identifies alternative talented employees for leadership positions'. In general, the overall mean of leadership development was 3.418 with consistent responses within this category to the value of standard deviation 0.734. The relative importance of leadership development was the third and last among talent development variables.

9.4.2.3. Talent retention

Table 9.7 depicts mean, standard deviations of responses, and the relative importance of the study sample for the talent retention construct. It includes 25 items which underline five categories: benchmarking, job satisfaction, non-financial rewards, employee empowerment, and employee motivation. Each of them involves five items.

Table 9.7: Descriptive statistics of the talent retention construct (N = 286)

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
		Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%			
Benchmarking	**1-** My university determines which talent retention strategies are most effective	17	5.9	34	11.9	112	39.2	115	40.2	8	2.8	**3.220**	**0.908**	**4**
	2- My university benchmarks with other universities inside Australia to evaluate talent retention strategies	13	4.5	16	5.6	145	50.7	102	35.7	10	3.5	**3.279**	**0.811**	**3**
	3- My university benchmarks with other universities outside Australia to evaluate talent retention strategies	13	4.5	26	9.1	148	51.7	91	31.8	8	2.8	**3.192**	**0.817**	**5**
	4- My university has a competitive compensation system which is a motivating factor to retain our talented employees	11	3.8	38	13.3	84	29.4	139	48.6	14	4.9	**3.374**	**0.911**	**2**
	5- My university provides a highly competitive compensation system for long-term to retain talent	9	3.1	41	14.3	81	28.3	140	49	15	5.2	**3.388**	**0.905**	**1**
The overall rate												**3.290**	**0.710**	**5**
Job Satisfaction (JS)	**1**- My university has a supportive learning environment which promotes employee job satisfaction to retain qualified employees	11	3.8	26	9.1	81	28.3	153	53.5	15	5.2	**3.472**	**0.877**	**4**
	2- My university has high-quality working conditions to retain the high qualified talent.	10	3.5	25	8.7	63	22	167	58.4	21	7.3	**3.573**	**0.882**	**3**
	3- My university managers treat employees well through relationship building to retain talent.	11	3.8	15	5.2	51	17.8	182	63.6	27	9.4	**3.695**	**0.859**	**1**
	4- My university promotes equal opportunity to retain its qualified employees.	7	2.4	20	7	62	21.7	170	59.4	27	9.4	**3.664**	**0.837**	**2**
	5- My university ensures talented employees are satisfied.	8	2.8	39	13.6	93	32.5	131	45.8	15	5.2	**3.370**	**0.884**	**5**
The overall rate												**3.555**	**0.704**	**3**

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
Non-Financial Rewards (NFR)	**1-** My university provides assistance with healthcare and safety issues to retain its qualified employees.	11	3.8	10	3.5	73	25.5	171	59.8	21	7.3	**3.632**	**0.826**	**3**
	2- My university accounts for personal factors and life events (e.g. family responsibilities) to retain its talented staff.	9	3.1	9	3.1	68	23.8	178	62.2	22	7.7	**3.681**	**0.790**	**2**
	3- My university provides fair acknowledgement of employee work efforts and achievements to better keep employees.	10	3.5	26	9.1	77	26.9	148	51.7	25	8.7	**3.531**	**0.904**	**4**
	4- My university provides flexibility for work hours, roles, and tasks (e.g. for care of young children) to retain its qualified employees.	9	3.1	8	2.8	39	13.6	180	62.9	50	17.5	**3.881**	**0.834**	**1**
	5- My university has a good system of non-financial rewards to retain talented staff.	10	3.5	38	13.3	82	28.7	134	46.9	22	7.7	**3.419**	**0.935**	**5**
The overall rate												**3.630**	**0.650**	**1**
Employee Empowerment (EE*)*	**1-** My university encourages innovative thinking, and promotes creative ideas from talented employees.	8	2.8	20	7	69	24.1	167	58.4	22	7.7	**3.611**	**0.837**	**2**
	2- My university keeps employees engaged and motivated to retain talented staff.	9	3.1	30	10.5	82	28.7	154	53.8	11	3.8	**3.447**	**0.851**	**4**
	3- My university adopts management by career enrichment programs to increase talented employees' confidence in themselves.	13	4.5	26	9.1	82	28.7	153	53.5	12	4.2	**3.437**	**0.887**	**5**
	4- My university retains its qualified employees by providing them with sufficient freedom to actively perform their jobs.	6	2.1	19	6.6	61	21.3	174	60.8	26	9.1	**3.681**	**0.812**	**1**
	5- My university retains its talented staff by providing them enough authority to complete their work efficiently.	9	3.1	22	7.7	64	22.4	172	60.1	19	6.6	**3.594**	**0.848**	**3**
The overall rate												**3.554**	**0.673**	**2**

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
Employ Motivation (EM)	**1-** My university retains its qualified employees by providing them opportunities to develop their careers.	8	2.8	17	5.9	65	22.7	177	61.9	19	6.6	**3.636**	**0.808**	**1**
	2- My university retains its talented staff with financial rewards, high salaries or remuneration.	13	4.5	37	12.9	77	26.9	139	48.6	20	7	**3.405**	**0.956**	**3**
	3- My university retains its qualified employees through providing them with individual funding for academic research.	12	4.2	51	17.8	100	35	106	37.1	17	5.9	**3.227**	**0.951**	**5**
	4- My university monitors performance and suggests advice regularly (e.g. per semester) in an encouraging manner to retain its talented staff.	10	3.5	28	9.8	83	29	151	52.8	14	4.9	**3.458**	**0.868**	**2**
	5- My university utilises an employee growth program for the development of motivation and engagement to retain its qualified employees.	9	3.1	38	13.3	93	32.5	132	46.2	14	4.9	**3.363**	**0.886**	**4**
The overall rate												**3.418**	**0.665**	**4**
The general rate of the talent retention construct												**3.489**	**0.601**	**2**

It is apparent from this table that the general mean of the talent retention construct was 3.489, which was greater than the standard mean 3, with a high consistency in the answers within this construct through the value of standard deviation 0.601. The relative importance of this construct was second among the talent management constructs. The means of talent retention items were between 3.192- 3.388 for benchmarking, 3.370-3.695 for job satisfaction, 3.419-3.881 for non-financial rewards, 3.437-3.681 for employee empowerment, and 3.227-3.636 for employee motivation.

The overall mean of benchmarking was 3.290 with consistent answers towards this category through the value of standard deviation 0.710. According to Table 9.7, respondents were slightly interested (3.388) in 'providing a highly competitive compensation system for long-term to retain talent'; but they were less interested (3.192) in 'benchmarking with other universities outside Australia to evaluate talent retention strategies'. The relative importance of benchmarking is the fifth and last among the talent retention variables.

The overall mean of the job satisfaction category was 3.555 with a great consistency in the answers to this construct through the value of standard deviation 0.704. The highest mean was for the third item 'managers treat employees well through relationship building to retain talent' 3.695. In contrast, the least attention of respondents (3.370) was paid to the fifth item 'ensuring talented employees are satisfied'. The relative importance of job satisfaction was third among the talent retention variables.

In regards to non-financial rewards, talented individuals agreed that 'providing flexibility for work hours, roles, and tasks (e.g. for care of young children)' was a motivation to retain talent, with a mean of 3.881. However, they agreed less (3.419) on 'having a good system of non-financial rewards to retain talented staff'. In general, the overall mean of non-financial rewards was 3.630 with consistent responses within this category through the value of standard deviation 0.650. The relative importance of non-financial rewards was first among talent retention variables.

Focusing on employee empowerment, talented individuals were moderately interesting in 'providing talented individuals with sufficient freedom to actively

perform their jobs' as a motivation to retain talent, with a mean and standard deviation of 3.681 and 0.812 respectively. However, they agreed less on 'adopting management by career enrichment programs to increase talented employees' and 'confidence in themselves', with a mean and standard deviation of 3.419 and 0.935 respectively. In general, the overall mean of this category was 3.554, which was greater than the standard mean 3, with a high consistency in the answers that fell within this construct through the value of standard deviation 0.673. The relative importance of employee empowerment was second among talent retention variables.

In terms of employee motivation, the overall mean of this category was 3.550 with consistent responses within this construct through the value of standard deviation 0.637. High quality individuals indicated most agreement (3.636) in 'providing them opportunities to develop their careers' to retain more talent. On the other hand, 'providing them with individual funding for academic research' was the least agreed upon (3.227), with variations between the responses being confirmed by the standard deviation (0.951). The relative importance of employee motivation was fourth among the talent retention variables.

9.4.2.4. Knowledge transfer

Table 9.8 shows the mean, the standard deviation of responses, and the relative importance of the study sample for the knowledge transfer construct. It includes 10 items which underline the following two categories: codification knowledge transfer and personalisation knowledge transfer.

Table 9.8 descriptive statistics of the knowledge transfer construct (N =286)

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
		Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%			
Codification Knowledge Transfer (CKT)	**1-** My university effectively transfers information using an e-mail, meetings, discussions and internal networks.	8	2.8	23	8	35	12.2	149	52.1	71	24.8	**3.881**	**0.966**	1
	2- My university effectively transfers information using the intranet and databases (e.g. staff profiles).	10	3.5	24	8.4	59	20.6	129	45.1	64	22.4	**3.744**	**1.009**	2
	3- All employees can access appropriate knowledge systems and software	7	2.4	22	7.7	47	16.4	176	61.5	34	11.9	**3.727**	**0.859**	3
	4- It is easy for my colleagues using a university social network (electronic) to seek information.	11	3.8	32	11.2	48	16.8	159	55.6	36	12.6	**3.618**	**0.972**	5
	5- My university saves and renews important information accessed through a computer for easy browsing	3	1	23	8	66	23.1	169	59.1	25	8.7	**3.664**	**0.789**	4
The overall rate												**3.727**	**0.766**	**1**
Personalisation Knowledge Transfer (PKT)	**1-** Employees are effective at transferring experiences or abilities to other employees	6	2.1	37	12.9	74	25.9	151	52.8	18	6.3	**3.482**	**0.873**	5
	2- My university transfers useful knowledge through-out the academic workforce by training courses, seminars, workshops, and presentations.	4	1.4	17	5.9	64	22.4	188	65.7	13	4.5	**3.660**	**0.720**	2
	3- Knowledge is transferred through informal mechanisms for use by individual employees (e.g. face-to-face discussions).	3	1	11	3.8	55	19.2	190	66.4	27	9.4	**3.793**	**0.702**	1
	4- My university has responsible managers who ensure communication strategies are working well with appropriate formation content	11	3.8	17	5.9	73	25.5	167	58.4	18	6.3	**3.573**	**0.850**	3
	5- Managerial techniques are effectively learned from colleagues	11	3.8	24	8.4	76	26.6	158	55.2	17	5.9	**3.510**	**0.877**	4
The overall rate												**3.604**	**0.631**	**2**
The general rate of the knowledge transfer construct												**3.665**	**0.650**	**1**

Looking at Table 9.8, it is apparent that the general mean of this construct was 3.665, which was greater than the standard mean 3, with a great consistency in the answers within this construct through the value of standard deviation 0.650. The relative importance of this construct showed it was the first among the knowledge management constructs. The means of knowledge transfer items were between 3.618-3.881 for codification knowledge transfer, and 3.482-3.793 for personalisation knowledge transfer.

The overall mean of codification knowledge transfer was 3.727 with consistent answers within this category through the value of standard deviation 0.766. As can be seen in Table 9.8, respondents were interested (3.881) in 'transfering information using an e-mail, meetings, discussions and internal networks' as a preferred practice for transferring information, but they were less interested (3.618) in 'easy for colleagues using a university social network (electronic) to seek information'. The relative importance of codification knowledge transfer was first among the knowledge transfer variables.

In regards to personalisation knowledge transfer, talented individuals were interested in 'transferring knowledge through informal mechanisms for use by individual employees (e.g. face-to-face discussions)' with a mean and standard deviation of 3.793 and 0.702 respectively. However, they agreed less on 'transferring experiences or abilities to other employees' with a mean and standard deviation of 3.482 and 0.873 respectively. In general, the overall mean of this category was 3.604 which was greater than the standard mean (3), with a high consistency in the answers within this construct through the value of standard deviation 0.631. The relative importance of personalisation knowledge transfer was second among the knowledge transfer variables.

9.4.2.5. Knowledge creation

Table 9.9 presents the means, the standard deviation of responses, and the relative importance of the study sample for the knowledge creation construct. It comprises 20 items which underline four categories: socialisation, externalisation, combination, and internalisation.

Table 9.9: Descriptive statistics of the knowledge creation construct (N =286)

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
		Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%			
1- Socialisation (S)	**1-** The technology enables creativity and innovation through collaboration.	3	1	21	7.3	60	21	183	64	19	6.6	**3.678**	**0.750**	1
	2- In my university, the technology facilitates creative discussion through the learning process (e.g. exploring and understanding ideas).	7	2.4	19	6.6	88	30.8	157	54.9	15	5.2	**3.538**	**0.797**	5
	3- In my university, the technology facilitates skills development (e.g. learning by observation).	6	2.1	20	7	64	22.4	180	62.9	16	5.6	**3.629**	**0.782**	2
	4- My university encourages social learning through employees' discussion (e.g. social spaces such as dining rooms).	11	3.8	28	9.8	59	20.6	167	58.4	21	7.3	**3.555**	**0.907**	4
	5- Knowledge about how to use technology is learned effectively from colleagues.	7	2.4	24	8.4	74	25.9	164	57.3	17	5.9	**3.559**	**0.826**	3
The overall rate												**3.592**	**0.657**	**4**
2- Externalisation (E)	**1-** My university seeks external technology solutions for knowledge management problems (e.g. search ability or accessibility).	6	2.1	9	3.1	92	32.2	163	57	16	5.6	**3.608**	**0.735**	3
	2- Knowledge creation with external parties is well facilitated through collaborative tools (e.g. meetings, confluences, conferences, seminars, and sharepoint).	8	2.8	19	6.6	86	30.1	157	54.9	16	5.6	**3.538**	**0.814**	5
	3- My university is effective in creating new knowledge through research and publications.	4	1.4	8	2.8	65	22.7	173	60.5	36	12.6	**3.800**	**0.743**	1
	4- Employees share knowledge and best practices with staff from other organisations.	9	3.1	19	6.6	75	26.2	168	58.7	15	5.2	**3.562**	**0.821**	4
	5- My university acquires new knowledge from investigation of external sources.	6	2.1	10	3.5	68	23.8	182	63.6	20	7	**3.699**	**0.740**	2
The overall rate												**3.642**	**0.582**	**2**

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
		Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%			
3- Combination (C)	**1-** Relevant knowledge can be accessed in online databases.	3	1	17	5.9	50	17.5	182	63.6	34	11.9	**3.793**	**0.765**	2
	2- My university has effective communication channels supported by technology to distribute knowledge.	8	2.8	18	6.3	60	21	176	61.5	24	8.4	**3.664**	**0.828**	3
	3- My work is supported by the university technology and IT systems, software, and equipment	4	1.4	12	4.2	41	14.3	186	65	43	15	**3.881**	**0.758**	1
	4- The university database provides support and improvement to employee skills.	7	2.4	16	5.6	85	29.7	162	56.6	16	5.6	**3.573**	**0.785**	4
	5- My university adopts information repositories, best practices, and lessons learned.	7	2.4	15	5.2	84	29.4	168	58.7	12	4.2	**3.569**	**0.763**	5
The overall rate												**3.696**	**0.587**	**1**
4-Internalisation (I)	**1-** My university designs, develops, and builds appropriate technological systems and solutions.	8	2.8	18	6.3	79	27.6	168	58.7	13	4.5	**3.559**	**0.795**	4
	2- My university has effective methods for creating learning policies and procedures.	6	2.1	16	5.6	79	27.6	171	59.8	14	4.9	**3.597**	**0.760**	3
	3- My university has responsible employees to manage and advise on learning processes.	8	2.8	13	4.5	96	33.6	156	54.5	13	4.5	**3.535**	**0.774**	5
	4- Talented employees can access support when learning by practice (e.g. for teaching or course content development).	8	2.8	16	5.6	71	24.8	177	61.9	14	4.9	**3.604**	**0.786**	2
	5- My university provides on-the-job training.	8	2.8	18	6.3	62	21.7	173	60.5	25	8.7	**3.660**	**0.833**	1
The overall rate												**3.591**	**0.642**	**3**
The general rate of the knowledge creation construct												**3.630**	**0.560**	**2**

As can be seen from the table (above), the general mean of this construct was 3.630 which was higher than the standard mean 3, with a great consistency in the answers within this construct through the value of standard deviation 0.560. The relative importance of this construct was second among the knowledge management constructs. The means of knowledge creation items were between 3.538-3.678 for socialisation, 3.538-3.800 for externalisation, 3.569-3.881 for combination, and 3.535-3.660 for internalisation.

The overall mean of socialisation was 3.592 with a great consistency in the answers to this construct through the value of standard deviation 0.657. According to Table 9.9, respondents were moderately interested (3.678) in 'the technology enables creativity and innovation through collaboration' as a preferred practice for creating knowledge, yet they were less interested (3.538) in 'the technology facilitates creative discussion through the learning process'. The relative importance of socialisation was fourth among the knowledge creation variables.

The overall mean of the externalisation category was 3.642 with consistent answers within this category through the value of standard deviation 0.582. The highest mean was for the third item 'my university is effective in creating new knowledge through research and publications' at 3.800. In contrast, the least attention of respondents (3.538) was paid to the second item 'knowledge creation with external parties is well facilitated through collaborative tools'. The relative importance of externalisation was second among the knowledge creation variables.

Focusing on combination, talented individuals were interested in 'the university technology and IT systems, software, and equipment support works and careers' as an activity to create knowledge with a mean and standard deviation of 3.881 and 0.758 respectively. However, they agreed less on 'adopting information repositories, best practices, and lessons learned' with a mean and standard deviation of 3.569 and 0.774 respectively. In general, the overall mean of this category was 3.696, which was greater than the standard mean 3, with a high consistency in the answers within this construct through the value of standard deviation 0.587. The relative importance of combination was first among knowledge creation variables.

In regards to internalisation, talented individuals moderately agreed with 'the university provides on-the-job training' as an activity to create knowledge, with a mean 3.660. However, they agreed less (3.535) on 'the university has responsible employees to manage and advise on learning processes'. The overall mean of internalisation was 3.591 and consistent responses within this category had a standard deviation value of 0.642. The relative importance of internalisation was third among the knowledge creation variables.

9.4.2.6. Knowledge sharing

Table 9.10 presents the means, the standard deviation of responses, and the relative importance of the study sample for the knowledge sharing construct. It comprises 5 items that underline one category: sharing information. As shown in Table 9.12 below, the overall mean of this construct was 3.491 with a great consistency in the answers to this construct through the value of standard deviation 0.667. Respondents were interested (3.737) in 'supporting the sharing of information through group interaction, individual collaboration, and library resources' as a preferred practice for sharing knowledge, yet they were less interested (3.220) in 'having reciprocal collaboration and sharing information methods with other universities'. The relative importance of socialisation ranked third and last among the knowledge management constructs.

Table 9.10: Descriptive statistics of the knowledge sharing construct (N = 286)

Category	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	S.D.	R.I
		Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%			
Sharing Information (SI)	**1**- My university has effective collaboration and sharing information between professional and academic staff.	8	2.8	35	12.2	57	19.9	172	60.1	14	4.9	**3.521**	**0.873**	**2**
	2- My university has reciprocal collaboration and sharing information methods with other universities.	6	2.1	28	9.8	160	55.9	81	28.3	11	3.8	**3.220**	**0.756**	**5**
	3- My university promotes a sharing information culture.	12	4.2	28	9.8	60	21	172	60.1	14	4.9	**3.517**	**0.893**	**3**
	4- My university has effective collaboration and sharing information with non-university researchers (e.g. organisations and individuals externally).	9	3.1	24	8.4	90	31.5	152	53.1	11	3.8	**3.461**	**0.827**	**4**
	5- My university supports sharing information through group interaction, individual collaboration, and library resources.	7	2.4	10	3.5	57	19.9	189	66.1	23	8	**3.737**	**0.757**	**1**
The general rate of the knowledge sharing construct												**3.491**	**0.667**	**3**

9.5. Exploratory factor analysis

Prior to measuring the construct validity using factor analysis of the questionnaire instrument and multivariate data analysis, the data file was first screened to ensure the quality of the data analysis process. For this purpose, *Mahalanobis Distance (MD)* within SPSS was used to identify multivariate outliers (De Maesschalck et al. 2000; Mertler & Reinhart 2017). Through this procedure, 49 survey questionnaires were identified and eliminated from further data analysis. The final sample size comprised 237 for further analysis. To achieve the purpose of this particular study, ECV as a method was utilised to measure the construct validity of the questionnaire instrument (Aladwani 2014; Hajian et al. 2016; Olufadi 2015, 2017). This instrument was evaluated by conducting Exploratory Factor Analysis (EFA), which is commonly used in statistical applications in the social sciences (Osborne & Costello 2009; Tharenou et al. 2007; Yong & Pearce 2013). Chin (1998a) recommends utilising the EFA technique prior to conducting SEM. The key aim of this technique is to summarise and reduce composite variables into a smaller number of generated factors that are greatly associated with them (Osborne & Costello 2009; Schumacker & Lomax 2010; Tharenou et al. 2007; Yong & Pearce 2013; Zikmund et al. 2013). To determine the initial number of retained factors, the following two criteria should be considered when using EFA (Field 2018; Hair et al. 2010):

1- sampling adequacy and correlation between variables should exist; and
2- correlation coefficient of items should be greater than, or equal to, 40% (≥ 0.40) to be statistically significant and this should be included in a factor; and a cumulative precentage of variance explained should be greater than 60% or equal.

Thus, each element in the conceptual framework model of this research was calculated to obtain load factors. The data set being used consisted of 86 items that measured six composite variables; three of them related to talent management processes, and the other three to knowledge management processes. An explicit exploration of the dimensions of the talent management processes scale, which consists of 51 items, had to be conducted. This required using EFA in order to identify the valid items to be included in this scale. Using a similarly explicit exploration the dimensions of the knowledge management processes scale consisted of 35 items. Items not meeting the considerations of the above criteria were eliminated.

9.5.1. Sampling adequacy and correlation between variables

For verification of sampling adequacy, Kaiser (1974) recommends the use of the Kaiser-Meyer-Olkin Measure (KMO) of computing sampling adequacy, which ranges between 0-1 (Dimitrov 2012; Field 2018; Gaskin & Happell 2014). The value 0 denotes a totality of partial correlations greater than the sum of the total correlations. This also means that the correlation model is widespread, which made the use of EFA not appropriate. If the value is close to 1.0, this indicates that the correlation model is reliable (more total correlations), and the EFA analysis will be credible (Field 2018). Kaiser (1974) has also emphasised that the accepted values should be greater than (0.50); if values are less than (0.50), a researcher should either collect more data (increase the sample size) or rethink the included variables in their measurement (Field 2018; Somashekhar et al. 2016; Van Delft-Schreurs et al. 2016). To verify the correlation between variables, the Bartlett test was used to examine the null hypothesis. If the correlation matrix was an identity matrix, this indicates that all correlation coefficients would be zero. The significance test will inform a researcher that a correlation matrix is not the identity matrix (Field 2018). Table 9.11 provides the results of the KMO and Bartlett's test in relation to the study scales.

Table 9.11: KMO and Bartlett's Test to the study scales

Kaiser-Meyer-Olkin Measure (KMO) Sampling Adequacy	**0.938**
Bartlett's Test of Sphericity	
Approx. Chi-Square	5438.616
df	561
Sig.	**0.000**

As shown in Table 9.11, the value of KMO was 0.938. This result confirmed the verification of the first EFA criterion for the research measurement because the value of KMO was greater than 0.50. This indicates that the correlation model was reliable in terms of total correlations, and the EFA analysis would be credible. In addition, the Bartlett test was significant ($p < 0.000$).

9.5.2. Principal Component Analysis (PCA)

Factor analysis was conducted by Principal Component Analysis (PCA) to decrease the data set (Field 2018; Gaskin & Happell 2014; Yong & Pearce 2013). PCA is considered one of the most accurate methods and common uses of EFA methods

(Gefen et al. 2000; Quiyono 2014). Chin (1998a) recommends using PCA prior to conducting SEM. The aim of using this analysis is to condense contained information of original variables into fewer factors without missing information (Bańbura & Modugno 2014; Hair et al. 2010). In the current study, EFA was repeated many times to reach ultimate solutions around related items and achieve the two criteria above. A total of 52 items were eliminated from the preliminary set of 86 items. Table 9.12 shows the results of the factor analysis for each component using PCA.

Table 9.12: EFA results of the factor analysis (Rotated component matrix)

No.	Items	Component					
		1	2	3	4	5	6
1	KT1	**0.772**					
2	KT2	**0.766**					
3	KT4	**0.761**					
4	KT5	**0.735**					
5	KT3	**0.716**					
6	KT6	**0.646**					
7	KT7	**0.531**					
8	KT9	**0.476**					
9	TD8		**0.757**				
10	TD2		**0.698**				
11	TD3		**0.681**				
12	TD13		**0.671**				
13	TD7		**0.651**				
14	TD14		**0.625**				
15	TD1		**0.618**				
16	TD10		**0.568**				
17	TD11		**0.510**				
18	KC1			**0.718**			
19	KC2			**0.689**			
20	KC3			**0.655**			
21	KC4			**0.602**			
22	KC5			**0.577**			
23	KC16			**0.538**			
24	KC17			**0.523**			
25	TR4				**0.837**		
26	TR5				**0.792**		
27	TR14				**0.754**		
28	TR22				**0.680**		
29	TA1					**0.934**	
30	TA8					**0.932**	
31	TA7					**0.792**	
32	KS2						**0.630**
33	KS5						**0.611**
34	KS4						**0.491**
Total Variance Explained (%) 66.191							

It is apparent from this table that although 52 items were eliminated of the 86 items, all the six composite variables were included in the research scales, which thus accounted for 66.191% of the variance. The correlation coefficient of items was significant because the values were greater than 0.40. Hence, this free exploration confirms the validity of the questionnaire instrument. Again, the Cronbach alpha was calculated in total and individually to manage the reliability of the composite variables of the study (Tables 9.13 and 9.14).

Table 9.13: The reliability test for all the composite variables of the study

The composite variables	Items included	No. of items	Cronbach 's alpha
Talent Attraction (TA),Talent Development (TD), Talent Retention (TR), Knowledge Transfer(KT), Knowledge Creation (KC), and Knowledge Sharing (KS)	TA1, TA7, TA8, D8, TD2, TD3, TD13, TD7, TD14, TD1, TD10, TD11, TR4, TR5, TR14, TR22, KT1, KT2, KT4, KT5, KT3, KT6, KT7, KT9, KC1, KC2, KC3, KC, KC5, KC16, KC17, KS2, KS5, & KS4	34	**0.957**

As can be seen from Table 9.13, the value of the Cronbach Alpha for all the items of the composite variables was 0.957. This indicates that the instrument of the study had a high internal constancy, because the value of Cronbach Alpha was greater than 0.70.

Table 9.14: The reliability test for each composite variable of the study

No.	Composite variables	Items included	No. of items	Cronbach 's alpha
1	TA	TA1, TA7, &TA8	3	**0.915**
2	TD	TD8, TD2, TD3, TD13, TD7, TD14, TD1, TD10, &TD11	9	**0.897**
3	TR	TR4, TR5, TR14, & TR22	4	**0.868**
4	KT	KT1, KT2, KT4, KT5, KT3, KT6, KT7, & KT9	8	**0.912**
5	KC	KC1, KC2, KC3, KC, KC5, KC16, & KC17	7	**0.896**
6	KS	KS2, KS5, & KS4	3	**0.771**

As shown in Table 9.14, values of the Cronbach alpha of the composite variables ranged between (0.771-0.915). These indicate that the values were statistically acceptable, because they were greater than the acceptable rate (0.70). Hence, this result

insured the reliability of the whole measurement of both talent management processes and knowledge management processes. However, the reliability test using Cronbach Alpha did not calculate the reliability between items. Therefore, the reliability test using Interclass Correlation Coefficient (ICC) was used to ensure the items measuring the same composite variable belonged (Field 2018). This test was required before testing the research hypothesis using regression analysis to confirm the items that measured the same composite variable. Table 9.15 provides the brief values of the reliability test using ICC for the composite variables of the study.

Table 9.15: Brief values of the reliability test using ICC for the composite variables

No.	Composite variables	Interclass coorelation		Sig.
		Single measure	Average measure	
1	TA	0.782	0.915	**0.000**
2	TD	0.491	0.897	**0.000**
3	TR	0.621	0.868	**0.000**
4	KT	0.565	0.912	**0.000**
5	KC	0.551	0.896	**0.000**
6	KS	0.529	0.771	**0.000**
All composite variables		0.397	0.957	**0.000**

Looking at Table 9.15, the values of a single measure were lower than for the average measure, with significant (P= 0.000) at level 0.01. Hence, the items related to each composite variable measured the same composite variable. Overall, the actual outputs as measured within SPSS for the reliability tests using both Cronbach's alpha and ICC are shown in Appendix H, Table B.

9.5.3. Correlation analysis

Correlation analysis was used to assess the significant relationships that may exist between talent management processes and knowledge management processes that were explored by factor analysis. Correlation analysis is one of the common methods to evaluate construct validity in business research (Sekaran & Bougie 2016). The correlation cofficient is a measure to assess the level of association between two variables (Collis & Hussey 2013; Field 2018; Remenyi et al. 1998). This cofficient ranges between -1 and +1 (Cooper & Schindler 2011; Hair et al. 2010; Remenyi et al. 1998). If the value of the correlation cofficient is 0, it means that there is no correlation between two variables (Cooper & Schindler 2011; Saunders et al. 2016). A value of

+1 means a perfect positive correlation; however, if the value of the correlation cofficient is -1 it means a perfect positive correlation between two variables (Field 2018; Saunders et al. 2016). The strong correlation cofficient should be statistically significant with a P-value of at least 0.05 (Saunders et al. 2016). Table 9.16 provides a summary of the Pearson Correlation (r) analysis to measure the relationship among the composite variables that were explored by factor analysis. Here, r-analysis is fitting due to all the variables of the study being expressed in terms of the ratio scale.

Table 9.16: Correlation analysis for the composite variables explored by factor analysis

Composite variables		**TA**	**TD**	**TR**	**KT**	**KC**	**KS**
TA	Pearson Correlation	1	0.326**	0.195**	0.304**	0.315**	0.381**
	Sig. (2-tailed)		0.000	0.003	0.000	0.000	0.000
TD	Pearson Correlation	0.326**	1	0.534**	0.589**	0.665**	0.581**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000
TR	Pearson Correlation	0.195**	0.534**	1	0.462**	0.517**	0.463**
	Sig. (2-tailed)	0.003	0.000		0.000	0.000	0.000
KT	Pearson Correlation	0.304**	0.589**	0.462**	1	0.727**	0.603**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000
KC	Pearson Correlation	0.315**	0.665**	0.517**	0.727**	1	0.711**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000
KS	Pearson Correlation	0.381**	0.581**	0.463**	0.603**	0.711**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
**. Correlation is significant at the 0.01 level (2-tailed).							

As can be seen from Table 9.16, there was a statistically significant strong positive relationship between independent variables and dependent variables of the study at the 0.01 level (2-tailed). In general, all the r-values among the composite variables had strongly significant relationships. The r-values between the composite variables of talent management processes and the composite variables of knowledge management processes ranged between 0.304 and 0.665. The minimum significant r-value (0.304) was between talent attraction and knowledge transfer. In contrast, the higher r-value (0.665) was between talent development and knowledge creation. Therefore, talent management processes (independent variables) contributed significantly to knowledge management processes (dependent variables).

9.6. Regression analysis and hypotheses testing

The second key objective of this research was to investigate the relationship between talent management processes and knowledge management processes in Australian higher education. To achieve this objective hypotheses testing using the simple regression analysis technique was applied (Remenyi et al. 1998; Sekaran & Bougie 2016). Simple (bivariate) regression analysis is a statistical method to examine the relationships between two variables, one independent and one dependent (Field 2018; Hair et al. 2010; Jeon 2015). According to the conceptual model of this study, each composite variable of talent management processes (independent variables) influenced each composite variable of knowledge management processes (dependent variables) individually. Hence, simple regression was a suitable technique to test the research hypotheses (Hair et al. 2010). Regression analysis is a powerful method when the aim is to comprehend the relationships between composite variables, both independent and dependent (Baig 2010; Chin 1998a; Jeon 2015).

To assess the regression analysis results in regards descriptions of the relationship between independent and dependent variables, there are three key indicators: coefficient of determination (R^2), F-value, and t-value (Hair et al. 2010; Saunders et al. 2016; Sekaran & Bougie 2016). The R^2-value ranges between 0-1 (Field 2018; Hair et al. 2010). In terms of an acceptable level of R^2-value, determining the satisfactory value is difficult and depends on the research complexity (Hair Jr et al. 2016). Nonetheless, Chin (1998b); Ringle (2004) suggest three levels of R^2-values: 0.670 substantial, 0.333 moderate, and 0.190 weak (Urbach & Ahlemann 2010). The F-value and *t*-value should be statistically significant with a P-value of at least 0.05 (Field 2018; Hair et al. 2010; Saunders et al. 2016).

Table 9.17 provides the results of the research hypotheses using simple regression to investigate the relationship between talent management processes and knowledge management processes. It shows the values of regression paths: R^2-value, estimate (β), Standard Error (S.E.), F-value, t-value, and P-value of nine hypotheses. Actual outputs, using SPSS, for the regression analysis are shown in Appendix I.

Table 9.17: The results of the research hypotheses using the simple regression technique (N=237)

Hypothesis	**The path**	**Regression Weights using SPSS**							**Results**
		R^2	(β)	S.E	F-value	P-value	t-value	P-value	
$H1_0$ or $H1_1$	Knowledge transfer <--- Talent attraction	0.103	0.322	0.162	27.11	0.000	5.21	0.000	**Accepted alternative hypothesis $H1_1$**
$H2_0$ or $H2_1$	Knowledge transfer <--- Talent development	0.346	0.588	0.054	124.48	0.000	5.66	0.000	**Accepted alternative hypothesis $H2_1$**
$H3_0$ or $H3_1$	Knowledge transfer <--- Talent retention	0.214	0.926	0.116	63.83	0.000	7.98	0.000	**Accepted alternative hypothesis $H3_1$**
$H4_0$ or $H4_1$	Knowledge creation <--- Talent attraction	0.099	0.315	0.126	25.94	0.000	5.09	0.000	**Accepted alternative hypothesis $H4_1$**
$H5_0$ or $H5_1$	Knowledge creation <--- Talent development	0.444	0.667	0.039	187.99	0.000	13.71	0.000	**Accepted alternative hypothesis $H5_1$**
$H6_0$ or $H6_1$	Knowledge creation <--- Talent retention	0.267	0.517	0.087	85.71	0.000	9.25	0.000	**Accepted alternative hypothesis $H6_1$**
$H7_0$ or $H7_1$	Knowledge sharing <--- Talent attraction	0.165	0.406	0.045	46.45	0.000	6.81	0.000	**Accepted alternative hypothesis $H7_1$**
$H8_0$ or $H8_1$	Knowledge sharing <--- Talent development	0.344	0.586	0.016	123.15	0.000	11.09	0.000	**Accepted alternative hypothesis $H8_1$**
$H9_0$ or $H9_1$	Knowledge sharing <--- Talent retention	0.214	0.463	0.034	64.07	0.000	8.00	0.000	**Accepted alternative hypothesis $H9_1$**

The first hypothesis was as follows: *$H1_0$: there is no significant positive influence of talent attraction on knowledge transfer in a university*; or *$H1_1$ there is significant positive influence of talent attraction on knowledge transfer in a university*. Looking at Table 9.17, it is apparent that the regression path is acceptable and sufficient to describe the relationship between talent attraction and knowledge transfer. This is demonstrated through calculated F-*value* 27.11 and *t-value* 5.21, which are significant ($P< 0.05$). However, the R^2-value is very weak (0.103) and not sufficient to explain the variance between the two stated variables. This value indicates that 10.3% of variation in knowledge transfer was contributed to talent attraction. The remaining percentage (89.7%) is unexplained variance which may be due to other factors that were not included in the regression model, and these might be areas for future research. The value of beta (β) is 0.322, which means that when there is an increase of 1 unit in talent attraction, knowledge transfer is expected to increase by 0.322 units, with a standard error of 0.162. These results confirmed that there was a strongly significant positive influence for talent attraction in knowledge transfer, which allowed rejection of null hypothesis *$H1_0$* and acceptance of alternative hypothesis *$H1_1$*.

The second hypothesis was as follows: $H2_0$: *there is no significant positive impact of talent development on knowledge transfer in a university*; or $H2_1$: *there is significant positive impact of talent development on knowledge transfer in a university*. As shown in Table 9.17, it is apparent that the regression path is acceptable and sufficient to describe the relationship between talent development and knowledge transfer. This is indicated through an accounted F-*value* of 124.48 and t-value of 5.66, which are significant ($P< 0.05$). The R^2-value is relatively medium (0.346), which indicates that 34.6% of variation in knowledge transfer is accounted for by talent development. The remaining percentage (65.4%) is unexplained variance caused by other factors that are outside of the regression path, and possibly could be investigated for future research. The value of beta (β) is 0.588 which means that when there is a rise of 1 unit in talent development, knowledge transfer is increased by 0.588 units with a standard error of 0.054. These results confirmed that there was a strongly significant positive impact of talent development on knowledge transfer in a university, which allowed for rejection of null hypothesis *$H2_0$* and acceptance of alternative hypothesis *$H2_1$*.

The third hypothesis was as follows: *$H3_0$: there is no significant positive effect of talent retention on knowledge transfer in a university; or $H3_1$: There is significant and positive effect of talent retention on knowledge transfer in a university*. Based on the table above the regression path is acceptable and sufficient to describe the relationship between talent retention and knowledge transfer. This is explained through a calculated F-*value* of 63.83 and a t-value of 7.98 with P-*value* 0.000, which is lower than the acceptable level (0.05). Nevertheless, the R^2-value is relatively weak (0.214), which is not sufficient to explain the variance between the two mentioned variables. This indicates that 21.4% of variation in knowledge transfer was accounted for by talent retention. The remaining percentage (78.6%) is unexplained variance, which might have been due to other factors that were not involved in the regression path, and could be studied by other investigators. The value of beta (β) is 0.926, which means that when there is an increase of 1 standard deviation in talent retention, the knowledge transfer is expected to increase via 0.926 standard deviations, with a standard error of 0.116. These outcomes emphasise that there was a strongly significant positive effect of talent retention on knowledge transfer, which allowed for a rejection of null hypothesis *$H3_0$* and an acceptance of alternative hypothesis *$H3_1$*.

The fourth hypothesis was as follows: $H4_0$: *there is no significant positive influence of talent attraction on knowledge creation in a university*; or $H4_1$: *there is significant positive influence of talent attraction on knowledge creation in a university*. From Table 9.17, it is apparent that the regression path is reasonably strong and sufficient to describe the relationship between talent attraction and knowledge creation. This is demonstrated through an accounted F-*value* of 25.94 and a t-value of 5.09, which are significant ($P< 0.05$). However, the R^2-value is very weak (0.099), which is not enough to explain the variance between the two mentioned variables. This indicates that the 9.9% of variation in knowledge creation is contributed to talent attraction. The remaining percentage (90.1%) is unexplained variance through other factors that were not included in the regression path, and might be areas for future research. The value of beta (β) is 0.315, which means that when there is a rise of 1 unit in talent attraction, knowledge creation is predicted to rise by 0.315 units with a standard error of 0.126. These results confirm that there was a strongly significant positive influence of talent attraction on knowledge creation in a university, which in turn allowed for a rejection of null hypothesis *$H4_0$* and an acceptance of alternative hypothesis *$H4_1$*.

The fifth hypothesis was as follows: $H5_0$: *there is no significant and positive impact of talent development on knowledge creation in a university*; or $H5_1$: *there is significant and positive impact of talent development on knowledge creation in a university*. From Table 9.17, it is clear that the regression model is satisfactory and sufficient to describe the relationship between talent development and knowledge creation. This is through an accounted F-*value* of 187.99 and a *t*-value of 13.71, which are significant ($P< 0.05$). However, the R^2-value is reasonably medium (0.444), which is not sufficient to explain the variance between the two stated variables. The R^2-value indicates that 44.4% of variation in knowledge creation is accounted for by talent development. The remaining percentage (55.6%) is unexplained variance by other factors that were outside of the regression path, and could be areas for future investigation. The value of beta (β) is 0.667, which means that when there is a rise of 1 unit in talent development, knowledge creation is increased by 0.667 units with a standard error of 0.039. These results confirmed that there was a strongly significant positive impact of talent development on knowledge creation in a university, which allowed for the rejection of null hypothesis *$H5_0$* and the acceptance of alternative hypothesis *$H5_1$*.

The sixth hypothesis was as follows: $H6_0$: *there is no significant positive impact of talent retention on knowledge creation in a university*; or $H6_1$: *There is significant positive impact talent retention on knowledge creation in a university*. From Table 9.17, it is obvious that the regression path is acceptable and sufficient to describe the relationship between talent retention and knowledge creation. This is demonstrated through an accounted F-*value* of 85.71 and a *t*-value of 9.25 with P-*value* 0.000, which is significant ($P< 0.05$). On the other hand, the R^2-value is weak (0.267) and not sufficient to explain the variance between the two mentioned variables. This ratio indicates that 26.7% of variation in knowledge creation is accounted for by talent retention. The remaining percentage (73.3%) is unexplained variance by other factors that were not included in the regression path, and should be researched in future investigations. The value of beta (β) is 0.517, which means that when there is an increase of 1 unit in talent retention, knowledge creation is predicted to increase by 0.517 units with a standard error of 0.087. These findings emphasised that there was a strongly significant positive impact of talent retention on knowledge creation in a university, which then allowed for a rejection of null hypothesis *$H6_0$* and an acceptance of alternative hypothesis *$H6_1$*.

The seventh hypothesis was as follows: *$H7_0$: there is no significant positive influence of talent attraction on knowledge sharing in a university*; or *$H7_1$ there is significant positive influence of talent attraction on knowledge sharing in a university*. From Table 9.17, it is apparent that the regression path is acceptable and sufficient to describe the relationship between talent attraction and knowledge sharing. This is indicated by a calculated F-*value* of 46.45 and a t-value of 6.81 with P=0.000, which is significant (P< 0.05). By contrast, the R^2-value is weak (0.165) and not enough to explain the variance between the two stated variables. It indicates that 16.5.8% of variation in knowledge sharing is contributed for by talent attraction. The remaining percentage (83.5%) is unexplained variance which may be due to other factors that were outside of the regression path, and these could be areas for future studies. The value of beta (β) is 0.406, which means that when there is an increase of 1 unit in talent attraction, knowledge sharing is expected to increase by 0.406 units with a standard error of 0.045. These results confirmed that there was a strongly significant positive influence of talent attraction on knowledge sharing, which allowed for a rejection of null hypothesis *$H7_0$* and an acceptance of alternative hypothesis *$H7_1$*.

The eighth hypothesis was as follows: $H8_0$: *there is no significant and positive impact of talent development on knowledge sharing in a university*; or $H8_1$: *there is significant and positive impact of talent development on knowledge sharing in a university*. From Table 9.17, it is obvious that the regression path is acceptable and sufficient to describe the relationship between talent development and knowledge sharing. This is specified through an accounted F-*value* of 123.15 and a t-value of 11.09, which are significant (P< 0.05). Conversely, the R^2-value is relatively moderate (0.344), which indicates that 34.4% of variation in knowledge sharing is accounted for by talent development. The remaining percentage (65.6%) is unexplained variance by other factors that were not included in the regression path, and should be investigated in future research. The value of beta (β) is 0.586, which means that when there is a rise of 1 unit in talent development, knowledge sharing is increased by up to 0.586 units, with a standard error of 0.016. These results confirmed that there was a strongly significant positive impact of talent development on knowledge sharing in a university, which allowed for a rejection of null hypothesis *$H8_0$* and an acceptance of alternative hypothesis *$H8_1$*.

The ninth and final hypothesis was as follows: *$H9_0$: there is no significant positive impact of talent retention on knowledge sharing in a university; or $H9_1$: There is significant positive impact talent retention on knowledge sharing in a university*. From the table above it can be seen that the regression path is acceptable and sufficient to describe the relationship between talent retention and knowledge sharing. This is demonstrated through a calculated F-*value* of 64.07 and a *t*-value of 8.00, which are significant ($P< 0.05$). However, R^2-value is very weak (0.214), which is not sufficient to explain the variance between the two stated variables. This ratio indicates that 21.4% of variation in knowledge sharing is accounted for by talent retention. The remaining percentage (78.6%) is unexplained variance which may be due to other factors that were not involved in the regression path, and could be areas for future research. The value of beta (β) is 0.463, which means that when there is an increase of 1 standard deviation in talent retention, knowledge sharing is expected to increase via 0.463 standard deviations with a standard error of 0.034. These outcomes emphasised that there was a strongly significant positive impact for talent retention on knowledge sharing, which allowed for a rejection of null hypothesis *$H9_0$* and an acceptance of alternative hypothesis *$H9_1$*.

In conclusion, as shown in Table 9.17, all regression paths between talent management processes (independent composite variables) and knowledge management processes (dependent composite variables) in the Australian higher education sector are strongly significant and positive. There are nine alternative hypotheses of the study suggesting that F-values and *t*-values are significant ($P< 0.05$). Figure 9.2 provides a summary of the liner relationships between talent management processes and knowledge management processes in the Australian higher education sector.

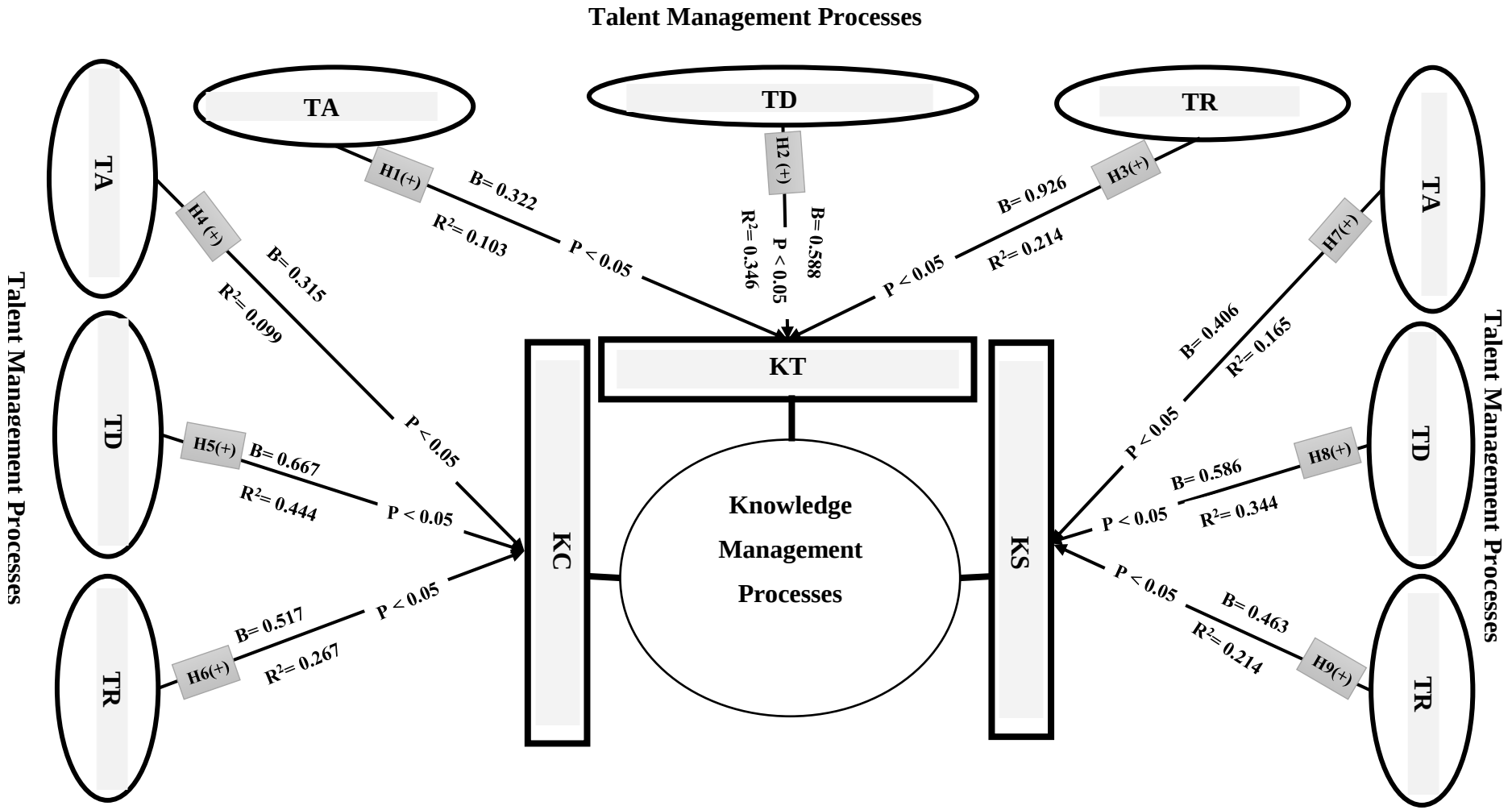


Figure 9.2: Liner relationships between talent management processes and knowledge management processes in Australian higher education

9.6.1 Discussion

The regression analysis method was utilised to reveal associations between talent management processes and knowledge processes in the Australian higher education sector. However, this method is limited to testing the measurement and structural models simultaneously (Hair et al. 2010; Musil et al. 1998). Consequently, in each simple regression model of the study, there was only one independent composite variable and dependent composite variable. In other words, regression analysis does not examine relations' influence on item loadings, non-common variance, and whole model (Gefen et al. 2000). Furthermore, one of the essential limitations of the regression method is that it does not imply causal relationships (Jeon 2015). Many other reasons can be stemmed by strong relationships between variables such as the effect of other unmeasured variables (Jeon 2015). However, this is the reason that in Figure 9.2 above, causal relationships between the independent composite variables or the dependent composite variables are rarely considered, as the regression model does not examine the indirect influence between the independent composite variables or the dependent composite variables, such as the influence of talent attraction on talent development or talent retention. In addition, regression analysis ignores measurement errors of a study (Dimitruk et al. 2007; Jeon 2015; Musil et al. 1998). Therefore, when yielding one dependent variable, several variables need to be combined, a process which requires the estimation of reliability (e.g. internal consistency, test-retest) (Jeon 2015). Moreover, regression analysis provides only a single relationship at a time (Hair et al. 2010). This means that regression analysis allows for only one or more than one independent variable, with only one dependent variable in one regression model. For example, in this study regression analysis has been investigated for each single composite variable of independent variables (talent management processes) with one composite variable of dependent variables (knowledge management processes).

SEM is used to overcome such limitations (Dimitruk et al. 2007; Musil et al. 1998). For example, SEM identifies the associated errors among measured items through using the measurement model (Awang 2012; Jeon 2015; Musil et al. 1998). SEM can simultaneously investigate direct influence, indirect influence, and total influence among hypothesised structural links (Ardasheva 2016; Awang et al. 2015; Hair et al. 2010; Hayton et al. 2014; Jeon 2015; Lau et al. 2017; Lau et al. 2015; Lau et al. 2016;

Musil et al. 1998; Othman & Naintin 2016; Vikkraman & Duraikannan 2015). For instance, SEM provides a more effective and direct method of the hypothesised structural relationships among independent and dependent composite variables, and between each composite variable and its items at any one time in a model (Gefen et al. 2000; Jeon 2015; Lei & Wu 2007; Musil et al. 1998).

Even though the analysis using SEM is more complicated than regression analysis, the results obtained by SEM are more precise estimations than those in regression analysis (Baumgartner & Homburg 1996; Golob 2003; Jeon 2015; MacCallum & Austin 2000; Musil et al. 1998). SEM provides more accurate causal relations between composite variables and is more meticulous in terms of assessing the size of an effect, statistical significance, fitting the measurement and structural models, as well as the appropriateness of the data (Baumgartner & Homburg 1996; Golob 2003; Jeon 2015; Lei & Wu 2007; MacCallum & Austin 2000; Musil et al. 1998). SEM provides a progressive level of statistical analysis, which is a more powerful alternative to regression analysis (Baumgartner & Homburg 1996; Golob 2003; MacCallum & Austin 2000). It includes extensions and generalisations of regression analysis procedures (Chin 1998a; Lei & Wu 2007). Furthermore, SEM applies several analyses such as confirmatory factor analysis, path analysis, correlation analysis, structural errors in dependent composite variables, and other complicated relationships among composite variables in a single causal model (Jeon 2015; Lei & Wu 2007). Overall, SEM is thus a better method than regression analysis in an investigation into the relationship between talent management processes and knowledge processes in the Australian higher education sector. More details of SEM are discussed in the next chapter: Quantitative data analysis, part B of this thesis.

9.7. Summary

This chapter has provided the results of the quantitative study. It has focused on the quantitative data analyses in seven sections. Section one started by presenting an overview of this chapter. In Section two, a general introduction was provided to the quantitative data analyses. Reliability and validity were examined in the third section. In terms of validity, content validity was examined. The reliability of a questionnaire instrument was assessed utilising Cronbach's alpha test to examine construct-items

correlation. The descriptive statistical analysis was presented in Section four, which also provided demographic features of the research sample. Statistical analyses were individually described items for all the research constructs by using mean and standard deviation. Generally, the importance of levels for all talent management processes and knowledge management processes was greater than the standard mean. EFA was utilised in Section five to measure the construct validity of the questionnaire instrument. 52 items were eliminated from 86 items, however all the six composite variables were included in the research scales. Regression analysis and hypotheses testing were used in Section six to achieve the second research objective. Regression analysis was employed in this study as the first generation analysis technique to test the nine research hypotheses. All the nine alternative hypotheses were strongly significant and positive at level 0.01. Finally, the summary in Section seven concluded this chapter.

CHAPTER 10: QUANTITATIVE DATA ANALYSIS, PART B

10.1. Chapter overview

In the previous chapter, the first part of the quantitative data analysis was discussed. This chapter articulates the quantitative data analysis, part B using AMOS software (version 25), including SEM. This chapter discusses all procedures and processes related to how the analysis using SEM was conducted. It includes outcomes from the pre-test and pilot surveys. The significant results of this chapter relate to accepting or rejecting the research hypotheses. Following hypotheses testing, the research objective is achieved by answering the research questions addressed in the first chapter.

The analysis of the quantitative data is covered in six sections. Section 10.1 is an overview of the chapter. Section 10.2 then provides the introduction of the chapter, which is followed by a discussion of the rationale behind the selection of SEM in section 10.3. Multivariate data analysis: measurement model analysis is addressed in Section 10.4. Four stages were employed to evaluate the measurement model using Confirmatory Factor Analysis (CFA) in this section. The subsequent section (10.5) discusses multivariate analysis: structural model analysis. Finally, this chapter is summarised in Section 10.6. This chapter covers six sections which are presented in the following graphical layout.

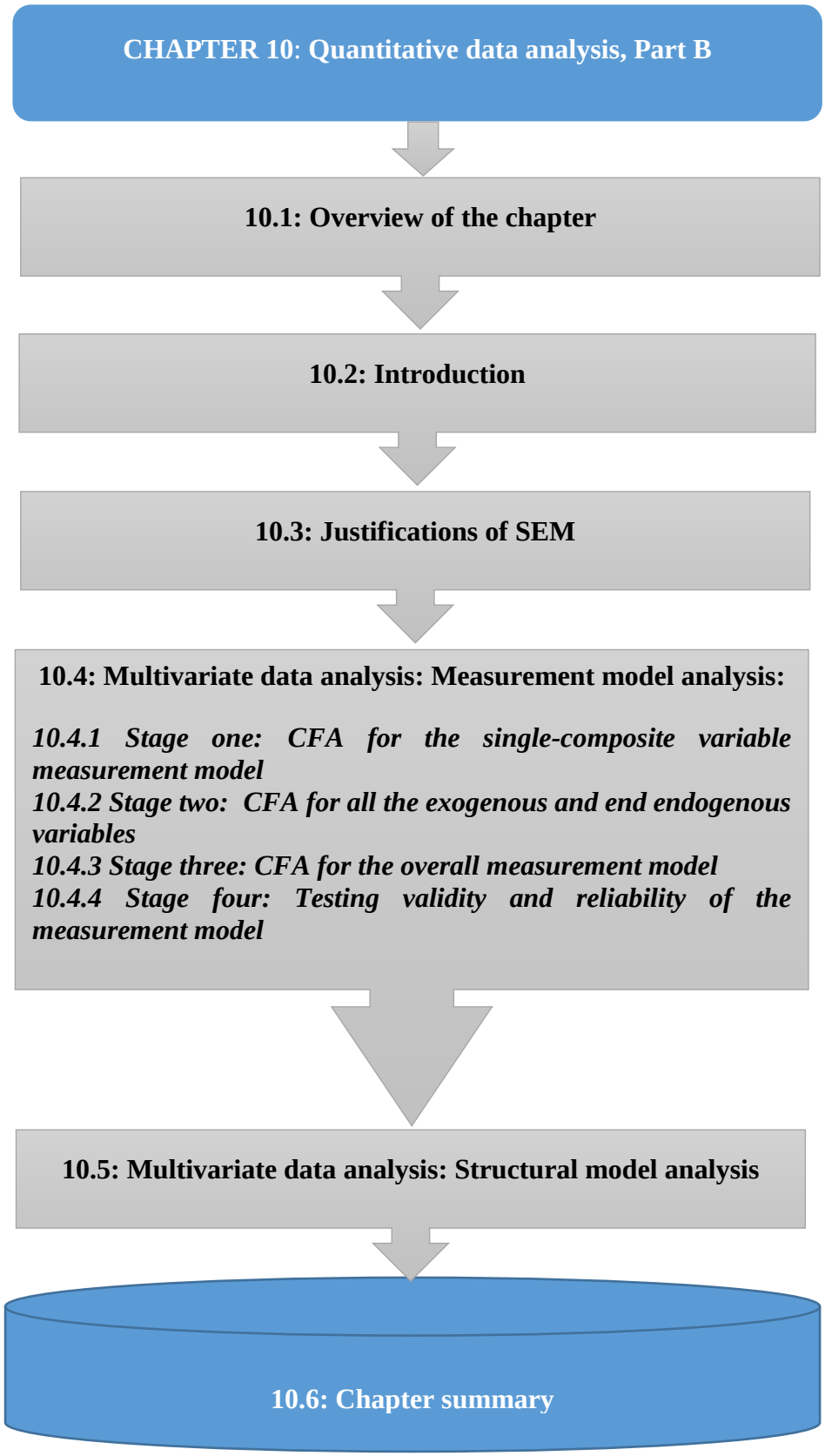


Figure 10.1: A graphical layout for Chapter 10

Source: Prepared by the researcher.

10.2. Introduction

As first-generation techniques, descriptive and interpretive correlation, and regression analyses were used to understand the nature of relationships between talent management processes and knowledge management processes. It was decided that the best method to adopt for this investigation is using SEM as the second generation analysis technique. Considering the multivariate analysis, SEM is one of the most helpful techniques for social science research (Awang et al. 2015; Byrne 2016; Hair Jr et al. 2016; Othman & Naintin 2016). The SEM method is statistical in nature and takes a confirmatory (i.e., hypothesis-testing) approach to the analysis of a structural theory in relation to a particular phenomenon (Byrne 2016). It provides researchers 'with the flexibility to: (a) model relationships among multiple predictor and criterion variables, (b) construct unobservable composite variables, (c) model errors in measurements for observed variables, and (d) statistically test a priori substantive/theoretical and measurement assumptions against empirical data (i.e., confirmatory analysis)' (Chin 1998a, p. vii). Multivariate data statistical methods analyse multiple variables, focusing on the structure of simultaneous relationships among three or more variables (Cooper & Schindler 2011; Mertler & Reinhart 2017; Tharenou et al. 2007; Zikmund et al. 2013).

According to the literature, SEM can be divided into two kinds: Covariance-Based SEM (CB-SEM) and Partial Least Squares SEM (PLS-SEM) (Chin 1998a; Gefen et al. 2011; Hair Jr et al. 2016). The first type of SEM is essentially utilised to accept or refuse theories (Hair Jr et al. 2016). It highlights the issue of measurement errors by explicitly modeling measurement error variance structures, and by depending on factor analytic measurement models, which insulate random measurement errors (Gefen et al. 2011). Conversely, PLS-SEM is basically utilised to upgrade theoretical models in exploratory studies (Gefen et al. 2011; Hair Jr et al. 2016). Therefore, this research is considered to fit the first type because CB-SEM is consistent with the second research objective of the study. It is a statistical procedure to test and develop the research hypotheses through an investigation of relationships that might exist among variables (Ardasheva 2016; Lau et al. 2016; Othman & Naintin 2016; Winke 2014; Zhou 2016).

In regards to affirming the right fit and testing SEM, Jöreskog and Sörbom (1993) highlight three research situations: (1) strictly confirmatory; (2) alternative models;

and (3) model generating (Byrne 2016). In strictly confirmatory situation research, one single model is formulated to test it and then either accept or reject it (Jöreskog & Sörbom 1993). There are no further adjustments to the model (Byrne 2016). In the second research situation, a set of alternative models are tested by a researcher to select only one of them as the most convenient in representing the sample data (Byrne 2016; Jöreskog & Sörbom 1993). In the process of model generation, the researcher specifies a tentative initial model (Jöreskog & Sörbom 1993). If this model does not work for the data provided, modification and re-estimation to the model should be utilised to improve the quality of the model, which may be re-evaluated several times until a model is generated that strongly fits (Byrne 2016; Jöreskog & Sörbom 1993). The first and second research situtions are not commonly used in SEM research (Byrne 2016; Jöreskog & Sörbom 1993; Lei & Wu 2007). The reason behind this notion is that in the strictly confirmatory situation, researchers are rarely satisfied dismissing a particular model unless there is an alternative model they can suggest, while in an alternative models situation, alternative models are seldom specified a priori (Byrne 2016; Jöreskog & Sörbom 1993; Lei & Wu 2007). The model generating situation is the most popular in SEM research (Byrne 2016; Jöreskog & Sörbom 1993), because this situation provides more flexible solutions to researchers than alternative research situations (Jeon 2015; Jöreskog & Sörbom 1993). For this reason, this study has followed the model generating situation.

In this research a number of statistical techniques were examined, including CFA, to assess the quality of the measurement model and SEM in testing the research hypothesised structural relationships (Schreiber et al. 2006; Schumacker & Lomax 2010). Anderson and Gerbing (1988) recommend using a two-step approach, a measurement model analysis and a structural model analysis, to analyse multivariate data (Schumacker & Lomax 2010). In this study, CFA and SEM were used to provide an inclusive validation of the nature of the relationship level between talent management processes and knowledge management processes in the Australian higher education sector in Queensland.

10.3. Justifications of SEM

As mentioned in Chapter nine, regression analysis provided only a single relationship at the time (Hair et al. 2010). Therefore the decision was taken to use SEM to provide greater flexibility for the researcher in terms of ascertaining the links between relevant theory and the data, and to validate the research conceptual model of the study (Chin 1998a). SEM, as one of the strongest multivariate techniques, allows researchers to assess the data quality of their studies' measurement models (Awang 2012; Hair et al. 2010; Hair et al. 2011; Musil et al. 1998). SEM is simultaneously utilised to investigate direct and indirect structural links between multiple independent composite variables and dependent composite variables (Ardasheva 2016; Awang et al. 2015; Hayton et al. 2014; Lau et al. 2017; Lau et al. 2015; Lau et al. 2016; Othman & Naintin 2016; Vikkraman & Duraikannan 2015).

Overall, SEM was selected as the second-generation technique in this research for the following four reasons (Baumgartner & Homburg 1996; Fan et al. 2016; Golob 2003; MacCallum & Austin 2000; Othman & Naintin 2016):

1. This technique is a powerful statistical methodology that can deal with large numbers of independent and dependent variables (Hair Jr et al. 2016; Lau et al. 2016);
2. It has the ability to deal with underlying variables (composite variables) (non-quantifiable) formed by a set of variables that can be measured;
3. SEM is a confirmatory and exploratory method, because it can allow researchers to use it in order to build a model in a system of non-directional influences or conditions, from one variable to another (Lau et al. 2017; Lau et al. 2015; Lau et al. 2016; Schreiber et al. 2006); and
4. This procedure is a statistical tool used to estimate and determine the linear relationships between variables in models. These variables within the model may include all of the measurable variables and underlying variables. Composite variables are a hypothesis that cannot be measured directly.

In brief, SEM is a more powerful alternative to regression analysis, because the results obtained by SEM regression analysis provide more accurate estimations than regression analysis would (Baumgartner & Homburg 1996; Golob 2003; Jeon 2015;

MacCallum & Austin 2000; Musil et al. 1998). SEM offers more accurate causal relationships between endogenous and exogenous composite variables, as well as more information in terms of extracting the size of the effect, assessment of statistical significance, assessment of whether the models fit, and assessment of the appropriateness of the data (Baumgartner & Homburg 1996; Golob 2003; Jeon 2015; Lei & Wu 2007; MacCallum & Austin 2000; Musil et al. 1998).

10.4 Measurement model analysis

The measurement model examines the connections among composite variables (Schumacker & Lomax 2010). In this study, CFA was used to assess the measurement model (Hair et al. 2010; Musil et al. 1998). CFA as a specific case of SEM provides a comprehensive picture of how well the measured items represent the variables (Hair et al. 2010; Jeon 2015). It is employed to ensure the measurement model's quality, which depends on the following indexes (Schumacker & Lomax 2010): Chi-Square/ Degree of Freedom (Chisq/df); Root Mean Square Error of Approximation (RMSEA); Root Mean square Residual (RMR); Goodness of Fit Index (GFI); Incremental Index of Fit (IFI); Adjusted Goodness-of-Fit statistic (AGFI); Comparative Fit Index (CFI); and Tucker Lewis Index (TLI). Conversely, according to Byrne (2016, p. 3), 'if goodness of fit is adequate, the model argues for plausibility of supposed relations among variables; if it is inadequate, the tenability of such relation is rejected'. Zainudin (2011) suggests bases of fit goodness which are shown in Table 10.1:

Table 10.1: Indexes and bases of fit goodness for SEM

Name of category	Indexes	Level of Acceptance	Reference	The meaning
1- Absolute fit	Chi-square (Chisq)	$P \leq 0.05$	(Bagozzi & Yi 1988; Hooper et al. 2008; Jöreskog & Sörbom 1996; Wheaton et al. 1977; Zainudin 2011)	- Probability value (P-value) should be statistically significant at least with 0.05 (Saunders et al. 2016). - Sensitive to sample size > 200
	RMSEA	RMSEA ≤ 0.08	(Baumgartner & Homburg 1996; Chan et al. 2007)	The model will sensitively select numbers of estimated parameters with a lower parameter (Hooper et al. 2008).
	GFI	GFI ≥ 0.90	(Baumgartner & Homburg 1996; Chan et al. 2007; Hair et al. 2010)	The estimated population covariance accounts for the proportion of variance (Hooper et al. 2008).
	RMR	RMR≤ 0.05	(Browne & Cudeck 1993; Byrne 2016; Gefen et al. 2000; Schumacker & Lomax 2010)	Represents an average residual value across all standardised residuals, and it ranges between 0-1(Byrne 2016).
2- Incremental fit	CFI	CFI ≥ 0.90	(Baumgartner & Homburg 1996; Byrne 2016; Chan et al. 2007; Hair et al. 2010)	All the composite variables are assumed to be non-correlated within an independent model and the sample covariance matrix is compared with this independent model (Hooper et al. 2008).

	TLI	TLI ≥ 0.90	(Byrne 2016; Hu & Bentler 1999)	It compares alternative models (Schumacker & Lomax 2010).
	IFI	IFI ≥ 0.90	(Bagozzi & Yi 1988; Byrne 2016)	It addresses the parsimony and sample size, which are known to be linked to normed fit index (Byrne 2016).
3-Parsimonious fit	Chisq/df	Chisq/df ≤ 5.00	(Baumgartner & Homburg 1996; Chan et al. 2007)	The sample data depends on the estimation process (Hooper et al. 2008).
	AGFI	AGFI ≥ 0.90	(Bagozzi & Yi 1988; Hair et al. 2010)	GFI is adjusted, based on degrees of freedom, which often increases with sample size (Hooper et al. 2008).

In this study, four stages were employed to assess the measurement model (Al-Sabawy et al. 2013): (1) CFA for single-composite variable measurement model; (2) CFA for all exogenous and endogenous variables individually; (3) CFA for the overall measurement model; and (4) testing validity and reliability of the measurement model.

10.4.1 Stage one: CFA for single-composite variable measurement model

The CFA procedures for composite variables of measurement model is used individually (Al-Sabawy et al. 2013). In this study, the CFA procedures for each composite variable in the measurement model was calculated to obtain load factors. Regression weights between a particular composite variable and its items were calculated by this stage. During this stage, the data set being used consisted of 34 items that measured six composite variables.

1- The CFA procedures for the talent attraction variable

Figure 10.2 presents the initial and final measurement model of factor loadings for each item in the talent attraction variable. In this model, three items and their standardised loadings were used as input: TA1 (My university attracts more talented employees through providing them with social support in difficult times (e.g. maternity, paternity, death, and financial difficulties)) 0.95; TA7 (My university has a good reputation through high-quality research, which enables the university to attract the best academic and professional staff) 0.71; and TA8 (My university has a high university ranking enabling the university to attract the best academic and professional staff) 1.00. Factor loadings of the initial measurement model were between 0.71-1.00.

Looking at Figure 10.2, there were no values of a number of fit indices for the talent attraction measurement model, while one index (RMSEA) did fit the criteria of goodness for SEM. AMOS outputs did not show any values regarding Chisq/df, P-value, AGFI, and TLI. Furthermore, RMSEA was 1.006, which was higher than 0.08, the satisfactory level of the model-fit indices. Therefore, a modification indices technique should be utilised to improve the quality of the fit model, yet, the current model is untestable. The degrees of freedom in the measurement model of the talent attraction variable was zero. There should be no discrepency between the model and the data, while zero should be the chi-square statistic. As a result, the chi-square

statistic could not be assigned with a probability level, mainly because there are only three items in the talent attraction variable. Afthanorhan (2013); Raubenheimer (2004) have noted in this respect that a measurement model with three items could not be properly identified. This means that AMOS does not separately provide any fit indices outputs for one-factor scale that contain three indicators (items). To overcome this problematic situation, the talent attraction variable was included within the exogenous composite variables simultaneously during stage Two of this section.

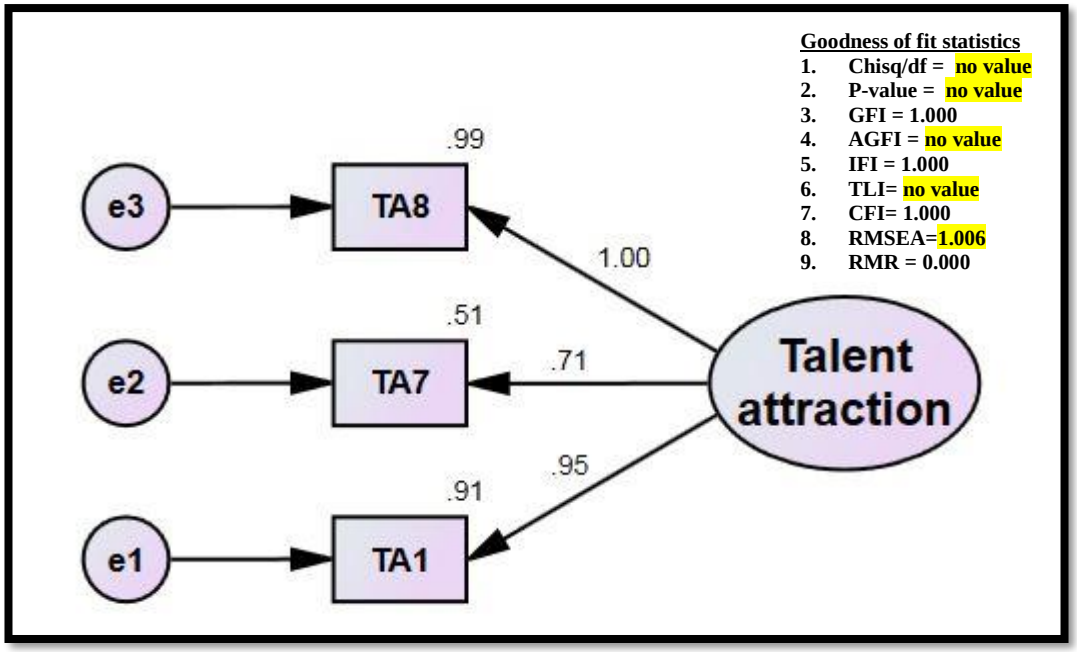


Figure 10.2: The initial and final measurement model of the talent attraction variable

Overall, the regression weights for the talent attraction items in the final measurement model are revealed in Table 10.2. Critical Ratio (CR) (critical t-values) was used to assess the measurement model results in regard to description of the relationship between a composite variable and its items (Hair Jr et al. 2016). The t-value should be at least 1.96 with a P-value of not more than 0.05 (Byrne 2016; Gefen et al. 2000; Hair Jr et al. 2016), or at least 2.56 with a P-value of not more than 0.01, to be acceptable (Gefen et al. 2000; Schumacker & Lomax 2010). There are three items that are significant, one of which is assigned weight as a reference to TA1 so a solution can be established. The weights for TA7 and TA8 were significant at $p < 0.001$ level. More details about talent attraction measures are provided in Appendix J, Table A.

Table 10.2: Regression weights for the talent attraction items

	Estimate	S.E.	C.R.	P
TA1 <--- Talent_attraction	1.000			
TA7 <--- Talent_attraction	.730	.049	14.829	***
TA8 <--- Talent_attraction	1.067	.032	33.742	***

Note: ***p <.001

2- The CFA procedures for the talent development variable

Figure 10.3 depicts the initial and final measurement model of factor loadings for each item in the talent development variable. In this model, nine items and their standardised loadings were input: TD8 (developing by training and mentoring programs) 0.74; TD2 (determining training needs) 0.77; TD3 (facilitating employee performance and development) 0.72; TD13 (supporting high potential employees to become leaders) 0.74; TD7 (developing by sessions with learning and teaching training) 0.61; TD14 (assisting leaders to be professionals) 0.73; TD1 (providing effective talent development strategies) 0.70; TD10 (providing staff with career development opportunities) 0.63; and TD11 (including leaders with the design of all job roles) 0.69. Factor loadings of the initial measurement model were between 0.61-0.77. In summary, the initial (final) values of fit indices for the talent development measurement model has satisfied the indices that fit the criteria of goodness for SEM.

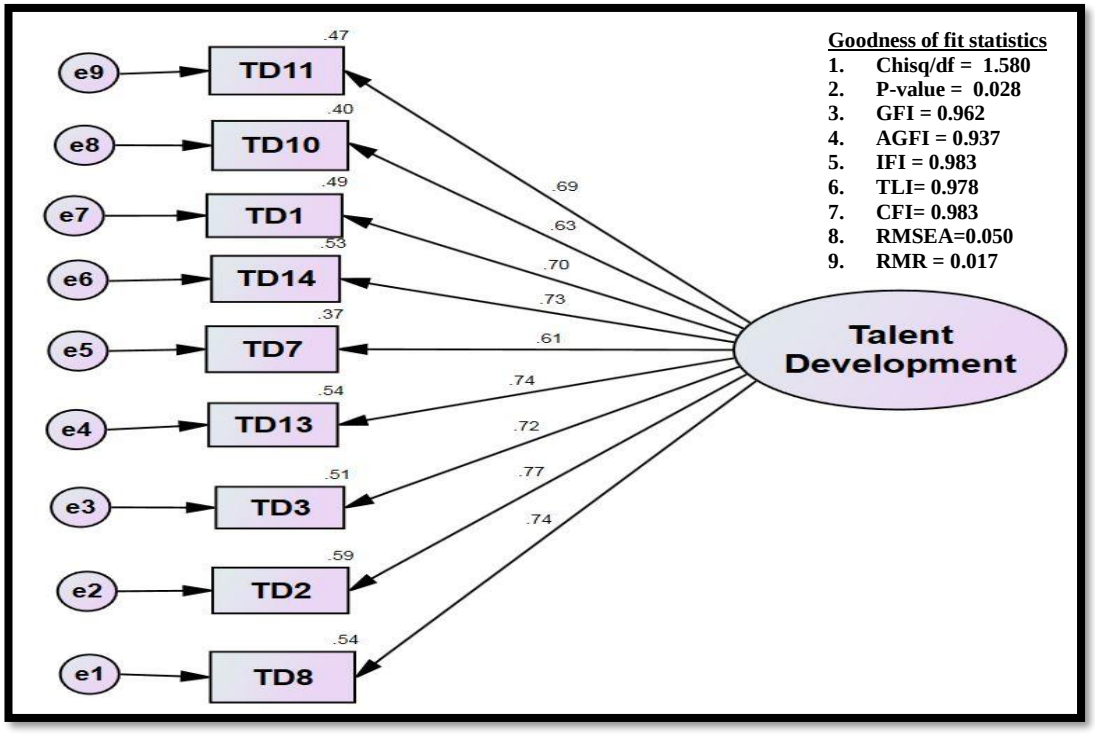


Figure 10.3: The intial (final) measurement model of the talent development variable

In summary, the regression weights for the talent development items in the final measurement model are revealed in Table 10.3. There are nine items that are significant, one of which is the assigned weight as a reference to TD8 so a solution can be established. The weights for the other items were significant at $p < 0.001$ level. More details of talent development measures are provided in Appendix J, Table B.

Table 10.3: Regression weights for the talent development items

			Estimate	S.E.	C.R.	P
TD8	<---	Talent_Development	1.000			
TD3	<---	Talent_Development	1.148	.107	10.713	***
TD2	<---	Talent_Development	1.143	.100	11.476	***
TD1	<---	Talent_Development	1.024	.098	10.467	***
TD13	<---	Talent_Development	1.161	.105	11.042	***
TD7	<---	Talent_Development	.878	.097	9.078	***
TD10	<---	Talent_Development	.920	.098	9.367	***
TD14	<---	Talent_Development	1.114	.102	10.946	***
TD11	<---	Talent_Development	1.122	.109	10.273	***

Note: ***p <.001

3- The CFA procedures for the Talent Retention variable

Figure 10.4 presents the initial and final measurement model of factor loadings for each item in the talent retention variable. In this model, four items and their standardised loadings were input: TR4 (having a competitive compensation system which is a motivating factor to retain our talented employees) 0.94; TR5 (providing a highly competitive compensation system for long-term retention of talent) 0.84; TR14 (providing flexibility for work hours, roles, and tasks) 0.66; and TR22 (retaining talented staff with financial rewards, high salaries or remuneration) 0.74. Factor loadings of the initial (final) measurement model were between 0.66-0.93. In brief, the initial (final) measurement model of talent retention has satisfied indices that fit the criteria of goodness for SEM; it presents the outcomes for the initial values of fit indices for the talent retention measurement model (Figure 10.4).

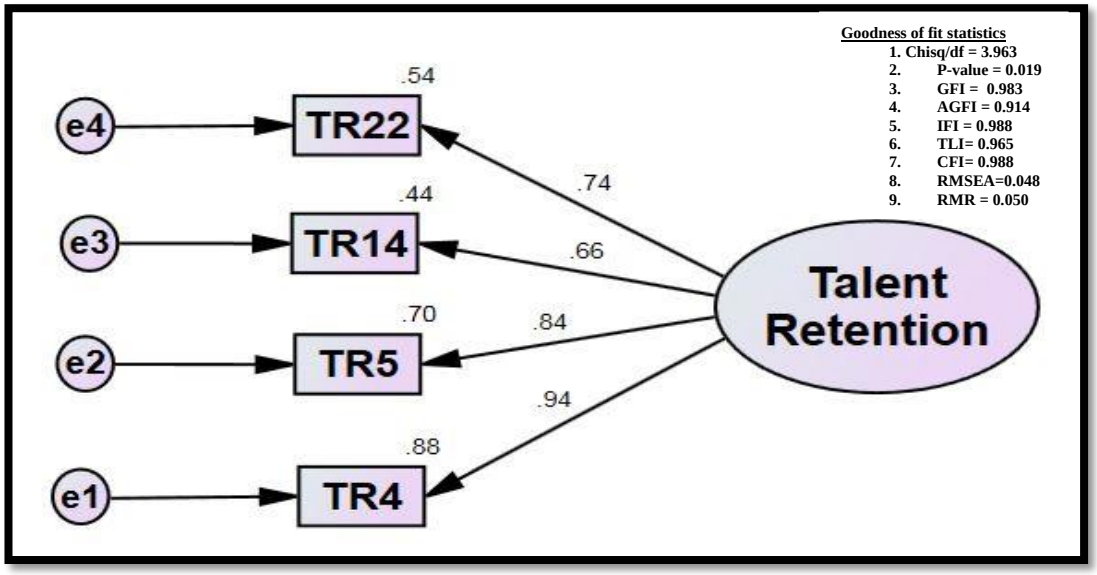


Figure 10.4: The initial and final measurement model of the talent retention variable

In brief, the regression weights for the talent retention items in the final measurement model are shown in Table 10.4. There are four items that are significant, one of which is the assigned weight as a reference to TR4 so a solution can be established. The weights for the other items were significant at $p < 0.001$ level. More details of talent retention measures are provided in Appendix J, Table C.

Table 10.4: Regression weights for the talent retention items

			Estimate	S.E.	C.R.	P
TR4	<---	Talent_Retention	1.000			
TR5	<---	Talent_Retention	.915	.055	16.739	***
TR22	<---	Talent_Retention	.830	.060	13.765	***
TR14	<---	Talent_Retention	.681	.058	11.765	***

Note: ***p <.001

4- The CFA procedures for the knowledge transfer variable

Figure 10.5a shows the initial measurement model of factor loadings for each item in the knowledge transfer variable. In this model, eight items and their standardised loadings were input: KT1(effectively transfers information using e-mail, meetings, discussions and internal networks) 0.78; KT2 (transferring information using the intranet and databases) 0.80; KT4 (the ease of using a university social network to seek

information) 0.84; KT5 (saving and renewing important information accessed through a computer for easy browsing) 0.77; KT3 (accessing appropriate knowledge systems and software for transferring information) 0.72; KT6 (transferring experiences or abilities to other employees) 0.75; KT7 (transferring useful knowledge through-out the academic workforce through training courses, seminars, workshops, and presentations) 0.69; and KT9 (having responsible managers who ensure communication strategies are working well with appropriate information content) 0.67. Factor loadings of initial measurement model were between 0.67-0.84.

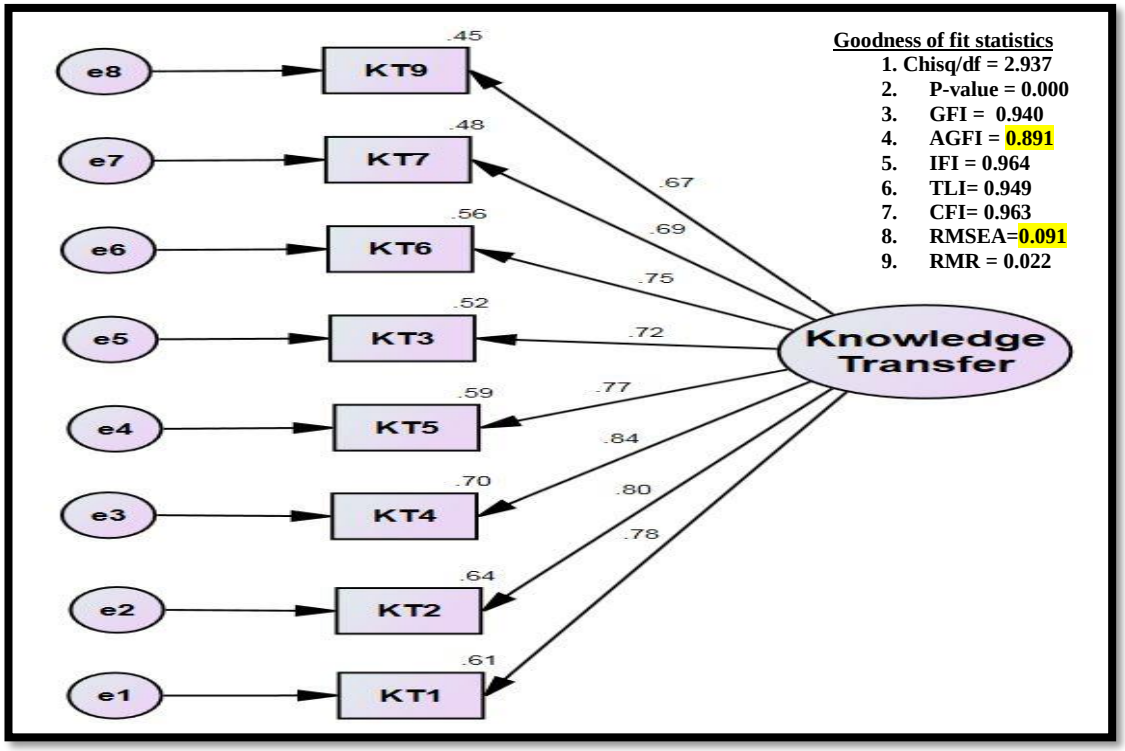


Figure 10.5a: The initial measurement model of the knowledge transfer variable

It can be seen from the results in Figure10.5a that initial measurement model of knowledge transfer had two unsatisfied indices, which did not fit the criteria of goodness for SEM. In this intial measurement model, AGFI-value is 0.891, which is lower than 0.90 (the acceptable level); and RMSEA is 0.091, which is higher than 0.08, the satisfactory level of the model-fit indices. Therefore, a modification indices technique was utilised to improve the quality of the fit model and increase the composite reliability. This technique is achieved through the selection of one of the two following options: (1) great modification indices (e.g, 'reset free one at a time'), or (2) items loadings (e.g. removing low-loading items) (Anderson & Gerbing 1988).

Hair et al. (2010) suggest that modification indices can work by adding covariance between two measurement error items that are correlated, with 0.40 or greater to be freely improved. In this option, modification indices start with the higher two correlated measurement error items of the whole set of correlated measurement error items. They also recommend that loadings of items between 0.40-0.70 should be removed from the measurement model to improve the composite reliability (Hair Jr et al. 2016). Loading items under this scale should be removed from the measurement model, because low loading-items do not meet the minimum threshold of goodness for SEM. Thus, modification indices were utilised to upgrade the quality of the knowledge transfer measurement model, which was re-evaluated two times before being considered a highly fit model (Table 10.5).

Table 10.5: The step-by-step measurement model of the knowledge transfer variable

No.	items	Re-solution decision
1	KT 9	Removed based on factor loading of **0.67**
2	KT7	Removed based on factor loading of **0.68**

In conclusion, the final measurement model of knowledge transfer with new factor loadings for each item is presented in Figure 10.5b and fits the criteria of goodness for SEM. The modification indices technique slightly improved factor loadings (0.72-0.83).

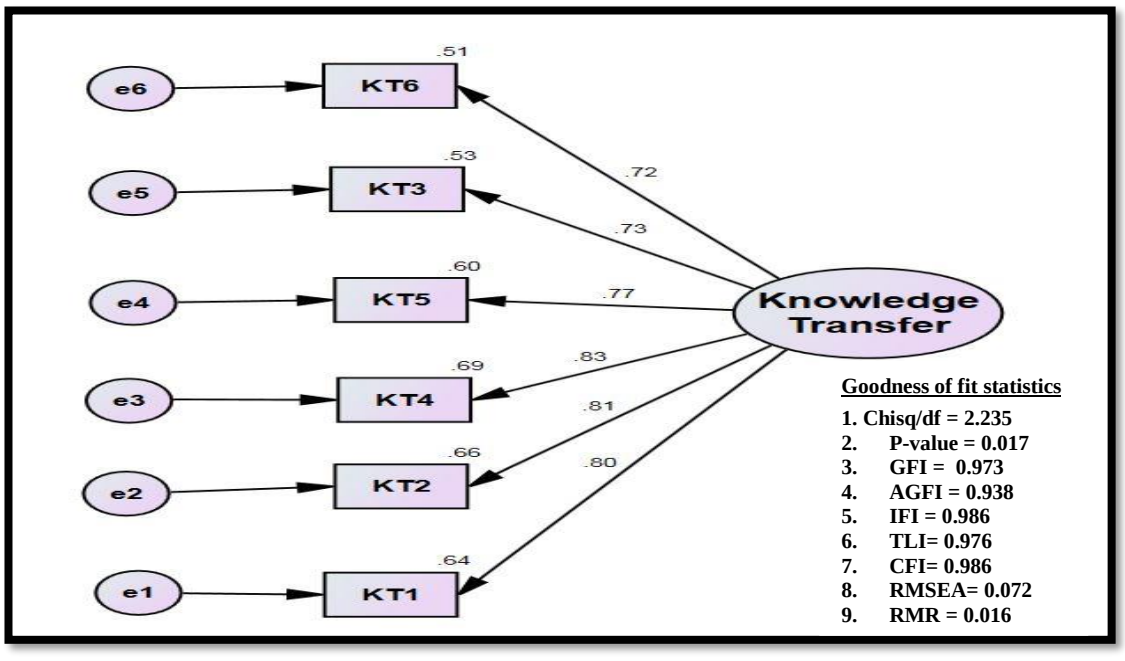


Figure 10.5b: The final measurement model of the knowledge transfer variable

In summary, the regression weights for the knowledge transfer items in the measurement model that was ultimately used can be seen in Table 10.6. There are eight significant items, one of which is the assigned weight as a reference to KT1 so a solution can be established. The other items' weights were significant at a level of $p < 0.001$. Knowledge transfer measures are further detailed in Appendix J, Table D.

Table 10.6: Regression weights for the knowledge transfer items

			Estimate	**S.E.**	**C.R.**	**P**
KT1	<---	Knowledge_Transfer	1.000			
KT2	<---	Knowledge_Transfer	1.101	.080	13.732	***
KT4	<---	Knowledge_Transfer	1.088	.077	14.083	***
KT5	<---	Knowledge_Transfer	.867	.067	12.874	***
KT3	<---	Knowledge_Transfer	.814	.068	11.947	***
KT6	<---	Knowledge_Transfer	.843	.072	11.700	***

Note: ***p <.001

5- The CFA procedures for the knowledge creation variable

Figure 10.6a depicts the initial measurement model of factor loadings for each item in the knowledge creation variable. In this model, fourteen items and their standardised loadings were input: KC1 (the technology enables creativity and innovation) 0.81; KC2 (the technology facilitates creative discussion through the learning process) 0.83; KC3 (the technology facilitates skills development) 0.82; KC4 (encouraging social learning through employees' discussion) 0.70; KC5 (using technology is learned effectively from colleagues) 0.64; KC16 (designing, developing, and building appropriate technological systems and solutions) 0.71; and KC17 (having effective methods for creating learning policies and procedures) 0.69. Factor loadings of the initial measurement model were between 0.64-0.83. Figure 10.6a presents the outcomes for the initial values of fit indices for the measurement model of knowledge creation.

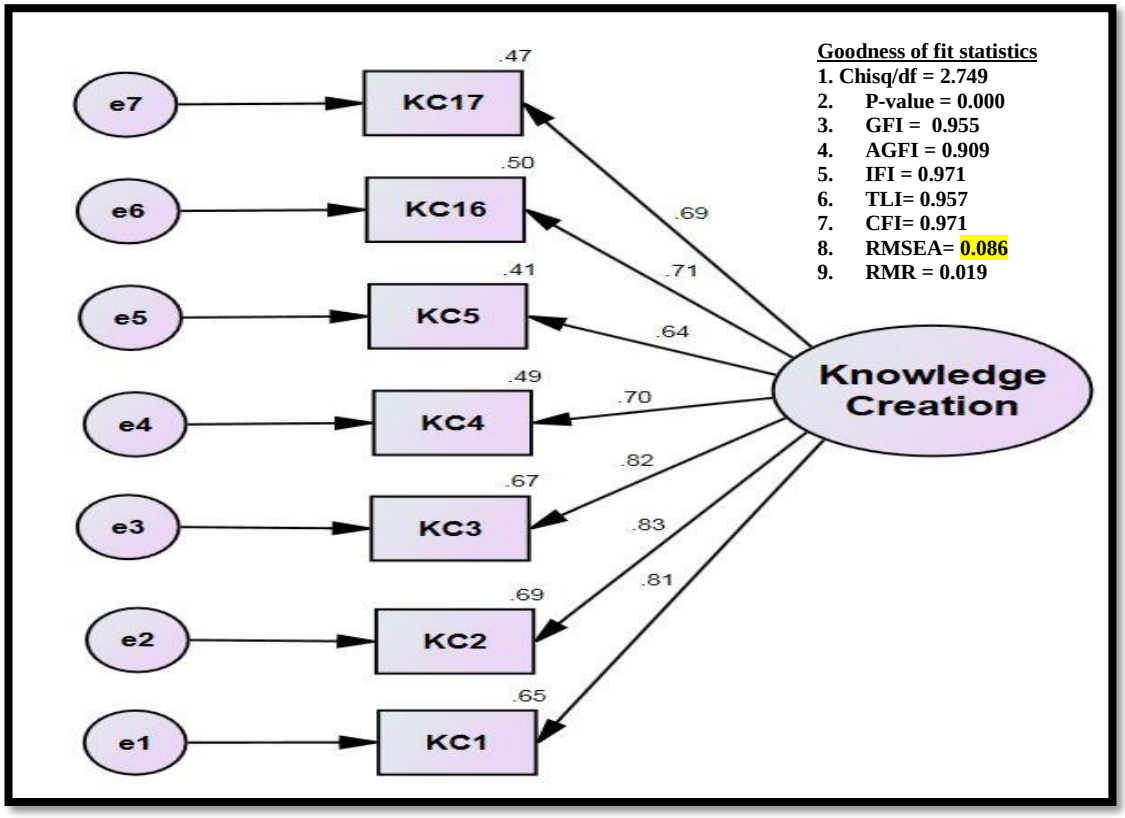


Figure 10.6a: The initial measurement model of the knowledge creation variable

It can be seen from the results in Figure 10.6a that the initial measurement model of knowledge creation had one unsatisfied index which did not fit the criteria of goodness for SEM. In this intial measurement model, *RMSEA* was 0.086 which was a greater than 0.08 (the satisfactory level of the model-fit indices). Therefore, modification indices were used to improve the quality of the measurement model, which was re-evaluated once to be considered as a highly fit model (Table 10.7).

Table 10.7: The step-by-step measurement model of the knowledge creation variable

No.	items	Re-solution decision
1	KC5	Removed based on factor loading of **0.64**

In conclusion, the final measurement model of knowledge creation with new factor loadings for each item and new values of fit indices is presented in Figure 10.6b. The modification indices technique slightly improved the factor loadings (0.68- 0.84).

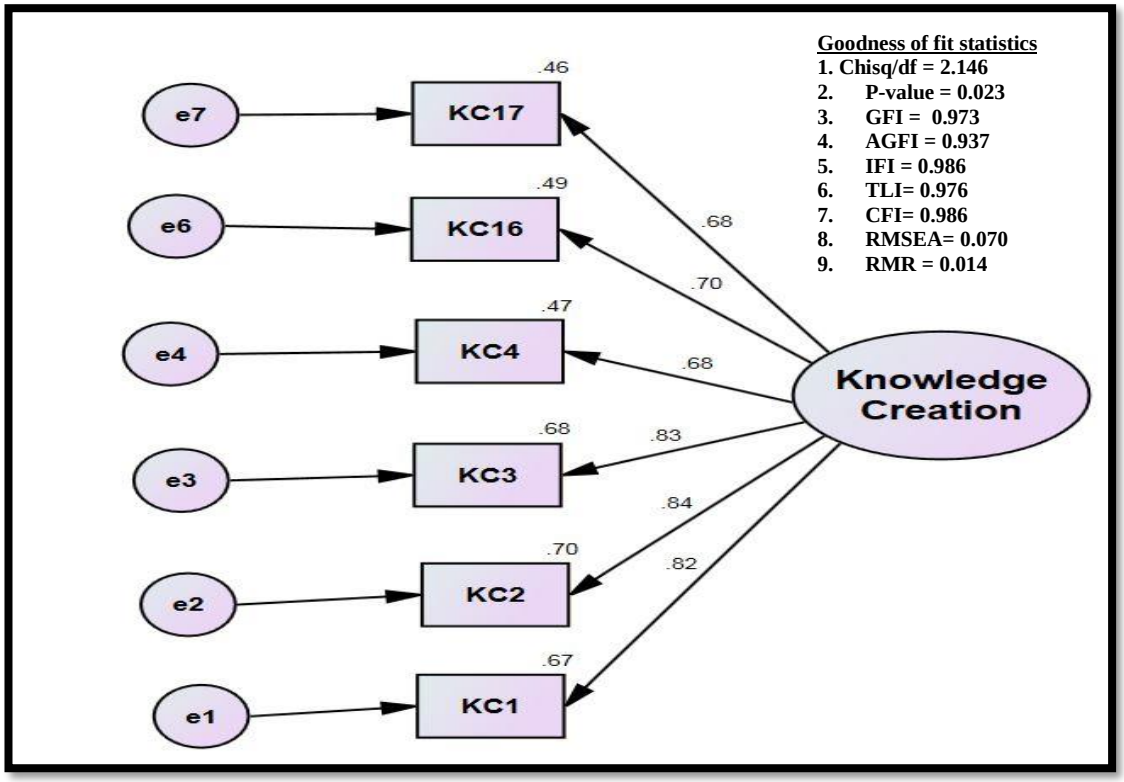


Figure 10.6b: The final measurement model of the knowledge creation variable

In brief, the regression weights for the knowledge creation items in the final measurement model are shown in Table 10.8. There are seven items that are significant, one of which is the assigned weight as a reference to KC1 so a solution can be established. The other items' weights were significant at level of p <0.001. More knowledge creation measures are detailed in Appendix J, Table E.

Table 10.8: Regression weights for the knowledge creation items

			Estimate	S.E.	C.R.	P
KC1	<---	Knowledge_Creation	1.000			
KC2	<---	Knowledge_Creation	1.085	.074	14.575	***
KC3	<---	Knowledge_Creation	1.012	.071	14.268	***
KC4	<---	Knowledge_Creation	.937	.084	11.160	***
KC16	<---	Knowledge_Creation	.893	.077	11.541	***
KC17	<---	Knowledge_Creation	.787	.071	11.141	***

Note: ***p <.001

6- The CFA procedures for the knowledge sharing variable

Figure 10.7 presents the initial and final measurement model of factor loadings for each item in the knowledge sharing variable. In this model, three items and their standardised loadings were input: KS2(my university promotes a sharing information culture) 0.62; KS5 (My university has reciprocal collaboration and sharing information methods with other universities) 0.80; and KS4 (My university supports sharing information through group interaction, individual collaboration, and library resources) 0.78. Factor loadings of initial measurement model were between 0.62-0.80.

Looking at Figure 10.7, similar to the case of the talent attraction variable, there were no values either for a number of fit indices in the knowledge sharing measurement model; but one index (RMSEA) did fit the criteria of goodness for SEM. AMOS outputs did not show any values regarding Chisq/df, P-value, AGFI, and TLI. In addition, RMSEA is 0.523, which is higher than 0.08, the satisfactory level of the model-fit indices. Therefore, this suggests that a modification indices technique should be used to improve the quality of the fit model, yet, the current model is untestable. The degrees of freedom in the measurement model of the knowledge sharing variable was zero. The data should fit perfectly in the model, while the chi-square statistic should be zero. As a result, the chi-square statistic cannot be assigned with any probability level. To overcome this challenging situation, the knowledge sharing variable was included simultaneously within the endogenous composite variables in stage Two of this section.

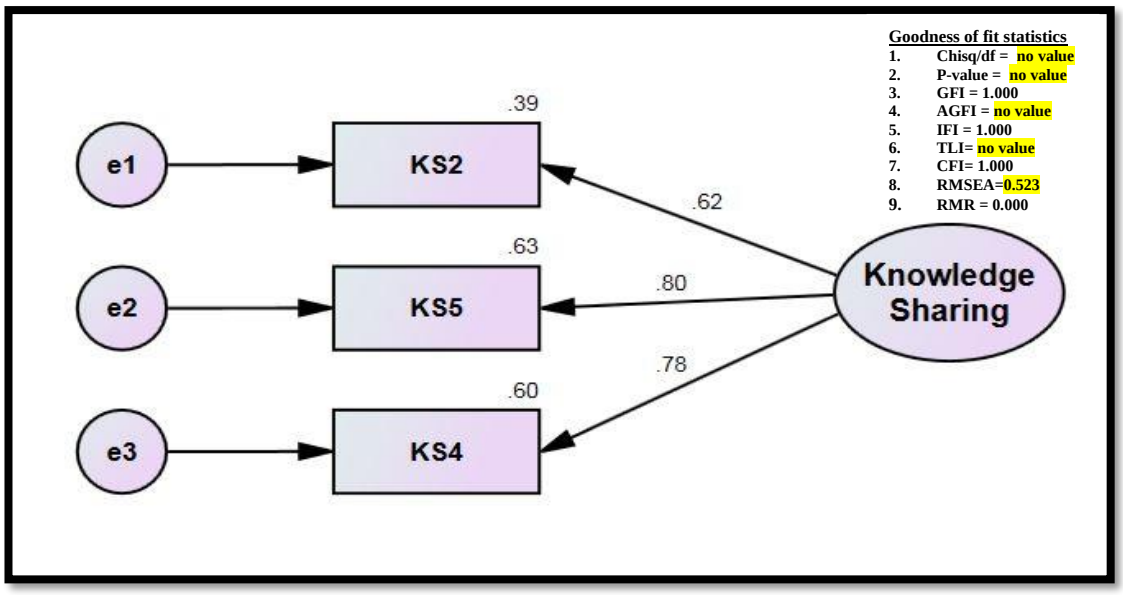


Figure 10.7: The final measurement model of the knowledge sharing variable

Overall, the regression weights for the knowledge sharing items in the final measurement model are shown in Table 10.9, which has three significant items, one of which is the assigned weight as a reference to KS4, so a solution can be established. The significant weight levels for the KS5 and KS2 were at p <0.001. More knowledge sharing measures details are provided in Appendix J, Table F.

Table 10.9: Regression weights for the knowledge sharing items

			Estimate	S.E.	C.R.	P
KS4	<---	Knowledge_Sharing	1.000			
KS5	<---	Knowledge_Sharing	.941	.110	8.591	***
KS2	<---	Knowledge_Sharing	.795	.097	8.155	***

Note: ***p <.001

In conclusion, CFA provided the one-factor results of each variable. There were three items eliminated in this stage. Table 10.10 provides a results summary of the CFA one-factor technique. The data set used with CFA procedures of the one-factor technique resulted in 31 items out of 34 items: three items for talent attraction; nine items for talent development; four items for talent retention; six items for knowledge transfer; six items with knowledge creation; and three items with knowledge sharing. Thus, the data set being used with CFA procedures of the one-factor technique was used as input in the next stage (CFA procedures for the exogenous and end endogenous variables).

Table 10.10: CFA for single-composite variable measurement model

Composite variables	Items input	Itemes output	Removed items
Talent attraction	**3**	**3**	**0**
Talent development	**9**	**9**	**0**
Talent retention	**4**	**4**	**0**
Knowledge transfer	**8**	**6**	**2**
Knowledge creation	**7**	**6**	**1**
Knowledge sharing	**3**	**3**	**0**
The total	**34**	**31**	**3**

10.4.2 Stage two: CFA for all the exogenous and endogenous variables

In this first-order, CFA was independently conducted with all exogenous variables (independent variables), and subsequently the same technique was executed with endogenous variables (dependent variables) (Gefen et al. 2000). Anderson and Gerbing (1988); Holmes-Smith and Rowe (1994) recommend conducting a two-step approach to decrease any potential cross–loading between variables prior to examining a research model using SEM (Al-Sabawy et al. 2013). As stated earlier, CFA procedures were utilised to improve the fit model. Regression weights between the exogenous and endogenous variables, with their items, were also calculated at this stage. The exogenous variables of this study were considered talent mangement processes: talent attraction (three items), talent development (nine items), and talent retention (four items). Figure 10.8 depicts the initial and final measurement model of factor loadings for talent mangement processes. It shows the values of fit indices and sixteen items with their standardised loadings. Factor loadings for the initial (final) measurement model of the exogenous variables were between 0.61-1.00.

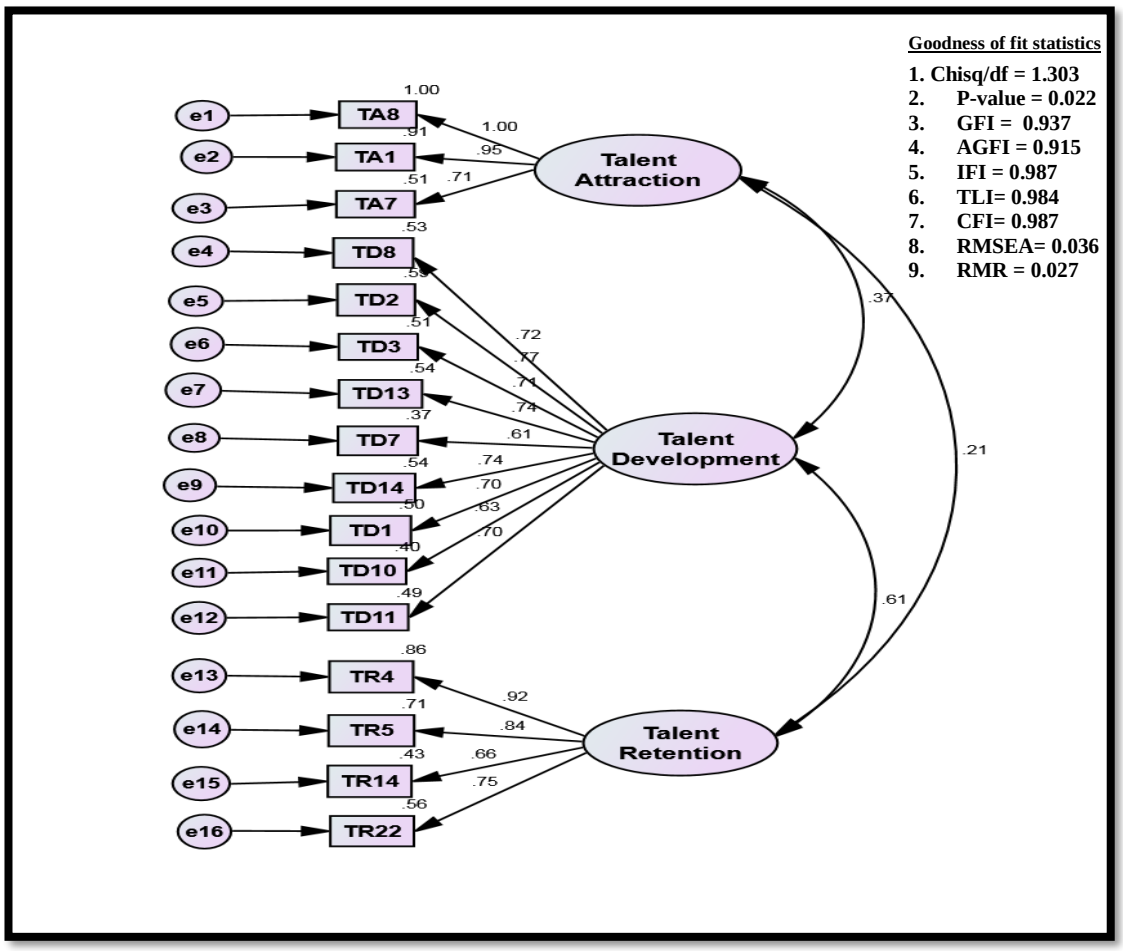


Figure 10.8: The initial (final) measurement model of the exogenous variables

Generally, the regression weights for the exogenous variables items in the final measurement model are shown in Table 10.11. There are sixteen significant items, three of which are the weights assigned as a reference to TA7, TR22, and TD7, so a solution can be established. The significant weight levels for other items were at p <0.001. More details of the exogenous variables measures are provided in Appendix J, Table G.

Table 10.11: Regression weights for the exogenous variables items

			Estimate	S.E.	C.R.	P
TA7	<---	Talent_Attraction	1.000			
TA1	<---	Talent_Attraction	1.370	.093	14.761	***
TA8	<---	Talent_Attraction	1.470	.099	14.868	***
TD13	<---	Talent_Development	1.318	.144	9.135	***
TD10	<---	Talent_Development	1.045	.129	8.124	***
TD2	<---	Talent_Development	1.301	.139	9.390	***
TR22	<---	Talent_Retention	1.000			
TR5	<---	Talent_Retention	1.093	.082	13.269	***
TR4	<---	Talent_Retention	1.166	.082	14.263	***
TD3	<---	Talent_Development	1.299	.146	8.919	***
TD8	<---	Talent_Development	1.121	.124	9.034	***
TD7	<---	Talent_Development	1.000			
TD14	<---	Talent_Development	1.274	.140	9.124	***
TD11	<---	Talent_Development	1.294	.147	8.786	***
TD1	<---	Talent_Development	1.171	.132	8.848	***
TR14	<---	Talent_Retention	.801	.079	10.114	***

Note: ***p <.001

In regard to the CFA procedures for all endogenous composite variables of the study, the initial (final) measurement model of the exogenous variables had satisfied indices, which fitted the criteria of goodness for SEM. The endogenous variables of this research were deemed knowledge mangement processes: knowledge transfer (eight items), knowledge creation (seven items), and knowledge sharing (three items). Figure 10.9a depicts the initial measurement model of factor loadings for knowledge mangement processes.

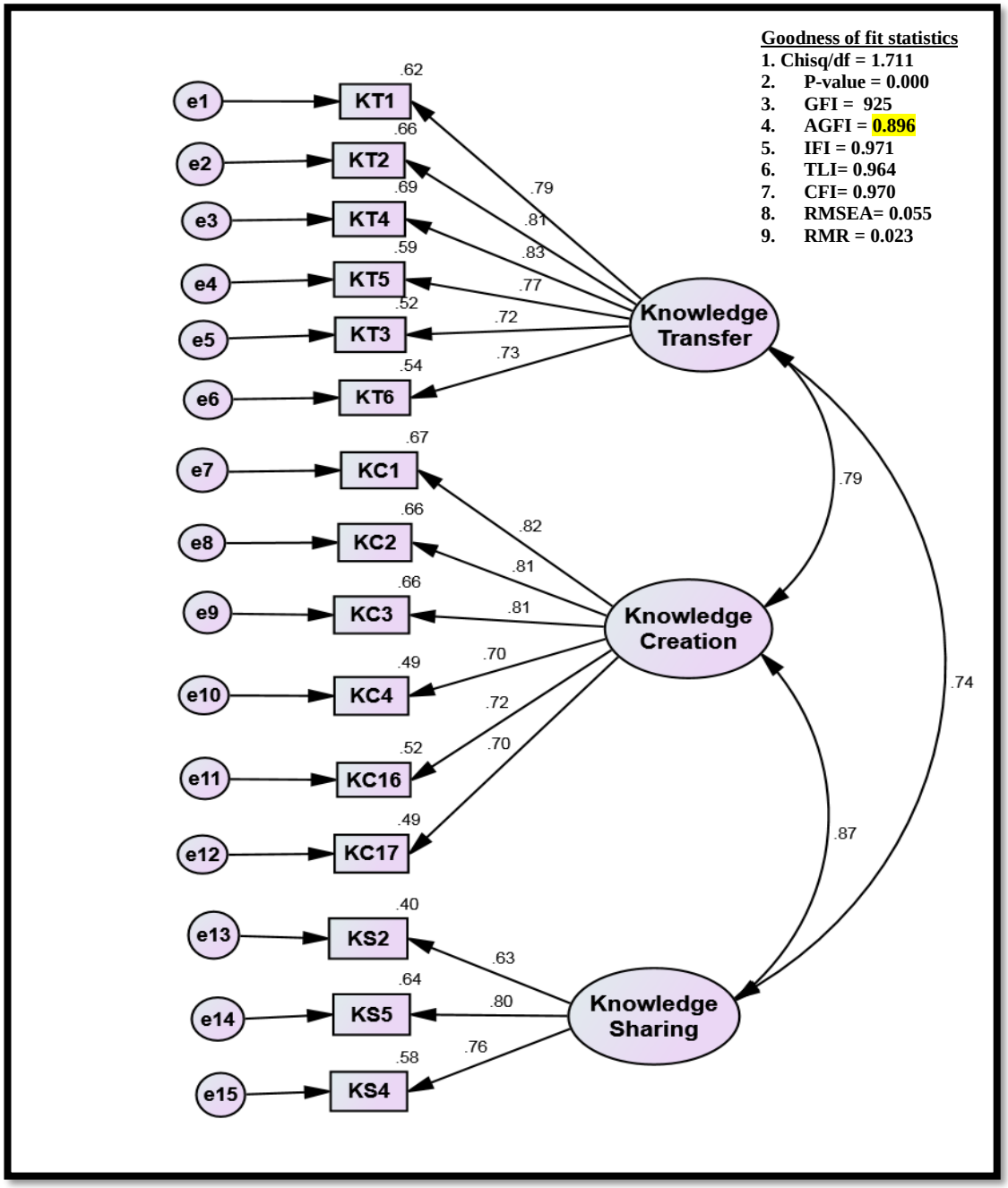


Figure 10.9a: The initial measurement model of the endogenous variables

As shown in Figure 10.9a, factor loadings of the initial measurement model was between (0.63-0.83). The initial measurement model of the endogenous variables measurement had one unsatisfied index, which did not fit the criteria of goodness for SEM. In this intial measurement model, *AGFI*-value was 0.896 wich was slightly lower than 0.90 (the acceptable level). Therefore, modification indices were used to improve the quality of the measurement model. Modification indices proposed the addition of covariance between two correlated measurement error items. The

measurement model of the endogenous variables was re-evaluated once to be considered a highly fit model (Table 10.12).

Table 10.12: The step-by-step measurement model of the endogenous variables

No.	items	Re-solution decision
1	e2-e13	Reset free based on modification indicators of **9.421**

In conclusion, the final measurement model of knowledge mangement processes with new factor loadings for each item are presented in Figure 10.9b, which depicts the results for the new values of fit indices. The modification indices technique improved factor loadings (0.62-0.90). AMOS actual outputs for the endogenous variables can be seen in Appendix J, Table H.

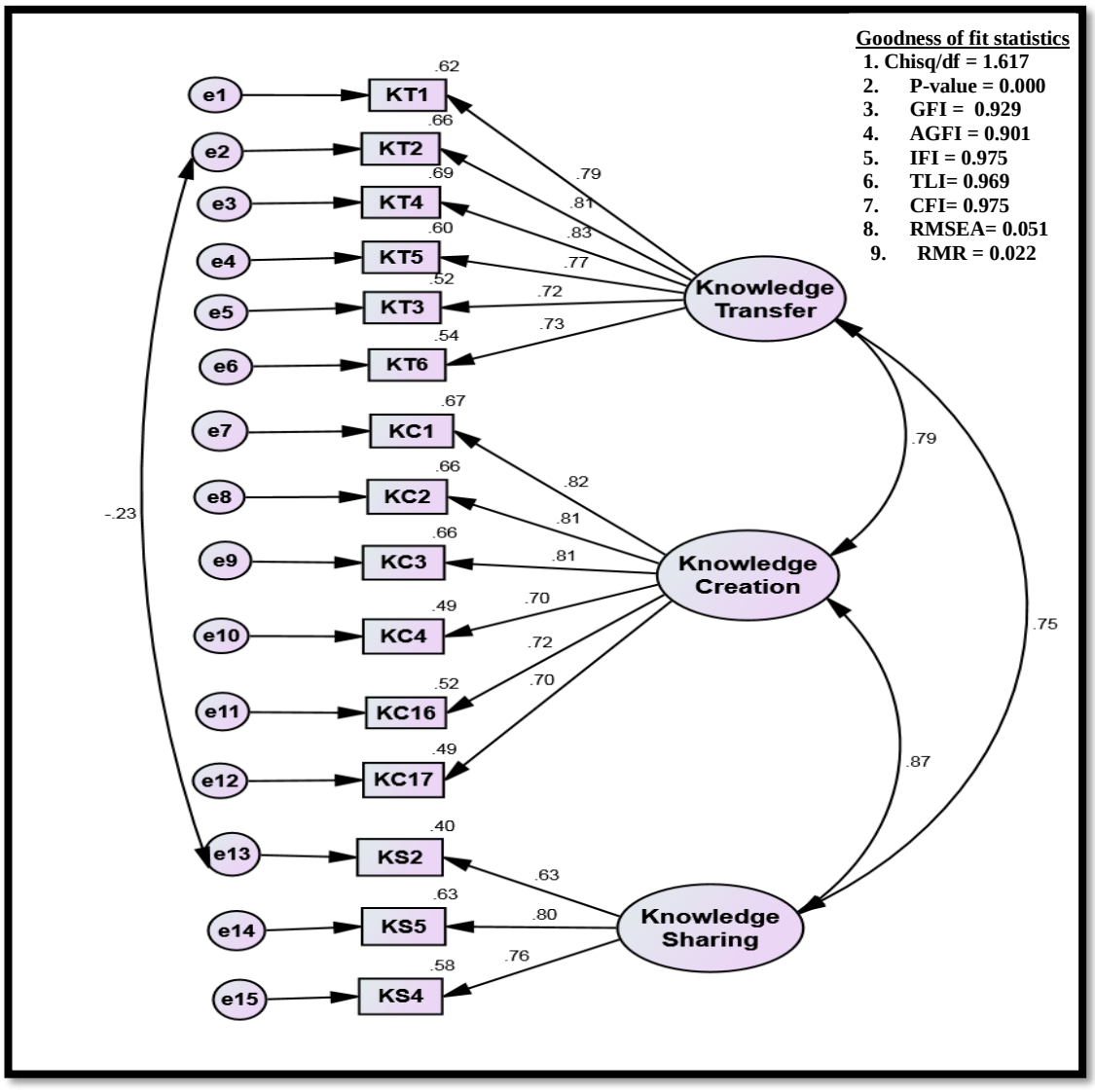


Figure 10.9b: The final measurement model of the endogenous variables

Generally, the regression weights for the endogenous variables items in the final measurement model are shown in Table 10.13. There are fifteen significant items, three of which are the weights assigned as a reference to KT4, KS4, and KC2 so a solution can be established. Significant weight levels for other items were at p <0.001. More details of the endogenous variables measures are provided in Appendix J, Table H.

Table 10.13: Regression weights for the exogenous variables items

			Estimate	S.E.	C.R.	P
KT4	<---	Knowledge_Transfer	1.000			
KT2	<---	Knowledge_Transfer	1.002	.068	14.636	***
KT1	<---	Knowledge_Transfer	.899	.064	13.967	***
KC1	<---	Knowledge_Creation	.959	.067	14.412	***
KS4	<---	Knowledge_Sharing	1.000			
KS2	<---	Knowledge_Sharing	.827	.088	9.366	***
KC2	<---	Knowledge_Creation	1.000			
KC3	<---	Knowledge_Creation	.947	.067	14.130	***
KC16	<---	Knowledge_Creation	.880	.072	12.172	***
KC4	<---	Knowledge_Creation	.913	.079	11.606	***
KS5	<---	Knowledge_Sharing	.959	.081	11.801	***
KC17	<---	Knowledge_Creation	.768	.066	11.624	***
KT5	<---	Knowledge_Transfer	.793	.058	13.591	***
KT3	<---	Knowledge_Transfer	.741	.060	12.425	***
KT6	<---	Knowledge_Transfer	.790	.062	12.645	***

Note: ***p <.001

In short, CFA provided the one-factor results of each variable. There were non-eliminated items at this stage. The data set being used by CFA procedures for all exogenous and endogenous variables was used as input in the next stage (CFA procedures for the overall measurement model).

10.4.3 Stage three: CFA for the overall measurement model

In this stage of data analysis, the output of stage two was the initial input. Figure 10.10 presents both the exogenous and endogenous variables in one measurement model that involves six variables and 31 observed items. In this model, 31 items and their standardised loadings are provided. Likewise, it shows the outcomes of fit indices for the whole measurement model of the study.

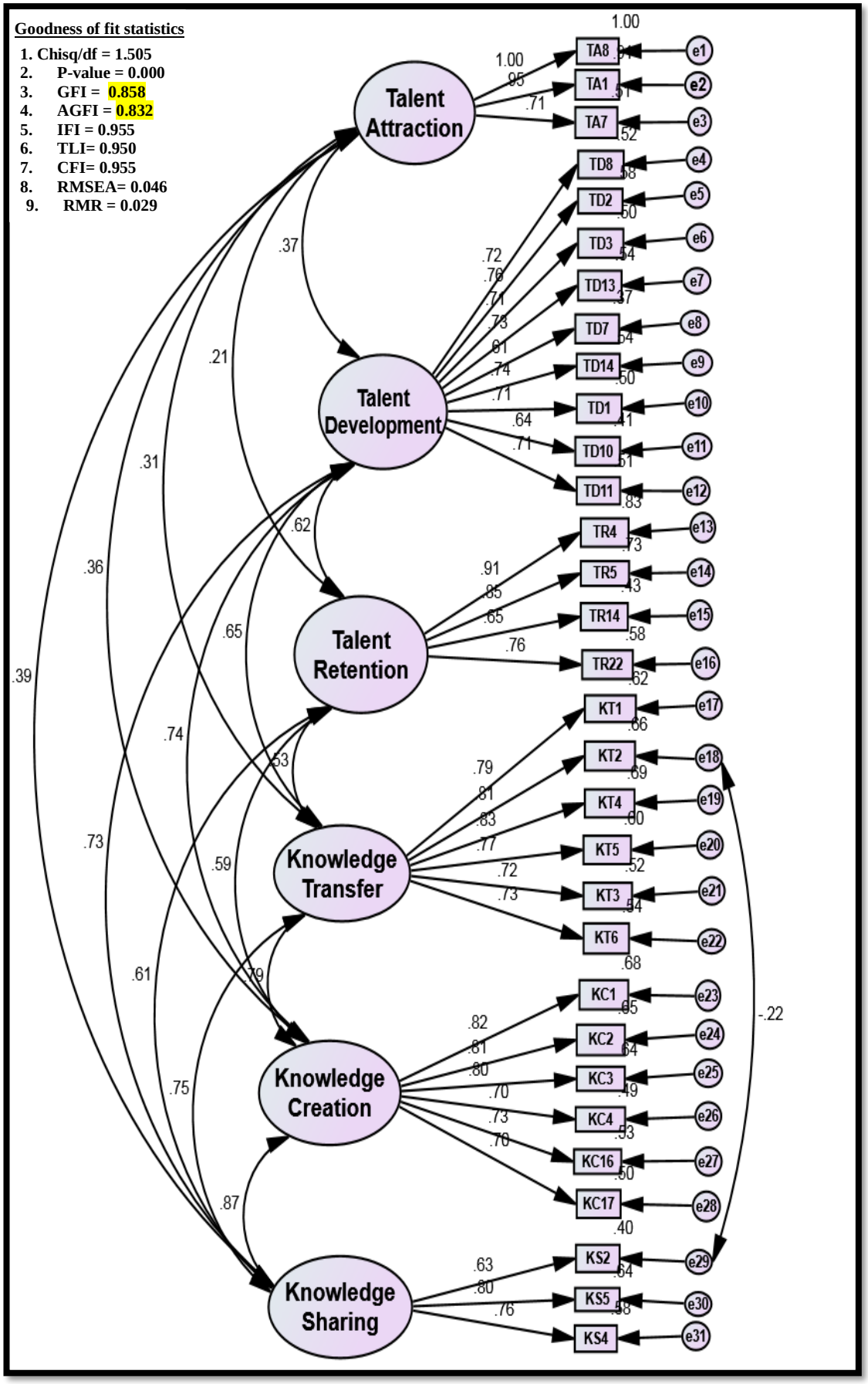


Figure 10.10: The whole measurement model of the study

As can be seen from Figure 10.10, there were two unsatisfied indices (GFI and AGFI) which did not fit the criteria of goodness for SEM. This might have been affected by the complication of the research model which could result in a decrease in the values of GFI and AGFI. In this respect, 'Jais (2007) claims that GFI and AGFI can be affected by model complexity, and model complexity can contribute to reducing the value of those two indices' (Al-Sabawy 2013, p. 213). The measurement model of this research is almost complex. It includes six variables and 31 measured items. Moreover, there is no agreement amongst authors and specialists in SEM as to which fit indices should be addressed in the measurement model (Awang 2012). In addition, Hair et al. (2010); Holmes-Smith et al. (2005) recommend the utilisation of a minimum of one index from each goodness category of the measurement model to achieve the acceptable fit. In terms of providing unique information for assessing a measurement model, Hair et al. (2010) suggest the use of the four key fitness indexes: *Chisq/df (*parsimonious fit*); CFI* and *TLI (*incremental fit*);* and *RMSEA* as well as *RMR (*absolute fit).

Therefore, this study follows the recommendations of the mentioned scholars to use a minimum of one index for each fitness category in the measurement model. In summary, Table 10.14 shows the final outcomes of fit indices for the whole measurement model of the study. In this table, there are at least two indices of goodness categories that are reported in the measurement model of the study.

Table 10.14: The evaluation of fitness for the overall measurement model

Fitness Category	Fit indices	Fit statistics	Comment
Parsimonious fit	Chisq/df	1.505	Satisfactory
	P-value	0.000	Satisfactory
Absolute fit	RMSEA	0.046	Satisfactory
	RMR	0.029	Satisfactory
Incremental fit	IFI	0.955	Satisfactory
	TLI	0.950	Satisfactory
	CFI	0.955	Satisfactory

Generally, the regression weights for the exogenous variables items in the final measurement model are shown in Table 10.15. There are 31 items that are significant, six of which are the weights assigned to TA7, TR22, TD7, KT2, KC4, and KS2, soa solution can be established. The significant weight levels for the other items were at p <0.001. Correlations between composite variables were also calculated at this stage. More details of AMOS actual outputs for the whole measurement model are provided in Appendix J, Table I.

Table 10.15: Regression weights for the exogenous variables items

			Estimate	S.E.	C.R.	P
TA1	<---	Talent_Attraction	1.370	.093	14.799	***
TD13	<---	Talent_Development	1.326	.146	9.060	***
TD1	<---	Talent_Development	1.184	.134	8.810	***
TD2	<---	Talent_Development	1.303	.140	9.280	***
TR22	<---	Talent_Retention	1.000			
TR5	<---	Talent_Retention	1.093	.080	13.634	***
TR4	<---	Talent_Retention	1.137	.079	14.433	***
KT2	<---	Knowledge_Transfer	1.000			
KT6	<---	Knowledge_Transfer	.790	.064	12.317	***
KT4	<---	Knowledge_Transfer	1.002	.069	14.625	***
KT5	<---	Knowledge_Transfer	.794	.060	13.211	***
KC4	<---	Knowledge_Creation	1.000			
KC16	<---	Knowledge_Creation	.965	.091	10.592	***
KC1	<---	Knowledge_Creation	1.045	.088	11.866	***
KC3	<---	Knowledge_Creation	1.022	.088	11.602	***
KC2	<---	Knowledge_Creation	1.081	.093	11.638	***
KC17	<---	Knowledge_Creation	.844	.082	10.235	***
KS2	<---	Knowledge_Sharing	1.000			
KS5	<---	Knowledge_Sharing	1.166	.120	9.751	***
KS4	<---	Knowledge_Sharing	1.209	.128	9.440	***
TA8	<---	Talent_Attraction	1.467	.098	14.930	***
TA7	<---	Talent_Attraction	1.000			
TD7	<---	Talent_Development	1.000			
TD3	<---	Talent_Development	1.303	.148	8.834	***
TD8	<---	Talent_Development	1.123	.126	8.937	***
TD14	<---	Talent_Development	1.290	.142	9.092	***
TD11	<---	Talent_Development	1.335	.150	8.878	***
TR14	<---	Talent_Retention	.783	.078	10.078	***
TD10	<---	Talent_Development	1.069	.131	8.170	***
KT1	<---	Knowledge_Transfer	.902	.066	13.584	***
KT3	<---	Knowledge_Transfer	.740	.061	12.094	***

10.4.4 Stage four: *Testing validity and reliability of the measurement model*

With regards to prior testing of the research hypotheses, there are further tests that should be examined to ensure the validity and reliability of the results. Average Variance Extracted (AVE) and Composite Reliability (CR) are considered common measures for measuring validity and reliability of the measurement model (Hair et al. 2010). AVE is used to assess the convergent validity of a variable (Fornell & Larcker 1981; Hair et al. 2010), while CR is utilised to evaluate variable reliability (Bagozzi & Yi 1988; Nunnally & Bernstein 1994) and Squared Multiple Correlation (SMC) to evaluate item reliability (Al-Sabawy et al. 2013). An SMC test was examined using AMOS software. AVE was calculated manually while CR was calculated following the standard set in the Composite Reliability Calculator (http://www.thestatisticalmind.com/calculators/comprel/composite_reliability.htm) using the following equations:

$$\text{AVE} = \frac{\sum_{i=1}^{n} \text{L}i^2}{n} \qquad \ldots\ldots\ldots\ldots (1)$$ (Hair et al. 2010, p. 709)

Li: Factor loadings; i: number of items.

$$\text{CR} = \frac{\left(\sum_{i=1}^{i} \lambda i\right)^2}{\left(\sum_{i=1}^{i} \lambda i\right)^2 + \sum_{i=1}^{i} (1 - \lambda \text{i}^{\,2})} \qquad \ldots\ldots\ldots\ldots (2)$$ (Gerbing & Anderson 1988)

λi: Factor loadings of each variable.

In regards to satisfactory and significant values, AVE values of a composite variable should be at least 0.50 (Bagozzi & Yi 1988; Fornell & Larcker 1981; Hair et al. 2010) while an acceptable level of item loadings is 0.60 or more (Chin 1998a). CR should be at least 0.70 to be satisfactory (Fornell & Larcker 1981; Gefen et al. 2000; Nunnally & Bernstein 1994). Holmes-Smith (2011) recommends that SMC should be at least 0.30 to be acceptable. Table 10.16 provides a summary of the validity and reliability results.

Table 10.16: Validity and reliability tests for the whole measurement model of the study (N=237)

Items	Path	Composite variables	Estimate (β)	Standard Error	C.R (t)	P< 0.05	Loadings ≥ 0.60	AVE ≥ 0.50	CR ≥ 0.70	SMC ≥ 0.30
TA1	<---	*Talent Attraction (TA)	1.370	0.093	14.789	***	0.952	0.803	0.923	0.907
TA7	<---		1.000				0.712			0.507
TA8	<---		1.468	0.98	14.920	***	0.998			0.997
TD8	<---	*Talent Development (TD)	1.123	0.125	8.977	***	0.721	0.50	0.900	0.518
TD2	<---		1.299	0.140	9.305	***	0.762			0.576
TD3	<---		1.301	0.147	8.861	***	0.712			0.501
TD13	<---		1.324	0.146	9.091	***	0.733			0.538
TD7	<---		1.000				0.612			0.366
TD14	<---		1.287	0.141	9.121	***	0.742			0.543
TD1	<---		1.179	0.134	8.823	***	0.713			0.497
TD10	<---		1.067	0.130	8.195	***	0.642			0.406
TD11	<---		1.328	0.149	8.884	***	0.713			0.508
TR4	<---	*Talent Retention (TR)	1.138	0.079	14.452	***	0.913	0.641	0.876	0.833
TR5	<---		1.090	0.080	13.609	***	0.855			0.730
TR14	<---		0.784	0.078	10.095	***	0.653			0.426
TR22	<---		1.000				0.759			0.577

KT1	<---	**Knowledge Transfer (KT)	0.902	0.061	13.584	***	0.788	0.615	0.906	0.622
KT2	<---		1.000				0.809			0.655
KT4	<---		1.002	0.069	14.625	***	0.832			0.693
KT5	<---		0.794	0.060	13.211	***	0.772			0.596
KT3	<---		0.740	0.061	12.094	***	0.722			0.521
KT6	<---		0.790	0.064	12.317	***	0.732			0.536
KC1	<---	**Knowledge Creation (KC)	1.045	0.088	11.866	***	0.843	0.611	0.904	0.676
KC2	<---		1.081	0.093	11.638	***	0.805			0.648
KC3	<---		1.022	0.088	11.602	***	0.803			0.644
KC4	<---		1.000				0.701			0.492
KC16	<---		0.965	0.091	10.592	***	0.822			0.532
KC17	<---		0.844	0.082	10.235	***	0.704			0.496
KS2	<---	**Knowledge Sharing (KS)	1.000				0.633	0.540	0.777	0.401
KS5	<---		1.166	0.120	9.751	***	0.799			0.639
KS4	<---		1.209	0.128	9.440	***	0.762			0.580

Note:

* = Exogenous variables

** = Endogenous variables

***p <.001

As can be seen from the table above, the outcomes confirmed the validity and reliability of the whole measurement model. There are 31 significant items, six of which are the assigned weights as a reference to TA7, TR22, TD7, KT2, KC4, and KS2, so a solution can be established. The significant weight levels for other items were at $p < 0.001$. These indicated that there were strongly significant positive effects for each variable and its items. This is because their values were greater than 0.50. All factor loadings of the endogenous and exogenous variables were greater than 0.60. The values of AVE for both the endogenous and exogenous variables ranged between 0.50-0.803 which were equal and greater than the satisfactory rate (0.50). Values of CR for all the variables included in the measurement model ranged between 0.777-0.923 which meant they were greater than the acceptable rate (0.70). These confirm that all CR-values were statistically acceptable. Values of SMC for the measurement model variables ranged between 0.366-0.997, which was greater than the acceptable rate (0.30). These ensured that all SMC-values were statistically satisfactory.

In addition, even though Fornell-Larcker's (Fornell & Larcker 1981) and the cross-loading criterion are used to evaluate the discriminant validity in SEM research, these criterion have poor performance (Henseler et al. 2015). 'The Fornell-Larcker criterion and the assessment of crossloadings—have an unacceptably low sensitivity, which means that they are largely unable to detect a lack of discriminant validity' (Henseler et al. 2015, p. 128). To overcome this issue, Henseler et al. (2015) have suggested the heterotrait-monotrait (HTMT) ratio as a new criterion to evaluate discriminant validity in variance-based SEM. According to Garson 2016, "The HTMT ratio is the geometric mean of the heterotrait-heteromethod correlations (i.e., the correlations of indicators across constructs measuring different phenomena) divided by the average of the monotrait-heteromethod correlations (i.e., the correlations of indicators within the same construct)" (Yusif 2017, p. 196). Discriminant validity is established when the HTMT ratio between two composite variables not exceed 0.90 (Henseler et al. 2015). As a result, statistical issues commonly occur for correlations at 0.90 or above (Henseler et al. 2015; Tabachnick & Fidell 2007). Table 10.17 shows the results of discriminant validity of the measurement model using the HTMT technique. Values of HTMT for the measurement model variables ranged between 0.247-0.875 (below 0.9), which confirmed that the measurement model achieves the sufficient level of discriminant validity.

Table 10.17: Discriminant validity of the measurement model

Composite variables	TA	TD	TR	KT	KC	KS
TA	1					
TD	0.476	1				
TR	0.247	0.630	1			
KT	0.342	0.651	0.515	1		
KC	0.375	0.757	0.617	0.803	1	
KS	0.462	0.734	0.630	0.722	0.875	1

In conclusion, the measurement model analysis provides a strong confirmation for the relationships between exogenous variables (talent management processes) and their items, as well as endogenous variables (knowledge management processes) and their items. For instance, C.R (t)-value for all paths in the measurement model were significantly acceptable (C.R > 1.96, P < 0.05). Thus, the first stage of multivariate data representing the measurement model analysis of the study has been achieved; the second and final stage (the structural model analysis) is examined in the next section to assess the hypothesised structural relationships.

10.5. Structural model analysis

First the quality of the measurement model has been achieved using CFA. A Maximum Likelihood (ML) technique is one of the most broadly used estimation methods, which was used here secondly to analyse the structural model (Bentler 1990; Hu & Bentler 1999; Musil et al. 1998). In this study, the structural model of the study was analysed using SEM analyses to maximise reliability of the quantitative findings of the study. The use of two SEM analyses assists in confirming the results obtained by using simple regression analysis, and building the foundation of the relationships between exogenous and endogenous variables through providing more accurate causal relations between composite variables. Nine research hypotheses were examined using the SEM technique to investigate the relationship between talent management processes and knowledge management processes in Australian higher education. Critical Ratio (CR) was used to evaluate the structural model results in regard to a description of the relationship between independent and dependent composite variables (Hair Jr et al. 2016). Table 10.18 provides a summary of the results of the research hypotheses using SEM. This table shows the values of the following regression paths: estimate (β); Standard Error (S.E); C.R (t)-value; and P-value of nine hypotheses.

Table 10.18: The results of the research hypotheses based on the structural model

Hypothesis	**The path**	**Regression weights**				**Results**
		Estimate (β)	**S.E**	**C.R (t)**	**P-value**	
$H1_0$ or $H1_1$	Knowledge transfer <--- Talent attraction	0.041	0.042	0.967 $^{N.S}$	0.334	Accepted null hypothesis **$H1_0$**
$H2_0$ or $H2_1$	Knowledge transfer <--- Talent development	0.804	0.136	**5.890*****	***	Accepted alternative hypothesis **$H2_1$**
$H3_0$ or $H3_1$	Knowledge transfer <--- Talent retention	0.139	0.059	**2.341***	**0.019**	Accepted alternative hypothesis **$H3_1$**
$H4_0$ or $H4_1$	Knowledge creation <--- Talent attraction	0.043	0.030	1.435 $^{N.S}$	0.151	Accepted null hypothesis **$H4_0$**
$H5_0$ or $H5_1$	Knowledge creation <--- Talent development	0.718	0.111	**6.480*****	***	Accepted alternative hypothesis **$H5_1$**
$H6_0$ or $H6_1$	Knowledge creation <--- Talent retention	0.117	0.042	**2.757****	**0.006**	Accepted alternative hypothesis **$H6_1$**
$H7_0$ or $H7_1$	Knowledge sharing <--- Talent attraction	0.078	0.038	**2.050** *	**0.040**	Accepted alternative hypothesis **H7**$_1$
$H8_0$ or $H8_1$	Knowledge sharing <--- Talent development	0.739	0.121	**6.086*****	***	Accepted alternative hypothesis **H8**$_1$
$H9_0$ or $H9_1$	Knowledge sharing <--- Talent retention	0.165	0.054	**3.088****	**0.002**	Accepted alternative hypothesis **$H9_1$**

Significant at various levels * : 0.05; ** : 0.01; *** : 0.001; and $^{N.S}$: Not significant

The first hypothesis is as follows: *$H1_0$: there is no significant positive influence of talent attraction on knowledge transfer in a university*; or *$H1_1$ there is significant positive influence of talent attraction on knowledge transfer in a university*. From Table 10.18, it is apparent that the regression path is weak and insufficient to describe the relationship between talent attraction and knowledge transfer. This is demonstrated through a calculated value of *C.R (t)* 0.967, which is lower than the minimum acceptance level of significance (1.96) with a P-value of 0.334, which is greater than 0.05. The value of beta (β) is 0.041, which means that when there is an increase of 1 unit in talent attraction, knowledge transfer is expected to increase by 0.041 units with a standard error of 0.042. The influence of talent attraction on knowledge transfer is not significant (P= 0.334) at each of the significant levels above. These results confirmed that there was no significant positive influence for talent attraction in knowledge transfer, and allowed acceptance of null hypothesis *$H1_0$* and rejection of alternative hypothesis *$H1_1$*.

The second hypothesis is as follows: $H2_0$: *there is no significant positive impact of talent development on knowledge transfer in a university*; or $H2_1$: *there is significant positive impact of talent development on knowledge transfer in a university*. As shown in Table 10.18, it is apparent that the regression path is reasonably acceptable and sufficient to describe the relationship between talent development and knowledge transfer. This is indicated through an accounted value of C.R (t) 5.890 with a P-*value* of 0.000. The value of beta (β) is 0.804, which means that when there is a rise of 1 unit in talent development, knowledge transfer is increased by 0.804 units with a standard error of 0.136. The impact of talent development on knowledge transfer is significant (P= 0.000) at level 0.001. These results confirmed that there is a significant positive impact for talent development on knowledge transfer in a university, and allowed rejection of null hypothesis *$H2_0$* and acceptance of alternative hypothesis *$H2_1$*.

The third hypothesis is as follows: *$H3_0$: there is no significant positive effect of talent retention on knowledge transfer in a university; or $H3_1$: There is significant and positive effect of talent retention on knowledge transfer in a university*. From the table above (10.17), it is obvious that the regression path is reasonably acceptable and sufficient to describe the relationship between talent retention and knowledge transfer. This is explained through a calculated t-value of 2.341, which is within an acceptance

level 1.96 with a P-*value* of 0.019, which is lower than 0.05. The value of beta (β) is 0.140, which means that when there is an increase of 1 standard deviation in talent retention, the knowledge transfer is expected to increase via 0.14 standard deviations with a standard error of 0.053. The influence of talent retention on knowledge transfer is significant (P= 0.008) at level 0.01. These outcomes emphasised that there is a significant positive effect for talent retention on knowledge transfer, and allowed rejection of null hypothesis $H3_0$ and acceptance of alternative hypothesis $H3_1$.

The fourth hypothesis addressed is: $H4_0$: *there is no significant positive influence of talent attraction on knowledge creation in a university*; or $H4_1$: *there is significant positive influence of talent attraction on knowledge creation in a university*. As shown in Table 10.18, it is apparent that the regression path is reasonably weak and insufficient to describe the relationship between talent attraction and knowledge creation. This is demonstrated through an accounted value of *C.R (t)* 1.435, which is less than 1.96 (a minimum acceptance level of significance), with a *P-value* of 0.151, which is higher than a minimum acceptance level of significance (0.05). The value of beta (β) is 0.043, which means that when there is a rise of 1 unit in talent attraction, knowledge creation is predicted to rise by 0.043 units with a standard error of 0.030. The effect of talent attraction on knowledge creation is not significant (P= 0.151) at each of the significant levels above. These results confirmed that there is no significant positive influence for talent attraction on knowledge creation in a university, and allowed acceptance of null hypothesis $H4_0$ and rejection of alternative hypothesis $H4_1$.

The fifth hypothesis is titled as follows: $H5_0$: *there is no significant and positive impact of talent development on knowledge creation in a university*; or $H5_1$: *there is significant and positive impact of talent development on knowledge creation in a university*. As shown in Table 10.18, it is clear that the regression model is reasonably satisfactory and sufficient to describe the relationship between talent development and knowledge creation. This is through an accounted value of C.R (t) 6.480, which is higher than 1.96 or 2.56 (the acceptance level of significance). The value of beta (β) is 0.718, which means that when there is a rise of 1 unit in talent development, knowledge creation is increased by 0.718 units with a standard error of 0.111. The effect of talent development on knowledge creation is significant (P= 0.000) at level 0.001. These results confirmed that there is a significant positive impact for talent development on

knowledge creation in a university, and allowed rejection of null hypothesis $H5_0$ and acceptance of alternative hypothesis $H5_1$.

The sixth hypothesis is addressed as: $H6_0$: *there is no significant positive impact of talent retention on knowledge creation in a university*; or $H6_1$: *There is significant positive impact talent retention on knowledge creation in a university*. As shown in Table 10.18, it is obvious that the regression path is reasonably acceptable and sufficient to describe the relationship between talent retention and knowledge creation. This is demonstrated through an accounted value of *C.R (t)* 2.757, which is within an acceptance level of significance (2.56) and a *P-value* of 0.01. The value of beta (β) is 0.117, which means that when there is an increase of 1 unit in talent retention, knowledge creation is predicted to increase by 0.117 units with a standard error of 0.042. The influence of talent retention on knowledge creation is significant (P= 0.006) at level 0.01. These findings emphasised that there is a significant positive impact for talent retention on knowledge creation in a university, and allowed rejection of null hypothesis $H6_0$ and acceptance of alternative hypothesis $H6_1$.

The seventh hypothesis is as follows: $H7_0$*: there is no significant positive influence of talent attraction on knowledge sharing in a university*; or $H7_1$ *there is significant positive influence of talent attraction on knowledge sharing in a university*. From Table 10.18, it is apparent that the regression path is acceptable and sufficient to describe the relationship between talent attraction and knowledge sharing. This is indicated through a calculated value of *C.R (t)* 2.050, which is bigger than an acceptance level of significance (1.96) with a *P-value* of 0.040, which is greater than 0.05. The value of beta (β) is 0.78, which means that when there is an increase of 1 unit in talent attraction, knowledge sharing is expected to increase by 0.78 units with a standard error of 0.038. The effect of talent attraction on knowledge sharing is significant (P= 0.040) at level 0.05. These results confirmed that there is significant positive influence for talent attraction in knowledge sharing, and allowed rejection of null hypothesis $H7_0$ and acceptance of alternative hypothesis $H7_1$.

The eighth hypothesis is addressed as: $H8_0$: *there is no significant and positive impact of talent development on knowledge sharing in a university*; or $H8_1$: *there is significant and positive impact of talent development on knowledge sharing in a*

university. As shown in Table 10.18, it is obvious that the regression path is reasonably acceptable and sufficient to describe the relationship between talent development and knowledge sharing. This is specified through an accounted value of C.R (t) 6.086, which is greater than 1.96 or 2.56 (the acceptance level of significance). The value of beta (β) is 0.739, which means that when there is a rise of 1 unit in talent development, knowledge sharing is increased by up to 0.739 units with a standard error of 0.121. The effect of talent development on knowledge sharing is significant (P= 0.000) at level 0.001. These results confirmed that there is a significant positive impact for talent development on knowledge sharing in a university, and allowed for a rejection of null hypothesis $H8_0$ and an acceptance of alternative hypothesis $H8_1$.

The ninth and final hypothesis is as follows: *$H9_0$: there is no significant positive impact of talent retention on knowledge sharing in a university; or $H9_1$: There is significant positive impact talent retention on knowledge sharing in a university*. From the table above (10.17), it is obvious that the regression path is reasonably acceptable and sufficient to describe the relationship between talent retention and knowledge sharing. This is demonstrated through a calculated t-value 3.088, which is bigger than an acceptance level (2.56). The value of beta (β) is 0.165, which means that when there is an increase of 1 standard deviation in talent retention, the knowledge sharing is expected to increase via 0.165 standard deviations with a standard error of 0.054. The influence of talent retention on knowledge sharing is significant (P= 0.002) at level 0.01. These outcomes emphasised that there is significant positive impact for talent retention on knowledge sharing, and allowed a rejection of null hypothesis $H9_0$ and an acceptance of alternative hypothesis $H9_1$.

In conclusion, Figure 10.11 shows the structural model of the study. It summarises multiple statistical analysis techniques (e.g. path analysis, correlation analysis, and structural errors in dependent composite variables) in a single causal model. Thus, the SEM analysis provides a clear picture of the causal relationship between talent management processes and knowledge management processes in the Australian higher education sector.

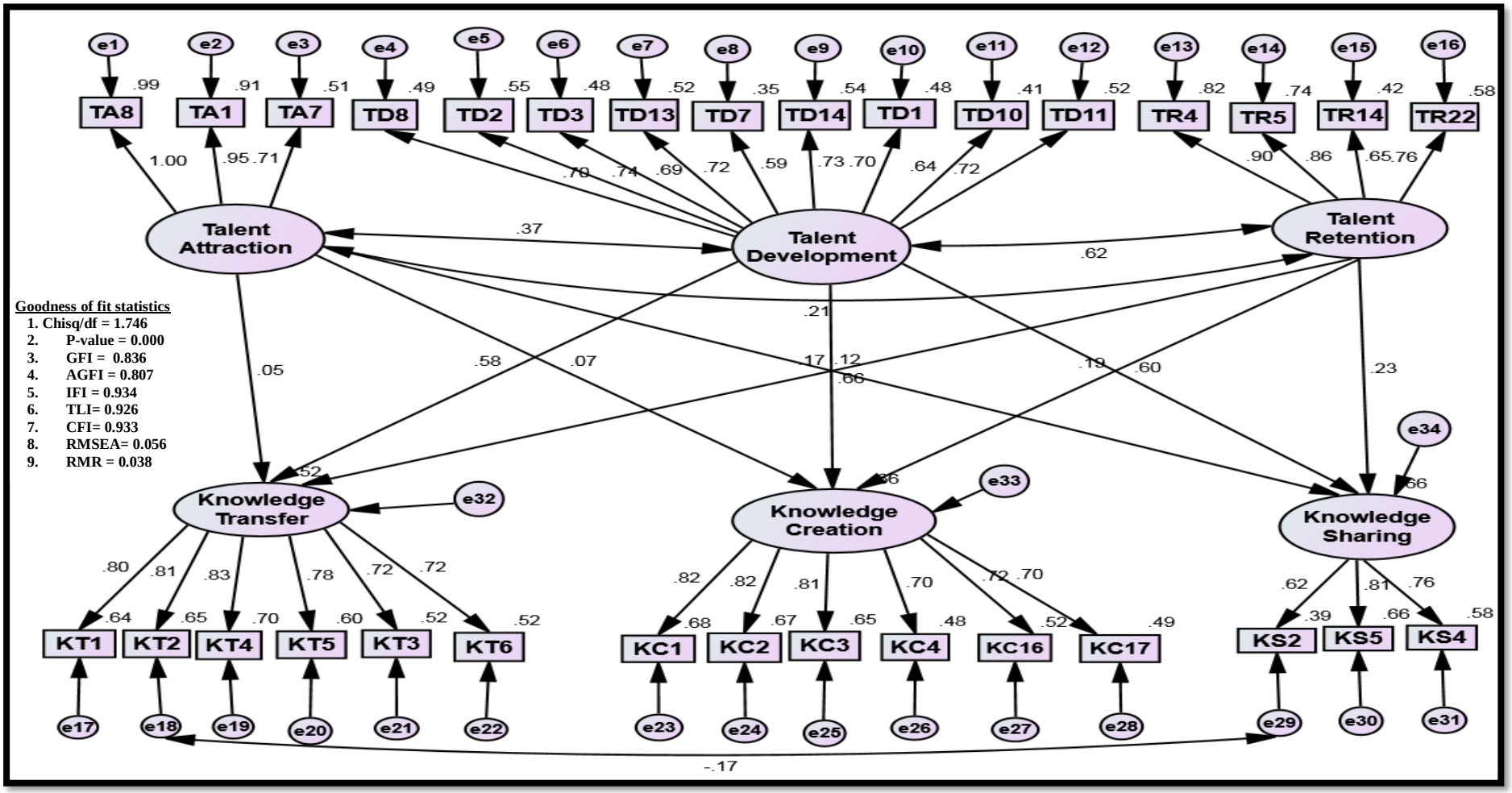


Figure 10.11: The structural model of the relationship between talent management processes and knowledge management processes in the Australian higher education sector

10.6. Summary

This chapter has provided the results of the second part of the quantitative study. It has focused on the quantitative data analyses in six sections. Section one started by presenting an overview of this chapter. In section two, a general introduction was provided about the quantitative data analyses. The third section developed an understanding of the rationale behind the selection of SEM. Multivariate analysis was tested in sections four and five to achieve the second research objective of the study. This analysis involved two core parts: the measurement model analysis (section four) and the structural model analysis (section five). In section four, four stages were employed to evaluate the measurement model. Section five analysed the structural model of the study. The SEM technique was used to analyse the structural model. The SEM analysis showed that seven out of the nine research hypotheses were significantly positive and the remaining two hypotheses were not significant. The significant levels ranged between 0.05, 0.01, and 0.001; the third and seventh hypotheses were at 0.05; the sixth and ninth hypotheses were at 0.01; the second, fifth, and eighth hypotheses were at 0.001; and the first as well as fourth hypotheses were insignificant. Finally, the summary in section six concluded this chapter. The next chapter discusses the findings of qualitative and quantitative methods used in this thesis.

CHAPTER 11: THE RESULTS DISCUSSION

11.1. Chapter overview

This study has investigated the nexus between managerial processes of both talent and knowledge. The scope of this research was the university environment within the Australian higher education sector, in Queensland. This chapter discusses the results from both qualitative and quantitative parts of the study. The review of the results discussion chapter is divided into five different sections. It starts with a general overview of this chapter. The next section (11.2) provides a clear explanation and discussion of qualitative results obtained through brainstorming, focus group, and individual interview techniques. It discusses the practical outcomes presented in Chapter Six (qualitative data analysis). Section 11.3 emphasises the implications of the research resulting from statistical analysis. It discusses the practical outcomes presented in Chapter Nine (quantitative data analysis part A) and Chapter Ten (quantitative data analysis part B) by comparing the results with the related literature. Contributions of the research are presented in Section 11.4. Finally, the Section 11.5 summarises this chapter. This chapter thus covers five sections which are presented in the following graphical layout.

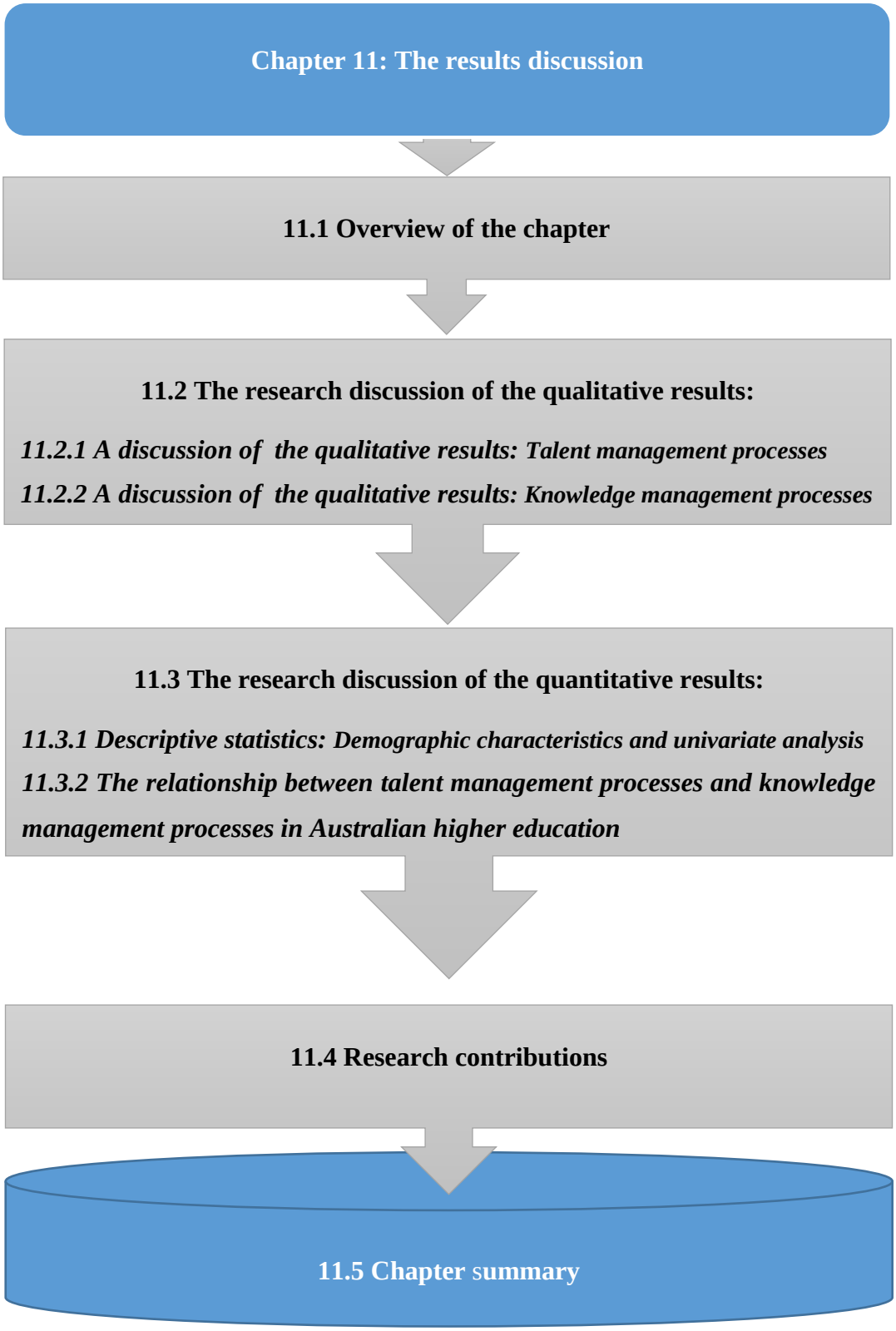


Figure 11.1: A graphical layout for Chapter 11

Source: Prepared by the researcher.

11.2. The research discussion of the qualitative results

The existing literature on the measurements of both talent management processes and knowledge management processes is extensive; nevertheless, the vast majority of research is outside the higher education sector, and the few studies from within are in non-Australian contexts. In this regard, the first key research objective of the study was *to understand the best processes that are currently used in managing talent and knowledge in Australian higher education.* This aim was achieved by using three qualitative multi-method approaches that are commonly used in empirical studies, namely brainstorming, focus group discussions and individual interviews. The qualitative procedures were based on a three-stage method (preliminary list of items, list of categories and items, and list of themes) of thematic analysis. The qualitative findings were then employed to develop the quantitative questionnaire.

The qualitative study explored three key themes and ten sub-themes of talent management processes that are used in Australian higher education: (1) talent attraction (social domain, and organisational excellence); (2) talent development (performance management, coaching talent, and leadership development); and (3) talent retention (benchmarking, job satisfaction, non-monetary rewards, employee empowerment, and employee motivation). There were 51 items in the talent management processes part of the quantitative questionnaire. Some of these were generated through the qualitative study and some were informed by the literature.

In a similar fashion to the talent management processes, three key themes and seven sub-themes of knowledge management processes that are utilised in Australian higher education were explored: (1) knowledge transfer (personalisation and codification); (2) knowledge creation (combination, socialisation, internalisation and externalisation); and (3) knowledge sharing (sharing information). There were 35 items in the knowledge management processes variable of the quantitative questionnaire. Some of these were generated through the qualitative study and some were informed by the literature.

In general, each of the themes and sub-themes of talent management and knowledge management are further discussed in the following sections.

11.2.1. A discussion of the qualitative results: Talent management processes

The first key theme explored by this research is talent attraction. The qualitative results confirmed that Queensland universities are interested in attracting prime talent, because talented staff have greatly affect achievment of organisational goals, overall success, and institutional growth in a dynamic industry environment. This theme, according to the views of participants, included two sub-themes: social domain, and organisational excellence.

According to the outcomes of the qualitative phase, social domain involves a number of items such as support in difficult times, social innovation, and work-life balance. These results about the social domain confirm the work of Nogueira Novaes Southgate and Mondo (2017) that was conducted in the Brazilian hotel sector. They state that an organisation can attract more talented employees through providing them with social support at critical times, for example through motherhood and in case of financial difficulties. These results from the social domain theme support the work of Chandra (2012); Lyria (2014); Ogbogu (2017); Schlechter et al. (2014); Thompson (2013) who all note that having an organisation characterised by ideal working conditions can be a motivating factor in attracting talented employees.

Organisational excellence is another sub-theme mentioned by participants, which Australian educational organisations should take note of to attract talented individuals. This sub-theme includes a number of items: talent branding, the reputation of an organisation, organisational culture, organisational climate, and work environment. These findings are consistent with those of Bali and Dixit (2016); He et al. (2012); Li and Devos (2008); Moayedi and Vaseghi (2016); Viktoria Rampl and Kenning (2014), who all concur that talent branding, as a key element of talent attraction, enables organisations to manage the talent of their employees through an organisation's identity, loyalty, and culture; and as a means of attracting potential individuals.

The second key theme explored in this research is talent development. Even though Queensland universities have a willingness to develop their talent, there are some challenges which may obstruct the development process of talented individuals, such as availability of experts of talent management. According to the outcomes of the qualitative phase of this research, the development process of talent involves three

elements: (1) performance management; (2) coaching talent; and (3) leadership development. Similar results were described in Lyria's research and applied in the Nairobi Securities Exchange in Kenya (Lyria 2014). She highlighted a number of themes related to talent development, two of which (leadership development and coaching) were the same as those found in this study.

The first sub-theme of talent development, as stated by participants, was performance management. The majority of the respondents emphasised that Queensland universities are interested in performance management of available talent. According to the sampling views, performance management is one of the core means for excellence. It comprises concepts such as appropriate development strategies, training need identification, and skills gap analysis. These outcomes corroborate with AlKerdawy (2016); Horváthová and Durdová (2011); Kimathi (2015); Lyria (2014); Wu et al. (2016); Xue (2014) who all propose that an organisation should offer its employees appropriate development strategies to improve their strong points; and hence improve their total performance including particular competencies, strengthening their motivation, and boosting their career development. In terms of a skills gap analysis, Queensland universities create job descriptions, learning content systems, and competency models depending on the required training of their talented staff. These outcomes are consistent with Bersin (2013) who does however recommends that an organisation should create a set of simple self-assessments, which describes essential skills required, and experience needed for each functional position in the organisation.

The empirical qualitative results in this study clarified that coaching talent is a key process of talent development in Queensland universities. This sub-theme covers a range of items, including career development programs (e.g. job rotations), learning and teaching orientations, training and mentoring, and other development opportunities. These results correspond to the work of AlKerdawy (2016); Garavan et al. (2012); Kimathi (2015); Lyria (2014); Meyers and Van Woerkom (2014) who point out that coaching talent can be a significant tool for achieving high talent development through learning skills. This view is supported by Cooke et al. (2014) who underline that coaching talent through internal job rotation can develop individual knowledge and leverage experiences from different departments and divisions within an

organisation. In the same vein Al Saifi (2014); AlKerdawy (2016); Prinsloo (2017); Walker (2017) state that training and mentoring programs, such as online learning and teaching courses, allow academic staff to gain required knowledge and skills, and are thus valuable tools for developing talent.

The third sub-theme of talent development is leadership development, which should be focused on by educational organisations to develop talented individuals. This sub-theme includes items such as role-assignment programs of leadership, education to leaders, career development programs, and succession planning. These outcomes are similar to a study by Chami-Malaeb and Garavan (2013, p. 4047) who outline that the leadership development process typically includes 'coaching, multi-source feedback, stretch assignments, mentoring, international job assignments and formal development programmes'. Similarly, Davis and Maldonado (2015); Dopson et al. (2016); Nica (2013); Peet et al. (2010) recommend that innovative organisations should focus on viable leadership development within higher education. Also, the findings on succession planning of leaders are aligned with those of Kimathi (2015); Lyria (2014); Xue (2014) who observe that the importance of embedding succession planning is to contribute positively to developing talented individuals' skills.

In terms of talent retention, which is the third key theme explored in this research, the majority of the respondents expressed the desire of the Queensland universities to retain rare talent represented by academic and professional staff. This is due to great performances provided by those staff and thus their key roles in achieving organisational success. According to the qualitative results, this includes five variables: (1) benchmarking; (2) job satisfaction; (3) non-monetary rewards; (4) employee empowerment; and (5) employee motivation. Similar outcomes were described in Lyria's (2014) research in which she highlighted a number of themes associated with talent retention, two of which were the same as those found in this research (employee motivation and non-monetary rewards).

The first sub-theme of talent retention was benchmarking as it relates to comparison, understanding other universities, and competitive compensation. The respondents emphasised the interest of Queensland universities in benchmarking of current talent, because benchmarking is one of the key strategies for institutional

success as it provides an opportunity to make comparisons to the best universities inside and outside Australia. These outcomes are consistent with the ideas of Dunkerly and Wonh (2017); Horseman (2018) who underline that assessing the current strategies of talent retention of the best performing organisations is considered useful for retaining talented staff within higher education organisations. Similarly, AlKerdawy (2016); Bhattacharyya (2015); Stahl et al. (2007) confirm that competitive compensation is an essential element of success in retaining highly qualified individuals within an organisation that seeks to achieve a competitive advantage, but this may be more relevant for universities in large cities rather than in regional areas.

The second explored sub-theme of talent retention was job satisfaction, and supportive learning environment, work conditions, and treating staff were the key items of job satisfaction within educational institutions. These outcomes corroborate with Asrar-ul-Haq et al. (2017); de Lourdes Machado-Taylor et al. (2017); Lima et al. (2017); Refozar et al. (2017); Walker (2017) who all suggest that job satisfaction could be realised through positive emotional attitudes in workplaces to assist higher education organisations to retain experienced staff and achieve a competitive advantage. In the same vein, Asrar-ul-Haq et al. (2017); Salau (2017); Walker (2017) emphasise that existing high-quality working environments and conditions promote job satisfaction, as they assist in the improvement of performance at both individual and institutional levels.

The qualitative results linked non-monetary rewards as a key factor for retaining talent. These results are in line with Haider et al. (2015); Hina et al. (2014); Lyria (2014); Nyaribo (2016); Uzonna (2013) who regard non-financial rewards as being able to play a crucial role in helping an organisation to retain its talented staff through increasing productive time and engagement among individuals, and consequently improving their productivity. Non-monetary rewards in the higher education sector can be understood in terms of healthcare and safety issues, as well as personal factors (e.g. family matters, acknowledgement, and flexibility). This is corroborated by Hina et al. (2014) who state that non-financial rewards include personal growth, interesting work, participation, flexibility, acknowledgement, significance of role, and recognised achievement. In addition, Belleflamme and Jacqmin (2016) highlight funding external education, promotion, and participation as non-financial rewards in higher education organisations.

Employee empowerment, as the fourth sub-theme mentioned by participants, was seen as an essential element for retaining talented staff working in Queensland universities. Such outcomes underpin previous research conducted in educational institutions by Chitorelidze (2017); Tsai (2012) who state that employee empowerment in academic workplaces assists in retaining talented staff, both academic and professional staff. Employee empowerment can be understood in terms of employee encouragement, promotion, engagement, autonomy, and authority. These outcomes are consistent with Malik et al. (2015); Sandhya and Kumar (2011); Smith (2017) who recommend that successful organisations that seek to increase productivity should empower employees through encouraging creative ideas in decision-making. This result is also supported by Sandhya and Kumar (2011) who underline that employee empowerment is a process that enhances employees by providing them with sufficient responsibility and authority to manage their work professionally

The fifth sub-theme of talent retention was employee motivation as it relates to career advancement, financial rewards, research funds, and employee growth. These participant views are confirmed by AlKerdawy (2016); Anwar et al. (2014); Horváthová (2011); Jindal and Shaikh (2015); Kimathi (2015); Moayedi and Vaseghi (2016); Nakhate (2016); Ogbogu (2017); Veer Ramjeawon and Rowley (2017) who all emphasise that motivational and valued work, professional advancement, and a supportive learning environment can be key in retaining talented employees. Such outcomes further underpin the work of Anyalebechi and Madu (2016); Ogbogu (2017) who recommend that an organisation should offer proper financial rewards to its employees to ensure employee motivation. Similarly, Carter et al. (2011); Kimathi (2015); Schlechter et al. (2014); Thompson (2013) point out that organisations should create opportunities for highly qualified individuals that would improve and develop their career paths.

Overall, the results of the three core themes of talent management above are in line with Bradley (2016); Kamal (2017); Rudhumbu and Maphosa (2015); Wu et al. (2016) who underline that attracting, developing, and retaining talent are essential, in a strategic sense, to the university's success and growth. This view is supported by Ford (2017); Hejase et al. (2016); Kim et al. (2014); Rothwell (2011); Rothwell et al. (2014); Tatoglu et al. (2016); Waheed et al. (2013) who point out that talent attraction,

retention, and development of constitute essential strategic elements in contemporay ephemeral knowledge economies, as they assist organisations to fulfill their strategic business objectives, meet their basic business needs, and set up the foundation for the implementation of their business strategies. Similarly, Kataike (2013); Mohammed et al. (2017); Mwangi et al. (2014); Suk Kim and Kotchegura (2017); van den Broek et al. (2018); Xue (2014) argue that organisations that establish their principal competence in talent attraction, talent development, and talent retention guarantee their own stability and growth in relation to their competitors in the same business sector. Thus, the qualitative findings of this research project regarding talent management processes support talent management theories through an emphasis on human capital as a strategic resource whereby staff should be attracted, developed, and retained to achieve a competitive advantage (Kim et al. 2014). In addition, these findings underpin resource-based theory through a focus on talented individuals as a rare and strategic resource that can be used to achieve a competitive advantage (Coff 1997; Grant 1991; Wade & Hulland 2004).

11.2.2. A discussion of the qualitative results: Knowledge management processes

The first key theme uncovered in this study is knowledge creation. According to the views of participants, this theme included four categories: socialisation, externalisation, combination, and internalisation. The universities in Queensland generate information through their learning processes. The creation of new content is based on the organisations' tacit and explicit knowledge. In educational organisations in Queensland, explicit knowledge is created during social interaction in various formats (documents, video, electronic, audio, visual, etc.) within various organisational units (faculty, academic, student-focused, and administration). The outcomes around knowledge creation in Queensland universities were shown to be similar to those mentioned in previous studies by Kasemsap (2017); Masa'deh et al. (2017); Oktavia et al. (2017); Sunalai and Beyerlein (2015); Veer Ramjeawon and Rowley (2017) who state that knowledge creation represents learning processes through social interaction among various educational units, which is significant to the university's functions.

The first category of knowledge creation was socialisation. Participants in the qualitative study perceived socialisation in terms of encouraging creativity and innovation, effective discussion among learning teams, and learning skills (by for example, observation). These results are in line with de Aguiar and Paterson (2017); Ganesh and Pravin Kumar (2017); Sasaki (2017) who all observed that employees learn tacit skills from each other through observation, imitation, or practice. This outcome also aligns with the work of Cao et al. (2012); Offong and Costello (2017) who state that converting tacit knowledge among an organisation's individuals occurs through writing and learning from written knowledge, such as about technology from colleagues, e.g. in the process of writing a journal paper.

The qualitative outcomes connected externalisation as a key element for creating new knowledge. This was expressed in terms of the university seeking external technology solutions for knowledge management problems (e.g. search ability or accessibility), creating new knowledge through research and publication, and acquiring new knowledge from investigation of external sources. These participants' views are confirmed by Hung (2014) who recommends that an organisation should develop new techniques to appraise the performance of talented individuals, and offer opportunities for learning outside the university (e.g. sabbaticals). In the same vein, Li et al. (2009) outline that the organisation can adopt a problem-solving system and collaboration tools for group work (e.g. meetings). Similarly, Sankowska (2013) states that the organisation can more easily create new knowledge if this is shared through effective communication strategies.

The third sub-theme of knowledge creation in this research was a combination of factors, which can be summarised in terms of access to online databases, supporting communication, and supporting work technology. Li et al. (2009) highlight that information repositories, best practices, lessons learned, and online access to data, as best practice, should be adopted by organisations.

Internalisation, as the fourth sub-theme mentioned by participants, is a vital element for creating knowledge within Queensland universities. It can be understood in terms of creating learning policies and procedures; designing, developing, and building appropriate technological systems and solutions; and accessing support when learning

through practice (e.g. for teaching or course content development). Such outcomes match the findings of prior research conducted in the higher education sector by Oktavia et al. (2017) who emphasise that internal new knowledge can be created through the learning and teaching process within educational institutions. The result of internalisation is also supported by Li et al. (2009) who state that internally created knowledge inside the organisation can take the shape of 'on-the-job training', and learning by observing practice.

The second key theme of this research was knowledge transfer. The results of knowledge transfer indicated that this process is essential to academic functions. These outcomes are in line with the views of Nicolae and Vitelar (2013); Rambe and Mbeo (2017); Sunalai and Beyerlein (2015) who underline that knowledge transfer is significant to the functioning of academic organisations. In the same vein, Fullwood and Rowley (2017); Kasemsap (2017); Rambe and Mbeo (2017); Veer Ramjeawon and Rowley (2017) confirm that knowledge transfer plays a strategic role in improving the educational and financial performance of universities through consultancies, working with businesses and other organisations, communication, intergenerational training, and popularisation of science.

The qualitative results regarding the knowledge transfer theme emerged in two categories: codification and personalisation. This result was in line with the thoughts of Rhodes et al. (2008); Tangaraja et al. (2016); Venkitachalam and Willmott (2016) who have stated that codification and personalisation are key categories of knowledge transfer. In terms of codification, according to the opinions of participants, information within educational organisations is transferred explicitly through the use of e-mail, meetings, discussions and internal networks, mail, staff profiles and the intranet. These findings are also supported by Abd Rahman et al. (2013); Rhodes et al. (2008); Tan and Wong (2015) who highlight that the codification of knowledge transfer occurs through the use of technological tools by individuals such as e-mail, meetings, documents, discussions, and internal networks.

Personalisation was another factor mentioned by participants which, Queensland universities need to focus on to explicitly or tacitly transfer individuals' experiences. It can be comprehended in terms of both formal mechanisms (e.g. training courses,

seminars, workshops, and presentations); as well as informal mechanisms (e.g. face-to-face discussions). These results are supported by the ideas of Abd Rahman et al. (2013); Elfar et al. (2017); Ganesh and Pravin Kumar (2017); Mašić et al. (2017); Reichardt et al. (2009); Rhodes et al. (2008); Tan and Wong (2015); Wiewiora et al. (2015) who recommend that an organisation should transfer employee experiences to other employees using indirect communication (e.g. training courses and presentations).

The third key theme explored in this research was knowledge sharing. The empirical results in the study demonstrated that knowledge sharing was widely used in Queensland universities. This finding is underpinned by an of Sunalai and Beyerlein (2015); Veer Ramjeawon and Rowley (2017) who state that knowledge sharing is a primary factor in knowledge management research in higher education. Qualitative participants with a high level of responsibility talked about the importance of sharing information both inside and outside the university. This suggests that sharing information is a key process of knowledge management in the higher education environment. These outcomes are consistent with statements by Ali et al. (2014); Fullwood and Rowley (2017); Howell and Annansingh (2013); Nicolae and Vitelar (2013); Sharma and Harsh (2017); Yasir et al. (2017) who have all observed that information sharing is essential for educational organisations to overcome the challenges of the knowledge community.

Overall, the qualitative findings of this study regarding knowledge management processes support knowledge-based theory by highlighting that knowledge can be represented in the shape of an organisation's capability, know-how, and information; and that creating and transferring this knowledge can produce a competitive advantage (Blome et al. 2014; Gioacasi 2015; Lee et al. 2017). In conclusion, although the qualitative findings of this study were consistent with some of the prior studies about talent management and knowledge management, there are major variances. This study is one of the earliest studies that examines both of these constructs in Australian higher education. The consistency with previous research was partial and either conceptual, theoretical, or related to methodological matters.

11.3. The research discussion of the quantitative results

This study has developed a conceptual model to investigate the relationship between talent management processes (talent attraction, talent development, and talent retention) and knowledge management processes (knowledge transfer, knowledge creation, and knowledge sharing). This investigation was based on data gathered from nine public and private universities in Queensland. This section discusses the quantitative results that were shown in chapter nine and ten of the study. The discussion includes practical outcomes of descriptive statistics and multivariate data analysis, which comprises Pearson correlation, simple regression, and SEM.

11.3.1. Descriptive statistics

11.3.1.1. Mean variances via respondent characteristics

Looking at the results of demographic features, and compares means using one-way analysis (refer to Chapter 9: Tables 9.3 and 9.4), the findings of demographic characteristics show that the highest number of respondents were from QU8 (20.3%). Analysis of variance illustrates that there were no significant differences in their responses regarding talent management processes within the university group. This means that respondents of Queensland universities all understood that talent management processes do not differ significantly between one university and another. However, they differed significantly in their views and understanding towards knowledge management processes. This indicates that there is significant variance in terms of interest in transfer, creation, and sharing of knowledge in the researched universities. This variance may be due to the differences among the researched universities in terms of the quality of technology that was being utilised within the university; quality levels of publications research; a culture of sharing information among staff members; knowledge transfer and creation levels among employees; university ranking and educational excellence; and/or awareness of work instructions, as well as other policies that are related to knowledge management. However, further research could be carried out to explore the reasons behind these variances.

These findings are supported by previous studies by Al-Sabawy et al. (2013); Santosh and Panda (2016) who state that utilisation of proper technology becomes a crucial contributor to the university's growth and success as well as the achievement of both institutional and individual objectives. Furthermore, prior research has highlighted the key role of the quality of technology utilised to improve the productivity of institutional individuals, such as more powerful workstations, faster networks, and employee development programs (Al-Sabawy et al. 2013; Samoilenko & Ngwenyama 2011). Other research, by Baptista Nunes et al. (2017); Kasemsap (2017); Rambe and Mbeo (2017); Santosh and Panda (2016); Yasir et al. (2017) underlines that universities seeking to excel in their internal and external activities should focus on advancing educational technologies; doing high-quality research, learning, teaching; and publishing in high-grade academic journals. In regards to the importance of sharing information, practical previous reseach by Fullwood and Rowley (2017); Howell and Annansingh (2013); Naeem et al. (2017) states that a culture of sharing best practices amongst staff members helps in meeting both organisational and individual objectives for educational organisations. In addition, the findings of Cruz-Castro et al. (2016); Horseman (2018) regarding university ranking emphasise that high reputation and university ranking are essential contributors to educational excellence.

In terms of academic and professional positions, as noted from the demographics, there was a roughly equal number of men and women. These results indicate that gender equality contributes to work in Queensland universities, and they are a good indication for researched universities regarding equal opportunities for males and females. In this regard, previous research by Tatli et al. (2013, p. 539) has indicated that 'gender inequalities in recruitment, retention and career development prevent talented women achieving equal outcomes at work as similarly to talented men'. The one-way analysis of variance towards the gender group confirmed that respondents by the gender group understood managing talent and knowledge in similar ways. This outcome aligns with previous research by Erasmus et al. (2015); Khasawneh (2011) who note that there is no significant variance between talent retention as a key part of talent management and gender in higher education institutions. Focusing on knowledge management processes, the results around gender were consistent with previous research of Chidambaranathan and Swarooprani (2015); Yusoff et al. (2012)

who found that there was no significant variance between males and females in knowledge management in higher education institutions.

Furthermore, the majority (31.1%) of the research respondents were between 40-49 years of age. In terms of research experience, the majority (42.7%) of respondents had five to ten years experience. These senior individuals can benefit their universities in terms of strategic planning through translating their visions, missions, and goals into desired performance. Having senior talent is a great index, which assists these universities to attract more students and conduct high-quality teaching and learning, conduct high-level research, and thereby secure funds for further research. These findings are consistent with those of Bradley (2016); Hazelkorn (2017); Horseman (2018); Lynch (2015); Refozar et al. (2017) who state that knowledgeable and skilled individuals contribute significantly to a university's performance in terms of monetary, technical, and scientific advantages. Nonetheless, there were significant differences for both the research variables within the respondents' age and their expertise years groups. This means that the age and the number of expertise years levels of the sample were significantly different in their comprehension of the managerial processes of both talent and knowledge among the researched universities. The results of age and the number of years of expertise levels were consistent with previous research by Lyria (2014) who stated that talent mangement is impacted by age of highly qualified employees; and Melon et al. (2016) who found that there was a significant difference between applied knowledge management and age as well as academic years. However, Chidambaranathan and Swarooprani (2015) found in their study that there was no significant variance between the ages of respondents and knowledge management in higher education institutions.

All participants had an academic qualification. Talented individuals who had a doctorate qualification were the largest portion of the research respondents (49.3%). This indicates that the majority of the research sample had a high scientific qualification, and thereby a higher awareness level about the research topic. However, the results of the one-way analysis indicate that there was also significant variance for both talent management processes and knowledge management processes within the academic qualification group. This means that the academic qualification group of respondents (diploma, bachelor, master, and doctorate) had a different understanding

of both research variables, and thus the holders of different certificates understood the managerial processes of talent and knowledge differently. This finding is supported by earlier studies of Melon et al. (2016) who found that there was significant variance between knowledge management and academic qualification. On the other hand, Chidambaranathan and Swarooprani (2015); Yusoff et al. (2012) noted that there was no significant difference between academic qualifications and knowledge management in highly educational institutions.

Of those surveyed, there were roughly equal numbers of professional and academic staff. The two working in functional balance is a natural phenomenon within organisational structures of higher education institutions. In regard to analysis of variance, the results of demographic characteristics show that there were no significant differences in responses regarding talent management processes within the current position group or between Queensland universities. This means that respondents of the Queensland universities do not differ significantly between one university and another, and thus understand talent management processes of attraction, development, and retention in similar ways. This finding does not correspond with previous research of Erasmus et al. (2015) who found that there was a significant difference between talent retention as a key process of talent management and staff (professional and academic) in different educational institutions. Conversely, they differed in their understanding of knowledge management processes. There were significant differences in orientation towards transfer, creation, and sharing of knowledge in the researched universities. This could be due to the variances in consciousness, job instructions, rules, and environments that are related to knowledge management processes among the researched universities. Nonetheless, further examinations could be carried out to explore the reasons behind these differences. This finding is not supported by an earlier study in higher education institutions by Yusoff et al. (2012) who found that there was no significant variance between job designation and knowledge management in educational institutions.

11.3.1.2. Univariate analysis

There were six core processes tested in this study: talent attraction, talent development, talent retention, knowledge transfer, knowledge creation, and knowledge sharing.

Here, the discussion includes level of importance for each process that was used in the study according the views of the participants in the research sample. This research firstly explored the statistical description of talent management processes, followed by a discussion of knowledge management processes.

11.3.1.2.1 Univariate analysis of talent management processes

Looking at the results of demographic features, and compares means using one-way analysis (refer to Chapter 9: Section 9.4.2), talent attraction is the first and most important process among talent management processes. This importance is represented by social domain and organisational excellence of the university. These results indicate that the researched universities seek to provide social networking activities for employees, and create an appropriate organisational climate in order to attract the appropriate talent. These findings are supported by Chandra (2012); Kimathi (2015); Thompson (2013); Yap (2016) who point out that socialising with colleagues, lifestyle opportunities, or appropriate locations are determinant factors for attracting new talented individuals. Also, these outcomes further support ideas of Lyria (2014); Schlechter et al. (2014); Thompson (2013) who have confirmed that organisational climate is a determinant of attracting new talented employees.

However, the policies and procedures that are being applied in researched universities to support the staff community through involvement in social, cultural, or economic initiatives appear to be insufficient. A key concern is the lack of plans, programs, or policies that organise these practices as strategic priorities for the best academic and professional staff. This indicates that these practices may be randomly carried out by the researched universities, which may negatively impact on the ability of the universities to attract more talent. Social facilities provided by the university are fundamental factors in attracting talent. Nogueira Novaes Southgate and Mondo (2017) emphasise in this respect that social services provided by an organisation, such as social support in critical times, for example motherhood or financial difficulties, are essential elements in attracting talent.

In terms of university rankings, there was variance across universities. Some participants said university rankings do not affect the attraction of talent. Some

universities have a relatively low ranking which does not enable them to attract the best academic and professional staff. A low ranking may become a factor in the current talented staff leaving the university. Highly qualified staff may be willing to consider more options or alternative opportunities by moving to other high-ranking universities even if these are a considerable distance away. Talented individuals who leave might negatively influence a university's performance in attracting new students, conducting high-quality teaching and learning, conducting high-level research, and securing funds for further research. In particular, some universities in Queensland employ strategies to improve their research performance and ranking (Diezmann 2018). University ranking is significant for attracting talented individuals, and as Cruz-Castro et al. (2016); Horseman (2018) state, university rankings are a key element of organisational excellence which in turn has an impact on the ability to attract talented individuals. In this case, social domain and university ranking of talent attraction were used in this study and they may only be supported in other universities that were not included in this study inside or that are outside Australia. Moreover, it could potentially be supported, which could be uncovered by examining other items that were not used in this study in order to obtain findings that could be statistically compared.

According to the perceptions of the participants in the research sample, talent retention is the second most important process among talent management processes. This importance was represented by five elements: benchmarking, job satisfaction, non-financial rewards, employee empowerment, and employee motivation. These findings indicate that Queensland universities seek to provide talented individuals with flexibility in terms of work hours, roles and tasks; provide them with sufficient freedom to actively perform their jobs; provide them with opportunities to develop their careers; and provide space for relationship building between managers and their employees. In accordance with the current results, past research has demonstrated that personal growth, interesting work, participation, flexibility, acknowledgement, significance of role (Hina et al. 2014), self-efficacy in the workplace (Saleem et al. 2017; Twyman-Abrams 2017), career opportunities, and relationships with supervisors (Asrar-ul-Haq et al. 2017; Lima et al. 2017; Salau 2017) are all essential aspects to retain highly qualified employees.

On the other hand, according to the research respondents, there is more work to be accomplished by Queensland universities in regard to the policies of strategic benchmarking with overseas universities to evaluate talent retention strategies. It is apparent that there is a lack of awareness by Queensland universities about the importance of benchmarking for talent retention. Strategic benchmarking is a leading cause of organisational growth. Given the evidence for this, Dunkerly and Wonh (2017); Horseman (2018) underline that strategic benchmarking allows an organisation to assess its current strategies of talent retention against the best performing organisations, thereby maintaining organisational stability and growth. At the same time, there are some limitations in providing the qualified employees with individual funding for academic research. These limitations might be impacted by top management rules at the researched universities around reducing expenses, including research, to increase profits. Decreasing financial support for academic research may negatively impact on the total scientific productivity of the higher education sector in general and the university specifically. There is no doubt that scientific research is of principal importance for developed countries. It is the foundation of a knowledge-based economy, sustainable development, and the creation of a "knowledge society". This idea is supported by Goldfarb (2008, p. 42) who states that ‘understanding the mechanisms of science funding is especially pertinent considering the importance of scientific research to technological change’. In the same vein, Beaudry and Allaoui (2012); Blume-Kohout et al. (2009) found that individual research funding can positively impact the scientific output of the university.

Additionally, with the policies and procedures that are applied in the researched universities for job satisfaction, non-financial rewards are insufficient to satisfy talented individuals. This means that there are some issues that negatively impact on job satisfaction, such as unsuitable work conditions, bad relationships with supervisors, or limited career opportunities, and they may also negatively impact on educational performance. This finding is broadly supported by Asrar-ul-Haq et al. (2017); Salau (2017); Walker (2017) who have stated that existing high-quality working environments and conditions promote job satisfaction, which assists the improvement of performance at both individual and institutional levels. Adding to this, there are some restrictions to employee empowerment in regard to career enrichment programs in the researched universities. This might be influenced by top management

policies that do not include employees in decision-making or self-efficacy in their workplaces, nor seek their input resolution in their issues, which in turn means losing out on creative thinking, accountability and insights from employees. These findings are somewhat surprising given the fact that other research shows employee empowerment in educational workplaces assists in retaining highely qualified individuals (Chitorelidze 2017; Tsai 2012). Similarly, Malik et al. (2015); Sandhya and Kumar (2011); Smith (2017) argue that involving employees in decision-making can increase the individual and organisational productivity.

Talent development was the third and final identified level of importance in talent management processes. This outcomes demonstrates that the policies of the researched universities are determined by training needs of talented individuals who have the desired skills; providing staff with training programs and career development opportunities; and assisting leaders to be professionals through career development programs. These empirical results are consistent with ideas expressed by Brunila and Baedecke Yllner (2013); Chami-Malaeb and Garavan (2013); Joo et al. (2012); Yap (2016) who point out that leading institutions provide their highly qualified staff with career development opportunities to continually develop them. Similarly, Prinsloo (2017); Walker (2017) state that training and mentoring programs are valuable tools for developing talent. In addition, these results are in agreement with Bradley (2016); Mohan et al. (2015) who have emphasised that high-level leadership provides talented individuals with sufficient opportunities to benefit from functional planning programs.

Succession planning and processes for identifying alternative talented employees for leadership positions were not identified as strong points by respondents. This indicates that researched universities may confront challenges in terms of selecting the right candidates for leadership positions. In this regard, Osigwelem (2017); Rothwell (2005) recommend that obtaining the right candidate with suitable skills in the correct roles should be managed by succession planning. Furthermore, human resource planning in the researched universities was relatively insufficient for their talented staff. This might impact negatively on the university's performance. In this respect, Beardwell and Thompson (2014); Cappelli (2008a); Cui et al. (2016); Lewis and Heckman (2006); Visuri (2014) have all recommended that an organisation should develop a plan to meet organisational resource needs, in order to attract individuals

with the appropriate skills in the appropriate area of work. Additionally, there is more work to be accomplished by Queensland universities to increase the activity of internal job rotation, which benefits the transference of talented employees' experiences and development amongst divisions of the university. Increasing this activity may assist the university in establishing talent pools As Rothwell (2005) states, multifaceted contributions to an organisation are made by job rotation, which assists in reaching high potential through exposure to many organisational units.

11.3.1.2.2 Univariate analysis of knowledge management processes

Looking at the results of demographic features, and compares means using one-way analysis (refer to Chapter 9: Section 9.4.2), that knowledge transfer is the first important process amongst knowledge management processes. This importance lies in codification and personalisation of knowledge transfer. These results indicate that universities seek to transfer information using e-mail, meetings, discussions and internal networks, as well as face-to-face discussions. As Abd Rahman et al. (2013); Li and Devos (2008); Rhodes et al. (2008); Tan and Wong (2015) point out, using technical tools such as e-mail and meetings are essential for organisational units to transfer knowledge.

Conversely, there are some restrictions that academic and professional staff members can face when they are using a university social network. Furthermore, there are some limitations in transferring experiences and abilities among academic staff members. This might be due to sensitive or personal information that a talented individual owns, for example in the form of copyright. These findings contrast with previous research, which has suggested that to improve personal and institutional productivity, employee experiences should be transmitted to other staff members (Abd Rahman et al. 2013; Ganesh & Pravin Kumar 2017; Rhodes et al. 2008; Tan & Wong 2015).

Knowledge creation is the second important process as part of knowledge management processes. This importance derives from four categories: socialisation, externalisation, combination, and internalisation. These outcomes demonstrate the universities' efforts to support technology and information technology systems,

software and equipment; the creation of new knowledge through research and publications; the provision of on-the-job training; and efforts to enable creativity and innovation through collaboration among talented individuals. In accordance with the outcomes of this study, past research has demonstrated that creation of new information can be achieved through on-the-job training (Li et al. 2009); by changing explicit knowledge into new and more systematic groups of knowledge and subsequently disseminating those amongst organisational colleagues (de Aguiar & Paterson 2017; Sasaki 2017; Von Krogh et al. 2012); by converting tacit knowledge into new formats for the comprehension of others for example in the from of publications (de Aguiar & Paterson 2017; Sasaki 2017); and by encouraging employee creativity and innovation through collaboration (Tho & Trang 2015).

Nevertheless, there are some difficulties in converting tacit knowledge amongst an organisation's individuals when it comes to creative discussion through learning processes. Also, there is variance across universities in the number of responsible employees to manage and advise on learning processes. Talented individuals may be hesitatant in passing their new knowledge to other employees, which then inhibits the creation of new knowledge and the sharing of ideas among educational colleagues. This outcome contrasts with that of Steyn (2004); Tho and Trang (2015); Tyagi et al. (2015) who recommend that to create new tacit knowledge, an organisation should encourage employee creativity and innovation through collaboration. Likewise, creating new knowledge in the form of information repositories, best practices, lessons learned, meetings, conferences, seminars, and SharePoint, asthey are provided by the researched universities, were not identified as strong points by respondents. This could be linked to the availability of staff on the day of the meeting; weakness of trainers, trainees, or both; a lack of financial support provided for conferences; and difficulties in accessing software or insufficient experience of an employee with application software, e.g. SharePoint. All mentioned factors should be considered by Queensland universities to increase knowledge creation. In this regard, Li et al. (2009) underline that problem-solving systems and learning collaboration tools for group work (e.g. meetings) are effective ways of creating information. Similarly, Nicolae and Vitelar (2013) have emphasised the importance of ideas and academic conferences in creating new knowledge, while Rambe and Mbeo (2017) recommend that SharePoint should be easily accessible by academic staff to create knowledge.

The third and final important process among knowledge management processes is knowledge sharing. The findings in this study indicate that the university seeks to develop skills of academic colleagues through sharing information via group interaction, individual collaboration, and library resources. This result is in agreement with results obtained by Howell and Annansingh (2013, p. 33); Naeem et al. (2017); Shih and Tsai (2016); Tan and Ramayah (2014) who have stated that collaboration and discussion practices between academic groups increase their experiences and capabilities. However, the researched universities have some limitations in regard to reciprocal collaboration and sharing information methods with other universities. This might be prudent behaviour as there is some valuable information that could cost the university dearly if it is freely transferred to another university.

However, sharing information should be effectively managed by the researched universities to internally and externally activate reciprocal collaboration among other universities. This assists the university to be in continuity with the dynamic higher education environment. In this respect, Howell and Annansingh (2013); Veer Ramjeawon and Rowley (2017) confirm that to continue competitively in the knowledge-based economy, universities need to professionally manage their knowledge sharing practices.

11.3.2. The relationship between talent management processes and knowledge management processes in Australian higher education

This subsection discusses the results of three different analysis techniques that were used to examine the relationship between talent management processes and knowledge management processes in the Australian higher education sector, including Pearson correlation, simple regression, and SEM. Pearson correlation analysis in this study demonstrated that talent management processes (independent variables) are contributing significantly to knowledge management processes (dependent variables). This means that an increase in one process leads to increase in another process. This outcome corroborates previous research by Daraei et al. (2014); Norhafizah (2016); Rahimi et al. (2015) who have also shown that there is a positive and significant relation between talent management and knowledge management.

The second core objective of this study was to investigate the relationship between talent management processes and knowledge management processes. This objective was achieved by testing the research hypotheses using simple regression analysis as the first generation analysis technique to comprehend the relationship level between talent management processes and knowledge management processes. This analytical procedure is supported by Baig (2010); Chin (1998a); Gefen et al. (2000); Jeon (2015) who have emphasised that regression analysis is a powerful method when the aim is to comprehend the relationships between independent composite variables and dependent composite variables. SEM was subsequently used as the second generation analysis technique to provide improved comprehension of the relationship between talent management processes and knowledge management processes in Australian higher education. SEM provided a progressive level of statistical analysis and confirmed the results that were obtained by simple regression analysis by providing a further investigation into the relationship between the mentioned research topics.

The strategy of using both analysis techniques in one research project is supported by Chin (1998a) who has suggested that using simple regression and SEM analysis methods in one study provides greater flexibility to the researcher through examining the relationship between theory and data. Similarly, Chin (1998a); Graham (2003); Hair et al. (2011); Jeon (2015) have reinforced this. They recommend that using two quantitative analysis techniques in the study to achieve the same research objective assists in the maximisation of reliability for the quantitative findings. Other academics and researchers like Awang (2012); Chin (1998a); Gefen et al. (2000); Hair et al. (2010); Hair et al. (2011); Musil et al. (1998); Schumacker and Lomax (2010) have highlighted that using SEM as the second generation analysis technique provides enhanced comprehension and assists with an examination of the extent to which the study has met recognised standards for highly qualified statistical analysis.

The results of simple regression analysis revealed that all the relationships between talent management processes (independent variables) and knowledge management processes (dependent variables) in the Australian higher education sector are strongly and significantly positive. These findings are consistent with previous research byKeat and Abdullah (2017) who concluded that there are significant impacts from different talent management processes, including attraction, development, and retention and

knowledge management. However, regression paths conducted using SEM showed that seven out of nine alternative hypotheses were positively significant. Even though the same data set was used for the two analytical techniques, the standardised coefficients were different between simple regression and SEM analyses.

One of the key reasons behind this difference is that the algorithms utilised in each technique are different. In addition, in SEM, all independent and dependent composite variables are simultaneously included in the hypothesised structural model, contrary to the simple regression analysis model in which only one dependent composite variable is included. In this regard, Jeon (2015) provides some reasons for the difference in results obtained using these techniques. He states that SEM applies multiple statistical methods (e.g. CFA, path analysis, correlation analysis, and structural errors in dependent composite variables) as well as other complicated relationships among composite variables in a single causal model. There is a possibility for inference of causal relationships between dependent composite variables which are affected by both independent composite variables and structural errors (Jeon 2015). Similarly, Gefen et al. (2000) provide two further reasons for the differences in the results obtained by regression analysis and SEM analysis. First of all, regression anlysis cannot provide a partial variance for the whole model. Secondly, 'the assumptions and algorithms used in each of the techniques [change] quite a bit and this could be the explanation' (Gefen et al. 2000, p. 20). Furthermore, the significant difference between the two mentioned analysis techniques may lie in residual analysis. As per Baumgartner and Homburg (1996), residual analysis of SEM indicates the difference of the observed and estimated variance-covariance matrices. On the other hand, residual analysis in the case of regression analysis refers to 'the difference between observed and predicted values of a dependent variable' (Baumgartner & Homburg 1996, p. 155).

The results optained using SEM were only adopted and included in the discussion and conclusions of this study, because this method provided an opportunity to conduct an inclusive investigation into the conceptual model of the study as one integrated entity. Furthermore, the SEM technique produced more accurate casual relationships between independent composite variables and dependent composite variables of the study than the simple regression analysis technique would have. This argument is

supported by Baumgartner and Homburg (1996); Golob (2003); Jeon (2015); Lei and Wu (2007); MacCallum and Austin (2000); (1998) who have stated that SEM is better than regression anlysis. Similarly, Baumgartner and Homburg (1996); Golob (2003); Jeon (2015); MacCallum and Austin (2000); Musil et al. (1998) have argued that SEM provides more accurate causal relations between composite variables and is more meticulous with regards to evaluating the size of an effect, statistical significance, fitting measurement and structural models, as well as appropriateness of the data.

Looking at the results of the research hypotheses using SEM (refer to Chapter 10: Table 10.18), talent attraction, talent development, and talent retention positively influence knowledge transfer, knowledge creation, and knowledge sharing. These results support the designed hypothesised model of the study. However, talent attraction has no significant effect on both knowledge transfer and knowledge sharing. This means that if a university's intent is to enhance knowledge transfer and knowledge sharing, the university should invest in the development and retention of talent more than in attracting new talent. The discussion of this investigation is detailed in the following sections.

11.3.2.1 Hypothesis 1

Regression paths of the first hypothesis (refer to Chapter 10: Table 10.18) revealed that there is no significant positive influence of talent attraction on knowledge transfer in the university sector in Australia, and allowed **acceptance of $H1_0$** and **rejection of $H1_1$**. To explain, social support in difficult times, as well as university reputation and ranking, are not significantly underpinned by transferring information using e-mail, meetings, discussions and internal networks, the intranet and databases; saving and renewing important information accessed through a computer for easy browsing; accessing appropriate knowledge systems and software for transferring information; and transferring experiences or abilities to other employees. This means that if a university's intent is to improve knowledge transfer, the university should not invest in attracting new talent.

This result is not consistent with previous research conducted in Malaysian private colleges by Khor (2017), which showed that there was a significant positive influence of talent attraction on knowledge transfer. Likewise, this outcome does not support the

results of prior research (conducted outside the higher education sector) which have suggested that implementing effective talent attraction may lead to the implementation of knowledge transfer (Kim et al. 2014; Vaiman et al. 2015). Surprisingly, Chadee and Raman (2012a) concluded in relation to offshore information technology service providers in developing countries that talent management enhances their ability to achieve excellence in performance through the effective use of knowledge transfer. Thus, the link between talent attraction, as a key process of talent management and knowledge transfer, may be supported only by other organisations that are outside the higher education sector. Moreover, it could be supported by examining other items that were not tested in this study to obtain findings which could be statistically compared with the findings in this study.

11.3.2.2 Hypothesis 2

The outcomes of examining the conceptual study model underpinned hypothesis two and emphasised the key role of talent development in transferring educational knowledge at the significant level of 0.001 (refer to Chapter 10: Table 10.18), and allowed **rejection of $H2_0$** and **acceptance of $H2_1$**. To clarify, personalisation and codification of knowledge transfer significantly impact on training and mentoring programs; determining training needs; and facilitating employee performance and development. Likewise, transfer of academic knowledge significantly and positively supports talent to become leaders; assists leaders to be professionals; provides staff with effective talent development strategies and career development opportunities; and includes leaders with the design of all job roles. This means that performance management, coaching talent, and leadership development are positively and significantly supported by transferring information using e-mail, meetings, discussions and internal networks, the intranet and databases; and transferring experiences or abilities to other employees. Moreover, it means that if a university's intent is to enhance knowledge transfer, the university should invest in the development of talent.

This outcome is consistent with previous research conducted in Malaysian private colleges by Khor (2017), which has shown a significant positive effect of talent development on knowledge transfer. Furthermore, comparison of the outcomes of those previous studies (conducted outside the higher education area) confirms that

talent development has a direct influence on knowledge transfer towards institutional goals (Ling 2016; Prinsloo 2017; Vaiman et al. 2015). This means that implementing organisational knowledge transfer contributes fundamentally to optimising the capabilities of organisational individuals (Egerova et al. 2013; Li & Devos 2008). Similarly, Li and Devos (2008); Ling (2016) report that an organisation can successfully develop a talent factory by establishing talent development pathways to maximise employees' potential. In addition, skills development, coaching, and a successful utilisation of mentoring can ensure knowledge transfer (Prinsloo 2017). Finally, leaders thus developed support a communication process and knowledge transfer among departments of an organisation (Peet et al. 2010; Prinsloo 2017).

11.3.2.3 Hypothesis 3

Hypothesis three focused on an investigation of the relationship between talent retention and knowledge transfer in Australian universities. The outcomes (refer to Chapter 10: Table 10.18) revealed that there was a significant positive effect of talent retention on knowledge transfer at the significant level of 0.05, and allowed **rejection of $H3_0$** and **acceptance of $H3_1$**. To simplify, providing a highly competitive compensation system and flexibility in work hours, roles and tasks, as well as financial rewards or remuneration, are positively and significantly impacted by transferring information using e-mail, meetings, discussions and internal networks, the intranet and databases; and by transferring experiences or abilities to other employees. In addition, the stated components of benchmarking, non-financial rewards, and employee motivation are positively affected by saving and renewing important information accessed through a computer for easy browsing; and by accessing appropriate knowledge systems and software for transferring information. This means that if a university's intent is to improve knowledge transfer, the university should invest in the retention of talent.

This outcome is in agreement with previous research conducted in Malaysian private colleges by Khor (2017) which has shown a significant positive influence of talent retention on knowledge transfer. Such an empirical outcome is in line with the ideas of Calo (2008); Rambe and Mbeo (2017); Reilly (2008) who have stated that one of the most important strategies for organisations that seek to expand greatly is talent

retention, that is used to facilitate and ensure the knowledge transfer among employees within the organisation. These outcomes are also supported by Koseoglu et al. (2010) who determined that when organisational individuals transfer their knowledge with others, it assists with increasing their retention and satisfaction rates (Kianto et al. 2016).

11.3.2.4 Hypothesis 4

Hypothesis four emphasised the investigation of the relationship between talent attraction and knowledge creation in Australian universities. Contrary to expectations, this study did not find a significant effect between these variables (refer to Chapter 10: Table 10.18) and allowed **acceptance of $H4_0$** and **rejection of $H4_1$**. To explain, social support in difficult times, as well as university ranking and reputation, were insignificantly supported by encouraging social learning through employees' discussion; by designing, developing, and building appropriate technological systems and solutions; and by having effective methods for creating learning policies and procedures. Also, the aforementioned components of social domain and organisational excellence were significantly influenced by knowledge creation through creativity and innovation, creative discussion via the learning process, and skills development. This means that if a university's intent is to enhance knowledge creation, the university should not invest in attracting new talent.

This outcome does not align with the results of previous research conducted in Malaysian private colleges by Khor (2017) which showed there was a significant positive influence of talent attraction on knowledge creation. Yet, that outcome does not match the findings of other prior research (conducted outside the higher education sector) by Rahimi et al. (2015) who found a significant effect of talent recruitment on knowledge creation in Amirkabir Petrochemical Company, Mahshahr. Furthermore, this result does not support other researchers such as Chadee and Raman (2012a); Daraei et al. (2014); Egerova et al. (2013); Whelan and Carcary (2011) who have all stated that the advancement of knowledge creation can be achieved by conducting talent attraction practices as an essential element of the talent management system. In the same vein, Frank and Taylor (2004); Scaringella and Malaeb (2014) have emphasised that talent attraction assists organisations in enhancing their abilities in

creating individual knowledge, by providing the best way to meet major challenges through reducing knowledge creation gaps among employees at various organisational levels. In this investigation, the connection between talent attraction and knowledge creation could be underpinned only in other institutions that are outside the university sector. Otherwise, it could be supported by investigating other items that were not examined in this study to obtain outcomes which could statistically compare with this study's empirical outcomes.

11.3.2.5 Hypothesis 5

The results (refer to Chapter 10: Table 10.18) of testing the research model buttressed hypothesis five and highlighted the strategic role of talent development in creating academic knowledge in Australia at the significant level of 0.001, and allowed **rejection of $H5_0$** and **acceptance of $H5_1$**. To clarify, developing talent through training and mentoring programs; determining training needs; facilitating employee performance and development; supporting talents to become leaders; assisting leaders to be professionals; providing staff with effective talent development strategies and career development opportunities; and including leaders in the design of all job roles, were all significantly and positively supported by:

- encouraging social learning through employees' discussion;
- designing, developing, and building appropriate technological systems and solutions; and
- having effective methods for creating learning policies and procedures.

Likewise, the stated aspects of performance management, coaching talent, and leadership development were positively and strongly affected by creating new information through creativity and innovation, creative discussion via the learning process, and skills development. This means that if a university's intent is to improve knowledge creation, the university should invest in the development of talent.

This outcome aligns with previous investigations conducted in Malaysian private colleges by Khor (2017) which showed a significant positive effect of talent development on knowledge creation. Such results underpin the thoughts of Ling (2016); Whelan and Carcary (2011); Wu et al. (2016) who have suggested that

knowledge creation can contribute to talent development through better communications amongst all the organisation's employees. These results are further supported by the ideas of Gateau and Simon (2017); Ling (2016); Scaringella and Malaeb (2014) who have stated that talent development is an approach to building knowledge creation competencies in order to improve and develop innovation. Similarly, this finding is reinforced by previous studies conducted in the Indian information technology services sector by Kong et al. (2013) and the Nigerian higher education by Osigwelem (2017) both of which showed that talent development through coaching and training assists in creating new knowledge.

11.3.2.6 Hypothesis 6

In terms of the sixth hypothesis, regression paths (refer to Chapter 10: Table 10.18) indicated a significant positive effect of talent retention on knowledge creation in Australian higher education. The significant level was at 0.01, and allowed **rejection of $H6_0$** and **acceptance of $H6_1$**. Thus, providing a highly competitive compensation system and flexibility for work hours, roles, and tasks, as well as monetary rewards, and high salaries were positively and significantly supported via:

- encouraging social learning through employees' discussion;
- designing, developing, and building appropriate technological systems and solutions; and
- having effective methods for creating learning policies and procedures.

Furthermore, the stated aspects of benchmarking, non-financial rewards, and employee motivation were positively affected by creating new knowledge through creativity and innovation, creative discussion via the learning process, and skills development. This means that if a university's intent is to improve knowledge creation, the university should invest in the retention of talent. This outcome supports prior studies conducted in Malaysian private colleges by Khor (2017) which showed a significant positive effect of talent retention on knowledge creation. Moreover, these outcomes corroborate prior research conducted outside the higher education sector by Brockbank (1999); Kong et al. (2013); Rahimi et al. (2015) who found that talent retention can be enhanced via greater learning capabilities through encouraging

creativity and an innovation culture, as well as creating new knowledge and promoting continuous learning.

11.3.2.7 Hypothesis 7

Hypothesis seven emphasised the investigation of the relationship between talent attraction and knowledge sharing in Australia universities. The results (refer to Chapter 10: Table 10.18) of this hypothesis revealed that knowledge sharing was significantly affected by talent attraction in Australian higher education at the significant level of 0.05, and allowed **rejection of $H7_0$** and **acceptance of $H7_1$**. To clarify, social support in difficult times, as well as the university reputation and ranking, were not significantly underpinned by promoting a sharing information culture; by supporting the sharing of information through group interaction, individual collaboration, and library resources; nor by having reciprocal collaboration and sharing information methods with other universities. This means that if a university's intent is to enhance knowledge sharing, the university should invest in attracting new talent.

This outcome underpins previous research conducted in Malaysian private colleges by Khor (2017) which showed a significant positive effect of talent development on knowledge creation. Such outcomes match findings of other prior research conducted outside educational institutions by Kim et al. (2014); Lai et al. (2014); Li and Devos (2008); Zhu (2017) who have claimed that knowledge sharing externally may be a form of organisational promotion, which also facilitates attracting interested talent to the organisation through lessons-learned databases, knowledge libraries, research publications, and conference presentations. These outcomes further underpin the ideas of Lai et al. (2014) who have proposed that knowledge sharing may have a significant influence on talent attraction; and of Zhu (2017) who suggests that generating an appropriate environment of effective collaboration among organisational individuals makes for a more desirable workplace and encourages the attraction of talented employees.

11.3.2.8 Hypothesis 8

The outcomes (refer to Chapter 10: Table 10.18) of examining the study model supported hypothesis H8 emphasised the key role of talent development in sharing

educational knowledge at the significant level of 0.001, and allowed **rejection of $H8_0$** and **acceptance of $H8_1$**. To simplify, developing talent through training and mentoring programs; determining training needs; facilitating employee performance and development; supporting talent to become leaders; assisting leaders to be professionals; providing staff with effective talent development strategies and career development opportunities; and including leaders in the design of all job roles are significantly and positively underpinned by:

- having reciprocal collaboration and sharing information methods with other universities;
- supporting the sharing of information through group interaction, individual collaboration, and library resources; and
- promoting a sharing information culture.

This means that if a university's intent is to improve knowledge sharing, the university should invest in the development of talent. Such results also underpin previous investigations conducted in Malaysian private colleges by Khor (2017) that showed a significant positive effect of talent development on knowledge sharing. Moreover, the outcomes of this investigation in Queensland universities support the views of Beyerlein et al. (2017); Gateau and Simon (2017); Zhu (2017) who have observed that facilitating knowledge sharing through encouraging collaboration within teams and between departments can develop talent, for example in the form of tailored training programs and by facilitating on-the-job learning. Similarly, Al-Awamleh (2009); Ali et al. (2017); Cooke (2017); Egerova et al. (2013); Li and Devos (2008) have confirmed that creating an appropriate environment of effective collaboration among staff members can transform into high performance. Similarly, Wang and Noe (2010) have proposed that training, career advancement opportunities, and performance management, as essential elements of talent development may facilitate knowledge sharing among the organisation employees.

11.3.2.9 Hypothesis 9

Finally, hypothesis nine focused on the relationship between talent retention and knowledge sharing in Australia universities. The outcomes (refer to Chapter 10: Table

10.18) revealed that there was a significant positive effect of talent retention on sharing information at the significant level of 0.01, and allowed **rejection of $H9_0$** and **acceptance of $H9_1$**. To explain, providing a highly competitive compensation system and flexibility for work hours, roles, and tasks, as well as financial rewards or remuneration, were all positively and significantly impacted by a sharing information culture; supporting the sharing of information through group interaction, individual collaboration, and library resources; and having reciprocal collaboration and sharing information methods with other universities. This means that if a university's intent is to improve knowledge sharing, the university should invest in the retention of talent.

These finding are consistent with previous research conducted in Malaysian private colleges by Khor (2017) which showed a significant positive effect of talent retention on knowledge sharing. On the other hand, previous studies conducted outside the higher education sector have demonstrated that tools of knowledge sharing can also be effective in retaining talent through making work tasks easier by sharing best practices, and in the from of a supportive collegial environment of mutual assistance (Li & Devos 2008; Zhu 2017). A review paper by Wang and Noe (2010) emphasises non-financial rewards in describing the relationship between talent retention and knowledge sharing. They state that rewards and incentives are essential elements of talent retention, which then assists knowledge sharing and facilitates the establishment of an encouraging culture of sharing information among the staff members of an organisation. A number of previous studies (Kianto et al. 2016; Koseoglu et al. 2010; Wang & Noe 2010) have supported this finding through a focus on the satisfactory aspects of talent retention and knowledge sharing, and have claimed that when employees share their knowledge with others, this assists in increasing their retention and satisfaction levels. However, these studies have been conducted outside academic organisations.

To conclude this section, even though the majority of the quantitative results of this study are in agreement with prior research associated with talent management and knowledge management, there are essential differences. A high number of the previous research studies were conducted outside the higher education domain. In addition, the agreement was only partial or very general in most cases.

11.4. Research contributions

This study is unique in a sense that it has been conducted in Australian universities as the emprical setting. It has followed Corley and Gioia (2011); Dubois and Gadde (2014) who have stated that in order to produce high quality outcomes, a research project should be original and utilitarian. Thus, this study offers three major contributions: theoretical, practical, and policy aspects. Details of these contributions are described below.

Theoretically, the study has offered a value-add to both talent management and knowledge management literature through its design of a conceptual model that has linked both of these variables in the Australian higher education sector. There was a deficiency of pragmatic evidence in terms of the relationship between talent management processes and knowledge management processes in this sector. Hence, this study has provided pragmatic evidence of the effect of talent management processes on knowledge management processes. In addition, this study has provided a comprehensive review that can assist future research in choosing common processes around talent management and knowledge management. This would assist researchers in these fields to provide a deeper understanding and underpin future studies with a deeper theoretical foundation. In addition, this research has demonstrated an adequate understanding of relevant literature through providing a critical review of the evolution of both talent management and knowledge management, which is unique in terms of the advancement of both talent and knowledge management theories. Furthermore, this study has clearly and comprehensively outlined the extant scholarly research of both talent management processes and knowledge management processes of the period 2006-2017. Reviews of this period have provided an opportunity to learn from prior experiences in both variables. Most significantly, this empirical research is one of the first few studies that has extended previous investigations of both talent management processes and knowledge management processes in various industries to the higher education sector.

In terms of the practical contributions, this study has collected rich and original qualitative and quantitative data regarding talent management and knowledge management in the higher education domain. For instance, the research findings have validated what had already been found but this is significant because it relates to

practical rather than theoretical data, which was gathered through a discussion with experts in both talent management and knowledge management. This study has strengthened the effect of the in-depth case study. To explain, the quantitative measure of this study was based on three qualitative investigation methods with three groups of specialists in the fields of talent management and knowledge management. These three multi-method studies were the first part of the methodology adopted to design a measurement to link both talent management and knowledge management in the higher education sector. This measurement may be adapted for other sectors outside higher education. Thus, the qualitative results of this study has provided a conceptual model that enables academic institutions to evaluate their managerial processes in regards to talent and knowledge.

Even though both of the qualitative and quantitative results of this research were in agreement with previous studies about the relathionship between talent management and knowledge management, there are some fundamental differences. In terms of the qualitative findings, this research is one of the first few studies that has examined both of these constructs in the Australian university sector. The consistency with prior research was partial in terms of either conceptual, theoretical, or methodological meanings. For example, there was little previous conceptual understanding that included whole themes, sub-themes, and associated items in the way in which they were explored in this study. To explain, the model was designed and comprehensively conceptualised by utilising social, excellent, performance, strategic, behavioural, and developmental concepts within talent management processes with innovative, informational, and technological concepts underlining knowledge management processes within higher education in Queensland.

In regards to the quantitative results, a high number of previous research studies was conducted outside the higher education domain. In addition, their similarities consisted of either partial or general relationships. For example, these studies generally investigated the relationship between talent management and knowledge management without mentioning their actual processes in any depth. Also, most of the prior studies were conceptual, whereas this study was empirically tested. In contrast to previously published research, this study has combined talent attraction, talent development, talent retention, knowledge creation, knowledge transfer, and knowledge sharing

altogether in one study. The significance of this was only realised when it was applied to the university sector.

Overall, this means that quantitative findings are more reliable/and valid and we can be more confident when they support qualitative findings. This reflects real work experiences. The qualitative investigation methods in turn can improve and increase the reliability and validity of the quantitative study's results (Ayón et al. 2016; Huff et al. 2015; Mauceri 2014). The empirical results indicate that high-performance cultures of talent management practices are essentially conducive to the effectiveness of knowledge management processes. Unlike the high number of prior studies that have focused on either one aspect (quantitative, qualitative, or mixed method with a single case study or small sample size) or on general investigations, this study is methodologically comprehensive through adopting a sequential exploratory strategy as a specific mixed-methods design. This means a more comprehensive analysis, and hence the findings are better searched and have more convincing results that, when practically applied in policy, are more beneficial.

From a policy point of view, this research has provided more debate around adding new ideas to Australian education strategic plans for higher education in general and for Queensland specifically (Training, D. o. E. 2015; Training 2016). To explain, the findings of the study has provided a clear picture for Australian educational institutions in regard to social domain, organisational excellence, performance management, coaching talent, leadership development, benchmarking, job satisfaction, non-monetary rewards, employee empowerment, employee motivation, personalisation, codification, combination, socialisation, internalisation, externalisation, and sharing information. This can be used to shed light on these dual processes within the nine universities included in the study. The significance of this finding is that a current quantitative tool can be used with other universities to specifically evaluate their talent management processes as well as knowledge management processes and generally inform their management processes. If Australian educational institutions use these concepts efficiently, they should gain a competitive advantage over their competitors. Consequently, these concepts enable universities to set themselves apart from other universities. Thus, significant contributions are made to the body of knowledge by the theoretical and practical results of this study.

11.5. Summary

This chapter has discussed both the qualitative and quantitative results of the current study. The discussion has covered five sections. Section one started by presenting an overview of the chapter. Section two provided a deep discussion of the qualitative results of the study and it discussed the emergent themes that were explored in Chapter Six. These themes were utilised to develop the questionnaire instrument to comprehend the best practices that are currently used in managing talent and knowledge in Australian higher education. Section three discussed the practical outcomes of the quantitative study that was presented in Chapters Nine and Ten. The discussion included two parts: descriptive statistics and multivariate analysis. Section four outlined the contributions of the study. The designed conceptual model is the core contribution to the body of knowledge on strategic human resources and information systems. The original model is designed and comprehensively conceptualised by utilising social, excellent, performance, strategic, behavioural, and developmental concepts within talent management processes with innovative, informational, and technological concepts that underline knowledge management processes, within the public and private universities in Queensland-Australia. This research has attempted to progress talent management and knowledge management theories through filling the gaps in the talent management and knowledge management literature. This study has provided a clear outline of an examination into the relationship between talent management processes (attraction, development, and retention) and knowledge management processes (transfer, creation, and sharing) in the Australian higher education sector. Finally, the summary in section five concluded this chapter. The next and final chapter of this thesis highlights the conclusions and recommendations of this study.

CHAPTER 12: CONCLUSIONS AND RECOMMENDATIONS

12.1. Chapter overview

This study has investigated the nexus between talent management processes and knowledge management processes. The scope of this research covered the university environment within the Australian higher education sector in Queensland. This chapter provides conclusions that emerged from the study as well as recommendations.

Chapter 1 provided the introductory information for the study and discussed the research motivations and justification. Then, the research setting and participants were outlined, and the statement of the problem was outlined. The scope of the study and operational definitions were examined next, before the research objectives and research questions were set out.

In Chapter 2 an extensive review of the literature associated with talent management and knowledge management was provided. The review started with conceptions and descriptions of talent management and knowledge management. Then, the processes of talent management and knowledge management were outlined. As discussed, there is not one empirical research paper addressing talent management processes (attraction, development and retention) together with knowledge management processes (such as transfer, creation, and sharing of knowledge) in the Australian higher education sector.

In Chapter 3 measurements and theoretical underpinnings related to talent management processes and knowledge management processes were clarified. By pragmatic use of selected parts of previous research approaches, combined with a comprehensive qualitative study, this chapter provided the foundation for this study in terms of constructing its conceptual model.

Chapter 4 explained a scientific method of business research by applying the methodological approach for this study. Mixed method research was adopted in the form of multi-method, qualitative and quantitative design. Qualitative data collection

and analysis, as the first stage, was followed by the second stage of quantitative data collection and analysis.

In Chapters 5 and 6 qualitative data were gathered and analysed, using both manual and content analysis software (NVivo 11), to comprehend the best practices that are currently used in managing talent and knowledge in Australian higher education. Three key themes and ten sub-themes of talent management processes were explored and included: (1) talent attraction (social domain, and organisational excellence); (2) talent development (performance management, coaching talent, and leadership development); and (3) talent retention (benchmarking, employee motivation, employee empowerment, non-monetary rewards, and job satisfaction). In a similar fashion to the talent management analysis, exploration of three key themes and seven sub-themes of knowledge management processes was conducted. These incuded: (1) knowledge creation (combination, socialisation, internalisation and externalisation); (2) knowledge transfer (personalisation knowledge transfer and codification knowledge transfer); and (3) knowledge sharing (sharing information).

Chapter 7 reviewed the conceptual model development for this study, based on the qualitative results of this study. The refined model included knowledge sharing as a new construct for the dependent variable (knowledge management processes). To achieve the second research objective, nine hypotheses were outlined to determine any potential relationship between talent management processes and knowledge management processes in the Australian higher education sector in Queensland.

In Chapters 8, 9 and 10 quantitative data were analysed, utilising SPSS 25 and AMOS 25, to test the relationship between talent management processes and knowledge management processes in the Australian higher education sector in Queensland. Seven out of the nine research hypotheses were significantly positive and the remaining two hypotheses were not significant. Chapter 11 then provided a discussion of the qualitative and quantitative results.

Finally, in this Chapter 12, conclusions and recommendations are reviewed. This chapter focuses on identifying the conclusions derived from the theoretical description of the key research variables and the practical results, and then determines appropriate recommendations. Finally, a number of potential future studies are suggested. The

overall structure of this chapter takes the form of four sections. It starts with a general overview of this chapter. The next section 12.2 provides a comprehensive and brief view of the general conclusions drawn from the theoretical description and practical results. This is followed by a discussion of the research recommendations in section 12.3. The final section deals with the research limitations. This chapter thus covers four sections, which are presented in the following a graphical layout.

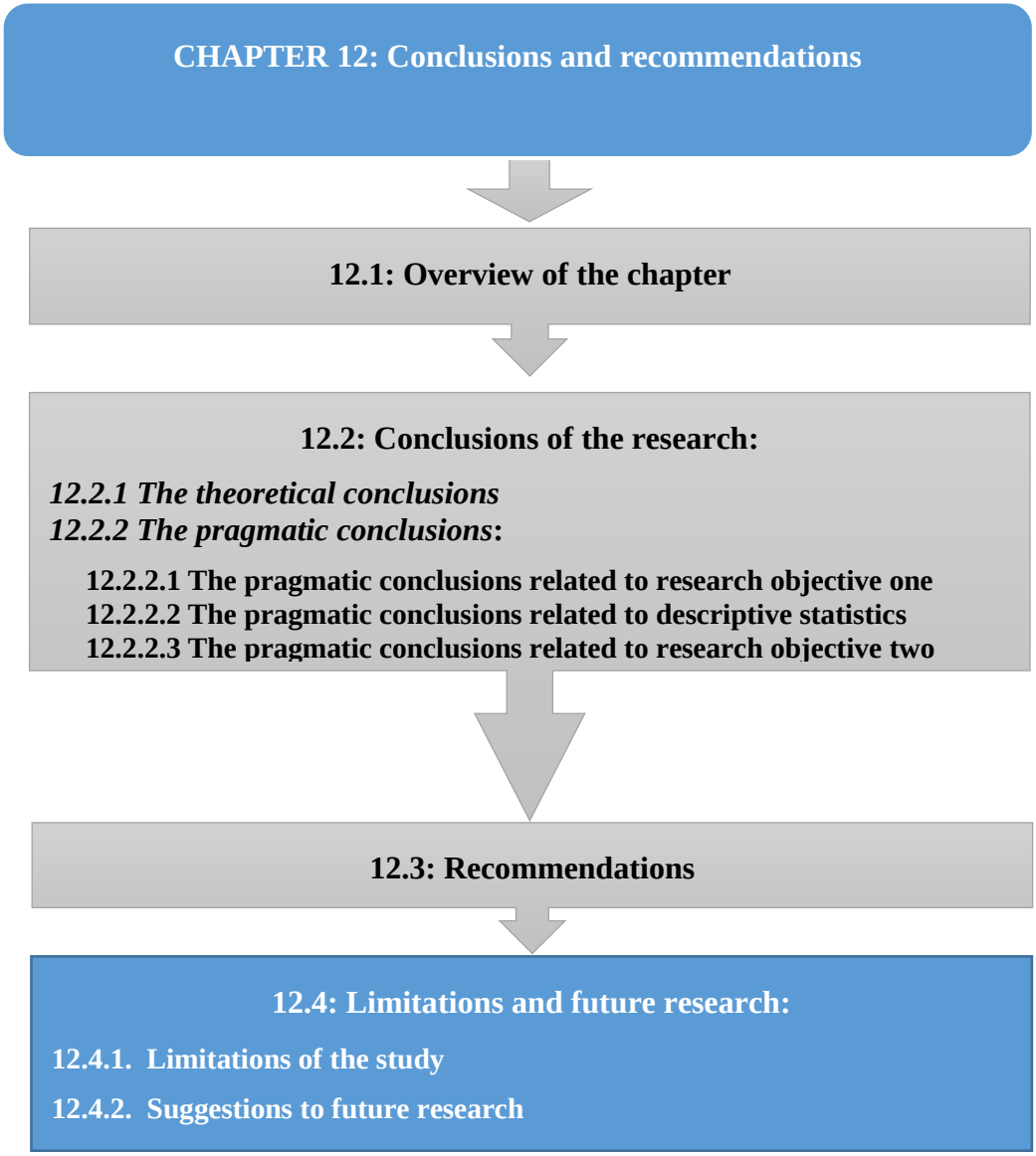


Figure 12.1: A graphical layout for Chapter 12

Source: Prepared by the researcher.

12.2. Conclusions of the research

This section outlines the conclusions drawn from the relevant literature and results of the data analysis, which reflect the intellectual processing of the numerical results obtained through the statistical descriptive and hypotheses tests. These conclusions pave the way for relevant recommendations and suggestions for potential future research in this area. Therefore, this section reviews the main conclusions in two parts: the first one covers the theoretical conclusions, while the second summarises the pragmatic conclusions.

12.2.1 The theoretical conclusions

The review of the literature has revealed some conclusions that can be highlighted in terms of talent management and knowledge management. Here, philosophical, theoretical, and analytical conclusions are offered as follows:

1- Talent management is an integrated management system that starts with the processes of attracting, developing and retaining talent, so that organisations can benefit from this in the form of products (commodities/services) that have characteristics which are difficult to imitate and provide a competitive edge, as a result of the expertise and knowledge of efficient human resources.

2- Although scholars and researchers differ in determining a unified concept of talent, the specialised literature produces two trends in its definitions, some of which are traditionally based on high intelligence, while the modern trend is based on excellent performance, mental ability, technical and dynamic skills, creative thinking, and leadership abilities. In addition, the review of literature included various views of talent, but all scholars and researchers agree that talent is a valuable resource for any organisation. The literature review also identified six common perspectives on talent management, of which the strategic perspective was identified as most relevant to achieving the research objectives of this study.

3- Knowledge management is one of the modern management trends adopted by organisations to achieve many benefits, including improving the effectiveness of organisational performance, increasing their ability to adapt to the challenges and

requirements of rapid changes in the environment, maintaining their intellectual capital, and increasing their innovative abilities.

4- Knowledge management is a continuous dynamic process that includes a set of targeted activities and practices to transfer, create, and share knowledge. It thereby assists an organisation in increasing its performance and reducing its costs, it improves the organisation's adaptive capacity to rapidly change the environment, and provides it with a substantial ability towards achieving an educated organisation.

5- This millennium has witnessed the appearance of an infinite number of developments in strategic administration-thinking as a result of the "information technology revolution", and the appearance of the term "knowledge economy", which looks at the organisation's excellence not only in terms of quantitative or qualitative productivity, but also in terms of the quality of knowledge that exists in its human assets, represented as talent. Therefore, management as a contemporary science has changed its language to focus on mental abilities where talented individuals constitute a strategic resource in an organisation.

6- The review of past research in talent management and knowledge management revealed a distinct lack of attention paid to the Australian higher education sector.

12.2.2 The pragmatic conclusions

12.2.2.1 The pragmatic conclusions related to research objective one

The analytic-inductive approach of this study has explored six key themes and seventeen sub-themes related to both talent management processes and knowledge management processes in Australian higher education. Inductive research is based on talent and knowledge management theories that are developed from observation of practical actuality. The core conclusion of this study in regard to research objective one is that Queensland universities are significantly aware of the six key themes that are currently used in managing talent and knowledge in their divisions and faculties. These three key themes and ten sub-themes of talent management processes are: (1) talent attraction (social domain, and organisational excellence); (2) talent development

(performance management, coaching talent, and leadership development); and (3) talent retention (benchmarking, job satisfaction, non-monetary rewards, employee empowerment, and employee motivation). Similarly, three key themes and seven sub-themes of knowledge management processes are: (1) knowledge transfer (personalisation and codification); (2) knowledge creation (combination, socialisation, internalisation, and externalisation); and (3) knowledge sharing (sharing information). As a result, Queensland universities through their participants deem these practices to be critical keys to educational success.

12.2.2.2 The pragmatic conclusions related to descriptive statistics

- The understanding of talent management processes by Queensland universities based on the demographic characteristics (gender, the university, and current position) of their talented individuals was similar. However, the personal characteristics (age of respondents, the number of expertise years, and academic qualification) of their talented individuals were considered differently and thus showed a difference in their comprehension of talent attraction, development, and retention.
- Queensland universities, based on the personal characteristics (gender) of their talented individuals, were equal in their comprehension of knowledge management processes. Nevertheless, the individual characteristics (the university, age of respondents, the number of expertise years, academic qualification, and current position) of their talented individuals differered, which was realted to their understanding of knowledge transfer, creation, and sharing.

- The results of descriptive statistics confirmed, through their respondents, that the majority of researched universities were interested in talent attraction activities with consistent responses towards this construct. This was indicated by a small value of the standard deviation. The activities related to social domain and organisational excellence constituted a strategic weapon in the global competition environment. According to the research respondents, there were some items that supported the importance of talent attraction, such as social networking activities for employees, social support for employees in difficult times, appropriate

organisational climate, innovative culture, and reputation. This indicated that talented individuals preferred social aspects more than excellent aspects. However, this importance did not prevent a great weakness in some aspects of these activities. Some of these weaknesses were identified in relation to university rankings, organisational culture, and social support.

- According to the views of the research respondents, talent retention was perceived to be the second most important process among talent management processes with a great consistency in the responses towards this process. This importance derives from a range of practices around talent retention such as flexibility of work hours, roles, and tasks; accounting for personal factors and life events related to family responsibilities; and providing employees with healthcare, safety issues, and self-efficacy in their workplaces. Conversely, benchmarking of talent retention practices appeared to need more awareness and attention from Queensland universities. For example, participants identified a lack of benchmarking with national and international universities; not much determining which were the most effective strategies of talent retention; and a lack of research funds provided to academics.

- The outcomes of descriptive statistics demonstrated that talent development was the third and final level of importance among talent management processes with a high consistency in the answers towards this construct. There are some developmental activities that contribute to an increase in the importance level of this construct. These activities include determining training needs, providing talented individuals with training and mentoring programs, and career development opportunities; and assisting leaders to be professionals through career development programs. Nevertheless, Queensland universities were shown not to fully enact talent development through internal job rotation; human resource planning; or succession planning for leadership positions.

- The results of descriptive statistics showed that knowledge transfer was the first most important process among knowledge management processes with consistent responses towards this construct. This was shown by a small value of the standard deviation. Transfer of information using e-mail, meetings, discussions and internal

networks, as well as face-to-face discussions were the key activities to increase the importance level of knowledge transfer within the researched universities. Nonetheless, transferring talent experiences or abilities to other employees was limited.

- The results of descriptive statistics indicate that knowledge creation follows knowledge transfer in terms of the importance level, with a high consistency in the answers towards this construct. This importance derives from support from the university technology and IT systems, software, and equipment; creating new knowledge through research and publications; and accessing relevant knowledge in online databases. On the other hand, more efforts should be carried out by researched universities in terms of facilitating responsible employees to manage and advise on learning processes; knowledge creation with external parties (e.g meetings, confluences, conferences, seminars, and SharePoint); reducing complications of the university's technology (e.g. it should facilitate exploring and understanding ideas); social learning through employees' discussion; and information repositories, best practices, and lessons learned.

- According to the opinions of the research sample, knowledge sharing was the least observed process among knowledge management processes, with a great consistency in the responses in this regard. The focus here was on collaboration among the individual, group, and university levels, and library resources. However, reciprocal collaboration and sharing information methods with other universities were limited.

12.2.2.3 The pragmatic conclusions related to research objective two

1. The results of the statistical analysis confirmed that there was a significant influence of talent management processes (talent development and talent retention) on knowledge transfer; of talent management processes (talent development, talent retention) on knowledge creation; and of talent management processes (talent attraction, talent development, and talent retention) on knowledge sharing. This means that talent management processes play a core role in knowledge

management processes in Australian higher education, as most of the relationships between these processes were significant and positive.

2. The highest level relationship between talent management processes and knowledge management processes was through talent development and retention. Academic talent was considered the most valuable talent source of the university, which could be continuously developed, retained, and utilised by creating, transferring, and sharing knowledge from talented individuals.
3. Talent development was seen as the most important process of talent management in conjunction with knowledge management processes. It plays a major role in transforming, creating and disseminating knowledge to research universities. This practice achieved the strongest effect with knowledge management processes.
4. The role of talent management processes with knowledge transfer and sharing was seen to be weakened through talent attraction. This reflected the lack of focus by Queensland universities on the transfer and sharing of academic knowledge through available activities of talent attraction. Talent attraction practices did not significantly affect academic knowledge sharing in the researched universities. This is confirmed by the result of the relationship between the two variables. This may reflect an inability of the top management of the researched universities to employ talent attraction in relation to the sharing of knowledge of their talented individuals. The reason for this may be that the policies adopted by Queensland universities in dealing with their talented individuals could be outside the control of talent management and thereby restrict academic knowledge sharing.

12.3. Recommendations

Organisations should use new human resources measures that focus on human capital indicators, which in turn are based on developing the skills of an organisation's individuals rather than on employing new individuals. In addition, competition and the lack of highly talented staff in the higher education environment has made maintaining such talented staff a key priority for organisations. Talent management is fundamental to organisational success in the postmodern era. Consequently, it should be considered a form of investment to see individuals as the core source of innovation and social development. In this respect, organisations should have a rigorous employment

strategy to attract, develop, and retain the best talent. Overall, based on the research conclusions in this thesis, of the following practical recommendations can be made:

1. The six explored constructs should be highlighted by Queensland universities to increase their competitive advantage, because these constructs are strategic keys to educational growth and success.

2. The researched universities should focus on how they attract, develop, and retain talented individuals; also, how they create, transfer, and share knowledge of those individuals with other staff members. This focus should be on a way that reflects performance excellence and provides the university with real institutional superiority. In this regard, Queensland universities should benefit from experiences of international universities in developed countries with regards to the talent and knowledge management fields, as well as learning from specialised frameworks for administration, and providing proper training programs to develop the capabilities of talented staff.

3. According to the descriptive statistics, researched universities should prioritise a focus on talent development (leadership development, performance management, and coaching talent); talent retention (benchmarking, employee motivation, job satisfaction, employee empowerment, and non-monetary rewards); talent attraction (organisational excellence and social domain); knowledge transfer (personalisation and codification); knowledge creation (socialisation, internalisation, externalisation, and combination); and knowledge sharing (sharing information) to increase their rankings and profits.

4. There are further recommendations as per the following:

- Queensland universities should observed a need to be aware of their university ranking, organisational culture, and social support as determining factors in attracting the best talent.

- The researched universities should be aware of benchmarking opportunities with national and international universities; they should determine which are the most effective strategies of talent retention; provide academics with research

funds; and ensure job satisfaction among their academic and professional staff to effectively retain them.

- The researched universities should pay more attention to talent retention by providing an appropriate organisational environment to embrace talent and prevent them from moving to other competitive organisations. They should be aware internal job rotation, human resource planning, and succession planning for leadership positions in order to develop the best talent.

- The researched universities should provide more attention to a range of knowledge transfer practices as they could improve the transfer of talent experiences or abilities to other employees.

- More effort should be made by Queensland universities to designate responsible employees to manage and advise on learning processes; stimulate knowledge creation with external parties (e.g meetings, confluences, conferences, seminars, and SharePoint); decrease the complications of the university's technology, i.e. so that it facilitates exploring and understanding of ideas); social learning through discussion amongst employees; and information repositories, best practices, and lessons learned.

- Queensland universities should address a sector-wide weakness in reciprocal collaboration and sharing information methods with other universities.

5. It is not enough for universities to attract highly skilled employees and expect that their skills and capabilities will remain current throughout their employment. They should focus instead on both development and retention processes of talent, which should occur at all managerial levels of the university.

6. Talent development is one of the most important processes of talent management that impacts significantly on knowledge management processes in Australian higher eduction. Therefore, the researched universities should pay more attention to this process by supporting and activating talent development programs and provide the necessary funds for the success of development activities in order to create, transfer, and share knowledge of talented individuals.

7. There is a need to host external experts and specialists in the field of talent management to raise the awareness of staff members at all managerial levels within the university, due to the strategic role that talent management plays in achieving sustainable success.

8. Talent management should be seen as a business strategy instead of a small part of human resources management. This requires it being incorporated within the university's vision, mission and strategy; and included in educational practices and strategic decisions of the top management, as an integral part of the educational institution's culture.

12.4. Limitations and future research

This research has yielded empirical evidence to enable educational institutions to evaluate their managerial processes in regards to talent and knowledge. This section outlines the limitations of the current study and propositions for addressing the limitations in future research. This section is divided into two parts. The first part highlights the limitations of the study, followed by the second part inn which suggestions for future research are made.

12.4.1. Limitations of the study

1- The principle limitation of this study was the scope. It only targeted one country (Australia), one state (Queensland), and a one section of the tertiary education sector (the university). The study's conceptual model was developed based on the qualitative study. Then, the quantitative study was conducted within the scope of the overall study and final results were derived. Hence, the generalisability of these results is limited to the Australian university sector in Queensland.

2- The second limitation was associated with the qualitative phase. In terms of brainstorming and focus group invitations, although the researcher invited many participants from all target universities, only USQ's participants responded. It is difficult to get professional participants together from various universities at the same time for a group session. In terms of individual interviews, some interviewees

were reluctant to provide in-depth information through open-ended questions so that a better comprehension of the research topic could be obtained. The reason behind this reluctance is the sensitive information that is associated with information that is important to the topic of the current study. For example, talent management as a sensitive concept might be linked to the strategic planning of the university. This claim is supported by Al Haidari (2015); Piansoongnern and Anurit (2010); Piansoongnern et al. (2011) who all point out that talent management is a sensitive term and that most of the strategic information of highly skilled individuals should be confidentially shared inside an organisation.

3- The target research sample included academic and professional staff with at least a diploma and five years experience in the fields of human resources management, talent management, and knowledge management. Therefore, other talented individuals without these criteria were not included.

12.4.2. Suggestions for future research

Based on the research conclusions, recommendations, and limitations, a number of suggestions for future research can be made as follows:

1. It would be useful to investigate the current methodology and topic of this research in other Australian universities or sectors, such as in industrial and commercial sectors, in order to generalise the results within the overall Australian environment.
2. It would be beneficial to carry out studies on talent management processes or knowledge management processes with other managerial topics, such as effectiveness, quality of work life, productivity, quality of product, organisational learning, and intelligent management in the higher education sector using a mixed methods design to fill gaps in talent management and knowledge management research.
3. It would be useful to investigate other processes of both talent management and knowledge management that have not beeen examined by this study in the Australian higher education sector to fill gaps in knowledge within this area.
4. It would further be useful to target other talented individuals that were not included in the current study such as individuals with only a high school background and no further qualifications.

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APPENDICES

Appendix A: Ethics approval letter of USQ

OFFICE OF RESEARCH
Human Research Ethics Committee
PHONE +61 7 4687 5703| FAX +61 7 4631 5555
EMAIL human.ethics@usq.edu.au

UNIVERSITY OF SOUTHERN QUEENSLAND

6 July 2017

Mr Atheer Abdullah Mohammed Mohammed

Dear Atheer

The USQ Human Research Ethics Committee has recently reviewed your responses to the conditions placed upon the ethical approval for the project outlined below. Your proposal is now deemed to meet the requirements of the *National Statement on Ethical Conduct in Human Research (2007)* and full ethical approval has been granted.

Approval No.	**H17REA138**
Project Title	An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia
Approval date	6 July 2017
Expiry date	6 July 2020
HREC Decision	**Approved**

The standard conditions of this approval are:

(a) Conduct the project strictly in accordance with the proposal submitted and granted ethics approval, including any amendments made to the proposal required by the HREC
(b) Advise (email: human.ethics@usq.edu.au) immediately of any complaints or other issues in relation to the project which may warrant review of the ethical approval of the project
(c) Make submission for approval of amendments to the approved project before implementing such changes
(d) Provide a 'progress report' for every year of approval
(e) Provide a 'final report' when the project is complete
(f) Advise in writing if the project has been discontinued, using a 'final report'

For (c) to (f) forms are available on the USQ ethics website:
http://www.usq.edu.au/research/support-development/research-services/research-integrity-ethics/human/forms

Samantha Davis

Appendix B: A consent form of the brainstorming, focus group, and individual interview techniques

UNIVERSITY OF SOUTHERN QUEENSLAND AUSTRALIA	University of Southern Queensland **Consent Form for USQ Research Project Brainstorming**

Project Details	
Title of Project:	**An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia**
Human Research Ethics Approval Number:	H17REA138

Research Team Contact Details	
Principal Investigator Details	Supervisor Details
Mr. Atheer Abdullah Mohammed Email: AtheerAbdullahMohammed.Mohammed@usq.edu.au Telephone: +61746311460	Prof. Raj Gururajan Email: Raj.Gururajan@usq.edu.au Telephone: +61734704539

Statement of Consent

By signing below, you are indicating that you:

Have read and understood the information document regarding this project.	☐Yes / ☐No
Have had any questions answered to your satisfaction.	☐Yes / ☐No
Understand that if you have any additional questions you can contact the research team.	☐Yes / ☐No
Understand that the brainstorming session will be audio recorded.	☐Yes / ☐No
Understand that you are free to withdraw at any time, without comment or penalty.	☐Yes / ☐No
Understand that you can contact the University of Southern Queensland Manager of Research Integrity and Ethics on +61 7 4631 2214 or email researchintegrity@usq.edu.au, if you have any concern or complaint about the ethical conduct of this project.	☐Yes / ☐No
Are over 18 years of age?	☐Yes / ☐No
Agree to participate in the project.	☐Yes / ☐No

Participant Name	
Participant Signature	
Date	

Please return this sheet to a research team member prior to undertaking the brainstorming.

	University of Southern Queensland
	Consent Form for USQ Research Project Focus Group

Project Details	
Title of Project:	**An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia**
Human Research Ethics Approval Number:	H17REA138

Research Team Contact Details	
Principal Investigator Details	Supervisor Details
Mr. Atheer Abdullah Mohammed Email: AtheerAbdullahMohammed.Mohammed@usq.edu.au Telephone: +61746311460	Prof. Raj Gururajan Email: Raj.Gururajan@usq.edu.au Telephone: +61734704539

Statement of Consent

By signing below, you are indicating that you:

Have read and understood the information document regarding this project.	☐Yes / ☐No
Have had any questions answered to your satisfaction.	☐Yes / ☐No
Understand that if you have any additional questions you can contact the research team.	☐Yes / ☐No
Understand that the brainstorming session will be audio recorded.	☐Yes / ☐No
Understand that you are free to withdraw at any time, without comment or penalty.	☐Yes / ☐No
Understand that you can contact the University of Southern Queensland Manager of Research Integrity and Ethics on +61 7 4631 2214 or email researchintegrity@usq.edu.au, if you have any concern or complaint about the ethical conduct of this project.	☐Yes / ☐No
Are over 18 years of age?	☐Yes / ☐No
Agree to participate in the project.	☐Yes / ☐No

Participant Name	
Participant Signature	
Date	

Please return this sheet to a research team member prior to undertaking the focus group.

	University of Southern Queensland
	Consent Form for USQ Research Project Interview

Project Details	
Title of Project:	**An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia**
Human Research Ethics Approval Number:	H17REA138

Research Team Contact Details	
Principal Investigator Details	Supervisor Details
Mr. Atheer Abdullah Mohammed Email: AtheerAbdullahMohammed.Mohammed@usq.edu.au Telephone: +61746311460	Prof. Raj Gururajan Email: Raj.Gururajan@usq.edu.au Telephone: +61734704539

Statement of Consent

By signing below, you are indicating that you:

Have read and understood the information document regarding this project.	☐Yes / ☐No
Have had any questions answered to your satisfaction.	☐Yes / ☐No
Understand that if you have any additional questions you can contact the research team.	☐Yes / ☐No
Understand that the brainstorming session will be audio recorded.	☐Yes / ☐No
Understand that you are free to withdraw at any time, without comment or penalty.	☐Yes / ☐No
Understand that you can contact the University of Southern Queensland Manager of Research Integrity and Ethics on +61 7 4631 2214 or email researchintegrity@usq.edu.au, if you have any concern or complaint about the ethical conduct of this project.	☐Yes / ☐No
Are over 18 years of age?	☐Yes / ☐No
Agree to participate in the project.	☐Yes / ☐No

Participant Name	
Participant Signature	
Date	

Please return this sheet to a research team member prior to undertaking the interview.

Appendix C: Brainstorming, focus group, and individual interviews questions

Step 1:

A- Brainstorming

Q1 What processes are used in your university for managing talent and knowledge?

B- Focus group discussions

Q1 What processes are used in your university for managing talent?

Q2 What processes are used in your university for managing knowledge?

Step 2:

C- Individual interviews

Q1. How is new information and knowledge created within your university?

Q2. How is knowledge transferred and shared from one department to another in your university?

Q3. How is knowledge transferred and shared from one staff member to another in your university?

Q4. How would your university attract talent?

Q5. How are talented staff developed in your university?

Q6. How does your university retain talented staff ?

Appendix D: An information sheet form of the brainstorming, focus group, individual interviews, and quantitative survey questionnaire.

UNIVERSITY OF SOUTHERN QUEENSLAND AUSTRALIA	University of Southern Queensland **Participant Information for USQ Research Project Brainstorming Group**

Project Details	
Title of Project:	**An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia**
Human Research Ethics Approval Number:	H17REA138

Research Team Contact Details	
Principal Investigator Details	Supervisor Details
Mr. Atheer Abdullah Mohammed Email: AtheerAbdullahMohammed.Mohammed@usq.edu.au Telephone: +61746311460	Prof. Raj Gururajan Email: Raj.Gururajan@usq.edu.au Telephone: +61734704539

Description

This project is being undertaken as part of PhD.

The important of this project comes from both knowledge and talent that are two primary sources of competitive advantage for organisations. As a result, there are many benefits for organisations that focus on knowledge continuity and talent management. The purpose of this project is to investigate the relationship between talent management processes and knowledge management processes in the organisation.

The research team requests your assistance to provide information about the relationship between talent management processes and knowledge management processes.

Participation

Your participation will involve contributing your thoughts and ideas in a group discussion-brainstorming group) that will take approximately 60 minutes of your time. The brainstorming group will include**:**

- Number of participants: 4-8
- Location: at the University of Southern Queensland/ Toowoomba. In addition, brainstorming participants can attend Skype or Zoom.

Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. You will be unable to withdraw data collected about yourself after you have participated in the brainstorming group. If you wish to withdraw from the project, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland .

Expected Benefits

It is expected that this project will directly benefit you.

1- Participants will benefit because they get an opportunity to discuss with other issues that are similar.
2- Participants will be able to understand various processes followed external to their organisations.

Risks

There are minimal risks associated with your participation in this project. These include a minor time imposition. Participation is voluntary and you may leave the research at any time without comment or penalty. Data that contain identifiers linked to the participants will be kept confidential at all times and will be accessible to only the principal investigator and the co-principal investigators. All the data obtained from participants will be kept confidential and will only be reported in the aggregate format

(reporting only combined results and never reporting individual results). Prior any presentation, sharing data outside of the research team or publication the names and identifiers linked to the participants will be removed to ensure anonymity.

Privacy and Confidentiality

All comments and responses will be treated confidentially unless required by law.

- The brainstorming group will be audio recorded.
- You may contact the research team if you wish to receive a summary of research results.
- Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy.

Consent to Participate

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate in this project. Please return your signed consent form to a member of the Research Team prior to participating in your brainstorming group.

Questions or Further Information about the Project

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

Concerns or Complaints Regarding the Conduct of the Project

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Manager of Research Integrity and Ethics on +61 7 4631 2214 or email researchintegrity@usq.edu.au. The Manager of Research Integrity and Ethics is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Thank you for taking the time to help with this research project. Please keep this sheet for your information.

	University of Southern Queensland
	Participant Information for USQ Research Project Focus Group

Project Details	
Title of Project:	**An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia**
Human Research Ethics Approval Number:	H17REA138

Research Team Contact Details

Principal Investigator Details	Supervisor Details
Mr. Atheer Abdullah Mohammed Email: AtheerAbdullahMohammed.Mohammed@usq.edu.au Telephone: +61746311460	Prof. Raj Gururajan Email: Raj.Gururajan@usq.edu.au Telephone: +61734704539

Description

This project is being undertaken as part of PhD. The important of this project comes from both knowledge and talent that are two primary sources of competitive advantage for organisations. As a result, there are many benefits for organisations that focus on knowledge continuity and talent management.

The purpose of this project is to investigate the relationship between talent management processes and knowledge management processes in the organisation.
The research team requests your assistance to provide information about the relationship between talent management processes and knowledge management processes.

Participation

Your participation will involve contributing your thoughts and ideas in a group discussion that will take approximately 60-90 minutes of your time.
The focus group will include**:**

- Number of participants: 8-10
- Location: at the University of Southern Queensland/ Toowoomba. In addition, focus group participants can attend Skype or Zoom.

Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. You will be unable to withdraw data collected about yourself after you have participated in the focus group. If you wish to withdraw from the project, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland .

Expected Benefits

It is expected that this project will directly benefit you.

3- Participants will benefit because they get an opportunity to discuss with other issues that are similar.
4- Participants will be able to understand various processes followed external to their organisations.

Risks

There are minimal risks associated with your participation in this project. These include a minor time imposition. Participation is voluntary and you may leave the research at any time without comment or penalty. Data that contain identifiers linked to the participants will be kept confidential at all times and will be accessible to only the principal investigator and the co-principal investigators. All the data obtained from participants will be kept confidential and will only be reported in the aggregate format (reporting only combined results and never reporting individual results). Prior any presentation, sharing data outside of the research team or publication the names and identifiers linked to the participants will be removed to ensure anonymity.

Privacy and Confidentiality

All comments and responses will be treated confidentially unless required by law.

- The focus group will be audio recorded.
- You may contact the research team if you wish to receive a summary of research results.
- Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy.

Consent to Participate

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate in this project. Please return your signed consent form to a member of the Research Team prior to participating in your focus group.

Questions or Further Information about the Project

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

Concerns or Complaints Regarding the Conduct of the Project

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Manager of Research Integrity and Ethics on +61 7 4631 2214 or email researchintegrity@usq.edu.au. The Manager of Research Integrity and Ethics is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Thank you for taking the time to help with this research project. Please keep this sheet for your information.

UNIVERSITY OF SOUTHERN QUEENSLAND AUSTRALIA	University of Southern Queensland **Participant Information for USQ Research Project Interview**

Project Details	
Title of Project:	**An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia**
Human Research Ethics Approval Number:	H17REA138
Research Team Contact Details	

Principal Investigator Details	Supervisor Details
Mr. Atheer Abdullah Mohammed Email: AtheerAbdullahMohammed.Mohammed@usq.edu.au Telephone: +61746311460	Prof. Raj Gururajan Email: Raj.Gururajan@usq.edu.au Telephone: +61734704539

Description

This project is being undertaken as part of PhD.

The important of this project comes from both knowledge and talent that are two primary sources of competitive advantage for organisations. As a result, there are many benefits for organisations that focus on knowledge continuity and talent management.

The purpose of this project is to investigate the relationship between talent management processes and knowledge management processes in the organisation.

The research team requests your assistance to provide information about the relationship between talent management processes and knowledge management processes.

Participation

Your participation will involve contributing your thoughts and ideas in an interview that will take approximately 60 minutes of your time.

The interview will include**:**

- Number of participants: 6-10
- Location: at the University of Southern Queensland/ Toowoomba. You can attend Skype or Zoom.

Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. You will be unable to withdraw data collected about yourself after you have participated in the interview. If you wish to withdraw from the project, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland .

Expected Benefits

It is expected that this project will directly benefit you.

5- Participants will benefit because they get an opportunity to discuss with other issues that are similar.

6- Participants will be able to understand various processes followed external to their organisations.

Risks

There are minimal risks associated with your participation in this project. These include a minor time imposition. Participation is voluntary and you may leave the research at any time without comment or penalty. Data that contain identifiers linked to the participants will be kept confidential at all times and will be accessible to only the principal investigator and the co-principal investigators. All the data obtained from participants will be kept confidential and will only be reported in the aggregate format (reporting only combined results and never reporting individual results). Prior any presentation, sharing data outside of the research team or publication the names and identifiers linked to the participants will be removed to ensure anonymity.

Privacy and Confidentiality

All comments and responses will be treated confidentially unless required by law.

- The interview will be audio recorded.
- You will be provided endorsement prior to inclusion in the project data.
- The period you will be given to review and request any changes to the transcript before the data is included in the project two weeks.
- You may contact the research team if you wish to receive a summary of research results.
- Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy.

Consent to Participate

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate in this project. Please return your signed consent form to a member of the Research Team prior to participating in your interview.

Questions or Further Information about the Project

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

Concerns or Complaints Regarding the Conduct of the Project

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Manager of Research Integrity and Ethics on +61 7 4631 2214 or email researchintegrity@usq.edu.au. The Manager of Research Integrity and Ethics is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Thank you for taking the time to help with this research project. Please keep this sheet for your information.

	University of Southern Queensland
	Participant Information for USQ Research Project Questionnaire

Title of Project:	**An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia**
Human Research Ethics Approval Number:	H17REA138

Research Team Contact Details	
Principal Investigator Details	Supervisor Details
Mr. Atheer Abdullah Mohammed Email: AtheerAbdullahMohammed.Mohammed@usq.edu.au Telephone: +61746311460	Prof. Raj Gururajan Email: Raj.Gururajan@usq.edu.au Telephone: +61734704539

Description

This project is being undertaken as a part of my PhD research. I am seeking academic and professional staff with five years' experience in their fields to participate. Also, academic and professional staff who have technical knowledge in computing such as professionals in information technology. In addition, academic and professional staff who are in the top and middle managerial levels with responsibility for managing action plans related to attraction, development, retention of talents; as well as action plans associated with creation, transfer, sharing of knowledge in their universities.

Both talent and knowledge are involved in increased productivity and quality of services which underpins the importance of this project. For example, talented

individuals contribute significantly to a university's performance by attracting new students and securing funds for further research. Furthermore, both talent and knowledge are two primary sources of unique advantage. For example, competitive advantage can be maintained by attracting, developing, and retaining talented employees in key positions. Furthermore, knowledge provides many advantages to educational institutions, such as using technology for effective teaching and learning, reducing costs of overall research, and improving evaluation as well as administrative activities.

The purpose of this project is to investigate the relationship between talent management processes (attraction, development, and retention) and knowledge management processes (transfer, creation, and sharing) in the university. The focus of my research is about how universities attract, develop, and retain talented individuals. Also, how universities create, transfer, and share knowledge of those individuals to other staff members.The research team requests your assistance to provide information through answering our survey questionnaire

Participation

Your participation will involve contributing your thoughts and ideas in a questionnaire that will take approximately 10-15 minutes of your time. Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. If you wish to withdraw from the project, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland.

Expected Benefits

It is expected that this project will directly benefit you.

1- Participants will benefit because they get an opportunity to consider these issues with reference to their universities.
2- Participants will be able to understand various processes followed external to their universities with regards to talent management and knowledge management processes.

Risks

There are no anticipated risks beyond normal day-to-day living associated with your participation in this project.

Privacy and Confidentiality

All comments and responses will be treated confidentially unless required by law.

- The names of individual persons are not required in any of the responses.
- You may contact the research team if you wish to receive a summary of research results.
- Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy.

Consent to Participate

The return of the completed questionnaire is accepted as an indication of your consent to participate in this project.

Questions or Further Information about the Project

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

Concerns or Complaints Regarding the Conduct of the Project

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Manager of Research Integrity and Ethics on +61 7 4631 2214 or email researchintegrity@usq.edu.au. The Manager of Research Integrity and Ethics is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Thank you for taking the time to help with this research project. Please keep this sheet for your information.

Appendix E: The operationalisation of the constructs for the initial conceptual model

Construct	Definition	Categories	Items	References
Talent Attraction (TA) (9 items)	Is primarily aimed at attracting talented candidates from the internal or external labour market (AlKerdawy 2016).	Talents Branding (TB)	My organisation is actively involved in communication and implementation of employer branding	(Lyria 2014)
			My organisation seeks to build a good brand image to attract talented employees	(Lyria 2014)
			My organisation depends on internal and external branding to attract talented individuals	(Tiwari & Lenka 2015)
		Career Advancement (CA)	In our organisation, progress and career development policy is clearly outlined and known to all employees	(Waithiegeni Kibui 2015)
			The organisation always plans on employee career growth	(Waithiegeni Kibui 2015)
			My organisation offers opportunities for career advancement e.g. job advancement/promotions, internships, and apprenticeships with experts, internal job posting	(Thompson 2013)
		Work- life Balance (WLB)	Work-life balance as well as social networking activities in this organisation is a motivating factor to our employees	(Lyria 2014; Schlechter et al. 2014)
			My organisation has good organisational climate e.g. having social friendship at work in order to attract the right talents	(Schlechter et al. 2014; Thompson 2013)

			This organisation has good working conditions enabled it to attract the right talents	(Lyria 2014; Schlechter et al. 2014)
Talent Development (TD) **(**9 items)	Is focussed on achieving and maintaining an organisations competitive advantage through learning that changes behaviour in the organisation and in its employees and stakeholders (Lyria 2014).	Coaching Talent (CT)	I regularly receive sufficient coaching	(Strydom et al. 2014)
			My organisation introduces enough opportunities to develop talented employees.	(AlKerdawy 2016)
			My organisation appoints its own online training material for talented staff to gain required knowledge and skills.	(AlKerdawy 2016)
		Training Need Identification (TNI)	My organisation determines training needs accurately.	(AlKerdawy 2016)
			My organisation identifies competencies needed to develop key talents	(Vnoučková et al. 2016)
			My organisation establishes human resource planning to ensure skills utilization.	(AlKerdawy 2016)
		Appropriate Development Strategies (ADS)	My organisation has capabilities to develop talent strategies aligned with organisation's strategies.	(AlKerdawy 2016)
			The organisation has talent development strategies which are clearly understood by all the employees	(Waithiegeni Kibui 2015)
			In my organisation, talent development strategies meet the needs of talented individuals	(Al Ariss et al. 2014)

Talent Retention (TR) (9 items)	Is a process where employees are responsible for retaining talent, to have them remain with an organisation (Abdul Hamid et al. 2011; AlKerdawy 2016).	Competitive Compensation (CC)	My organisation has competitive compensation system in comparison to other organisations in the same industry which is a motivating factor to our employees	(Lyria 2014)
			My organisation highly provides competitive compensation, particularly long-term wealth accumulation	(Stahl et al. 2007)
			My organisation retains talent needed to achieve organisation goals.	(AlKerdawy 2016)
		Employ Motivation (EM)	My organisation seeks to employ all sorts of techniques to motivate and satisfy its employees.	(Nakhate 2016)
			My organisation ensures talented employees are satisfied and motivated all the time	(AlKerdawy 2016)
			My organisation manages employees to achieve a motivated employees	(Nakhate 2016)
		Non- Financial Rewards (NFR)	My organisation offers attractive non-monetary rewards to employees	(Lyria 2014)
			My organisation allows for employees to leave early when achieved targets are met as a great reward for hard work.	(Thompson 2013)
			My organisation has a good system of non-financial rewards enabled it to retain talented staff, e.g. acknowledgements	(Lyria 2014)
Knowledge Transfer	Is a process that allows employees to		My organisation saves and renews important information onto the computer for easy browsing	(Rhodes et al. 2008)

(KT) (6 items)	transfer their tacit to tacit and explicit to explicit knowledge with other employees inside and outside of their organisations (Bajwa et al. 2015; Birasnav 2014).	Codification Knowledge Transfer (CKT)	Knowledge is categorised in the database for use by all organisation employees	(Rhodes et al. 2008)
			Employees use e-mail , meetings, discussions and internal network to share their knowledge with others	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)
		Personalisation Knowledge Transfer (PKT)	My organisation transfers employee experiences to other employees	(Abd Rahman et al. 2013; Rhodes et al. 2008; Tan & Wong 2015)
			Employees are willing to share their experience and knowledge.	(Rhodes et al. 2008)
			My organisation transfers effective knowledge to employees through training courses, presentations and internal magazines	(Rhodes et al. 2008)
Knowledge Creation (KC) (12 items)	Is a set of processes such as discovery, knowledge production,	Socialisation	My organisation usually adopts cooperative projects across directorates	(Li et al. 2009)
			My organisation usually uses apprentices and mentors to transfer knowledge	(Li et al. 2009)

	absorption, purchase, possession, inventions, generation and gaining processes are included within this process (Badah 2012).		My organisation usually adopts brainstorming retreats or camp	(Li et al. 2009)
		Externalisation	My organisation usually adopts groupware and other learn collaboration tools	(Li et al. 2009)
			My organisation usually adopts a problem-solving system based on a technology like case-based reasoning	(Li et al. 2009)
			My organisation usually adopts pointers to expertise	(Li et al. 2009)
		Combination	My organisation usually adopts web-based access to data	(Li et al. 2009)
			My organisation usually adopts repositories of information, best practices, and lessons learned	(Li et al. 2009)
			My organisation usually uses web pages and databases	(Li et al. 2009)
		Internalisation	My organisation usually adopts on-the-job training	(Li et al. 2009)
			My organisation usually adopts learning by doing	(Li et al. 2009)
			My organisation usually adopts learning by observation	(Li et al. 2009)

Appendix F: Peer review-Questionnaire-researchers

An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia	

I am a PhD student at USQ under the supervision of ***Prof. Raj Gururajan*** *and* ***Dr. Abdul Hafeez-Baig***. The following questionnaire is intended to *investigate the relationship between talent management processes and knowledge management processes within Australian Higher Education organisations*. A formal ethical approval has been acquired from USQ ethic department (Approval # H17REA138). The results of the study will provide a critical insight in the following areas to improve the talent management system in Queensland. Your participation is very valuable and will involve contributing to improve the performance of Australian higher education organisations by applying both talent management processes and knowledge management processes. The questionnaire will take approximately 10-20 minutes of your time. You participation in this research is purely voluntary and research team appreciate your support and time. The outcome of this research study contribute and help to improve the total productivity for both the university and its talented individuals in the following areas:

2- Both talent and knowledge participate in increased rankings and profits of higher education organisations. To explain, universitys'rankings are aligned with their high-performing employees. These talented individuals contribute significantly to university's performance by attracting new students and securing funds for further research; and
3- Doing this research will benefit Australian higher education organisations. This is because both talent and knowledge are two primary sources of competitive advantages. Competitive advantage can be maintained by attracting, developing and retaining talented employees in key positions. Likewise, knowledge provides many advantages to educational organisations, such as using technology for effective teaching and learning, reducing costs of overall research, and improving evaluation as well as administrative activities.

Part A: For each of the following statements, **please tick (✓) one box** on the right side of the page best describe your views.

X	**Variables of Talent Management Processes (TMPs)**					
X1	**Talent attraction:** is primarily aimed to attract talented candidates from either internal or external labour markets. *(***SD ⇒ Strongly Disagree, D ⇒ Disagree, N ⇒ Neutral, Agree ⇒ A, SA ⇒ Strongly Agree)**	**SD**	**D**	**N**	**A**	**SA**
X1.1	***Social Domain (SD)***					
1	My university attracts more talented employees through providing them with social support in difficult times (maternity, paternity, death, and financial difficulties).	☐	☐	☐	☐	☐
2	My university attracts more qualified employees through having a socially progressive work environment (e.g. multicultural).	☐	☐	☐	☐	☐
3	My university supports the staff community through involvement in social, cultural, or economic initiatives to attract more talented employees.	☐	☐	☐	☐	☐
4	Work-life balance, and social networking activities, are attracting factors for our talented employees.	☐	☐	☐	☐	☐
5	My university has a good work-life balance (e.g. socialising with colleagues, proper location and amenities, recreation or lifestyle opportunities) to attract more talents.	☐	☐	☐	☐	☐
X1.2	***Organisational Excellence (OE)***					
6	My university attracts more talented employees through high salaries or remuneration.	☐	☐	☐	☐	☐
7	My university has effective recruitment strategies for attracting the best academics and professional staff.	☐	☐	☐	☐	☐
8	My university has a good reputation through high-quality research, and a high university ranking enables the university to attract the best academic and professional staff.	☐	☐	☐	☐	☐
9	My university has an innovative culture enabling it to attract more talented individuals.	☐	☐	☐	☐	☐
10	My university has a desirable organisational climate in order to attract the appropriate talents (e.g. having social friendships at work).	☐	☐	☐	☐	☐
11	My university attracts more talented staff through having a high-quality working environment that encourages talented employees to realise creativity and innovation (e.g. physical aspects such as well-equipped workplaces).	☐	☐	☐	☐	☐
X2	**Talent Development:** is focussed on achieving and maintaining an organisation's human capital through learning that changes behaviour in the organisation and in its talented employees. *(***SD ⇒ Strongly Disagree, D ⇒ Disagree, N ⇒ Neutral, Agree ⇒ A, SA ⇒ Strongly Agree)**	**SD**	**D**	**N**	**A**	**SA**
X2.1	***Performance Management (PM)***					
12	My university has effective talent development strategies aligned with its organisational strategies.	☐	☐	☐	☐	☐
13	My university determines training needs, and learning contents for talented individuals who have desired skills.	☐	☐	☐	☐	☐
14	My university facilitates employee performance and development with tailored training plans.	☐	☐	☐	☐	☐
15	My university uses human resource planning to ensure effective skill utilisation and development.	☐	☐	☐	☐	☐
16	My university identifies areas needed for employee's personal development (e.g. skills gap analysis).	☐	☐	☐	☐	☐
X2.2	***Coaching Talent (CT)***					

17	Internal job rotation is available to strengthen talented employees' experiences and development in different faculties, departments, and divisions.	☐	☐	☐	☐	☐
18	My university develops academic staff through sessions with learning and teaching training.	☐	☐	☐	☐	☐
19	My university develops professional and academic staff with training and mentoring programs.	☐	☐	☐	☐	☐
20	My university develops its own online training materials for talented staff to gain required knowledge and skills.	☐	☐	☐	☐	☐
21	My university provides the staff with career development opportunities (e.g. further education, certifications, scholarships, etc.).	☐	☐	☐	☐	☐
X2.3	***Leadership Development (LD)***					
22	My university includes leaders' development in the design of all job roles.	☐	☐	☐	☐	☐
23	My university develops leaders through further education.	☐	☐	☐	☐	☐
24	My university supports high potential employees to become leaders, in order to build a strong talent pool.	☐	☐	☐	☐	☐
25	My university assists leaders to be professionals through career development programs.	☐	☐	☐	☐	☐
26	My university develops succession planning, and identifies alternative talented employees for leadership positions.	☐	☐	☐	☐	☐
X3	**Talent Retention:** is a process where an organisation is responsible for retaining talent, to have them remain within an organisation (**SD ⇒ Strongly Disagree, D ⇒ Disagree, N ⇒ Neutral, Agree ⇒ A, SA ⇒ Strongly Agree)**	**SD**	**D**	**N**	**A**	**SA**
X3.1	***Benchmarking (B)***					
27	My university determines which talent retention strategies are most effective.	☐	☐	☐	☐	☐
28	My university benchmarks other universities inside Australia to evaluate talent retention strategies.	☐	☐	☐	☐	☐
29	My university benchmarks other universities outside Australia to evaluate talent retention strategies.	☐	☐	☐	☐	☐
30	My university has a competitive compensation system which is a motivating factor to retain our talented employees.	☐	☐	☐	☐	☐
31	My university provides highly competitive compensation system, particularly for long-term wealth accumulation for talent retention.	☐	☐	☐	☐	☐
X3.2	***Job Satisfaction (JS)***					
32	There is a supportive learning environment which promotes employee job satisfaction to retain qualified employees.	☐	☐	☐	☐	☐
33	My university has high-quality working conditions that enable employees to retain the right talents.	☐	☐	☐	☐	☐
34	My manager treats employees well through relationship building to retain talent.	☐	☐	☐	☐	☐
35	My university promotes equal opportunity to retain its qualified employees.	☐	☐	☐	☐	☐
36	My university ensures talented employees are satisfied.	☐	☐	☐	☐	☐
X3.3	***Non- Financial Rewards (NFR)***					
37	My university provides assistance with healthcare and safety issues to retain its qualified employees.	☐	☐	☐	☐	☐
38	My university accounts for personal factors and life events (e.g. family responsibilities) to promote its talented staff.	☐	☐	☐	☐	☐
39	My university provides fair acknowledgement of employee work efforts and achievements to retain talents.	☐	☐	☐	☐	☐

40	My university provides flexibility for work hours, roles, and tasks (e.g. for care of young children) to retain its qualified employees.	☐	☐	☐	☐	☐
41	My university has a good system of non-financial rewards to retain talented staff.	☐	☐	☐	☐	☐
X3.4	***Employee Empowerment (EE)***					
42	My university encourages innovative thinking, and promotes creative ideas from talented employees.	☐	☐	☐	☐	☐
43	My university keeps employees engaged and motivated to retain talented staff.	☐	☐	☐	☐	☐
44	My university adopts management by participation, and career enrichment programs to increase talented employees' confidence in themselves.	☐	☐	☐	☐	☐
45	My university retains its qualified employees through providing them with sufficient freedom to actively perform their jobs.	☐	☐	☐	☐	☐
46	My university retains its talented staff through providing them enough authority to complete their work efficiently.	☐	☐	☐	☐	☐
X3.5	***Employee Motivation (EM)***					
47	My university retains its qualified employees through providing them opportunities to develop their careers.	☐	☐	☐	☐	☐
48	My university retains its talented staff through financial rewards.	☐	☐	☐	☐	☐
49	My university retains its qualified employees through providing them with individual funding for academic research.	☐	☐	☐	☐	☐
50	My university monitors performance and suggests advice regularly (e.g. per semester) in an encouraging manner to retain its talented staff.	☐	☐	☐	☐	☐
51	My university utilises an employee growth program for the development of motivation and engagement to retain its qualified employees.	☐	☐	☐	☐	☐
Y	**Variables of Knowledge Management Processes (KMPs)**					
Y1	**Knowledge Transfer:** is a process that allows employees to transfer their tacit-to-tacit and explicit-to-explicit knowledge with other employees both internal and external their organisations *(***SD ⇒ Strongly Disagree, D ⇒ Disagree, N ⇒ Neutral, Agree ⇒ A, SA ⇒ Strongly Agree)**	**SD**	**D**	**N**	**A**	**SA**
Y1.1	***Codification Knowledge Transfer (CKT)***					
52	My university effectively transfers information using an e-mail, meetings, discussions and internal networks.	☐	☐	☐	☐	☐
53	My university effectively transfers information using the intranet and databases (e.g. staff profiles).	☐	☐	☐	☐	☐
54	All employees can access appropriate knowledge systems and software for transferring information.	☐	☐	☐	☐	☐
55	It is easy for my colleagues using a university social network (electronic) to seek information.	☐	☐	☐	☐	☐
56	My university saves and renews important information accessed through a computer for easy browsing.	☐	☐	☐	☐	☐
Y1.2	***Personalisation Knowledge Transfer (CKT)***					
57	Employees at my university are effective at transferring experiences or abilities to other employees.	☐	☐	☐	☐	☐
58	My university transfers useful knowledge through-out the academic workforce by training courses, seminars, workshops, and presentations.	☐	☐	☐	☐	☐
59	Knowledge is transferred through informal mechanisms for use by individual employees (e.g. face-to-face discussions).	☐	☐	☐	☐	☐
60	My university has responsible managers who ensure communication strategies are working well with appropriate information content.	☐	☐	☐	☐	☐

61	Managerial techniques are effectively learned from colleagues.	☐	☐	☐	☐	☐
Y2	**Knowledge Creation:** is a set of processes such as socialisation, externalisation, combination, and internalisation. **(SD ⇒ Strongly Disagree, D ⇒ Disagree, N ⇒ Neutral, Agree ⇒ A, SA ⇒ Strongly Agree)**	**SD**	**D**	**N**	**A**	**SA**
Y2.1	***Socialisation (S)***					
62	The technology at my university enables creativity and innovation through collaboration.	☐	☐	☐	☐	☐
63	The technology at my university facilitates creative discussion through the learning process (e.g. exploring and understanding ideas).	☐	☐	☐	☐	☐
64	The technology at my university facilitates skills development (e.g. learning by observation).	☐	☐	☐	☐	☐
65	My university encourages employees' discussion and team learning (e.g. social spaces such as dining rooms).	☐	☐	☐	☐	☐
66	Knowledge about how to use technology is learned effectively from colleagues.	☐	☐	☐	☐	☐
Y2.2	***Externalisation (E)***					
67	My university seeks external technology solutions for knowledge management problems (e.g. search ability or accessibility).	☐	☐	☐	☐	☐
68	Knowledge creation with external parties is well facilitated through collaborative tools (e.g. meetings, confluences, conferences, seminars, and SharePoint).	☐	☐	☐	☐	☐
69	My university is effective in creating new knowledge through research and publications.	☐	☐	☐	☐	☐
70	Employees share knowledge and best practices with staff from other organisations.	☐	☐	☐	☐	☐
71	My university acquires new knowledge from investigation of external sources.	☐	☐	☐	☐	☐
Y2.3	***Combination (C)***					
72	Relevant knowledge can be accessed in online databases.	☐	☐	☐	☐	☐
73	My university has effective communication channels supported by technology to distribute knowledge.	☐	☐	☐	☐	☐
74	My work is supported by the university technology and IT systems, software, and equipment.	☐	☐	☐	☐	☐
75	The university database provides employees with support and improvement to employee skills.	☐	☐	☐	☐	☐
76	My university adopts information repositories, best practices, and lessons learned.	☐	☐	☐	☐	☐
Y2.4	***Internalisation (I)***					
77	My university designs, develops, and builds appropriate technological systems and solutions.	☐	☐	☐	☐	☐
78	My university has effective methods for creating learning policies and procedures.	☐	☐	☐	☐	☐
79	My university is responsible for talented employees to manage and advise on learning processes.	☐	☐	☐	☐	☐
80	Talented employees can access support when learning by practice (e.g. for teaching or course content development).	☐	☐	☐	☐	☐
81	My university provides on-the-job training.	☐	☐	☐	☐	☐
Y3	**3- Knowledge Sharing:** is a process of sharing information, skills, expertise, and experiences among individuals, groups, or an organisation's departments. **(SD ⇒ Strongly Disagree, D ⇒ Disagree, N ⇒ Neutral, Agree ⇒ A, SA ⇒ Strongly Agree)**	**SD**	**D**	**N**	**A**	**SA**
Y3.1	**Information Sharing (IS)**					
82	My university has effective collaboration and information sharing tools between professional and academic staff.	☐	☐	☐	☐	☐

83	My university has reciprocal collaboration and information sharing methods with other universities.	☐	☐	☐	☐	☐
84	My university promotes an information sharing culture.	☐	☐	☐	☐	☐
85	My university has effective collaboration and information sharing with non-university researchers or knowledge holders (e.g. organisations and individuals externally).	☐	☐	☐	☐	☐
86	My knowledge is usually available on request to my colleagues and community.	☐	☐	☐	☐	☐

Part B: Please provide your information on the following and **tick (✓) an item**.

The University:	**Age:**	**Gender:**
[ ] QU1 [ ] QU2 [ ] QU3 [ ] QU4 [ ] QU5 [ ] QU6 [ ] QU7 [ ] QU8 [ ] QU9	[ ] ≤ 29 years [ ] 30 – 39 years [ ] 40 – 49 years [ ] 50 – 59 years [ ] ≥ 60 years	[ ] Male [ ] Female
Research Expertise: [ ] Sciences/Applied Sciences [ ] Technology/Engineering [ ] Social Sciences/Applied Arts [ ] Others	**Academic Qualification:** [ ] Doctorate [ ] Master [ ] Bachelor [ ] Others	**Position Description/Rank:** [ ] Professor [ ] Associate Professor [ ] Senior Lecturer / Lecturer [ ] Others

Thank you for your time and effort to complete this survey.
Your cooperation is valued and very much appreciated!
*With regards**: Atheer, Raj, and Abdul***

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Appendix G: The final version of the survey questionnaire

An investigation into the relationship between talent management processes and knowledge management processes: A case of the higher education sector in Queensland, Australia

My name is Atheer. I am a PhD student at USQ under the supervision of ***Professor Raj Gururajan*** *and* ***Dr***. ***Abdul Hafeez-Baig***. The following questionnaire is intended to *investigate the relationship between talent management processes and knowledge management processes within Australian higher education institutions*. Formal ethical approval has been acquired from USQ Human Research Ethics Committee (Approval # H17REA138). Your participation is valuable and will contribute to improving the performance of the Australian higher education sector by applying critical insight into both talent and knowledge management processes. **Your participation in this research is purely voluntary and can be withdrawn at any time, prior to submitting your completed survey. The research team appreciates your support and time**. The outcomes of this research study aim to contribute to improving the total productivity for both the university and individuals in the following areas:

1- Both talent and knowledge are involved in increased productivity and quality of services. For example, talented individuals contribute significantly to a university's performance by attracting new students and securing funds for further research; and
2- Both talent and knowledge are two primary sources of unique advantage. For example, competitive advantage can be maintained by attracting, developing, and retaining talented employees in key positions. Furthermore, knowledge provides many advantages to educational institutions, such as using technology for effective teaching and learning, reducing costs of overall research, and improving evaluation as well as administrative activities.

Part A: For each of the following statements, **please tick (✓) one box** on the right side of the page that best describes your views.

Variables of Talent Management Processes (TMPs)						
1- <u>Talent attraction</u>: is primarily aimed to attract talented candidates from either internal or external labour markets.		**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
My university….						
1	Attracts more talented employees through providing them with social support in difficult times (e.g. maternity, paternity, death, and financial difficulties).	☐	☐	☐	☐	☐
2	Attracts more talented employees through having a socially progressive work environment (e.g. multicultural).	☐	☐	☐	☐	☐
3	Supports the staff community through involvement in social, cultural, or economic initiatives to attract more talented employees.	☐	☐	☐	☐	☐
4	Provides social networking activities to employees.	☐	☐	☐	☐	☐
5	Has a good work-life balance (e.g. socialising with colleagues, proper location and amenities, recreation or lifestyle opportunities) to attract talented individuals.	☐	☐	☐	☐	☐
6	Has effective recruitment strategies for attracting the best academics and professional staff.	☐	☐	☐	☐	☐
7	Has a good reputation through high-quality research, which enables the university to attract the best academic and professional staff.	☐	☐	☐	☐	☐
8	Has a high university ranking which allows it to attract the best academic and professional staff.	☐	☐	☐	☐	☐
9	Has an innovative culture enabling it to attract more talented individuals.	☐	☐	☐	☐	☐
10	Has an appropriate organisational climate in order to attract the appropriate talent (e.g. having social friendships at work).	☐	☐	☐	☐	☐
11	Attracts more talented staff through having a high-quality working environment that encourages talented employees to realise creativity and innovation (e.g. physical aspects such as well-equipped workplaces).	☐	☐	☐	☐	☐
<u>2- Talent Development</u>: is focused on achieving and maintaining an organisation's human capital through learning that changes behaviour in the organisation and in its talented employees.		**Strongly Disagree(1) (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
My university….						

12	Has effective talent development strategies aligned with its organisational strategies.	☐	☐	☐	☐	☐
13	Determines training needs for talented individuals who have desired skills.	☐	☐	☐	☐	☐
14	Facilitates employee performance and development with tailored training plans.	☐	☐	☐	☐	☐
15	Uses human resource planning to ensure effective skill utilisation and development.	☐	☐	☐	☐	☐
16	Identifies areas needed for employee's personal development (e.g. skills gap analysis).	☐	☐	☐	☐	☐
17	Facilitates internal job rotation to strengthen talented employees' experiences and development in different faculties, departments, and divisions.	☐	☐	☐	☐	☐
18	Develops academic staff through sessions with learning and teaching training.	☐	☐	☐	☐	☐
19	Develops professional and academic staff with training and mentoring programs.	☐	☐	☐	☐	☐
20	Develops its own online training materials for talented staff to gain required knowledge and skills.	☐	☐	☐	☐	☐
21	Provides staff with career development opportunities (e.g. further education, certifications, scholarships, etc.).	☐	☐	☐	☐	☐
22	Includes leaders' development in the design of all job roles.	☐	☐	☐	☐	☐
23	Develops leaders through further education.	☐	☐	☐	☐	☐
24	Supports high potential employees to become leaders, in order to build a strong talent pool.	☐	☐	☐	☐	☐
25	Assists leaders to be professionals through career development programs.	☐	☐	☐	☐	☐
26	Develops succession planning, and identifies alternative talented employees for leadership positions.	☐	☐	☐	☐	☐
<u>3- Talent Retention</u>: is a process where an organisation is responsible for retaining talent, to have them remain within an organisation.		**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
My university….						
27	Determines which talent retention strategies are most effective.	☐	☐	☐	☐	☐
28	Benchmarks other universities inside Australia to evaluate talent retention strategies.	☐	☐	☐	☐	☐
29	Benchmarks other universities outside Australia to evaluate talent retention strategies.	☐	☐	☐	☐	☐

30	Has a competitive compensation system which is a motivating factor to retain our talented employees.	☐	☐	☐	☐	☐
31	Provides a highly competitive compensation system for long-term retention of talent.	☐	☐	☐	☐	☐
32	Has a supportive learning environment which promotes employee job satisfaction to retain qualified employees.	☐	☐	☐	☐	☐
33	Has high-quality working conditions to retain highly qualified talent.	☐	☐	☐	☐	☐
34	Managers treat employees well through relationship building to retain talent.	☐	☐	☐	☐	☐
35	Promotes equal opportunity to retain its qualified employees.	☐	☐	☐	☐	☐
36	Ensures talented employees are satisfied.	☐	☐	☐	☐	☐
37	Provides assistance with healthcare and safety issues to retain its qualified employees.	☐	☐	☐	☐	☐
38	Accounts for personal factors and life events (e.g. family responsibilities) to retain its talented staff.	☐	☐	☐	☐	☐
39	Provides fair acknowledgement of employee work efforts and achievements to better keep employees.	☐	☐	☐	☐	☐
40	Provides flexibility for work hours, roles, and tasks (e.g. for care of young children) to retain its qualified employees.	☐	☐	☐	☐	☐
41	Has a good system of non-financial rewards to retain talented staff.	☐	☐	☐	☐	☐
42	Encourages innovative thinking, and promotes creative ideas from talented employees.	☐	☐	☐	☐	☐
43	Keeps employees engaged and motivated to retain talented staff.	☐	☐	☐	☐	☐
44	Adopts management by career enrichment programs to increase talented employees' confidence in themselves.	☐	☐	☐	☐	☐
45	Retains its qualified employees by providing them with sufficient freedom to actively perform their jobs.	☐	☐	☐	☐	☐
46	Retains its talented staff by providing them with enough authority to complete their work efficiently.	☐	☐	☐	☐	☐
47	Retains its qualified employees by providing them with opportunities to develop their careers.	☐	☐	☐	☐	☐
48	Retains its talented staff with financial rewards, high salaries or remuneration.	☐	☐	☐	☐	☐
49	Retains its qualified employees through providing them with individual funding for academic research.	☐	☐	☐	☐	☐
50	Monitors performance and suggests advice regularly (e.g. per semester) in an encouraging manner to retain its talented staff.	☐	☐	☐	☐	☐
51	Utilises an employee growth program for the development of motivation and engagement to retain its qualified employees.	☐	☐	☐	☐	☐

Variables of Knowledge Management Processes (KMPs)						
1- Knowledge Transfer: is a process that allows employees to transfer their tacit-to-tacit and explicit-to-explicit knowledge with other employees both internal and external to their organisations. **In my university/ (My university)……**		**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
52	Effectively transfers information using e-mail, meetings, discussions and internal networks.	☐	☐	☐	☐	☐
53	Effectively transfers information using the intranet and databases (e.g. staff profiles).	☐	☐	☐	☐	☐
54	All employees can access appropriate knowledge systems and software for transferring information.	☐	☐	☐	☐	☐
55	It is easy for my colleagues using a university social network (electronic) to seek information.	☐	☐	☐	☐	☐
56	Saves and renews important information accessed through a computer for easy browsing.	☐	☐	☐	☐	☐
57	Employees are effective at transferring experiences or abilities to other employees.	☐	☐	☐	☐	☐
58	Transfers useful knowledge through-out the academic workforce through training courses, seminars, workshops, and presentations.	☐	☐	☐	☐	☐
59	Knowledge is transferred through informal mechanisms for use by individual employees (e.g. face-to-face discussions).	☐	☐	☐	☐	☐
60	Has responsible managers who ensure communication strategies are working well with appropriate information content.	☐	☐	☐	☐	☐
61	Managerial techniques are effectively learned from colleagues.	☐	☐	☐	☐	☐
2- Knowledge Creation: is a set of processes such as socialisation, externalisation, combination, and internalisation. **In my university/ (My university)….**		**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
62	The technology enables creativity and innovation through collaboration.	☐	☐	☐	☐	☐
63	The technology facilitates creative discussion through the learning process (e.g. exploring and understanding ideas).	☐	☐	☐	☐	☐

64	The technology facilitates skills development (e.g. learning by observation).	☐	☐	☐	☐	☐
65	Encourages social learning through employees' discussion (e.g. social spaces such as dining rooms).	☐	☐	☐	☐	☐
66	Knowledge about how to use technology is learned effectively from colleagues.	☐	☐	☐	☐	☐
67	Seeks external technology solutions for knowledge management problems (e.g. search ability or accessibility).	☐	☐	☐	☐	☐
68	Knowledge creation with external parties is well facilitated through collaborative tools (e.g. meetings, confluences, conferences, seminars, and SharePoint).	☐	☐	☐	☐	☐
69	Is effective in creating new knowledge through research and publications.	☐	☐	☐	☐	☐
70	Employees share knowledge and best practices with staff from other organisations.	☐	☐	☐	☐	☐
71	Acquires new knowledge from investigation of external sources.	☐	☐	☐	☐	☐
72	Relevant knowledge can be accessed in online databases.	☐	☐	☐	☐	☐
73	Has effective communication channels supported by technology to distribute knowledge.	☐	☐	☐	☐	☐
74	My work is supported by the university technology and IT systems, software, and equipment.	☐	☐	☐	☐	☐
75	The database provides employees with support and improvement to employee skills.	☐	☐	☐	☐	☐
76	Adopts information repositories, best practices, and lessons learned.	☐	☐	☐	☐	☐
77	Designs, develops, and builds appropriate technological systems and solutions.	☐	☐	☐	☐	☐
78	Has effective methods for creating learning policies and procedures.	☐	☐	☐	☐	☐
79	Is responsible for talented employees to manage and advise on learning processes.	☐	☐	☐	☐	☐
80	Talented employees can access support when learning by practice (e.g. for teaching or course content development).	☐	☐	☐	☐	☐
81	Provides on-the-job training.	☐	☐	☐	☐	☐
<u>3- Knowledge Sharing</u>: is a process of sharing information, skills, expertise, and experiences among individuals, groups, or an organisation's departments.		**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
My university….						
82	Has reciprocal collaboration and sharing information methods with other universities.	☐	☐	☐	☐	☐

83	Promotes a sharing information culture.	☐	☐	☐	☐	☐
84	Effective collaborates and shares information with non-university researchers or knowledge holders (e.g. organisations and individuals externally).	☐	☐	☐	☐	☐
85	Supports sharing information through group interaction, individual collaboration, and library resources.	☐	☐	☐	☐	☐
86	Has reciprocal collaboration and sharing information methods with other universities.	☐	☐	☐	☐	☐

Part B: Please provide your information on the following and **tick (✓) an item**.

The university:	**Gender:**	**Age:**
☐ QU1 ☐ QU2 ☐ QU3 ☐ QU4 ☐ QU5 ☐ QU6 ☐ QU7 ☐ QU8 ☐ QU9	☐ Male ☐ Female ☐ Do not want to disclose	☐ ≤ 29 years ☐ 30 – 39 years ☐ 40 – 49 years ☐ 50 – 59 years ☐ ≥ 60 years
The number of expertise years:	**Academic qualification:**	**Current position:**
[ ] year	☐ Doctorate ☐ Master ☐ Bachelor ☐ Diploma	☐ Professor ☐ Associate Professor ☐ Senior Lecturer/ Lecturer ☐ Others

Return process: In person to a member of research team or via email to emails below.

Thank you for your time and effort to complete this survey, your input to this research is valued and very much appreciated!

Thank you for your time and effort to complete this survey.

Your input to this research is valued and very much appreciated!

With regards**: Atheer, Raj, and Abdul**

For further information about this research, contact to the research team:

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Appendix H: SPSS actual outputs of the reliability tests for the composite variables

Table A: The reliability test for non-demographic variables (N=286)

```
RELIABILITY/VARIABLES=TA1 TA2 TA3 TA4 TA5 TA6 TA7 TA8 TA9 TA10 TA11
  /SCALE ('ALL VARIABLES') ALL/MODEL=ALPHA.
```

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	286	100.0
	Excluded[a]	0	.0
	Total	286	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.893	**11**

RELIABILITY/VARIABLES=TD1 TD2 TD3 TD4 TD5 TD6 TD7 TD8 TD9 TD10 TD11 TD12 TD13 TD14 TD15
/SCALE ('ALL VARIABLES') ALL/MODEL=ALPHA.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	286	100.0
	Excluded[a]	0	.0
	Total	286	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.934	**15**

RELIABILITY/VARIABLES=TR1 TR2 TR3 TR4 TR5 TR6 TR7 TR8 TR9 TR10 TR11 TR12 TR13 TR14 TR15 TR16 TR17 TR18 TR19
TR20 TR21 TR22 TR23 TR24 TR25/SCALE ('ALL VARIABLES') ALL/MODEL=ALPHA.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	286	100.0
	Excluded[a]	0	.0
	Total	286	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.955	**25**

```
RELIABILITY/VARIABLES=KT1 KT2 KT3 KT4 KT5 KT6 KT7 KT8 KT9 KT10
  /SCALE ('ALL VARIABLES') ALL/MODEL=ALPHA.
```

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	286	100.0
	Excluded[a]	0	.0
	Total	286	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.914	10

RELIABILITY /VARIABLES=KC1 KC2 KC3 KC4 KC5 KC6 KC7 KC8 KC9 KC10 KC11 KC12 KC13 KC14 KC15 KC16 KC17 KC18 KC19 KC20 /SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	286	100.0
	Excluded[a]	0	.0
	Total	286	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.948	20

RELIABILITY /VARIABLES=KS1 KS2 KS3 KS4 KS5/SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	286	100.0
	Excluded[a]	0	.0
	Total	286	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.870	**5**

RELIABILITY /VARIABLES=TA1 TA2 TA3 TA4 TA5 TA6 TA7 TA8 TA9 TA10 TA11 TD1 TD2 TD3 TD4 TD5 TD6 TD7 TD8 TD9 TD10 TD11 TD12 TD13 TD14 TD15 TR1 TR2 TR3 TR4 TR5 TR6 TR7 TR8 TR9 TR10 TR11 TR12 TR13 TR14 TR15 TR16 TR17 TR18 TR19 TR20 TR21 TR22 TR23 TR24 TR25 KT1 KT2 KT3 KT4 KT5 KT6 KT7 KT8 KT9 KT10 KC1 KC2 KC3 KC4 KC5 KC6 KC7 KC8 KC9 KC10 KC11 KC12 KC13 KC14 KC15 KC16 KC17 KC18 KC19 KC20 KS1 KS2 KS3 KS4 KS5/SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	286	100.0
	Excluded[a]	0	.0
	Total	286	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.984	86

Table B: The reliability test for the composite variables (N=237)

RELIABILITY/VARIABLES=**TA1 TA2 TA3 TD8 TD2 TD3 TD13 TD7 TD14 TD1 TD10 TD11 TR4 TR5 TR14 TR22 KT1 KT2 KT4 KT5 KT3 KT6 KT7 KT9 KC1 KC2 KC3 KC4 KC5 KC16 KC17 KS2 KS5 KS4**/SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA /ICC=MODEL (MIXED) TYPE (CONSISTENCY) CIN=95 TESTVAL=0.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	237	100.0
	Excluded[a]	0	.0
	Total	237	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.957	**34**

Intraclass Correlation Coefficient							
		95% Confidence Interval		F Test with True Value 0			
	Intraclass Correlation[b]	Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.397[a]	.354	.446	23.423	236	7788	**.000**
Average Measures	.957[c]	.949	.965	23.423	236	7788	**.000**
Two-way mixed effects model where people effects are random and measures effects are fixed.							
a. The estimator is the same, whether the interaction effect is present or not.							
b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.							
c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.							

RELIABILITY/VARIABLES= **TA8 TA1 TA7** /SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA
/ICC=MODEL (MIXED) TYPE (CONSISTENCY) CIN=95 TESTVAL= 0.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	237	100.0
	Excluded[a]	0	.0
	Total	237	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.915	**3**

Intraclass Correlation Coefficient							
		95% Confidence Interval		F Test with True Value 0			
	Intraclass Correlation[b]	Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.782[a]	.739	.821	11.775	236	472	**.000**
Average Measures	.915[c]	.894	.932	11.775	236	472	**.000**
Two-way mixed effects model where people effects are random and measures effects are fixed.							
a. The estimator is the same, whether the interaction effect is present or not.							
b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.							
c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.							

RELIABILITY /VARIABLES=**TD8 TD2 TD3 TD7 TD14 TD1 TD10 TD11 TD13**/SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA /ICC=MODEL (MIXED) TYPE (CONSISTENCY) CIN=95 TESTVAL=0.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	237	100.0
	Excluded[a]	0	.0
	Total	237	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.897	**9**

Intraclass Correlation Coefficient							
	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.491[a]	.439	.546	9.682	236	1888	**.000**
Average Measures	.897[c]	.876	.915	9.682	236	1888	**.000**
Two-way mixed effects model where people effects are random and measures effects are fixed.							
a. The estimator is the same, whether the interaction effect is present or not.							
b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.							
c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.							

RELIABILITY /VARIABLES=**TR4 TR5 TR14 TR22** /SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA /ICC=MODEL (MIXED) TYPE (CONSISTENCY) CIN=95 TESTVAL=0.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	237	100.0
	Excluded[a]	0	.0
	Total	237	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.868	**4**

Intraclass Correlation Coefficient							
		95% Confidence Interval		F Test with True Value 0			
	Intraclass Correlation[b]	Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.621[a]	.564	.676	7.554	236	708	**.000**
Average Measures	.868[c]	.838	.893	7.554	236	708	**.000**
Two-way mixed effects model where people effects are random and measures effects are fixed.							
a. The estimator is the same, whether the interaction effect is present or not.							
b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.							
c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.							

RELIABILITY/VARIABLES=**KT1 KT2 KT4 KT5 KT3 KT6 KT7 KT9**
/SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA/ICC=MODEL (MIXED) TYPE (CONSISTENCY) CIN=95 TESTVAL=0.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	237	100.0
	Excluded[a]	0	.0
	Total	237	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.912	**8**

Intraclass Correlation Coefficient							
		95% Confidence Interval		F Test with True Value 0			
	Intraclass Correlation[b]	Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.565[a]	.514	.618	11.393	236	1652	**.000**
Average Measures	.912[c]	.894	.928	11.393	236	1652	**.000**
Two-way mixed effects model where people effects are random and measures effects are fixed.							
a. The estimator is the same, whether the interaction effect is present or not.							
b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.							
c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.							

RELIABILITY /VARIABLES=**KC1 KC2 KC3 KC4 KC5 KC16 KC17** /SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA
/ICC=MODEL (MIXED) TYPE (CONSISTENCY) CIN=95 TESTVAL=0.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	237	100.0
	Excluded[a]	0	.0
	Total	237	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.896	**7**

Intraclass Correlation Coefficient							
		95% Confidence Interval		F Test with True Value 0			
	Intraclass Correlation[b]	Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.551[a]	.498	.606	9.605	236	1416	**.000**
Average Measures	.896[c]	.874	.915	9.605	236	1416	**.000**
Two-way mixed effects model where people effects are random and measures effects are fixed.							
a. The estimator is the same, whether the interaction effect is present or not.							
b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.							
c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.							

RELIABILITY /VARIABLES=**KS2 KS5 KS4**/SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA
/ICC=MODEL (MIXED) TYPE (CONSISTENCY) CIN=95 TESTVAL=0.

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	237	100.0
	Excluded[a]	0	.0
	Total	237	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.771	**3**

Intraclass Correlation Coefficient							
	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.529[a]	.457	.599	4.376	236	472	**.000**
Average Measures	.771[c]	.716	.818	4.376	236	472	**.000**
Two-way mixed effects model where people effects are random and measures effects are fixed.							
a. The estimator is the same, whether the interaction effect is present or not.							
b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.							
c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.							

Appendix I: SPSS actual outputs of simple linear regression for composite variables

REGRESSION/MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN (.05) POUT (.10) /NOORIGIN /**DEPENDENT KT /METHOD=STEPWISE TA**.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	**TA**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: **KT**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.322[a]	.103	.100	4.26744	**.103**	27.110	1	235	.000

a. Predictors: (Constant), **TA**

b. Predictors: (Constant), **TA**

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	493.708	1	493.708	**27.110**	**.000[b]**
	Residual	4279.596	235	18.211		
	Total	4773.304	236			

a. Dependent Variable: **KT**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.144	1.371		14.692	.000
	TA	.841	**.162**	**.322**	**5.207**	**.000**

a. Dependent Variable: **KT**

REGRESSION
/MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN (.05) POUT (.10)
/NOORIGIN /**DEPENDENT KT /METHOD=STEPWISE TD**.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	**TD**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: **KT**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.588[a]	.346	.343	3.64395	**.346**	124.480	1	235	.000

a. Predictors: (Constant), **TD**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1652.894	1	1652.894	**124.480**	**.000[b]**
	Residual	3120.410	235	13.278		
	Total	4773.304	236			

a. Dependent Variable: **KT**

b. Predictors: (Constant), **TD**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.199	1.625		5.661	.000
	TD	.601	**.054**	**.588**	**11.157**	**.000**

a. Dependent Variable: **KT**

REGRESSION

/MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN (.05) POUT (.10)
/NOORIGIN /**DEPENDENT KT /METHOD=STEPWISE TR**.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	**TR**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: **KT**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.462[a]	.214	.210	3.99667	**.214**	63.829	1	235	.000

a. Predictors: (Constant), **TR**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1019.563	1	1019.563	**63.829**	**.000[b]**
	Residual	3753.742	235	15.973		
	Total	4773.304	236			

a. Dependent Variable: **KT**

b. Predictors: (Constant), **TR**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.677	1.335		12.497	.000
	TR	.926	**.116**	**.462**	**7.989**	**.000**

a. Dependent Variable: **KT**

REGRESSION

/MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN (.05) POUT (.10)
/NOORIGIN /**DEPENDENT KC /METHOD=STEPWISE TA.**

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	**TA**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: **KC**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.315[a]	.099	.096	3.33856	**.099**	25.945	1	235	.000

a. Predictors: (Constant), **TA**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	289.179	1	289.179	**25.945**	**.000[b]**
	Residual	2619.312	235	11.146		
	Total	2908.491	236			

a. Dependent Variable: **KC**

b. Predictors: (Constant), **TA**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.309	1.073		16.137	.000
	TA	.644	**.126**	**.315**	**5.094**	**.000**

a. Dependent Variable: **KC**

REGRESSION
/MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN (.05) POUT (.10)
/NOORIGIN /**DEPENDENT KC /METHOD=STEPWISE TD**.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	**TD**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: **KC**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.667[a]	.444	.442	2.62219	**.444**	187.998	1	235	.000

a. Predictors: (Constant), **TD**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1292.656	1	1292.656	**187.998**	**.000[b]**
	Residual	1615.835	235	6.876		
	Total	2908.491	236			

a. Dependent Variable: **KC**

b. Predictors: (Constant), **TD**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.797	1.169		5.813	.000
	TD	.532	**.039**	**.667**	**13.711**	**.000**

a. Dependent Variable: **KC**

REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN (.05) POUT (.10) /NOORIGIN /**DEPENDENT KC /METHOD=STEPWISE TR**.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	**TR**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: **KC**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.517[a]	.267	.264	3.01144	**.267**	85.714	1	235	.000

a. Predictors: (Constant), **TR**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	777.325	1	777.325	**85.714**	**.000[b]**
	Residual	2131.166	235	9.069		
	Total	2908.491	236			

a. Dependent Variable: **KC**

b. Predictors: (Constant), **TR**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.528	1.006		13.453	.000
	TR	.808	**.087**	**.517**	**9.258**	**.000**

a. Dependent Variable: **KC**

REGRESSION

/MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN (.05) POUT (.10) /NOORIGIN /**DEPENDENT KS /METHOD=STEPWISE TA.**

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	**TA**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: **KS**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.406[a]	.165	.161	1.19264	**.165**	46.451	1	235	**.000**

a. Predictors: (Constant), **TA**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	66.072	1	66.072	**46.451**	**.000[b]**
	Residual	334.261	235	1.422		
	Total	400.333	236			

a. Dependent Variable: **KS**

b. Predictors: (Constant), **TA**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.774	.383		15.070	.000
	TA	.308	**.045**	**.406**	**6.816**	**.000**

a. Dependent Variable: **KS**

REGRESSION

/MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN (.05) POUT (.10)
/NOORIGIN /**DEPENDENT KS /METHOD=STEPWISE TD.**

Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	**TD**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
a. Dependent Variable: **KS**			

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.586[a]	.344	.341	1.05725	**.344**	123.151	1	235	.000
a. Predictors: (Constant), **TD**									

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.655	1	137.655	**123.151**	**.000[b]**
	Residual	262.678	235	1.118		
	Total	400.333	236			
a. Dependent Variable: **KS**						
b. Predictors: (Constant), **TD**						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.156	.471		6.693	.000
	TD	.174	**.016**	**.586**	**11.097**	**.000**
a. Dependent Variable: **KS**						

REGRESSION

/MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE
/CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /**DEPENDENT KS /METHOD=STEPWISE TR**.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	**TR**	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: **KS**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.463[a]	.214	.211	1.15698	**.214**	64.068	1	235	.000

a. Predictors: (Constant), **TR**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.761	1	85.761	**64.068**	**.000[b]**
	Residual	314.571	235	1.339		
	Total	400.333	236			

a. Dependent Variable: **KS**

b. Predictors: (Constant), **TR**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.299	.386		13.716	.000
	TR	.268	**.034**	**.463**	**8.004**	**.000**

a. Dependent Variable: **KS**

Appendix J: AMOS actual outputs for the composite variables

Table A: CFA for talent attraction measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	6
Number of distinct parameters to be estimated:	6
Degrees of freedom (6 - 6):	0

Result (Default model)

Minimum was achieved

Chi-square = .000

Degrees of freedom = 0

Probability level cannot be computed

Maximum Likelihood Estimates

Standardised Regression Weights: (Group number 1-Default model)

			Estimate
TA1	<---	Talent_attraction	.954
TA7	<---	Talent_attraction	.713
TA8	<---	Talent_attraction	.997

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Talent_attraction	.593	.061	9.718	***
e1	.059	.014	4.356	***
e2	.306	.029	10.577	***
e3	.004	.014	.300	.765

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
TA8	.994
TA7	.508
TA1	.910

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	6	.000	0		
Saturated model	6	.000	0		
Independence model	3	719.577	3	.000	239.859

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.000**	**1.000**		
Saturated model	.000	1.000		
Independence model	.366	.445	-.110	.222

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	1.000		**1.000**		**1.000**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Independence model	**1.006**	.945	1.069	.000

Table B: CFA for talent development measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	45
Number of distinct parameters to be estimated:	18
Degrees of freedom (45 - 18):	27

Result (Default model)

Minimum was achieved

Chi-square = 42.660

Degrees of freedom = 27

Probability level = .028

Maximum Likelihood Estimates

Standardised Regression Weights: (Group number 1-Default model)

			Estimate
TD8	<---	Talent_Development	.736
TD3	<---	Talent_Development	.716
TD2	<---	Talent_Development	.765
TD1	<---	Talent_Development	.701
TD13	<---	Talent_Development	.738
TD7	<---	Talent_Development	.611
TD10	<---	Talent_Development	.630
TD14	<---	Talent_Development	.731
TD11	<---	Talent_Development	.688

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Talent_Development	.237	.037	6.350	***
e1	.201	.021	9.443	***
e3	.296	.031	9.595	***
e2	.219	.024	9.159	***
e7	.258	.027	9.704	***
e4	.268	.028	9.427	***
e5	.307	.030	10.149	***
e8	.305	.030	10.075	***
e6	.256	.027	9.479	***
e9	.331	.034	9.782	***

Squared Multiple Correlations: (Group number 1-Default model)

	Estimate
TD11	.474
TD14	.535
TD10	.397
TD7	.373
TD13	.544
TD1	.491
TD2	.586
TD3	.513
TD8	.541

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	18	42.660	27	**.028**	**1.580**
Saturated model	45	.000	0		
Independence model	9	964.842	36	.000	26.801

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.017**	**.962**	**.937**	.577
Saturated model	.000	1.000		
Independence model	.239	.337	.172	.270

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.956	.941	**.983**	**.978**	**.983**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	**.050**	.016	.077	.479
Independence model	.331	.313	.349	.000

Table C: CFA for talent retention measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	10
Number of distinct parameters to be estimated:	8
Degrees of freedom (10 - 8):	2

Result (Default model)

Minimum was achieved
Chi-square = 7.925
Degrees of freedom = 2
Probability level = .019

Maximum Likelihood Estimates

Standardised Regression Weights: (Group number 1 - Default model)

			Estimate
TR4	<---	Talent_Retention	.938
TR5	<---	Talent_Retention	.836
TR22	<---	Talent_Retention	.737
TR14	<---	Talent_Retention	.663

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Talent_Retention	.561	.062	9.076	***
e1	.077	.022	3.529	***
e2	.203	.026	7.849	***
e4	.326	.034	9.545	***
e3	.331	.033	10.041	***

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
TR14	.440
TR22	.543
TR5	.698
TR4	.880

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	8	7.925	2	**.019**	**3.963**
Saturated model	10	.000	0		
Independence model	4	513.745	6	.000	85.624

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.016**	**.983**	**.914**	.197
Saturated model	.000	1.000		
Independence model	.320	.456	.093	.274

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.985	.954	**.988**	**.965**	**.988**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	**.048**	.015	.077	.479
Independence model	.328	.312	.346	.000

Table D: CFA for knowledge creation measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	21
Number of distinct parameters to be estimated:	12
Degrees of freedom (21 - 12):	9

Result (Default model)

Minimum was achieved
Chi-square = 20.111
Degrees of freedom = 9
Probability level = .017

Maximum Likelihood Estimates

Standardised Regression Weights: (Group number 1-Default model)

			Estimate
KT1	<---	Knowledge_Transfer	.802
KT2	<---	Knowledge_Transfer	.813
KT4	<---	Knowledge_Transfer	.829
KT5	<---	Knowledge_Transfer	.773
KT3	<---	Knowledge_Transfer	.728
KT6	<---	Knowledge_Transfer	.716

*Variances: (Group number 1 - Default model)***)**

	Estimate	S.E.	C.R.	P
Knowledge_Transfer	.439	.061	7.204	***
e1	.244	.028	8.782	***
e2	.273	.032	8.612	***
e3	.236	.028	8.319	***
e4	.222	.024	9.156	***
e5	.257	.027	9.568	***
e6	.296	.031	9.657	***

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
KT6	.513
KT3	.530
KT5	.597
KT4	.687
KT2	.661
KT1	.643

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	12	20.111	9	**.017**	**2.235**
Saturated model	21	.000	0		
Independence model	6	797.711	15	.000	53.181

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.016**	**.973**	**.938**	.417
Saturated model	.000	1.000		
Independence model	.340	.353	.095	.252

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.975	.958	**.986**	**.976**	**.986**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	**.072**	.029	.115	.169
Independence model	.470	.443	.498	.000

Table E: CFA for knowledge creation measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	21
Number of distinct parameters to be estimated:	12
Degrees of freedom (21 - 12):	9

Result (Default model)

Minimum was achieved

Chi-square = 19.312

Degrees of freedom = 9

Probability level = .023

Maximum Likelihood Estimates

Standardised Regression Weights: (Group number 1-Default model)

			Estimate
KC1	<---	Knowledge_Creation	.817
KC2	<---	Knowledge_Creation	.839
KC3	<---	Knowledge_Creation	.825
KC4	<---	Knowledge_Creation	.682
KC16	<---	Knowledge_Creation	.701
KC17	<---	Knowledge_Creation	.682

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Knowledge_Creation	.316	.043	7.384	***
e1	.158	.019	8.433	***
e2	.157	.020	7.976	***
e3	.152	.018	8.270	***
e4	.318	.032	9.821	***
e6	.261	.027	9.707	***
e7	.225	.023	9.826	***

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
KC17	.465
KC16	.491
KC4	.466
KC3	.681
KC2	.704
KC1	.667

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	15	24.281	13	**.029**	**1.868**
Saturated model	28	.000	0		
Independence model	7	868.997	21	.000	41.381

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.014**	**.970**	**.934**	.450
Saturated model	.000	1.000		
Independence model	.243	.349	.132	.262

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.972	.955	**.987**	**.979**	**.987**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	**.061**	.019	.098	.286
Independence model	.414	.390	.437	.000

Table F: CFA for knowledge sharing measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	6
Number of distinct parameters to be estimated:	6
Degrees of freedom (6 - 6):	0

Result (Default model)

Minimum was achieved

Chi-square = .000

Degrees of freedom = 0

Probability level cannot be computed

Maximum Likelihood Estimates

Standardised Regression Weights: (Group number 1-Default model)

			Estimate
KS4	<---	Knowledge_Sharing	.777
KS5	<---	Knowledge_Sharing	.796
KS2	<---	Knowledge_Sharing	.621

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Knowledge_Sharing	.287	.049	5.823	***
e3	.188	.033	5.620	***
e2	.147	.029	5.115	***
e1	.290	.032	8.989	***

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
KS2	.385
KS5	.634
KS4	.604

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	6	.000	0		
Saturated model	6	.000	0		
Independence model	3	196.459	3	.000	65.486

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.000**	**1.000**		
Saturated model	.000	1.000		
Independence model	.169	.636	.271	.318

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	1.000		**1.000**		**1.000**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Independence model	**.523**	.462	.586	.000

Table G: CFA for the exogenous variables measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	136
Number of distinct parameters to be estimated:	35
Degrees of freedom (136 - 35):	101

Result (Default model)

Minimum was achieved
Chi-square = 131.588
Degrees of freedom = 101
Probability level = .022

Maximum Likelihood Estimates

Standardised Regression Weights: (Group number 1-Default model)

			Estimate
TA7	<---	Talent_Attraction	.711
TA1	<---	Talent_Attraction	.951
TA8	<---	Talent_Attraction	.999
TD13	<---	Talent_Development	.736
TD10	<---	Talent_Development	.629
TD2	<---	Talent_Development	.766
TR22	<---	Talent_Retention	.750
TR5	<---	Talent_Retention	.844
TR4	<---	Talent_Retention	.925
TD3	<---	Talent_Development	.712
TD8	<---	Talent_Development	.725
TD7	<---	Talent_Development	.611
TD14	<---	Talent_Development	.741
TD11	<---	Talent_Development	.698
TD1	<---	Talent_Development	.704
TR14	<---	Talent_Retention	.660

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
Talent_Attraction	<-->	Talent_Development	.088	.020	4.421	***
Talent_Development	<-->	Talent_Retention	.166	.028	5.904	***
Talent_Attraction	<-->	Talent_Retention	.074	.026	2.891	.004

Correlations: (Group number 1 - Default model)

			Estimate
Talent_Attraction	<-->	Talent_Development	.367
Talent_Development	<-->	Talent_Retention	.614
Talent_Attraction	<-->	Talent_Retention	.208

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
Talent_Attraction	.314	.050	6.272	***	
Talent_Development	.183	.037	4.996	***	
Talent_Retention	.401	.061	6.556	***	
e3	.307	.029	10.614	***	
e2	.062	.013	4.806	***	
e1	.001	.013	.057	.955	
e8	.307	.030	10.198	***	
e7	.269	.028	9.540	***	
e11	.305	.030	10.133	***	
e5	.219	.024	9.278	***	
e6	.300	.031	9.713	***	
e4	.208	.022	9.625	***	
e16	.312	.033	9.471	***	
e14	.193	.024	7.893	***	
e13	.092	.020	4.623	***	
e9	.253	.026	9.549	***	
e12	.323	.033	9.804	***	
e10	.255	.026	9.763	***	
e15	.334	.033	10.060	***	

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
TR14	.435
TD1	.496
TD11	.487
TD14	.540
TR4	.855

	Estimate
TR5	.713
TR22	.563
TD8	.526
TD3	.507
TD2	.586
TD10	.396
TD13	.542
TD7	.374
TA8	.999
TA1	.905
TA7	.506

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	35	131.588	101	**.022**	**1.303**
Saturated model	136	.000	0		
Independence model	16	2396.210	120	.000	19.968

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.027**	**.937**	**.915**	.696
Saturated model	.000	1.000		
Independence model	.224	.288	.193	.254

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.945	.935	**.987**	**.984**	**.987**
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	.795	.830
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	**.036**	.014	.052	.923
Independence model	.284	.274	.293	.000

Table H: CFA for the endogenous variables measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	120
Number of distinct parameters to be estimated:	34
Degrees of freedom (120 - 34):	86

Result (Default model)

Minimum was achieved
Chi-square = 139.031
Degrees of freedom = 86
Probability level = .000

Maximum Likelihood Estimates

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
KT4	<---	Knowledge_Transfer	.831
KT2	<---	Knowledge_Transfer	.811
KT1	<---	Knowledge_Transfer	.786
KC1	<---	Knowledge_Creation	.821
KS4	<---	Knowledge_Sharing	.763
KS2	<---	Knowledge_Sharing	.634
KC2	<---	Knowledge_Creation	.811
KC3	<---	Knowledge_Creation	.810
KC16	<---	Knowledge_Creation	.724
KC4	<---	Knowledge_Creation	.698
KS5	<---	Knowledge_Sharing	.796
KC17	<---	Knowledge_Creation	.699
KT5	<---	Knowledge_Transfer	.771
KT3	<---	Knowledge_Transfer	.723
KT6	<---	Knowledge_Transfer	.733

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
Knowledge_Transfer	<-->	Knowledge_Creation	.337	.043	7.863	***
Knowledge_Creation	<-->	Knowledge_Sharing	.270	.035	7.783	***
Knowledge_Transfer	<-->	Knowledge_Sharing	.284	.039	7.246	***
e2	<-->	e13	-.065	.021	-3.073	.002

Correlations: (Group number 1 - Default model)

			Estimate
Knowledge_Transfer	<-->	Knowledge_Creation	.791
Knowledge_Creation	<-->	Knowledge_Sharing	.871
Knowledge_Transfer	<-->	Knowledge_Sharing	.746
e2	<-->	e13	-.234

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Knowledge_Transfer	.522	.068	7.660	***
Knowledge_Creation	.348	.047	7.386	***
Knowledge_Sharing	.277	.043	6.496	***
e3	.234	.027	8.641	***
e2	.272	.031	8.919	***
e1	.260	.028	9.257	***
e8	.181	.020	9.010	***
e7	.154	.017	8.861	***
e15	.198	.024	8.307	***
e13	.282	.029	9.661	***
e9	.164	.018	9.027	***
e11	.244	.025	9.808	***
e10	.306	.031	9.956	***
e14	.147	.019	7.638	***
e12	.215	.022	9.952	***
e4	.223	.024	9.408	***
e5	.261	.027	9.782	***
e6	.282	.029	9.720	***

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
KT6	.537
KT3	.523
KT5	.595
KC17	.488
KS5	.634
KC4	.487
KC16	.524
KC3	.656
KS2	.402
KS4	.583
KC1	.675
KC2	.658

	Estimate
KT1	.618
KT2	.658
KT4	.691

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	34	139.031	86	**.000**	**1.617**
Saturated model	120	.000	0		
Independence model	15	2199.787	105	.000	20.950

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.022**	**.929**	**.901**	.666
Saturated model	.000	1.000		
Independence model	.266	.217	.105	.190

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.937	.923	**.975**	**.969**	**.975**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.051	.035	.066	.436
Independence model	.291	.280	.301	.000

Table I: CFA for the whole measurement model measures

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	496
Number of distinct parameters to be estimated:	78
Degrees of freedom (496 - 78):	418

Result (Default model)

Minimum was achieved
Chi-square = 629.264
Degrees of freedom = 418
Probability level = .000

Maximum Likelihood Estimates

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
TA1	<---	Talent_Attraction	.952
TD13	<---	Talent_Development	.733
TD1	<---	Talent_Development	.713
TD2	<---	Talent_Development	.762
TR22	<---	Talent_Retention	.759
TR5	<---	Talent_Retention	.855
TR4	<---	Talent_Retention	.913
KT2	<---	Knowledge_Transfer	.809
KT6	<---	Knowledge_Transfer	.732
KT4	<---	Knowledge_Transfer	.832
KT5	<---	Knowledge_Transfer	.772
KC4	<---	Knowledge_Creation	.701
KC16	<---	Knowledge_Creation	.730
KC1	<---	Knowledge_Creation	.822
KC3	<---	Knowledge_Creation	.803
KC2	<---	Knowledge_Creation	.805
KC17	<---	Knowledge_Creation	.704
KS2	<---	Knowledge_Sharing	.633
KS5	<---	Knowledge_Sharing	.799
KS4	<---	Knowledge_Sharing	.762

			Estimate
TA8	<---	Talent_Attraction	.998
TA7	<---	Talent_Attraction	.712
TD7	<---	Talent_Development	.612
TD3	<---	Talent_Development	.712
TD8	<---	Talent_Development	.721
TD14	<---	Talent_Development	.742
TD11	<---	Talent_Development	.713
TR14	<---	Talent_Retention	.653
TD10	<---	Talent_Development	.642
KT1	<---	Knowledge_Transfer	.788
KT3	<---	Knowledge_Transfer	.722

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
Knowledge_Transfer	<-->	Knowledge_Sharing	.234	.034	6.869	***
Talent_Retention	<-->	Knowledge_Sharing	.171	.029	5.857	***
Talent_Development	<-->	Knowledge_Sharing	.133	.023	5.843	***
Talent_Attraction	<-->	Knowledge_Sharing	.095	.021	4.466	***
Talent_Attraction	<-->	Talent_Development	.087	.020	4.420	***
Talent_Development	<-->	Talent_Retention	.168	.028	5.926	***
Knowledge_Transfer	<-->	Knowledge_Creation	.310	.043	7.286	***
Talent_Development	<-->	Knowledge_Creation	.171	.027	6.255	***
Talent_Attraction	<-->	Knowledge_Transfer	.125	.031	4.069	***
Talent_Attraction	<-->	Talent_Retention	.074	.026	2.868	.004
Talent_Development	<-->	Knowledge_Transfer	.198	.032	6.175	***
Talent_Attraction	<-->	Knowledge_Creation	.109	.024	4.468	***
Knowledge_Creation	<-->	Knowledge_Sharing	.205	.031	6.661	***
Talent_Retention	<-->	Knowledge_Creation	.206	.033	6.155	***
Talent_Retention	<-->	Knowledge_Transfer	.244	.041	5.988	***
e18	<-->	e29	-.062	.021	-2.961	.003

Correlations: (Group number 1 - Default model)

			Estimate
Knowledge_Transfer	<-->	Knowledge_Sharing	.745
Talent_Retention	<-->	Knowledge_Sharing	.614
Talent_Development	<-->	Knowledge_Sharing	.725
Talent_Attraction	<-->	Knowledge_Sharing	.390
Talent_Attraction	<-->	Talent_Development	.368
Talent_Development	<-->	Talent_Retention	.619
Knowledge_Transfer	<-->	Knowledge_Creation	.792

			Estimate
Talent_Development	<-->	Knowledge_Creation	.745
Talent_Attraction	<-->	Knowledge_Transfer	.307
Talent_Attraction	<-->	Talent_Retention	.207
Talent_Development	<-->	Knowledge_Transfer	.648
Talent_Attraction	<-->	Knowledge_Creation	.357
Knowledge_Creation	<-->	Knowledge_Sharing	.872
Talent_Retention	<-->	Knowledge_Creation	.593
Talent_Retention	<-->	Knowledge_Transfer	.528
e18	<-->	e29	-.224

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Talent_Attraction	.315	.050	6.285	***
Talent_Development	.179	.036	4.951	***
Talent_Retention	.411	.062	6.667	***
Knowledge_Transfer	.522	.071	7.376	***
Knowledge_Creation	.293	.049	6.013	***
Knowledge_Sharing	.189	.037	5.131	***
e3	.306	.029	10.618	***
e2	.061	.013	4.803	***
e1	.002	.013	.179	.858
e7	.271	.028	9.659	***
e10	.254	.026	9.841	***
e5	.224	.024	9.455	***
e16	.302	.032	9.372	***
e14	.181	.024	7.662	***
e13	.107	.020	5.375	***
e18	.275	.031	8.968	***
e22	.282	.029	9.732	***
e19	.232	.027	8.640	***
e20	.223	.024	9.413	***
e26	.303	.030	9.980	***
e27	.240	.024	9.823	***
e23	.154	.017	8.942	***
e25	.169	.018	9.198	***
e24	.186	.020	9.167	***
e28	.212	.021	9.966	***
e29	.282	.029	9.765	***
e30	.145	.019	7.770	***
e31	.200	.023	8.515	***
e8	.310	.030	10.267	***
e6	.304	.031	9.826	***
e4	.211	.022	9.754	***

	Estimate	S.E.	C.R.	P
e9	.251	.026	9.632	***
e12	.310	.032	9.796	***
e15	.339	.034	10.072	***
e11	.300	.030	10.159	***
e17	.258	.028	9.248	***
e21	.262	.027	9.798	***

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
KT3	.521
KT1	.622
TD10	.406
TR14	.426
TD11	.508
TD14	.543
TD8	.518
TD3	.501
TD7	.366
KS4	.580
KS5	.639
KS2	.401
KC17	.496
KC2	.648
KC3	.644
KC1	.676
KC16	.532
KC4	.492
KT5	.596
KT4	.693
KT6	.536
KT2	.655
TR4	.833
TR5	.730
TR22	.577
TD2	.576
TD1	.497
TD13	.538
TA8	.997
TA1	.907
TA7	.507

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	78	629.264	418	**.000**	**1.505**
Saturated model	496	.000	0		
Independence model	31	5147.829	465	.000	11.071

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	**.029**	**.858**	**.832**	.723
Saturated model	.000	1.000		
Independence model	.225	.167	.111	.156

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.878	.864	**.955**	**.950**	**.955**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	**.046**	.039	.054	.795
Independence model	.207	.201	.212	.000