KNOWLEDGE UBIQUITY THROUGH THE TRANSFER OF TACIT KNOWLEDGE IN AUSTRALIAN UNIVERSITIES

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Abstract

Knowledge management is a process through which organisational intellectual capital and information can be managed. In order to be successful, both large and small organisations rely on their acquired information and intellectual capital. Sharing of tacit knowledge in organisations can contribute to improvements in organisational processes and is a key element in creating and sustaining competitive advantage. Universities are knowledge organisations, with knowledge embedded in people and processes, where the transfer of tacit knowledge is necessary for continual improvement and responding to the external changing environment. This research explores six dimensions (workplace, behavioural, workplace expectations, technology, learning, and culture, age and gender as a group) that have an impact on the transfer of tacit knowledge in four Australian universities. The research also identifies the enablers, inhibitors and processes that will aid in capturing, managing and distributing tacit knowledge.

The empirical findings for this study were drawn from surveys and interviews. A survey instrument was used to explore the perceptions and opinions of university academics in six dimensions of tacit knowledge transfer. Subsequent interviews provided an in-depth opportunity to ask a series of open-ended questions that revealed potential enablers and barriers to tacit knowledge transfer in an unconstrained environment. Primary data was collected from a sample of 141 questionnaire respondents and interviews of eight university academics.

The findings have revealed a positive consensus that the surveyed universities are generally very favourable to tacit knowledge transfer. The results indicate a high level of commitment from the universities towards the transfer of tacit knowledge. However, the findings also indicate that from a systematic perspective, changes need to be made to encourage and facilitate the transfer of tacit knowledge in both formal and informal settings. Largely the respondents revealed a feeling of discontent towards tacit knowledge transfer efforts from an organisational perspective, however from an individualistic perspective the picture was not so gloomy. Universities need to provide information technology that facilitates tacit knowledge transfer. It is also evident that senior management's commitment to enable the transfer of tacit knowledge is important. From a learning perspective, the analysis revealed that academics are open to lifelong learning. This will help to take universities in the right direction as tacit knowledge sharing evolves.

This study provides theoretical contribution regarding the nature of tacit knowledge transfer by university academics. It also provides a contribution relevant to practitioners by providing key processes that can aid in the transfer of tacit knowledge transfer, which can be used as a guideline not just in universities but other organisations too.

It is hoped that such a study would benefit research in tacit knowledge management and also eliminate confusion as to where universities should focus their knowledge management efforts for optimising performance and making tacit knowledge transfer possible. The findings are neither an endorsement nor a criticism of the academics or

the universities but simply a way of exploring how effectively tacit knowledge transfer can take place moving forward.

Student Declaration

I, Ritesh Chugh, declare that the PhD thesis entitled 'Knowledge Ubiquity through the Transfer of Tacit Knowledge in Australian Universities' is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature:  Date: 26 February 2014

Acknowledgements

Finally, a remarkable journey has come to an end. I have been able to complete this thesis with the support of certain people who deserve accolades for helping and supporting me through this journey.

First and foremost, I want to express extreme gratitude towards Dr. Josef Rojter, my supervisor, for his invaluable guidance, support, encouragement and most importantly for having full faith in my capabilities. I am also thankful to my associate supervisor Dr. George Messinis for pointing me out to vignettes that were used in the survey.

I would like to express my sincere gratefulness to all the academics who responded to the survey and consented for subsequent interviews. Their contributions and help are greatly appreciated. This study would not have been possible without their valuable insight and time.

I would also like to acknowledge my lovely children, Aryan and Ria, who patiently waited for me to complete the thesis and become a doctor in the hope that I will be able to give them injections. Unfortunately no real injections but injections of tacit knowledge are what I will be able to administer! My heartiest thanks go to my wife, Harita, who constantly supported and nudged me whenever I was down. Her love and affection provided me a steady source of energy. Last but definitely not the least, the constant blessings of my parents Jagdish and Kaushalya have been instrumental in helping me complete the thesis.

Finally, I hope that my study will influence the way tacit knowledge transfer is approached and universities will further encourage the transfer of tacit knowledge.

Thank you, God.

Ancora Imparo – I am still learning!

List of Publications and Awards

Chugh, R 2012, 'Knowledge sharing with enhanced learning and development opportunities', *In IEEE International Conference on Information Retrieval and Knowledge Management 2012*, Kuala Lumpur, Malaysia, March 13-15, 2012.

Chugh, R 2013, 'Workplace dimensions: tacit knowledge sharing in universities', *Journal of Advanced Management Science*, vol. 1, no.1, pp. 24-28.

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In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge - Nonaka, 1991, pg. 96

CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

This chapter provides an overview of the research by drawing a comprehensive picture of the study and sets the foundation for the following chapters. It begins with an overview of the research background and identifies the importance of tacit knowledge outlining key reasons for the retention of tacit knowledge in organisations. The second section highlights the importance of this study, outlines the research background and the broad research gaps are identified. It also elucidates why universities need to focus on tacit knowledge retention and transfer.

The third section identifies the significance and aims of the research. The fourth section outlines the overarching research aim and the specific research questions. The fourth

section also maps the questions from the questionnaire and the interview to fit into the specific research questions. The fifth section then follows by providing an outline of the structure of the thesis. The outline of the first chapter is illustrated in figure 1.1 below. The sixth section provides a conclusion of this chapter.

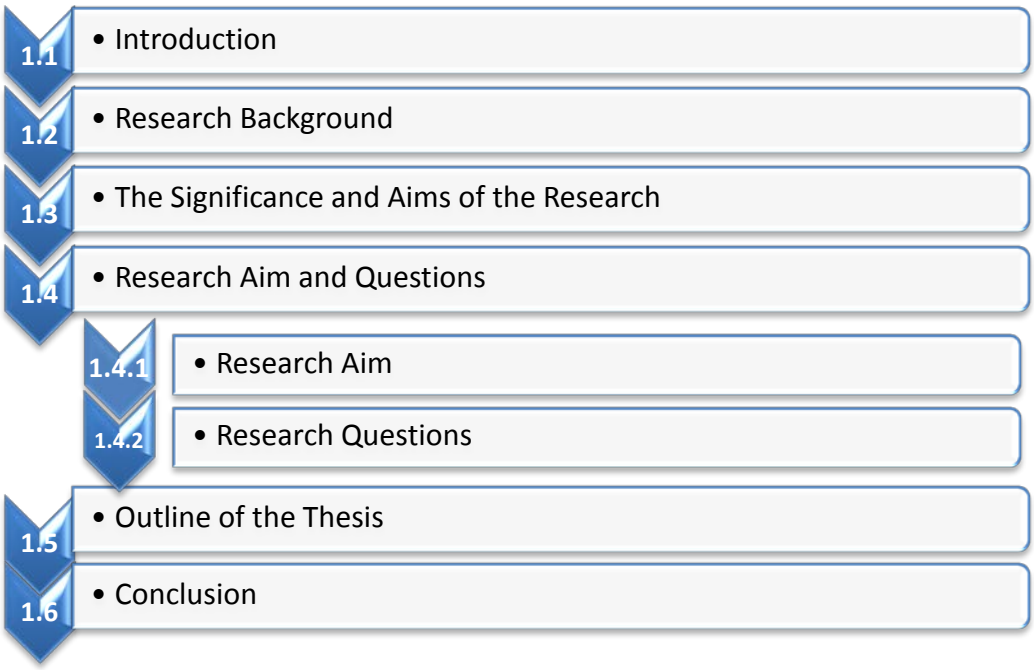

Figure 1.1 – Chapter one outline

1.2 RESEARCH BACKGROUND

Over the last decade organisations have taken a keen interest in retaining tacit knowledge as it is a very important asset for organisations. This has led to the adoption of knowledge management practices that provide innovation in decision making, product and process efficiency. However as organisational knowledge is greatly dependant on the tacit knowledge that its employees possess, it is important to pursue

strategies that encourage sharing of employees' knowledge and also possibly enhance employee retention. Sharing of information between employees creates a more knowledgeable workforce (Peariasamy & Mansor 2008) hence an organisation that learns and encourages learning amongst its employees is called a learning organisation. In the pursuit of becoming learning organisations, most organisations are investing in knowledge management (Bogner & Bansal 2007). Knowledge management is a discipline to manage information and intellectual capital that is considered to be a valuable resource by all organisations small or large because of the reliance of organisational processes on information. A growing number of companies have started realizing the importance of knowledge management and are taking steps towards its adoption and implementation (Chong 2005).

Van der Spek and Spijkervet (1997) define knowledge as 'a whole set of insights, experiences and procedures which therefore, guide the thoughts, behaviours and communication of people'. Tacit knowledge is repeatedly acknowledged as an intangible resource (Jacobson 1990), which implies that it does not have a physical presence whereas on the other end explicit knowledge is tangible and has a physical presence. Knowledge exists in both explicit (tangible) and tacit (intangible) forms. The use of knowledge in organisations can attribute to improvements in organisational processes and is a key element in creating and sustaining competitive advantage. Nonaka and Takeuchi (1995) suggest that collecting, storing and disseminating knowledge to the right people at the right time in the right place and in the right format is the key to effective knowledge management. Thus the importance of knowledge management in improving business processes cannot be over emphasised since it

creates value. Majchrzak, Cooper and Neece (2004) identify that it is evident from research conducted by academia and industry that a lot of knowledge is created during every process but the question is whether the knowledge is used any further or not. So an important question is why companies do not try to capture, retain and transfer tacit knowledge? Polanyi (1966), an influential philosopher of epistemology, put the importance of tacit knowledge through this quote 'we can know more than we can tell and we can know nothing without upon those things which we may not be able to tell' (p. 4). The focus of this research is to analyse transfer of tacit knowledge; tacit knowledge is knowledge that people have in their minds and is, therefore, difficult to access. Tacit knowledge is difficult to access and transfer (Syed-Ikhsan & Rowland 2004) but it is possible to convert tacit knowledge into explicit (Nonaka 1994). Explicit knowledge is knowledge that has been documented and found in books, databases, memos, documents and so forth (Botha, Kourie & Snyman 2008). Since tacit knowledge is intuitive and practice-based, it is both valuable and difficult to transfer (Stover 2004). It is crucial that organisations identify where tacit and explicit knowledge is located so that it can be easily transferred. Universities are knowledge institutions with knowledge embedded in people and processes. In universities, most important knowledge is often tacit in the mind of academics thus difficult to spread through the university and its internal stakeholders, not limited to students and other academics, because of time and resource constraints. The role of academics is to convey and transfer their tacit knowledge into more explicit forms so that it is available for further reuse by the stakeholders. Hence universities and more importantly its academics form the primary source of data for this research. Businesses today are not only dealing with baby boomers or generation 'X' but also with generation 'Y' which

may be high in talent but whose commitment to a single job isn't always for longer time periods (Hutley & Solomons 2004). It has been noted that human resources (HR) activities are critical in enhancing learning and sharing of knowledge in organisations (Argote, McEvily & Reagans 2003; Jackson, Hitt & DeNisi 2003) but retaining experienced and older employees for longer periods is only a short term solution for companies. However retaining the 'talent' of these experienced and older employees is essential for businesses. The skills of experienced employees are an incredibly valuable resource to any organisation however organisations can gain competitive advantage only if these skills are retained. According to Pasternack and Viscio (1998), knowledge and skills of experienced employees if not retained in the form of policies or structures within organisational memory will imply that knowledge will walk away with the employees when they leave the organisation.

A report prepared by PhillipsKPA for the Department of Education, Science and Training (DEST) in 2006 demonstrated that universities are expending a lot of effort in knowledge transfer through commercialisation of research but little emphasis is placed on knowledge transfer efforts made by universities in passing their tacit knowledge to internal stakeholders who could be students and academic peers. Housel and Bell (2001) refer to the loss of knowledge as the death of knowledge because either existing knowledge is not exercised or emphasis is placed on new knowledge ignoring the old. A study by Lin, Yeh and Tseng (2005) found that gaps have existed in the knowledge management of organisations and these gaps need to be resolved to improve organisational performance. Filling these gaps will make organisational knowledge, especially knowledge that is created during various business processes, available for reuse in the future. Literature has

provided few specific solutions to specific knowledge transfer problems that are based on empirical findings (Gupta & Govindarajan 2001; Martin & Salomon 2003). Gupta and Govindarajan (2000) have called for further research on organisational mechanisms and initiatives that can facilitate better knowledge transfer. Likewise, Connelly and Kelloway (2003) also call for further research to examine the relationship between processes and inhibitors of knowledge sharing and the impact of performance with improved knowledge transfer. In response to the DEST report (2006), Julie Bishop, ex- Minister for Education, Science and Training pointed out in a forum that there is a need to identify the gaps within the current system so that a case for additional funding on knowledge transfer can be made. Bishop (2006) also stated that 'at a later stage we may wish to consider the transfer of knowledge relating to scholarship and teaching' (pg.1) – thus becoming one of the main reasons for choosing Australian universities as the target audience for this research.

Universities are the epitome of learning and exhibit many characteristics of learning organisations. Universities are, also, an integral part of society and play a key role in knowledge transfer. Tacit knowledge can be defined as skills, ideas and experiences that people have in their minds and is, therefore, difficult to access because it is often not codified and not necessarily able to be easily expressed e.g. putting together pieces of a complex jigsaw puzzle, interpreting a complex statistical equation. What academics do to transfer their personal knowledge and make it available for reuse is an issue of contention. It can be argued that universities would enhance their status as learning organisations by facilitating internal tacit knowledge transfer. Sharing knowledge is *the raison d'être* of universities and Kidwell et al (2000) concluded that universities have

significant opportunities to apply knowledge management practices to support every part of their mission. According to Lim and Klobas (2000), organisations need to have processes and systems in place that will promote knowledge acquisition, sharing, and creation. A study conducted by Foos, Schum and Rothenberg (2006), has revealed that the subject of tacit knowledge transfer, content, and process is poorly understood. One of the limitations of their study was that knowledge management efforts can be consistently different amongst different industries and thus no focus was prevalent when determining the knowledge management efforts. The collective, situated and tacit nature of organisational knowledge makes it complicated to transfer and duplicate and thus is a sustainable source of competitive advantage (Kogut & Zander 1996; Winter 1987). Knowledge reuse and sharing should be encouraged by developing adequate processes that allow tacit knowledge reuse. There needs to be a systematic model to identify and transfer knowledge from one person to another or from one process to another. It needs to be captured, retained and indexed so that employees can use it for future application (Weiser & Morrison 1998). A study of Australian software development companies, by Aurum, Daneshgar, and Ward (2007), reported that a uniform model of knowledge management process did not exist and there were inadequate processes to address effective management of knowledge in the companies.

Karlsen and Gottschalk (2004) have identified that knowledge management efforts should not be restricted to the IT discipline only, thus it is important to explore how knowledge management efforts can be integrated into universities There are diverse views on the inherent nature of knowledge management (Goh 2002; Jasimuddin 2007; Riege 2007) and a lack of frameworks that provides the inhibitors and enablers along

with the impact. Riege (2007) has stressed the importance of overcoming diverse knowledge transfer barriers and then identified the effectiveness of those actions in order to assist executives and middle management in creating a systematically driven collaborative environment. Structured work processes exist in most organisations but little effort is made to capture tacit knowledge. These answers, if captured, will lead to the development of structured knowledge and a collaborative environment. Riege (2007) has also called for further research to examine the impact of knowledge transfer efforts on performance by analysing diverse managerial actions/efforts towards knowledge transfer.

Garavelli, Gorgoglione, and Scozzi (2002) have called for further action to analyse the context under which knowledge transfer takes place as the limitations are dependent on the context of knowledge usage in the organisation. Goh (2002) conducted a survey to assess the presence of five key learning attributes of a learning organisation and one of these attributes was the ability to transfer knowledge internally. In every organisation that was surveyed by Goh (ibid), the attribute that scored the lowest was the ability to transfer knowledge. This suggests that knowledge transfer is a continuing problem in organisations and the factors that affect it need to be researched, understood and a relevant model be established to resolve issues from both a social and technological perspective.

Knowledge acquired in one process or project is not transferred and reused in other contexts. In most instances, the tendency is to reinvent the process rather than learning

from past projects (Prusak, 1997). This shows that little efforts to transfer knowledge have been made in organisations thus the knowledge gained in the past is not utilised.

This shows that little efforts have been made in organisations thus the knowledge gained in the past is not utilised. Key findings of a paper by Owen, Burstein and Mitchell (2004) have indicated that there exists a link between knowledge practices and existing work processes but the lack of knowledge reuse may contribute to failure. Sun and Scott (2005) also like Jasimuddin (2007) have reported that most information in organisations has been viewed as disorganised information and knowledge management practices aim to provide a systematic approach. Collectively, they identified the need to conduct further research for identifying individual characteristics that will help in the study of knowledge transfer barriers. There is a lack of empirical studies in knowledge management (Leech & Sutton, 2002) as the majority of studies reported in the literature do not adopt a mixed method approach. Also, various researchers (Baumard 1999; Blair 2002; Laupase 2003) have identified barriers to tacit knowledge transfer but with no focus on university academics. Rigorous identification of tacit knowledge transfer in universities is warranted, especially if it leads to improvements in organisational performance.

1.3 THE SIGNIFICANCE AND AIMS OF THE RESEARCH

Universities are an integral part of our growing society and play a key role in knowledge transfer thus necessitating calls to explore tacit knowledge transfer. There are negligible existing studies that focus on tacit knowledge transfer in Australian universities. There is little knowledge and information concerning tacit knowledge

transfer at Australian universities. Studies of other organisations (Aurum, Daneshgar & Ward 2008; Foos, Schum & Rothenberg 2006; Riege 2007) and the ministerial view (Bishop 2006) on universities reveal that there exists a research gap in understanding the enablers and inhibitors of tacit knowledge transfer. The lack of a particular mechanism for knowledge transfer, both explicit and tacit, has prompted the author to identify ways of tacit knowledge transfer by analysing knowledge management enablers, inhibitors and processes that will aid in the creation, retention and distribution of tacit knowledge. This research will explore tacit knowledge transfer characteristics through surveys of academics in four Australian universities. It will explore and expand issues of knowledge management adoption towards improving organisational processes in different universities as previous papers have limited themselves to a marginal sample and thus provide neither a comparison nor a single model for its adoption. The research will also explore how knowledge management can be helpful in support of the sharing and creation of knowledge and how it can act as a catalyst for improved organisational processes. From both a research and applied perspective, there are negligible studies that focus on this topic especially ones that focus on tacit knowledge transfer within a university. Such a study would benefit research in tacit knowledge management and also help to eliminate confusion as to where universities should focus their knowledge management efforts for optimising performance and making tacit knowledge available for reuse.

Four Australian universities (CQUniversity, RMIT, Swinburne and Victoria University) have been selected based on their long history in the education sector thus providing a lot of scope for analysing tacit knowledge transfer. These four universities are

undergoing a lot of change, both in terms of organisational structure and introduction of new programs, and are rapidly strengthening their position towards the provision of learning and teaching services to national and international students. It is their uniqueness in the education sector that makes them ideal for this study. The survey focussed on academics in universities because academics can be classified as knowledge workers.

The research outcomes will assist university academics in creating a systematically driven collaborative environment by capturing tacit knowledge and making it available for reuse. Given the increased interest in knowledge management by organisations such a study is timely and relevant.

The aim of this research is to explore the transfer of tacit knowledge in Australian universities whose *raison d'être* is knowledge transfer. The research will explore the enablers and inhibitors of tacit knowledge transfer in Australian universities for improving processes and performance by elucidating various knowledge transfer mechanisms. The specific aims of the research are to explore the extent to which transfer of tacit knowledge takes place in Australian universities. This will help to identify the creation, acquisition and distribution of knowledge. This study will provide universities with some processes enabling academics to transfer knowledge thus improving their and their peers' performance and collectively the university's performance by providing a positivist outlook. Techniques to capture tacit knowledge from people will be identified before they disappear with a focus on process and performance improvements. This research will represent the study from both an empirical and practical perspective by

gaining primary information about knowledge management from a selected group of Australian universities. Processes and facilitation methods will be identified so that the right knowledge is captured, managed, distributed and kept up-to-date thus encouraging knowledge sharing and reuse.

The findings of the research will have both theoretical and practical implications for information science, knowledge management and business management. Possible beneficiaries of the research will include universities that will be able to implement the findings towards the adoption of knowledge management in their organisational culture with an aim to improve processes and performance. Both academics and managers will have a good base to understand tacit knowledge transfer and further define appropriate tacit knowledge transfer strategies more effectively. It will also provide a valuable resource to my professional peers who wish to conduct further study into this field since in the past, limited quantitative and qualitative research has been accomplished in this field. To quote the words of Hall (2005 pg.163) 'researchers need to better understand how to get from tacit to explicit knowledge and how to allow for the creation of new knowledge to be shared'. Thus the importance of knowledge transfer cannot be inconspicuous and effort needs to be made to retain it.

1.4 RESEARCH AIM AND QUESTIONS

In universities and other workplaces emphasis is placed on new knowledge ignoring the old. There is a need to identify the gaps in the current university system so that tacit knowledge transfer is possible. To examine the points previously discussed and address

the issues raised, the research aim and specific research questions have been identified below.

1.4.1 Research Aim

The overarching research aim for this study is:

To explore the extent to which transfer of tacit knowledge takes place in Australian Universities.

1.4.2 Research Questions

An analysis of the extant literature in the tacit knowledge arena led to six dimensions that have an impact on tacit knowledge transfer. The main reason for narrowing down to these six dimensions was that the barriers and enablers of tacit knowledge transfer in other areas seemed to indicate that there was scope for further study. The six dimensions will dwell upon the human, technical and workplace aspects of tacit knowledge transfer or more categorically upon the soft and hard factors. Exploring such dimensions will enable universities to create a more favourable work environment that fosters tacit knowledge sharing.

In order to meet the research aim and identify the enablers, inhibitors, and processes of tacit knowledge transfer, six major dimensions were identified: workplace, behavioural, workplace expectations, technology, learning, and cultural, age and gender.

The specific aspects of the research aim for this study are:

Workplace Dimensions

RQ1. To what extent do academics' workplaces (university) encourage the transfer of tacit knowledge?

Behavioural Dimensions

RQ2. What are academics' personal traits and their thoughts on tacit knowledge sharing?

Workplace Expectations

RQ3. What are the expectations that the workplace (university) has from academics for tacit knowledge sharing?

Technology Dimensions

RQ4. What information and communication technologies are used by universities to aid tacit knowledge transfer in the workplace (university) and academics' adaptability to ICT?

Learning Dimensions

RQ5. What is the academics' and their workplaces' (universities) conduciveness to be lifelong learners and learning organisations respectively?

Cultural, age and gender Dimensions

RQ6. Is there a difference in willingness to share tacit knowledge based on educational qualification, age and gender of academics?

Others

RQ7. Does employment status have an impact on tacit knowledge sharing?

RQ8. Does tenure at the university have an impact on tacit knowledge sharing?

RQ9. What are the different barriers and enablers of tacit knowledge transfer in universities?

RQ10. How can tacit knowledge be captured, managed, and distributed?

These research questions together help to explore different aspects of the transfer of tacit knowledge by academics in Australian universities.

A questionnaire and interview was designed to elicit responses about the above dimensions. The questions (Q) from the questionnaire and the interview have been mapped (as illustrated in figure 1.2) to fit into the above specific research questions (RQ).

RQ1: Q1-11(from questionnaire) and Q2, Q8, Q9 (from interview)

RQ2: Q12-23(from questionnaire) and Q3, Q4, Q7 (from interview)

RQ3: Q24-28, Q53 (from questionnaire) and Q5 (from interview)

RQ4: Q29-36, Q3, Q4, Q56, Q57 (from questionnaire) and Q10 (from interview)

RQ5: Q37-44, Q2, Q3, Q4, Q6, Q55 (from questionnaire) and Q6 (from interview)

RQ6: Q45-52, Q3, Q4, Q5 (from questionnaire) and Q11, Q12 (from interview)

RQ7: Q6, Q12-23 (from questionnaire)

RQ8: Q1, Q2, Q12-23 (from questionnaire)

RQ9 & RQ10: To specifically answer these two questions, qualitative data from the interviews (Q11 and Q12) will be used.

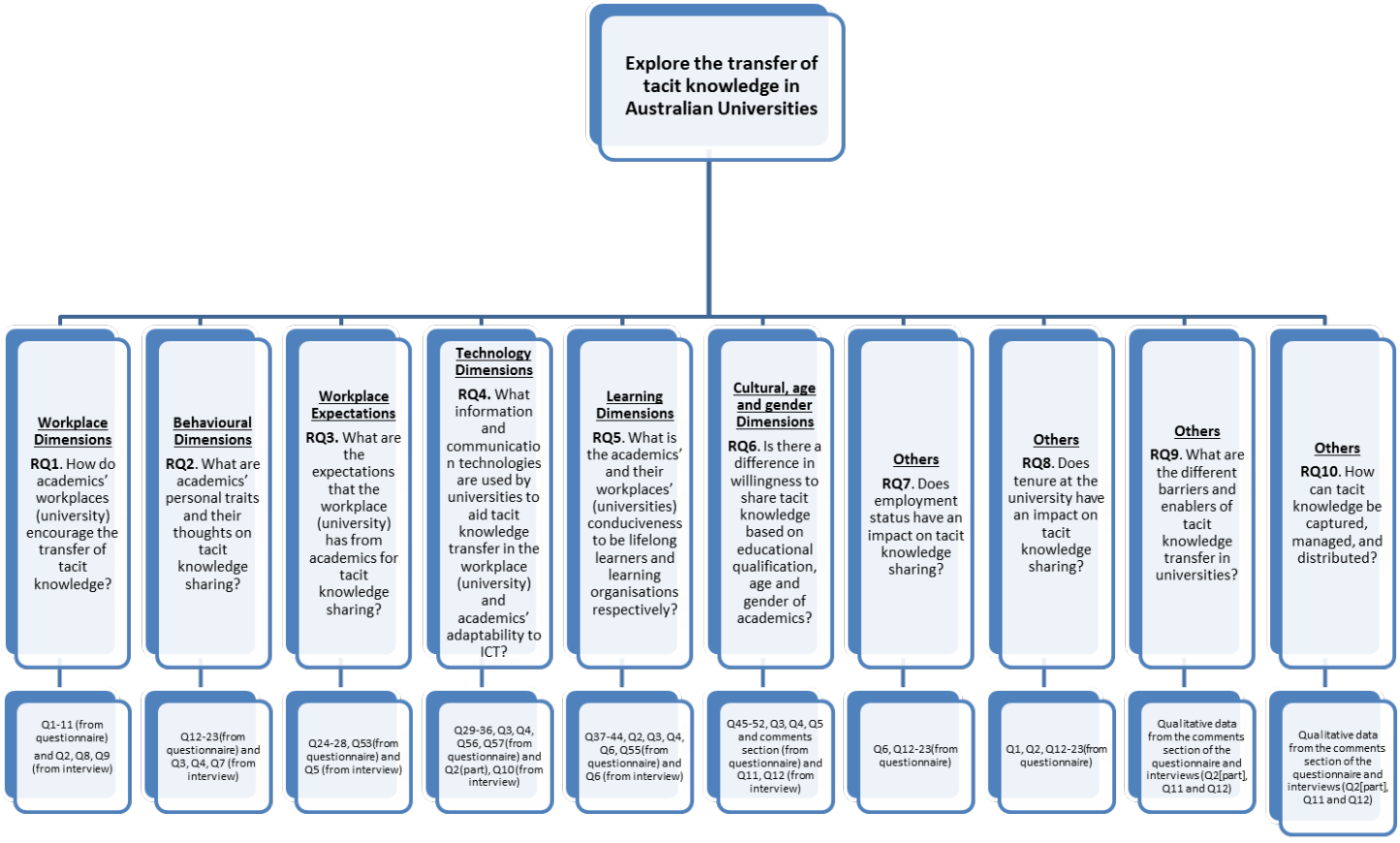

Figure 1.2 – Mapping of questions from the questionnaire and the interview

The specific research questions that the interview aimed to address have been outlined with the corresponding questions from the interview:

Workplace Dimensions

RQ1. To what extent do academics' workplaces (university) encourage the transfer of tacit knowledge?

Interview Question 2. Does the university encourage tacit knowledge transfer? If yes, how? If not, what can the university do to encourage tacit knowledge transfer? Are there technology/systems in the university that aid tacit knowledge transfer?

Interview Question 8. Do you perceive your manager as the information gatekeeper who does not pass information to others? Do you prefer this practice?

Interview Question 9. How does your manager value new ideas and innovation?

Behavioural Dimensions

RQ2. What are academics' personal traits and their thoughts on tacit knowledge sharing?

Interview Question 3. Do you freely share your knowledge with others? Why / Why not? Can you give me some examples?

Interview Question 4. How will tacit knowledge transfer improve your and the university's performance?

Interview Question 7. You are an expert in your field. Would you be willing to pass/teach these skills to others in the university? When? Where? Why/why are you not willing to teach them to others?

Workplace Expectations

RQ3. What are the expectations that the workplace (university) has from academics for tacit knowledge sharing?

Interview Question 5. Do you think transfer of tacit knowledge can be made mandatory and a key performance indicator in the annual performance appraisal/review? Why/Why not?

Technology Dimensions

RQ4. What information and communication technologies are used by universities to aid tacit knowledge transfer in the workplace (university) and academics' adaptability to ICT?

Interview Question 2 (part of it). Are there technology/systems in the university that aid tacit knowledge transfer?

Interview Question 10. How do you adapt to information technology implemented by the university?

Learning Dimensions

RQ5. What is the academics' and their workplaces' (universities) conduciveness to be lifelong learners and learning organisations respectively?

Interview Question 6. How do you consider yourself to be a lifelong learner?

Cultural, age and gender Dimensions

RQ6. Is there a difference in willingness to share tacit knowledge based on educational qualification, age and gender of academics?

Interview Question 11. Can you think of some barriers to tacit knowledge transfer in your university?

Interview Question 12. What processes/ways would you suggest in your university so that tacit knowledge can be captured and reused?

Qualitative data from the comments section of the questionnaire was also used.

Others

RQ9. What are the different barriers and enablers of tacit knowledge transfer in universities?

RQ10. How can tacit knowledge be captured, managed, and distributed?

Interview Question 2 (part of it). What can the university do to encourage tacit knowledge transfer?

Interview Question 11. Can you think of some barriers to tacit knowledge transfer in your university?

Interview Question 12. What processes/ways would you suggest in your university so that tacit knowledge can be captured and reused?

Results from the research may thus lead to more complete conclusions regarding the extent of tacit knowledge transfer within the academic community.

1.5 OUTLINE OF THE THESIS

This thesis is organised into seven distinctive chapters, as shown in figure 1.3. The first chapter has introduced the research and explains its significance and outlines the intended outcomes. The second chapter presents an extensive literature review. The third chapter presents the research methodology outlining reasons for adoption of both

qualitative and quantitative research. Chapter four presents the development of the web-based survey instrument and design of the interview questions. The fifth chapter reports on the data collection of the survey, presents a quantitative analysis of the collected data and discusses response rates and other descriptive statistics of the main data sample. Chapter six presents an analysis of the interviews conducted as part of this research and makes connections between the results of the qualitative analysis and existing theory and research. Finally chapter seven brings together the main points, presents the conclusion and provides recommendations to enhance tacit knowledge transfer and concludes with limitations and avenues for future research.

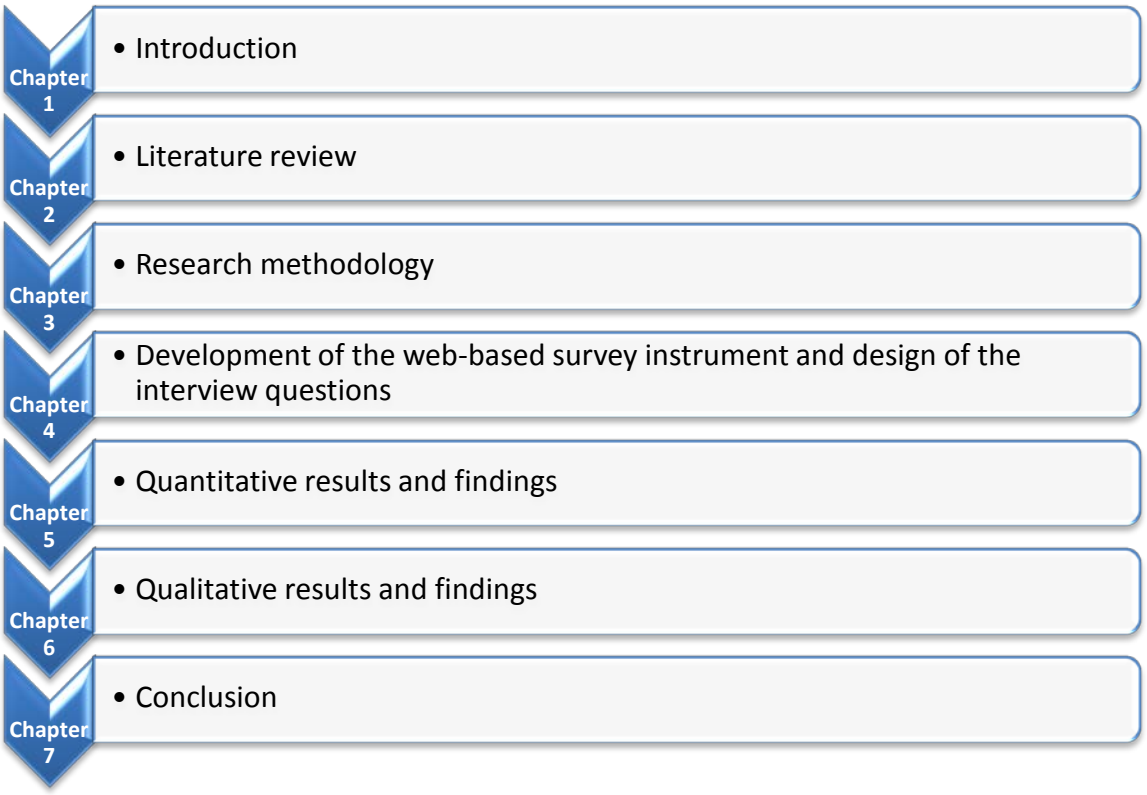

Figure 1.3 – Thesis outline

Chapter 2 Literature Review

The second chapter reviews the literature pertaining to knowledge management with an emphasis on tacit knowledge transfer. The review then examines fundamental concepts of knowledge and stages of the knowledge life cycle. Different types of knowledge are elucidated. This prepares the reader for a discussion on the factors that enhance and/or deter tacit knowledge transfer. Finally, consideration is given to the various aspects that are seen as crucial in assessing factors that have an impact on tacit knowledge transfer.

Chapter 3 Research Methodology

The research methodology adopted for this study has been described in chapter 3. It then elaborates on the choice of performing quantitative research complemented with qualitative research. This chapter informs the choice of methods and the approach to interpreting the data. The purpose of the research is clarified along with the research paradigm, ethical issues and the administration of the research along with certain limitations encountered. This chapter includes a discussion of the empirical methodology, methods of data collection, sampling strategy and ethical issues.

Chapter 4 Development of the web-based survey instrument and design of the interview questions

This chapter focusses upon the development of a web based survey instrument called the Tacit Knowledge Transfer Survey (TKTS) and then secondly upon the design of the interview questions. The chapter elucidates how the survey was developed identifying the different dimensions that were assessed. Towards the end, the chapter posits itself towards the design of the interview questions.

Chapter 5 Quantitative Results and Findings

This chapter presents and analyses the data collected via the TKTS. This chapter describes the quantitative results of the research project. The major findings of the research drawn from descriptive statistics are interpreted and discussed. The findings are structured to answer the research questions using the quantitative (questionnaire) data. The results of the data analysis are also discussed and the implications of these findings are presented.

Chapter 6 Qualitative Results and Findings

This chapter presents an analysis of the interviews conducted as part of this research. This chapter describes the qualitative results of the research project. Reporting of data is based on a structured approach drawing illustrative examples from each interview transcript as required. Main achievements have been discussed, results explained and connections made between the results of the analysis and existing theory and research.

Chapter 7 Conclusion

This chapter draws together all the arguments and findings. A summary of the research has been provided and the conclusions to this thesis are presented. The limitations of the research findings are acknowledged and explained and recommendations that build on the research findings are offered for future research.

1.6 CONCLUSION

By illustrating a complete representation of the research, this chapter lays the foundations for all chapters of the thesis. The chapter has provided an overview of the research background and identifies the importance of tacit knowledge outlining key reasons for the retention of tacit knowledge in organisations. The significance and aims of the research have been identified. The chapter next outlines the overarching research aim and the specific research questions. Mapping of the questions from the questionnaire and the interview to fit into the specific research questions has also been presented. Finally, an outline of the thesis is provided.

The next chapter reviews the literature and places the research problem in its academic context by presenting the relevant literature in the emerging discipline of knowledge management and tacit knowledge.

2

..tacit thought as an indispensable element of all knowing and as the ultimate mental power by which all explicit knowledge is endowed with meaning .. Polanyi, 1966, pg.60

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to place the research problem in its academic context by presenting the relevant literature in the emerging discipline of Knowledge Management (KM). This discussion begins with the emergence and purpose of KM and then proceeds to define knowledge, knowledge management and knowledge workers. The review then moves on with a discussion that elaborates the differences between tacit and explicit knowledge. The role of KM in improving organisational effectiveness has been discussed based on the extant literature in the area of KM. The reasons for sharing of tacit knowledge are to be subsequently articulated. The pivotal connection between learning organisations and organisational knowledge has been explored and previous research has been examined.

Finally, the concept of converting tacit knowledge to explicit knowledge has been introduced by looking at the theory of knowledge creation before moving on to a discussion of some barriers of tacit knowledge transfer and the significance of tacit knowledge transfer. The evaluations are centred on an attempt to understand the nuances of tacit knowledge transfer and identifying the values to be examined in this study. The outline of the second chapter is illustrated in figure 2.1 below.

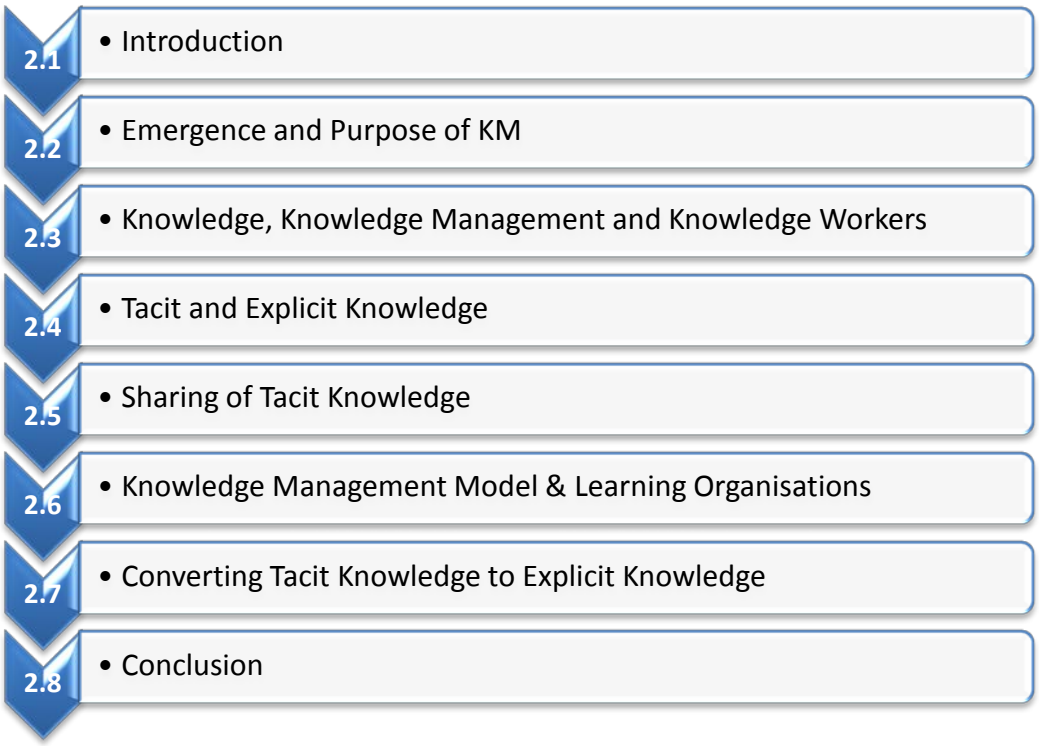

Figure 2.1 – Chapter two outline

2.2 EMERGENCE AND PURPOSE OF KM

Knowledge Management as a management and technology discipline is still relatively new, with interest starting in the management of knowledge from the mid-1980s (Wiig 1997). However the topic of KM has gained widespread interest since the mid-1990s.

Knowledge Management is a term that has been used over the past twenty years yet many organisations still have not adopted KM in their day-to-day business practices. Knowledge management is the process of systematically acquiring, organising, disseminating and applying knowledge to achieve strategic aims of an organisation (Gupta, Iyer & Aronson 2000; Hussain, Lucas & Ali 2004). The purpose of KM is to leverage knowledge both within and outside an organisation. Leveraging knowledge internally will improve the collaborative climate amongst employees and build trust whereas sharing knowledge externally will enhance institutional reputation and cement relationships with customers and other stakeholders (Kakabadse, Kouzmin & Kakabadse 2001). Leveraging knowledge will also provide organisations with a sustainable competitive advantage (Nissen 2005; Sharkie 2003). The concept of KM has emerged as a successful way forward to sustain long term competitive advantage to preserve organisational knowledge (Turban & Aronson 2001). Knowledge is now seen as an important organisational asset as it enables organisations to use and develop resources and enhance and further develop competitive advantage (Sharkie 2003).

Drucker (1999) stated that we live in a knowledge society whereas other commentators call it the information society. In this knowledge or information society, knowledge is becoming vital for enhanced organisational performance (Ichijo & Nonaka 2007). KM is important for all businesses regardless of industry or geographic location. Wigg (1993) concluded that the main purpose of KM is to create value from an organisation's tangible and intangible assets. Knowledge, as an organisational asset, is difficult to duplicate (Grant 1991) and also enables the creation of a sustainable competitive advantage in turbulent organisational environments (Bogner & Bansal 2007; Davenport

& Prusak 1998). Alavi (1999) has stated that the transfer and duplication of knowledge is not easy and the process is riddled with various barriers.

In the current global knowledge economy, job mobility is increasing rapidly where employees move around six employers over their entire career (O'Neal 2005). This problem is exacerbated with an aging current workforce, the baby boomers retiring or approaching retirement age and a lower number of employees entering their prime working age during this period (Jamrog 2004). It could also be argued that due to this mobility, knowledge has become scarce because knowledge is transferable with people. Employees who leave an organisation ultimately impact competitive performance of an organisation.

Hislop (2009) has defined knowledge worker as a person who is involved in primarily intellectual, creative and non-routine work, and involves the creation and use of abstract/theoretical knowledge. Academics, as knowledge workers, possess and utilise different types of knowledge to complete their work. While it may be difficult to understand the character of tacit and explicit knowledge used by academics, it is still important to classify it before proceeding further. Empson (2001) has suggested two types of knowledge (technical and client) used by workers in knowledge intensive firms. Since universities are knowledge intensive institutions and academics are classified as knowledge workers, the knowledge types developed by Empson (2001) must apply to university academics too. Academics predominantly work with students (customers) and other stakeholders to deliver the required output. Apart from this client knowledge, academics also possess technical knowledge about their discipline,

organisational specific knowledge pertaining to processes and procedures and personal knowledge that has been gathered through education and/or work experience. The main component of organisational knowledge is the contribution of its staff as individuals, not as silos of knowledge. However, it is the interconnectivity of staff to their colleagues that forms a significant component of organisational know-how (Venkitachalam & Busch 2012). The interconnectivity of staff with their colleagues as an enabler of tacit knowledge sharing could be in any organisational setting and not just universities alone.

Knowledge workers (academics in this case) capture and apply tacit knowledge which helps to develop and sustain competitive advantage (Lubit 2001; Nissen 2005). The loss of such knowledge workers (academics) breaks down existing social networks within an organisation and it takes time and effort to rebuild the social networks so that knowledge sharing can start again (Coleman 1988). Since it may not be possible at all times to retain knowledge workers, it is becoming increasingly important to preserve their tacit knowledge (Droege & Hoobler 2003).

Thus, it becomes all the more important for organisations to capture, distribute and leverage tacit knowledge before it leaves the organisation. It is the purpose of this research to investigate factors that inhibit and enhance tacit knowledge transfer in universities.

2.3 KNOWLEDGE, KNOWLEDGE MANAGEMENT AND KNOWLEDGE WORKERS

Since knowledge is a key organisational asset and as organisations are becoming knowledge intensive, it is first essential to understand the fundamental meaning of knowledge as an institutional function.

Knowledge is often considered as a self-evident concept (Hertog & Huizenga 2000). It is easy to clarify and understand the meaning of knowledge after a clear distinction is drawn between data and information and their interrelatedness is understood. Often the terms data and information are used interchangeably (Kakabadse, Kakabadse & Koizmin 2003). However these terms do not carry the same meaning and an intertwined relationship exists between them and hence cannot be used interchangeably. De Long and Fahey (2000) have suggested the importance of distinguishing between the inter-related concepts of data, information and knowledge in order to better understand how knowledge should be managed.

A common approach is to start with the distinction between data, information and knowledge. For this research, Shankar et al.'s (2003) knowledge value chain (as shown in figure 2.2) is used to differentiate between data, information and knowledge.

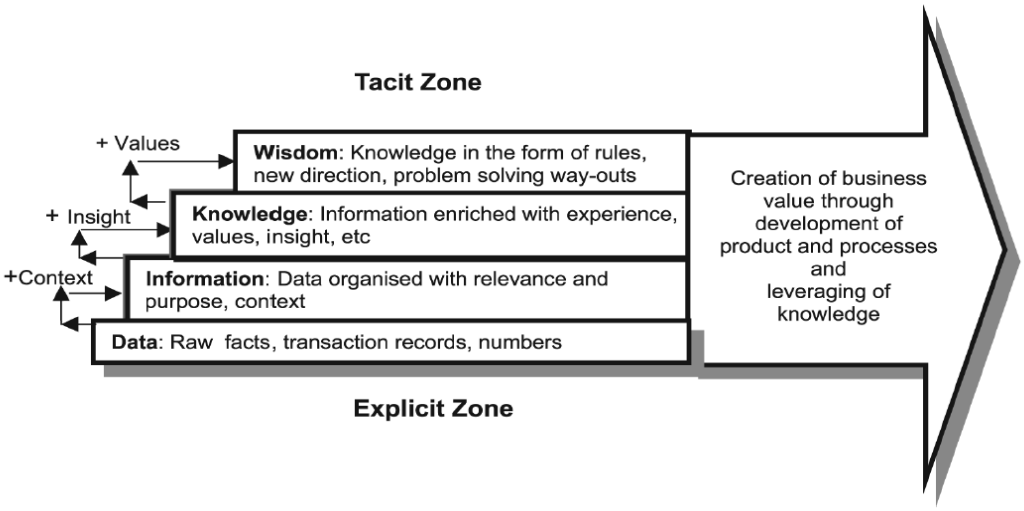

Figure 2.2 – Knowledge value chain; Source: Shankar et al. 2003, p. 192

Data is defined as raw unanalysed facts that are measures or attributes of phenomena, which are out of context and have no relation with other facts (Loshin 2001; Robbins et al. 2000; Zikmund 2000). Data is, therefore, objective (James 2005).

Information consists of analysed and processed data that forms a body of objective facts in a format suitable for decision making, and is often viewed in a context that defines the relationships between two or more pieces of data and possibly other information (Loshin 2001; Robbins et al. 2000; Zikmund 2000). Like data, information is also objective in a given context (James 2005).

Knowledge is an awareness, understanding or familiarity gained from a blending of information, experience, skills, principles, rules, value, insight, study, investigation and observation (Bollinger & Smith 2001; Davenport & Prusak 2000; Pemberton & Stonehouse 2000; Robbins et al. 2000). Because knowledge is a mixture of many things, it is usually subjective (James 2005). Hislop (2009) defines knowledge as an

entity/commodity that people possess, but which can exist independently of people in a codifiable form. Alavi and Leidner (2001) define knowledge as the inflow of new stimuli that is initiated by human cognitive processes. Looking at these different definitions of knowledge, it is evident that there are differing perspectives of knowledge and taxonomies of knowledge (Argote, McEvily & Reagans 2003). Knowledge can be defined according to its taxonomy i.e. either being classified as either tacit or explicit knowledge (Alavi & Leidner 2001). This distinction is discussed in the next section.

It is evident however that data, information, and knowledge are interrelated. Data and information in a certain circumstance may be knowledge in another circumstance. It also often depends upon the recipient. What may be data for one recipient may be information for another. Therefore, it is often difficult to distinguish between these three terms (Alavi & Leidner 2001; Davenport & Prusak 1998; Hislop 2009; Spiegler 2003; Tuomi 2000). Applying a comprehensive logic, they are all objects of knowledge management as data and information can provide the building blocks of knowledge. However, a clear boundary can be drawn between information and knowledge where knowledge can only exist within the human mind (Blumentritt & Johnston 1999).

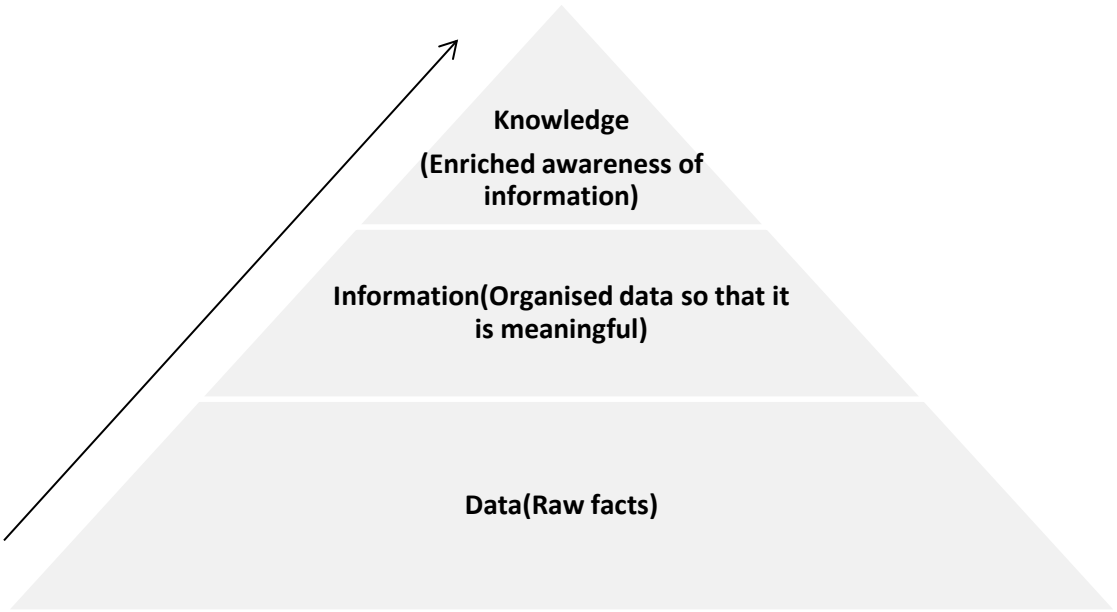

Figure 2.3 – Hierarchy of data, information and knowledge

Knowledge is often shown as the topmost layer of a hierarchy based on data and information (Davenport & Prusak 2000; Stenmark 2002) as depicted in figure 2.3. Knowledge is really an elusive concept with various definitions, dimensions, and perspectives. The elusive nature of knowledge comes from the complexity and multi-faceted nature of knowledge (Alavi & Leidner 2001; Davenport & Prusak 2000; Nonaka & Takeuchi 1995).

Knowledge management is the process of systematically acquiring, organising, disseminating and applying knowledge to achieve the strategic aims of an organisation (Gupta, Iyer & Aronson 2000; Hussain, Lucas & Ali 2004). It is a means for organisations to leverage this valuable and strategic organisational asset for achieving their organisational objectives. Depending on the perspective however, knowledge management can be largely seen as an individualistic, organisational, and technological phenomenon.

Knowledge management is an effective approach to solving problems such as competitive pressure (Cepeda 2006; Prusak 2006) and the need to innovate (Parlby & Taylor 2000). Effective knowledge management also leads to reduced time to market, improved innovation, and improved personal productivity (Miller 1996). Drucker (1993) advises that the key to competitive advantage for every organisation is knowledge management. Knowledge management 'involves people, processes, activities, technology, and the broader environment that enable the identification, creation, communication or sharing, and use of organisational and individual knowledge' (Lehaney et al. 2004, pg.13).

The message that emerged from Loermans (2002) is that 'KM should focus more on the tacit component of KM rather than on its contemporary emphasis on explicit knowledge' (p.293). The focus on tacit knowledge is an indicator of its importance in modern organisations who have constantly concentrated their efforts on explicit knowledge alone. It is also widely acknowledged that the key to success in knowledge management lies in individual and organisational factors, and in technology that facilitates the creation/acquisition, packaging/embodiment, transfer, sharing and use of knowledge. However it is vital to understand how knowledge workers engage in tacit knowledge transfer, which is an important organisational asset. In order to understand the individualistic or human factors it is important to look into the notion of knowledge workers.

Reich (1991) has defined knowledge workers as people who solve, identify and broker problems. This can be extended to selection of solutions and reflection on solutions

when applied. Davenport (2005) has defined knowledge workers as people who have a high degree of education or expertise and their primary job function involves the creation, distribution or application of knowledge.

Universities can be classified as knowledge intensive institutions because they are coherent with the definition of knowledge intensive firms provided by Alvesson (2000, pg. 1101) as 'companies where most work can be said to be of an intellectual nature and where well qualified employees form the major part of the workforce.' Other features of a knowledge intensive firm are that their workforce is typically highly qualified and the knowledge and skills of their workforce is a source of competitive advantage (Swart & Kinnie 2003). Considering their characteristics, universities can undoubtedly be considered as knowledge intensive firms and their workers as knowledge workers. Drucker (1998, pg. 164) has defined knowledge worker as 'someone who knows more about his or her job than anyone else in the organisation'. However this would be a very radical definition because even a labourer would know more about their daily chores than anyone else. The disagreement with Drucker's definition of knowledge worker is because his description of workers is not engaged in the creation, distribution or application of knowledge. A more subtle definition of a knowledge worker has been provided by Rifkin (2000, pg. 174) as 'creators, manipulators and purveyors of the stream of information that makes up the post-industrial, post-service, global economy'. Based on these definitions, university workers, especially academics, can be classified as knowledge workers.

2.4 TACIT AND EXPLICIT KNOWLEDGE

The phrase 'tacit knowledge' was coined by Polanyi (1958) but in recent years it has been used by theorists as an important part in the process of KM (Firestone & McElroy 2003). Nonaka and Takeuchi (1995) focus on the importance of tacit knowledge in Japanese culture and attribute it as one of the reasons for the success of major Japanese companies in the 1980s. Most knowledge in organisations exists in peoples' minds as tacit knowledge that has grown and developed through years of experience (Zack 1998).

Tacit knowledge is contrasted with explicit knowledge. Tacit knowledge is considered as personal knowledge that is difficult to express, formalise or share and exists in an intangible format (Sveiby 1997). Tacit knowledge has been defined as 'what people carry around with them, what they observe and learn from experience, and what is internalized and, therefore, not readily available for transfer to another' (Muralidhar 2000, p. 222). Hislop (2009) indicates that tacit knowledge may not only be difficult to articulate, it may even be subconscious. This characteristic of tacit knowledge makes it difficult to disembody from people and further codify it. Tacit knowledge is reflected in human actions and their interactions with the social environment (De Long & Fahey 2000; Nonaka 1994). Busch (2008) has defined tacit knowledge as knowledge that cannot be codified, is implicit in nature and not necessarily written anywhere and not able to be readily expressed. This implies that tacit knowledge would include peoples' skills, experiences, insight and judgement. Tacit knowledge could also be termed as 'sticky' knowledge as it stays in the minds of people. It is often known as preconscious knowledge based on an understanding of the fitness of things, instinctive actions and so

forth. The epistemic value of tacit knowledge is also a contentious issue and it is difficult to study.

Explicit knowledge is considered as objective knowledge that is separate from individual and social value systems and most importantly it can be codified into a tangible form through words, numbers or sound (Hislop 2009). Davenport and Prusak (2000) state that explicit knowledge can be readily transmitted and can be embedded in formal rules, tools and processes such as organisational databases, and standard operating procedures. Explicit knowledge could also be termed as 'leaky' knowledge as it is transferred into a more tangible form and widely available for others to use.

Documented policies and procedures, operating manuals and formalised business processes represent some examples of explicit knowledge. This explicit knowledge is easily accessible and available for reuse even after the knowledge creators have left the organisation (Choo 2002). Informal business processes and ways of working, expertise and personal understanding of work practices represent some examples of tacit knowledge. Knowing the right feel of bread dough before it goes into the oven is an example of tacit knowledge (Nonaka & Takeuchi 1995). This tacit knowledge is difficult to access and not necessarily available for reuse. Polanyi (1966) believes that a large part of human knowledge is tacit in nature and accessing it can present challenges.

Tacit knowledge is difficult to articulate in an explicit form. Nonaka, Toyama and Konno (2000) suggest that explicit knowledge can be expressed in a formal and systematic language and are easily shared in the form of data whereas tacit knowledge is

personal and includes subjective insights, intuitions and hunches. Converting tacit knowledge to explicit knowledge becomes really important as Hislop (2009) states that knowledge is primarily cognitive but is ultimately codifiable. It is necessary to root out the knowledge held in peoples' heads to a tangible form. DeLong (2004) proposes that 'humans have been creating and losing knowledge for thousands of years' (pg. 20). Housel and Bell (2001) state that 'knowledge resides primarily within human heads; when 'head count' is reduced, inevitably the sum of knowledge within the organization is reduced, sometimes critically so' (pg. 5). This problem of loss of head count could imply different situations such as downsizing or when aging employees leave the organisation with a lot of tacit knowledge in their heads.

Table 2.1 below summarises key differences or characteristics between tacit and explicit knowledge.

Table 2.1 – Differences between tacit and explicit knowledge (Adopted from Hislop 2009)

Tacit knowledge	Explicit knowledge
Difficult to codify	Codifiable
Personal	Impersonal
Difficult to share	Easy to share
Subjective	Objective

The imminent dichotomy between tacit and explicit knowledge falls within the views of subjective and objective knowledge too. Polanyi (1966) justifies that tacit and explicit knowledge are separate and distinct and hence need to be treated differently. Tacit

knowledge develops thorough practice as people engage in day-to-day activities whether at work or home. These day-to-day activities provide experience and develop different types of skills. Research suggests that 75 percent or more of an organisation's knowledge can be categorised as tacit knowledge (Frappaolo & Wilson 2002; O'Dell 2002). And yet universities are becoming more presumptive, focussing on outcomes which are measured by inexact and flawed tools.

After examining the way knowledge can be categorised into explicit and tacit, it is vital to focus on the sharing and management of tacit knowledge. In order to enable effective sharing and management of tacit knowledge, organisations need to outline processes for tacit knowledge capture, dissemination and reuse. It is vital to convert sticky knowledge to leaky knowledge and make it available for others in the organisation to reuse.

2.5 SHARING OF TACIT KNOWLEDGE

Sharing of tacit knowledge is difficult, complex and time consuming (Hislop 2009). A lot of organisational knowledge is tacit in nature but it is possible to convert it into an explicit form (Hislop 2009). Nonaka (1994) has argued that knowledge can only exist at the level of the individual, so it becomes really important to use the knowledge individuals possess. Apart from using their knowledge, means of making that personal knowledge for reuse is important. Tacit knowledge has to be transferred from an individual into a separate object in the form of something tangible such as a standard operating procedure or lessons learnt document, or it can be shared through seminars or story telling activities. Undoubtedly sharing of explicit knowledge is also important but

it does not form the focus of this research. In order to manage tacit knowledge, Management Review (Management Review & AMA 1999) reported that it is vital to identify useful information, develop knowledge repositories and access systems, gather knowledge and create employee talent.

Storey and Barnett (2000) have suggested that knowledge management initiatives are seen as highly political and different interest groups in the organisation want to gain control over KM initiatives. Whilst this research does not attempt to focus on the political conflicts over knowledge transfer, it is definitely an issue to be borne in mind when deciding knowledge management initiatives that organisations take. Since tacit knowledge is an important resource and asset for an organisation, it is vital to control and manage it. Hence knowledge management becomes crucial. Alvesson and Karreman (2001) have suggested that tacit knowledge is difficult to manage. However, senior management need to encourage staff to use, create and share knowledge in a contributory process. McKinlay (2002) suggested that some staff are reluctant to participate in the knowledge management efforts of their work places.

Knowledge management initiatives in organisations can be a success if they are linked to concrete business strategies (Hunter et al. 2002; McDermott & O'Dell 2001). By understanding and creating this link, it will become easier to implement and sustain knowledge assets in any organisation. Hansen et al (1999) have provided a knowledge management framework that focusses on a personalisation knowledge strategy which assumes that most knowledge of staff is tacit hence difficult to codify. Nevertheless

they have focussed on identifying social processes and improvement of face-to-face sharing of tacit knowledge between staff.

Subramanian and Venkatraman (2001) have suggested that utilising tacit knowledge effectively indicates an organisation's innovativeness. A learning organisation, that is innovative, displays innovation and creativity as an important trait. Sharing of tacit knowledge is possible when extensive social interactions occur in a trusting relationship (ibid). The social interactions will allow employees to gain an insight into the tacit knowledge of other interactions, which is what Nonaka's socialisation mode promulgates.

Hendriks (2001) has emphasised the role that information and communication technologies (ICT) can play in sharing knowledge, especially explicit knowledge. However, ICT can be an important aid to convert tacit knowledge to explicit too (Soon, Kerr & Fraser 2006). If knowledge remains only tacit in the heads of a few individuals in an organisation, then the organisation is putting themselves at risk and it is not always possible to move those few individuals around. However once tacit knowledge is converted into explicit, an organisation has a lower risk of losing its intellectual capital when employees leave the organisation (Davenport & Prusak 1998).

Much of the knowledge required to succeed in real-world tasks is tacit in nature (Sternberg & Horvath 1999). Tacit knowledge focuses on 'knowing how' rather than 'knowing that' (Sternberg et al. 2000). However in reality there is an intersection between 'how' and 'that'. An individual needs to know a task/skillset to be able to

articulate it. It is important to know the procedure and hence tacit knowledge is procedural too (Anderson 1983). A lot of Sternberg's (1984, 1997 & 2004) research focusses on human intelligence and wisdom. The crux of his work is to make explicit what has been previously been implicit in any setting such as schools, law firms, military and so forth. Sternberg and colleagues have distinguished tacit knowledge from other related concepts such as job knowledge, general intelligence and performance. Because of these differences, it is perceived that his approaches to tacit knowledge are not relevant up until now and the majority of his focus has only been on human intelligence. Being a psychologist, the testing approaches adopted by Sternberg were predominantly psychometric; however lack of the researcher's skills in psychometric testing was a deterrent in adopting similar tests for this study.

2.6 KNOWLEDGE MANAGEMENT MODEL & LEARNING ORGANISATIONS

Since there is a growing emphasis on managing organisational knowledge, a model to manage knowledge is important. Giga Information Group (1997) provided a model (as illustrated in figure 2.4) that has 4 key stages for managing knowledge. The 4 stages or processes highlight what people do with organisational knowledge.

- The first stage is knowledge creation and capture in which new knowledge is created or captured from either internal or external sources.

- The second stage encompasses organising and categorising the acquired knowledge for easy access. In this stage, organisations can create best practice repositories or index documents for faster retrieval.
- The third stage in this model is knowledge distribution and access, which focusses on pushing knowledge to users and/or providing ways through which staff can pull information themselves. The use of technology is crucial in all of these stages and an extensive discussion of the technology/tools that could be used will follow.
- The final stage of this model is knowledge absorption and reuse in which existing knowledge is absorbed.

However the model does not provide specific examples of activities that fit into each stage. The model also does not relate specifically to the needs of universities. The main shortcoming of the model is that it focuses on KM but not specifically on tacit knowledge transfer. Existing knowledge is only beneficial when it is available for reuse.

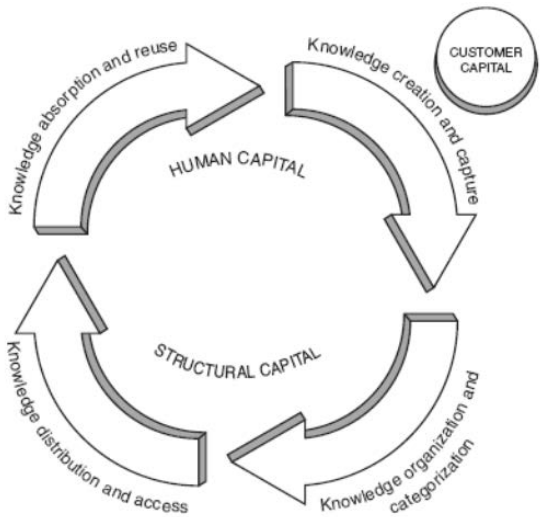

Figure 2.4 – Giga Information Group Knowledge Management Framework (Source: McNurlin, Sprague and Bui 2009, pg. 503)

McNurlin, Sprague and Bui (2009) have argued that knowledge cannot be controlled and can only be leveraged through processes. Since a lot of organisational knowledge and culture is tacit, it is difficult to codify. In knowledge intensive firms, knowledge is created and developed by staff and is often difficult to transfer. It is the tacit nature of this knowledge that makes transfer a problem. However codification of knowledge helps with the communication and sharing of tacit knowledge (Werr & Stjernberg 2003).

Organisations strive to exploit both tacit and explicit knowledge by building upon core capabilities and related competencies though these efforts are often not clearly segregated. Organisational learning and learning organisations are another significant and growing body of literature that has contributed to knowledge management. Organisational learning is defined as the capacity or processes within an organisation to maintain or improve performance based on experience (Nevis, DiBella & Gould 1995). Pedler et al (1997, pg.3) have defined learning organisation 'as an organisation which facilitates the learning of all its members and consciously transforms itself and its context'. The focus of this definition is on continuous learning and transformation. This learning can occur by accident or design, in formal and less formal ways and from doing and practicing (Nidumolu, Sunramani & Aldrich 2005). To encourage learning, the framework by Peddler et al (ibid) focusses upon developing open dialogue between people, rewards, usage of information technology, developing enabling structures that provide individual and organisational development, providing self-development opportunities for staff, propagating a learning environment that encourages risk and experimentation without being critical of failure and being open to learning from others

experiences. These characteristics will channel an organisation to becoming a learning one, facilitate tacit knowledge transfer and possibly lend to cultural evolution too. Not adopting or nurturing these characteristics will become impediments to tacit knowledge transfer. Since no previous study has looked at the barriers and enablers of tacit knowledge transfer in universities, it will be worth investigating the similarities or differences, if any. Loermans (2002) sees both learning organisations and knowledge management to be mutually self-supporting and critical to the well-being and survival of organisations. Loermans (ibid) also goes on to say that learning organisations and knowledge management cannot survive without each other. Amongst others, a learning organisation is one result of knowledge transfer (Bender & Fish 2000).

Some other researchers (Leonard 1998; Nonaka & Takeuchi 1995) also recognize the importance of the connection between learning and managing organisational knowledge. Since learning and knowledge management are inter-connected (Chiva & Allegre 2005) and it is not possible to perform either of these activities in isolation, it is important to identify some key constraints of learning organisations before proceeding further. Antonacopoulou (2006) found that learning in organisations involves a reciprocal relationship between processes at the individual, group and organisational level. Hislop (2009, pg.93) maintains that 'organisational learning would be where insights developed by an individual or group result in a systematic transformation of the organisations work practices/values'. The learning at the individual and/or group level will have an impact on organisational processes, typically towards improving existing processes. A learning organisation will provide significant benefits for individuals and their organisations (Senge 1990). The achievement of learning by its members and

subsequent transformation will unquestionably provide a competitive advantage for any organisation. Hislop (2009) has stated that learning organisations provide an organisational environment that encourages experimentation, risk taking and open dialogue. Driver (2002) points out that learning organisations have a relatively flat structure, open communication systems, limited top down control and autonomous working conditions. Considering the traits of learning organisations given by Hislop (2009) and Driver (2002), it is very safe to say that universities classify as learning organisations.

The emancipatory rhetoric of the learning organisation is crucial to effective tacit knowledge transfer and hence questions pertaining to the traits of a learning organisation and academics' personal traits on being a lifelong learner were included in the survey and interview to better understand the relationship.

The focus of this research is not solely on organisational learning however since tacit knowledge transfer is important for learning to take place, it cannot be ignored. The turbulent and dynamic environment in which universities operate makes it crucial for universities to cater for tacit knowledge transfer. Typically learning takes place when the skills and experience of employees helps to transform organisational processes and structures.

2.7 CONVERTING TACIT KNOWLEDGE TO EXPLICIT KNOWLEDGE

Since the creation and acquisition of knowledge is important for any organisation and reflecting on what was mentioned earlier i.e. convert tacit knowledge to explicit, it is vital to identify processes that provide a conducive-enabling environment. The theory of knowledge creation by (Nonaka et al. 2001; Nonaka & Takeuchi 1995) propagates the idea that continuous interaction between tacit and explicit knowledge is crucial to create new knowledge. Nonaka (1994) gave 4 modes of knowledge conversion as depicted in table 2.2 below.

Table 2.2 – Knowledge conversion modes

Modes	Type connected
Socialisation	Tacit to tacit knowledge
Externalisation	Tacit to explicit knowledge
Combination	Explicit to explicit knowledge
Internalisation	Explicit to tacit knowledge

Socialisation refers to knowledge that is created when tacit knowledge is converted into new forms of tacit knowledge. It is experiential knowledge that is created by people sharing their experience with others. Externalisation refers to the conversion of tacit knowledge into explicit. It involves eliciting, articulating and translating the tacit knowledge of others into a tangible format so that is available for reuse. After knowledge has been captured and made explicit, it can be further transferred through a process called combination. Combination is the conversion of explicit knowledge to new forms of explicit knowledge. ICT can be used to collect, disseminate and reuse

already existing explicit knowledge. Finally, the conversion of explicit knowledge to tacit is referred to as internalisation. Internalisation focusses on absorbing explicit knowledge and then reusing it. It is akin to reading from a book and then reusing that knowledge further.

These modes are continuous and interaction between explicit and tacit knowledge takes place throughout the four modes, forming a knowledge spiral that drives the flow of knowledge flow in any organisation (Huang & Wang, 2002). However, the theory of knowledge creation only focuses on the knowledge transformation between explicit and tacit knowledge and does not address other activities involved in managing knowledge. The main focus of this research is exploring the conversion of tacit to explicit however tacit to tacit also inexplicably follows due to the inherent social nature of knowledge transfer.

Nonaka and Polanyi have both argued that tacit knowledge can be completely converted into explicit knowledge (Grant 2007) although this is not necessarily a universal view. However Collins (2007) contends that it is not possible to completely convert tacit knowledge to an explicit form. Tacit knowledge is harder to embody and access. Nonaka and Takeuchi (1995) have suggested that the key to positive KM practices is to identify and implement successful strategies that convert tacit to explicit knowledge. The focus of this research is not on inter-organisational tacit knowledge transfer but solely on intra-organisational tacit knowledge transfer. The complex nature of tacit knowledge is extremely challenging for both researchers and practitioners, and this contributes to the difficulty in readily being able to transfer tacit knowledge. Numerous

studies (Empson 2001; Morris 2001) have found that human, social and cultural factors were important in determining the impact (success or failure) of KM initiatives. These authors also found that employees were often unwilling to share their knowledge. The motivation of employees is an important determinant in knowledge sharing efforts. Since tacit knowledge is sticky in nature and embodied in people, they are often reluctant to part with it. Flood et al (2001) have suggested that the tacit knowledge of employees can only be used if employees are willing to part with it on a voluntary basis.

Often employees retain their tacit knowledge and don't share it freely with others because they believe that retention of knowledge provides them benefits and status (Willman et al. 2000). Other factors that inhibit employees from sharing knowledge and participating in organisational knowledge management initiatives are job security, status, esteem and power loss and fear of revealing their personal drawbacks. (Newell et al. 2006; Renzl 2008). Terrett (1998) has cited employees' lack of willingness to share expertise as a cultural factor that inhibits knowledge sharing. Since tacit knowledge is personal and belongs to the employees, they can decide what to use, how to use, when to use, where to use and who to share it with.

A study by Currie and Kerrin (2004) revealed that employees were reluctant to partake in their organisations' KM initiatives since they were concerned that by transferring their knowledge their position in the organisation would become dispensable and hence the company could replace them with younger and inexperienced staff. These negative perceptions are an indication of the reluctance of employees to part with their tacit knowledge - something that has been acquired through years of working experience.

The negative perceptions that employees possess or acquire through the organisational culture will definitely inhibit tacit knowledge transfer.

In a general sense, data and information are subsets of explicit knowledge (Nonaka 1996). The conventional hierarchy from data to information and then to knowledge reflects the process of internalization and combination (Nonaka & Takeuchi 1995). The reversed hierarchy of knowledge to information to data reflects the process of externalization and combination. Bartol and Srivastava (2002) have suggested that knowledge sharing is vital to knowledge creation, organisational learning, and performance achievement. The social dynamics of developing tacit knowledge sharing processes between employees should be examined to better understand and recommend facilitation measures. Individual members are reluctant to share knowledge on their own as it is never accepted by groups through a voluntary process (Hislop 2009), it has been suggested that organisations should create and sustain a social environment that develops trust (Nonaka 1994) and fosters knowledge sharing. Since most organisational knowledge is tacit in nature, the sharing and communication of tacit knowledge can be difficult. Hence in a university environment it was considered necessary to assess the willingness of academics to share tacit knowledge.

Suddaby and Greenwood (2001) have developed a cycle that represents knowledge production and consumption. Knowledge management represents a potentially important area that opens up multitudinous and novel ways of organisational operations and performance improvements. To be able to proceed further, it is important to focus on how organisations produce, distribute and use knowledge. Hence due consideration

needs to be given to people and organisations who are vital for any process. Suddaby and Greenwood (2001) have defined academics as individuals who primarily test and define extant knowledge, and secondarily engage in innovation and generation of new knowledge.

Although Suddaby and Greenwood (ibid) have characterised business schools as being important for the production and consumption of knowledge, it is possible to extend the knowledge sharing culture to any school and any academic. Academics produce knowledge, disseminate it to a variety of stake holders and utilise knowledge to carry out their day-to-day tasks. Academics are very important in the process of knowledge sharing and reuse. Hence the focus of this research is on university academics and their underlying propensity to engage in tacit knowledge transfer.

2.8 CONCLUSION

The literature points to the importance of tacit knowledge sharing. Researchers from different disciplines have attempted to approach the field of knowledge from different views (Benbya 2004; Kakabadse, Kakabadse & Kouzmin 2003; Prat, 2006). Many of these researchers rest on the objective view and tend to privilege explicit over tacit knowledge (Cook & Brown 1999). Despite the progress that has been made in understanding the nature of explicit knowledge, little has been done to explore the transfer of tacit knowledge especially by academics in a university environment. The current understanding of the nature of tacit knowledge and its implications for

universities is still far from satisfactory. The lack of clearly defined concepts acts as a hindrance for further research and practice in tacit knowledge.

There remains ample scope for further research into the transfer of tacit knowledge. Based on the literature review and gaps in this area, this research explores the extent to which transfer of tacit knowledge takes place in Australian universities. While this research aims to identify enablers, inhibitors, and processes of tacit knowledge transfer within universities, it also intends to identify the tacit knowledge sharing workplace dimensions, behavioural dimensions, workplace expectations, technology dimensions, learning dimensions, as well as cultural, age and gender dimensions and their role in tacit knowledge sharing.

3

The beginning of knowledge is the discovery of something we do not understand - Frank Herbert (1920-1986)

CHAPTER 3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

In order to answer the research questions stated, it is vital to seek an appropriate research methodology. This involves clarifying the approach and strategy for collecting and analysing data related to the research questions, considering the validity and reliability of the data collected, and evaluating the suitability of the analysis techniques chosen.

The purpose of this chapter is to outline the methodological issues and approaches adopted for this research. This includes a discussion of the empirical methodology, methods of data collection, sampling strategy and ethical issues.

This chapter is divided into eleven sections. The second section examines the positivist and interpretivist paradigms and then provides the reasons for positioning this research within both paradigms. Quantitative, qualitative and mixed method research methodologies are explained in the third section. Section four explains the different data gathering methods (questionnaires and interviews) adopted for this study and provides justification for their adoption. Figure 3.1 illustrates the outline of chapter three.

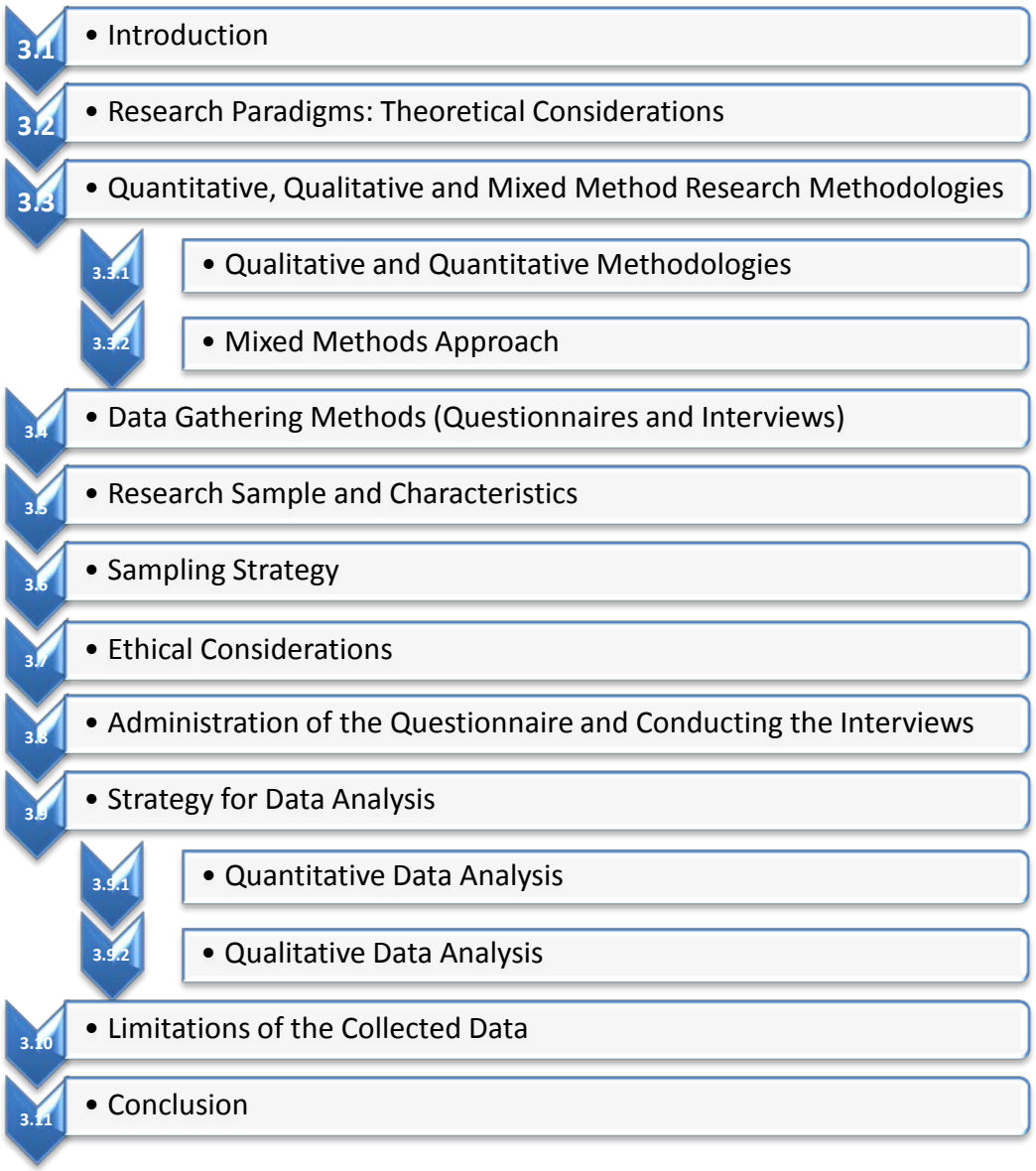

Figure 3.1 – Chapter three outline

The selection of the research samples and their characteristics are discussed in section five. Section six explains the sampling strategy adopted for this research. The importance of taking ethical issues into consideration has been discussed in section seven. The administration of the questionnaire and the process of conducting the interviews have been discussed in section eight. Section nine explains the strategies employed for data analysis. The limitations of the collected data and reasons for the inability to generalise the research findings to a larger population have been outlined in section ten and finally, in section eleven, the conclusion is presented.

3.2 RESEARCH PARADIGMS: THEORETICAL CONSIDERATIONS

This section outlines the research paradigm that has been adopted for this study. The purpose of any research is to investigate a specific problem or opportunity with the goal of finding answers to the issues. Before looking at the research paradigm and method adopted for this study, it is important to distinguish between these two terms. Paradigms can be defined as the mindset or beliefs that underlie an approach whereas methods are specific ways through which research data is collected (Kinash, 2010). Since researchers base their endeavours on different beliefs of how research should be conducted, it becomes important to adopt a research paradigm.

A research paradigm provides guidelines and principles about the way research is carried out (Hussey & Hussey 1997; Ticehurst & Veal 1999). Guba and Lincoln (1994) have defined a paradigm as a framework or a set of basic beliefs that helps to get ideas about the nature of reality, identify the relationship between variables and specify

appropriate methods for conducting research. A number of research paradigms exist that include positivism, realism, critical theory and constructivism (Healy & Perry 2000; Perry, Riege & Brown 1999); positivist, interpretivist and critical (Cavana, Delahaye & Sekaran 2003); and positivist and phenomenological (Hussey & Hussey 1997). There is a lot of debate about which paradigm is best suited to the research being conducted and its suitability.

Any method of inquiry presupposes an inquiry paradigm which is a set of basic beliefs about the nature of reality and how it may be known (Guba & Lincoln 1994; Heron & Reason 1997). Heron (2001) has emphasised that three questions need to be addressed to guide any research. Heron (2001) has deliberated that the researcher's responses and the beliefs within an inquiry paradigm are revealed by three fundamental and interrelated questions that determine the paradigm choice. The three questions are:

1. The ontological question: What is the form and nature of reality?
2. The epistemological question: What is the relationship between the knower and reality, and the extent of our knowledge of reality?
3. The methodological question: How can the inquirer find out about whatever he or she believes can be known?

On the basis of how these questions are addressed, two main belief systems typically triumph: a conventional belief system referred to also as positivist, scientific paradigm or hard paradigm, and a constructivist belief system referred to also as naturalistic, hermeneutic, interpretive paradigm or soft paradigm. In this research the terms positivist

and interpretivist paradigm will be used for these two belief systems. For the purpose of this research positivist and interpretivist paradigms have been considered. The differences between the two paradigms have been outlined in the table 3.1.

Table 3.1 – Differences between positivist and interpretivist paradigm; Source: Cavana, Delahaye & Sekaran 2003; Hussey & Hussey 1997

Positivist Paradigm	Interpretivist Paradigm
Objective world which science can measure	Intersubjective world which science can represent with concepts
Discover universal laws that can be used to predict human activity	Uncover the socially constructed meaning of reality as understood by an individual
Associated with quantitative data	Associated with qualitative data
Researcher is aloof from the research subjects during data gathering	High involvement with research subjects
Deductive reasoning	Inductive reasoning
Large samples	Small samples
Concerned with hypothesis testing	Concerned with generating theories
Highly specific and precise data	Rich and subjective data
High reliability	Low reliability
Low validity	High validity
Examples - experiments, questionnaires, secondary data analysis	Examples – ethnography, participant observation, interviews

Gummesson (2003) states that whether a researcher adopts a positivist paradigm or an interpretative paradigm, words from in-depth interviews and numbers from statistical tables both require interpretation. Gummesson (ibid) also believes that hermeneutics is a methodology for interpretation and is required for all research progressing it through a cyclical phases of pre-understanding, interpretation and understanding. The phases in the cycle feed from one to another so that the insight from one cycle becomes pre understanding and meaningful for the next and so on until the explanatory stage. This approach was adapted as the general methodology for interpretation for this research as it widens the scope of interpretation.

3.3 QUANTITATIVE, QUALITATIVE AND MIXED METHOD RESEARCH METHODOLOGIES

Each research approach brings its own unique perspective with each having its strengths and weaknesses. Researchers claim allegiance to one approach over another based on the research aims and/or their own personal skills and training in an approach. Each approach has its own unique perspective. Hence it is important to explore different approaches in order to make an informed decision on which approach to adopt.

3.3.1 Quantitative and Qualitative Methodologies

Commonly, research is separated into two broad methods - quantitative and qualitative. Quantitative methods rely on the capability of the researcher to measure the phenomena under investigation and the use of statistics to analyse the raw data whereas qualitative methods aim at understanding the rich, complex and idiosyncratic nature of human phenomena (Cavana, Delahaye & Sekaran 2003).

Curlette (2006) believes that data collected using qualitative techniques can be used to support conclusions reached by quantitative data and vice versa. Johnson and Onwuegbuzie (2004) have stated that 'differences in epistemological beliefs (such as a difference in beliefs about the appropriate logic of justification) should not prevent a qualitative researcher from utilising data collection methods more typically associated with quantitative research, and vice versa' (p. 15). Therefore, this research has deemed that since there is a dearth of research on tacit knowledge transfer in university academics, a methodology needs to be used to enable the tackling of the problem in

depth and breadth. This can be achieved with the adoption of quantitative and qualitative methodologies. Both methodologies have their strengths and weaknesses and as such it is possible to capitalise on the strengths of each methodology to overcome each one's weaknesses (Bryman 2004; Creswell 2003; Miles & Huberman 1994).

Table 3.2 outlines some key differences between quantitative and qualitative research methods.

Table 3.2 – Differences between quantitative and qualitative research methods; Source: (Cavana, Delahaye & Sekaran 2003; Cresswell, 1994; Neuman, 1997)

Characteristics	Quantitative	Qualitative
Reality	Objective and singular	Subjective and multiple
Interaction	Researcher is independent from the research subject	Researcher interacts with the subject
Methodology	concentrates on description and explanation	concentrates on understanding and interpretation
Analysis	Hypotheses is tested	Meaning is captured and discovered
Data	In the form of numbers	In the form of words
Sample	Many subjects	Fewer subjects
Examples	experiments, questionnaires, secondary data analysis	ethnography, participant observation, interviews

Qualitative and quantitative approaches differ in their ways of conducting research and each tends to claim superiority over the other. The major differences between these approaches are in the areas of data collection and analysis. According to Gall, Gall and Borg (2002), quantitative research 'relies heavily on numerical data and statistical analysis'. In contrast, qualitative research makes 'little use of numbers or statistics but

instead relies heavily on verbal data and subjective analysis' (pg. 13). Undoubtedly there are certain questions and topics where the qualitative approach will be useful and the same is true of quantitative research.

Typically quantitative research methods are used with the positivist paradigm whereas qualitative research methods are used with the interpretivist approach (Cavana, Delahaye & Sekaran 2003). Krauss (2005) has stated that the 'heart of the quantitative-qualitative 'debate' is philosophical, not methodological' (p. 759) while Mackenzie and Knipe (2006) have asserted that 'some paradigms may appear to lead a researcher to favour qualitative or quantitative approaches, in effect no one paradigm actually prescribes or prohibits the use of either methodological approach'(p. 7). These authors also hold the view that both perspectives need to be applied in order for any research to be fully effective.

With the belief that combining both quantitative and qualitative methods for this research would help in a better understanding of the issues in tacit knowledge transfer, a third method was explored namely being a mixed method approach.

3.3.2 Mixed Methods Approach

Tashakkori and Creswell (2007) have provided a succinct description of the mixed methods approach as: 'research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry'(pg. 4). Mixed method research has come of age and including only a quantitative or qualitative method will

not do justice to research. Mixed method designs are required in situations where neither the quantitative nor qualitative methods alone would be sufficient to answer the research questions. Many researchers have rejected the incompatibility thesis (the proposition that quantitative and qualitative research cannot be mixed) and advocated that both quantitative and qualitative research are important and should be thoughtfully mixed in research (Johnson & Christensen 2012). In almost every applied social research project there is value in consciously combining both qualitative and quantitative methods in what is referred to as a 'mixed methods' approach (Trochim & Donnelly 2007). It is important to identify research practices that lie somewhere on a continuum between quantitative or qualitative methods (Newman & Benz 1998), thus a mixed method approach has been adopted for this research. Mixed method research strategy integrating different methods is likely to produce better results in terms of quality and scope for this research allowing the addition of qualitative flesh to the quantitative bones through the adoption of interviews and questionnaires respectively.

Taking a mixed method approach would allow mixing and matching design components that would offer the best chance of answering the questions raised by this research. Johnson and Onwuegbuzie (2004) have stated that 'in many cases the goal of mixing is not to search for corroboration but rather to expand on our understanding' (pg.19).

Six core characteristics of mixed methods research have been provided by Creswell and Plano Clark (2007, pg. 5). When adopting these six characteristics, a researcher:

1. collects and analyses persuasively and rigorously both qualitative and quantitative data;

2. mixes the two forms of data concurrently by combining them, sequentially by having one build on the other, or embedding one within the other;
3. gives priority to one or both forms of data;
4. uses these procedures in a single study or in multiple phases of a program of study;
5. frames these procedures within philosophical worldviews and theoretical lenses; and
6. combines the procedures into specific research designs that direct the plan for conducting the study.

Tashakkori and Teddlie (2009, pg. 33) have mentioned three areas where mixed methods research is better than a single approach:

1. It can simultaneously address a range of confirmatory and exploratory questions with both quantitative and qualitative approaches.
2. It provides better (stronger) inferences.
3. It provides the opportunity for a greater assortment of divergent views.

Hence for this study, the prime reason for using a mixed methods approach was that the use of quantitative and qualitative approaches, in combination, will provide a better understanding of the research problem than approach either one alone(Creswell & Plano Clark 2007). This better understanding results from the fact that mixed methods offer strengths that offset the weaknesses of separately applied quantitative and qualitative research methods. Tashakkori and Teddlie (1998) have emphasised that a main advantage of mixed method research is the validation of the results of one method with

the results of the other. It could also be argued that the more the evidence the better the argument, hence combined quantitative and qualitative will provide more evidence.

According to Creswell (2003) mixed methods research can utilise either sequential or concurrent research designs. In sequential mixed methods design one type of data (e.g. qualitative) provides the basis for the collection of another type of data (e.g. quantitative). Sequential mixed methods design answers one type of question (qualitative or quantitative) by collecting and analysing two types of data (qualitative and quantitative). Sequential design can be exploratory or explanatory. Exploratory sequential design is characterised by an initial phase of qualitative data collection and analysis, followed by a phase of quantitative data collection and analysis (Creswell 2003). Therefore, the priority is given to the qualitative aspects of the study. Explanatory sequential design is characterised by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data. Priority is typically given to the quantitative data, and the two methods are integrated during the interpretation phase of the study (Creswell 2003).

In contrast, concurrent mixed method design 'is a multistrand design in which both QUAL and QUAN data are collected and analysed to answer a single type of research question (either QUAL or QUAN). The final inferences are based on both data analysis results. The two types of data are collected independently at the same time or with a time lag' (Teddlie & Tashakkori 2003, p. 705). For the purpose of this research sequential mixed methods design was employed, and more specifically, explanatory

design. In this research, the quantitative data was initially collected and followed by qualitative data at a later stage.

Since this research is focused on studying a relatively unstudied area, it can be termed as an exploratory study. This study will help to gain an insight and familiarity on tacit knowledge transfer by academics in universities. Exploratory research is utilised when there is limited knowledge about the topic (Cavana, Delahaye & Sekaran 2003).

The section that follows examines the possible data gathering approaches available within the positivist and interpretivist paradigm.

3.4 DATA GATHERING METHODS (QUESTIONNAIRES AND INTERVIEWS)

As mentioned towards the end of the last section, this research involves the collection of both qualitative and quantitative data through questionnaires and interviews respectively.

Questionnaires are an efficient data collection mechanism when the researcher knows exactly what is required and how to measure the variables of interest (Cavana, Delahaye & Sekaran 2003). Questionnaires can be utilised in a variety of survey situations, for example mail, electronic, face-to-face and telephone. Mail and electronic questionnaires are known as self-completion questionnaires, i.e. respondents complete them by themselves in their own time. A questionnaire has been developed for this study because they are economical to administer, cater for a rapid turnaround in data

collection and allow the collection of views from a larger population (Babbie 1990). Converse et al. (2008) identified various advantages of using web-based surveys: convenient access to samples, reduced costs, faster responses, more interactive or tailored formats, quick troubleshooting, automated data collection, scoring, reporting, and access to larger samples. In light of these advantages, this study utilises an online questionnaire as it provides an easy, quick form of data collection (Creswell 2005).

Interviews provide an opportunity to ask a series of open-ended questions and help to better understand the existing processes and to augment and check the validity of questionnaire findings (Cavana, Delahaye & Sekaran 2003). Interviews are considered to be useful for gaining insight and context into a topic and give an opportunity for respondents to describe what is important to them. In this research, interviews were deemed to be important as they would provide an in-depth opportunity to ask a series of open-ended questions that revealed potential enablers and barriers to tacit knowledge transfer in an unconstrained environment providing the opportunity to clarify and explain information. This approach can also be termed the hermeneutic paradigm that will help to explain relationships based on a personal interpretative approach (Gummesson 2000).

Once the data gathering methods have been decided, it is important to dwell upon the subjects from whom data will be gathered. The solitary research instrument that can reveal and build on tacit knowledge is the human (Lincoln & Guba 1985, pg.198). The unique characteristics that qualify humans as challenging research instruments in these circumstances – including responsiveness, adaptability, holistic emphasis, knowledge

base expansion capabilities, and processual immediacy (Lincoln & Guba 1985, p 192-195) are essential characteristics for studying a phenomenon as complex and intangible as tacit knowledge.

3.5 RESEARCH SAMPLE AND CHARACTERISTICS

This section describes the selection and description of the samples used in this research. Sample is defined as a subset of the population, which will be a representation of the whole population (Cavana, Delahaye & Sekaran 2003). Neuman (2003) asserts that well executed selection of study participants enables the researcher to measure variables from a smaller set of cases and to generalise the outcomes to all cases. In selecting the sample the researcher needs to ensure that the sample is more representative of the population that it is designed to represent (de Vaus 2002).

The use of key informants from organisations for data collection has been a popular method in many diverse research settings (Huber & Power 1985). Usually, these respondents are in the senior ranks of the organisation, executive managers and top managers, and middle managers. These key respondents can provide the researcher with the data required to conduct research in tacit knowledge transfer, since they possess tacit knowledge and are free to decide whether they share tacit knowledge or not.

The scope of this investigation has been constrained to universities alone. Universities are an essential fragment of our society and play a significant role in knowledge transfer. Sharing knowledge is the raison d'être of universities. There are negligible

existing studies that focus on tacit knowledge transfer in Australian universities. There is little knowledge and information concerning tacit knowledge transfer at Australian universities. This study aims to solicit data from academics in four Australian universities. Four Australian universities have been selected based on their long history in the education sector thus providing a lot of scope for analysing tacit knowledge transfer. They evolved from colleges of advanced education and institutes of technologies. These four universities are undergoing a lot of change, both in terms of organisational structure and introduction of new programs, and are rapidly strengthening their position towards the provision of learning and teaching services to national and international students. It is their uniqueness in the education sector that makes them ideal for this study. The four universities have also been chosen based on their program offerings to undergraduate and postgraduate students. Student cohorts in the chosen universities exceed 20,000 students. One of the focus in choosing a representative sample was also to spread out over research and training intensive universities. All four universities are public universities. The survey focussed on academics in universities because academics can be classified as knowledge workers who deal with tacit knowledge on a daily basis. Teachers are the foremost illustration of knowledge workers (Cortada, 1998). They are involved in tacit knowledge creation, distribution and application. The respondent profile considered ideal for the questionnaires was academics at any level of tenure because that would provide a good reflection of their willingness to contribute towards tacit knowledge transfer. The respondent profile considered ideal for the interviews was a lecturer or senior lecturer and an associate professor or professor from each university. The respondents for the

questionnaire and the interviewees were of a varying age (between 21 to 70) but none were under 18.

3.6 SAMPLING STRATEGY

Sampling refers to the 'process of selecting a sufficient number of elements from the population so that by studying the sample, and understanding the properties or characteristics of the sample subjects, it would be possible to generalise the properties or characteristics to the population elements' (Cavana, Delahaye & Sekaran 2003, pg. 253).

Sampling decisions need to consider an adequate sample size that provides a desired level of confidence in the findings. At this stage the question about sample size arises. What should the sample size be? A rule of thumb is that that if the sample size is 50 or more then serious biases are unlikely to occur, and if the sample size is over 100 then there is no concern with normality assumptions (StatSoft 1997). In most instances the rule of thumb is that the larger the sample size the more valid are the results. But there are arguments for the value of a smaller sample size too. When there is a scarcity of financial resources and when exploratory or pilot studies are under consideration, samples with N's between 10 and 30 can be valuable (Isaac & Michael 1995). In considering the sample size, it is also important to consider the heterogeneity or homogeneity of the respondents. A homogenous population is one in which members have highly similar traits whereas heterogeneous groups have a multiplicity of traits.

Adams and Schvaneveldt (1991, pg. 183) proposed a principle that mentions that 'the more homogeneous the population under study, the smaller the sample needs to be to accurately reflect the characteristics of that population, assuming random selection procedures'. Neuman (1997) has stated that when fewer variables are being studied, a smaller sample would suffice.

This study initially intended to gather around 100 responses to the questionnaires so that there is a high probability of clear evidence of tacit knowledge transfer and the results are of practical importance. 100 responses provide a margin of error of 10% thus providing more confidence in the results. So with a higher number of respondents the margin of error will be lower.

Based on the population of all academics, any sample to be used in this research should ideally be drawn randomly from the population. However, answers to the research questions may more readily be obtained by sampling techniques that involve purposeful sampling (Patton 2001), i.e. by sampling cases for which the phenomena under investigation is more readily manifested. Patton (2001) describes a stratified purposeful sampling as a technique that examines 'samples within samples' with each stratum representing a reasonably homogenous example and one which allows variations between strata to emerge. A purposeful sample would be more likely to shed light on the phenomena being investigated. As such, a more in-depth study involving the use of interviews was administered on a subset of the purposeful sample. Much of the web survey research that is conducted on general populations (Comley 1996; Flemming & Sonner 1999; Schillewaert, Langerak & Duhamel 1998; Witte et al. 2000) uses

convenience samples rather than probability samples (Schonlau, Asch & Du 2003). It could be argued that this research has utilised a mixed sampling strategy. Firstly a variation of the criterion strategy was used. In this the participants were selected to maximise the possibility of being able to inquire into tacit knowledge transfer and hence were academics who deal with tacit knowledge on a daily basis. Later, the theory-based or operational construct strategy was used to guide sampling as participants involved in tacit knowledge creation, distribution and application were approached for further interviews.

Cohen, Manion and Morrison (2003, p278) have stated that there 'is not a simple rule of thumb, as this depends on the purpose of the interview' in deciding how many people to interview. Johnson (2002) maintains that 'the number of interviews needed to explore a given research question depends on the nature of that question and the type of knowledge the interview seeks' (p. 113). In light of this, Kvale (1996) has suggested that researchers need to judiciously decide how many interviews to conduct so that the information being sought is collected. Sandelowski (1995, p.179) asserts that 'determining adequate sample size in qualitative research is ultimately a matter of judgement and experience'. A suitable sample size for qualitative research is one that sufficiently answers the research question (Marshall 1996). Wiersma & Jurs (2008) have suggested that sample sizes in qualitative research are typically small.

Sample sizes in qualitative research should not be too large otherwise it becomes difficult to extract thick, rich data (Onwuegbuzie & Leech 2007). At the same time, as noted by Sandelowski (1995), the sample should not be so small that it becomes difficult

to achieve data saturation (Flick 1998; Morse 1995), theoretical saturation (Strauss & Corbin 1990), or informational redundancy (Lincoln & Guba 1985). Since the aim of this research is not to estimate the prevalence of a phenomenon or to make generalisations but to provide an in-depth understanding of tacit knowledge transfer, to develop explanations and to generate ideas, only a small number of respondents were required. The in-depth data collected through the interviews is expected to supplement the data collected through the survey instrument. Thus for the interviews, this study primarily employed a stratified purposeful sample to identify academics (a lecturer or senior lecturer and an associate professor or professor from each university). These academics had previously completed the survey successfully. The researcher conducted eight interviews: 2 academics from each university.

3.7 ETHICAL CONSIDERATIONS

Research ethics is concerned with the acquisition, analysis and distribution of information without causing harm to the research participants (Rubin & Rubin 1995). There are numerous ethical issues to be considered in any research especially social research. Sustaining high ethical standards is extremely important in social research as it protects the respondents and improves the quality of the data retrieved. As the objects of inquiry in social research are human subjects, extreme care has to be taken to avoid any harm to them (Fontana & Frey 1998). Several ethical issues apply in research, such as respondents' right to privacy and confidentiality, the right not to be deceived or harmed as a result of participation in the research, the right to be informed about the purpose of research, the right to anonymity, the need for honesty in data collection, and the need

for objectivity in reporting data, especially for survey research (Creswell 2005; Zikmund 2003). Psychological harm such as stress, emotional distress, self-doubt and so forth can trigger sensitive issues and emotional experiences (van Manen 1990).

To address the ethical issues arising from the research, the application for approval of a project involving human participants was submitted and approved by Victoria University's human research ethics committee prior to the commencement of the research. The application was supported with multiple other documentation that included: a letter for gaining approval from participating universities (Appendix 2), recruitment letter for the questionnaire (Appendix 3), information sheet for the questionnaire (Appendix 4), consent form for the questionnaire (Appendix 5), the questionnaire (Appendix 6), recruitment letter for the interview (Appendix 8), information sheet for the interview (Appendix 9), consent form for the interview (Appendix 10) and the interview questions (Appendix 11). Information about all ethical considerations was holistically explained to the potential participants in the consent form and information sheet. Such information included a plain language summary (specifying nature and aims) of the project, nature of data gathering, the voluntary nature of participation, the use and distribution of the research findings, potential risks of participating in the project, protection of confidentiality and privacy of participants and the storage of data.

Participation in the survey and the interviews was entirely voluntary and respondents were free to discontinue at any time, without the need for reason or explanation. No information gained enables either the respondent or the university to be identified to anyone other than the research team and data has only been reported using pseudonyms.

All information gathered has been coded to prevent identification. To encourage participation, respondents were informed that the data will remain confidential and the identity of the participant and university will remain anonymous. Participation in this research will not affect the relationship of the respondent with the university in any way. Hence there were virtually no risks, side effects or discomforts associated with participating in this research. The research data has been stored in a secure computer or file storage in the office of the principal researcher (Dr. Josef Rojter) in the College of Engineering and Science at Victoria University and will be held for 5 years post-publication, after which it will be destroyed. Information collected has been treated with the strictest confidence and is only accessible to the research team comprising of principle researcher (Dr. Josef Rojter), associate investigator (Dr. George Messinis) and the student researcher (Ritesh Chugh).

The following checklist (as illustrated in table 3.3) has been used in shaping this research.

Table 3.3 – Ethics Checklist (Source: adapted from Hussey & Hussey 1997, p. 39)

Checkpoint	Response
1. Will any harm come to direct or indirect Participants from this research?	No. Anonymity, confidentiality and privacy are assured by following the procedures mentioned above.
2. Will any harm come to non-participants, from this research?	No. The topic and nature of this research is not likely to cause any harm or flow-on effects. Risks were clearly explained to the participants.
3. Will the research violate accepted research practice?	No. The research has been approved by Victoria University's human research ethics committee and their guidelines have been followed.
4. Will the research violate accepted community standards?	No. Common sense and common decency have been applied to this research at all times.

3.8 ADMINISTRATION OF THE QUESTIONNAIRE AND CONDUCTING THE INTERVIEWS

Before gaining the final approval of Victoria University's human research ethics committee, the researcher was required to gain approval of participation from all the four universities involved in the research. A letter for gaining approval from participating universities (Appendix 2) was emailed and subsequently three universities granted permission and also allowed the use of their email system to recruit academics for the study whereas one university was happy to support the project but did not allow the use of their email system to recruit academics. This university instead suggested the use of their weekly news bulletin to inform the target audience of the project.

The study was administered in two phases. The first phase involved the administration of an online questionnaire to university academics. The survey instrument was developed (discussed in the next chapter) by the researcher and was administered online. The recruitment letter for the questionnaire (Appendix 3) was developed to describe the brief background of the study and request participation. An information sheet for the questionnaire (Appendix 4) was designed that included a plain language summary (specifying nature and aims) of the project, nature of data gathering, the voluntary nature of participation, the use and distribution of the research findings, potential risks of participating in the project, protection of confidentiality and privacy of participants and the storage of data.

University academics were requested to fill in a questionnaire using an online web link to the survey which takes approximately 15-20 minutes to complete. The survey was web-based to facilitate easy distribution of the instrument to respondents and their eventual submission of responses. The questionnaire was administered to all academics in three universities, regardless of campus location, through the faculty/school email list whereas in one university a recruitment advertisement in the weekly email news bulletin was inserted. The recruitment advertisement contained a link to the online web survey. The email sent out to the academics contained a web link to the online web survey. A consent form comes up on the first page of the online questionnaire that the respondents need to complete before going further. The first page provides information about the questionnaire enabling the respondents to make an informed decision before completing the survey. Respondents had to sign and date the consent form before proceeding any further.

A follow-up reminder email (Appendix 7) was sent in order to get higher response rates from the surveys. The reminder email was sent out approximately 6 weeks after the initial request email. The web link to the survey was kept open for a period of three months and by the end of this period a favourable response of 142 complete questionnaires was obtained.

The second phase involved face to face interviews with the academics. In the second phase, in-depth structured interviews were conducted with key academics to uncover enablers and barriers of tacit knowledge transfer in the organisation. The interviews aimed at gathering qualitative data.

According to de Ruyter and Scholl (1998) a qualitative research project has between 10 and 60 respondents, with about 40 in a large project. To keep this project manageable and since it is not a very large project, 8 academics were interviewed. The respondent profile considered ideal for the interviews was a lecturer or senior lecturer and an associate professor or professor from each university. University academics were approached through an email soliciting their participation in an interview. Interview request emails were only sent to academics who had earlier successfully completed the questionnaire. The academics were requested to voluntarily participate in a 30-40 minute face-to-face interview. de Heer and Israels (1992) in their review of response trends to interview requests list average interview time as one of the factors that influence response and nonresponse. On the contrary Bradburn (1978) hypothesises that longer interviews may suggest importance to respondents resulting in higher response rates.

Academics who agreed to participate were then sent out a consent form to be signed before the interview could be scheduled. All interviews involved only the participant and the student researcher. The academics who responded positively to the interview requests were given the choice of choosing a convenient day, time and location for the interview. This choice was provided so there was no inconvenience for the interviewees. However coincidentally all interviews were conducted at the interviewees' workplace. The interviews provided an opportunity to ask a series of open-ended questions that further revealed potential enablers and barriers to tacit knowledge transfer.

Audio recordings of interviews were made, with the participants' approval, to allow the researcher to focus on the words used by the subject (Douglas 2003). With the permission of the interviewees, the interviews were digitally audio-recorded and transcribed for analysis to ensure that the researchers have an accurate record of the interview. The interviewees reserved the right to refuse to answer any specific question and the interview could be terminated at any time without the need for reason or explanation. During the interviews, the sequence and the wording of the questions in the interview schedule were followed to a large degree. However, there were some cases in which questions were either re-worded impromptu or were further explained to the interviewees.

Interviews were subsequently conducted with 8 academics who responded affirmatively to the interview request. The qualitative data from the interviews has been used to ascertain key variables that have an impact on tacit knowledge transfer. This also gives an insight into the perceptions of academics towards the weight placed on technology as opposed to behavioural aspects.

3.9 STRATEGY FOR DATA ANALYSIS

Data analysis is the step in the process of converting raw data into information so that it becomes meaningful. Data sources can include researcher field notes, interview notes, recordings, transcripts, and survey data (Douglas 2003; Yin 2003). A number of steps were undertaken prior to the analysis to ensure high quality of information. These steps include transcribing, editing, error checking and correcting and coding (Zikmund 2000).

This study has attempted to incorporate both a broad view of tacit knowledge transfer (using questionnaires) with narrower views (through interviews) from university academics to answer the research questions. The transcripts from the 324 minutes of interviews amounted to approximately 45,000 words whilst there were also 141 completed surveys to analyse.

Statistical analysis can be described as a form of modelling that explicitly recognises the existence of uncertainty in a set of data (Mingers 2006). Statistical analysis is conventionally seen as having two possible roles – descriptive and inferential. Dewberry (2004) has defined descriptive analysis as being concerned with describing numbers and relationships between them whilst inferential analysis focusses upon trying to draw conclusions that extend beyond the immediate data alone. The main approach in examining the data was descriptive although inferential analysis has also been carried out. Data was collected from the two phases i.e. survey and interviews. This allowed for triangulation of data (Denzin 1989) for validation to occur under multiple perspectives.

For the analysis of qualitative data obtained in this research, data analysis was carried out using three procedures, namely:

Open coding - the systematic analysis of interview transcripts and other data sources, word-by-word, line-by-line, or sentence-by-sentence to code or label words and phrases found in the transcript;

Axial coding - the identification of relationships between open codes to create themes or categories by grouping codes or labels given to words and phrases; and

Selective coding - the identification of the focal point from the core codes (Allan 2003; Carson et al. 2001; Douglas 2003; Miles & Huberman 1994).

Open Coding involves the systematic analysis of interview transcripts and other data sources, word-by-word, line-by-line, or sentence-by-sentence (Carson et al. 2001). Codes come from the subject's terminology, in vivo coding, or the researcher's own 'labels' that best suit the phenomenon. In vivo codes are wording that participants use in the interview (Allan 2003). With the open coding process, codes are derived from the data, not from a pre-determined list (Carson et al. 2001).

Axial Coding comes after open coding and involves the identification of relationships between open codes. This process produces core codes developed from the groupings and categories that emerge from the identified relationships.

Selective Coding is the final step in the overall encoding process. It involves the identification of the focal point from the core codes. The focal point is the central phenomenon that emerges from the previous coding stage and best describes the theory under investigation. The encoding process is highly iterative, with new codes being developed from initial 'conceptual' codes.

3.9.1 Quantitative Data Analysis

Statistical Package for Social Sciences (SPSS) has been used for the analysis of the quantitative data from the questionnaires to determine any discernible trends. Survey data from the questionnaires has been coded to allow for the translation of information

into values suitable for computer entry and statistical analysis. The data gained from Survey Gizmo (web-based software for online surveys) was not suitable for direct entry into SPSS, hence it had to be cleaned to remove inconsistent responses. A codebook was created before data was entered into SPSS and then data was screened to detect any errors and missing responses. Incomplete questionnaires were excluded from the final dataset. Following completion of the codebook, data was transferred into a Microsoft Excel spread sheet and then imported into SPSS. The data was analysed in SPSS and interpreted using statistical concepts like frequencies, percentages and means, correlations, multiple regressions, factor analysis, analysis of variance and chi-square tests.

The questionnaire data was analysed using descriptive statistics to obtain a demographic snapshot of the respondents. This was principally achieved by frequencies, percentages and means analysis of the data. Questionnaire data was explored by comparing their specific value and interdependence, highest and lowest values, totals, proportions, and distributions. Cross-tabulation analysis was performed to identify relationships. Graphs and tables were used to present the data.

Factor Analysis - All the questions in the questionnaire can be seen as variables, the values of which have been found by studying the responses that each question received. This allowed for grouping the respondents on the basis of their scores on one or several of the factors that were found in analysis. This enabled in identifying the nature of the constructs underlying responses in specific content areas such as workplace dimensions, behavioural dimensions, workplace expectations, technology dimensions, learning

dimensions, cultural, age and gender dimensions. Factor analysis also enabled in generating factor scores representing values of the underlying constructs for use in further analyses.

Correlation Studies - Correlation studies have been used to evaluate the data collected from the four universities to determine the enablers and inhibitors of tacit knowledge transfer. Correlation analysis is excellent for the initial analysis of a large number of variables, when there is no clear idea of their mutual relations.

The open ended questions at the end of the survey were analysed using content analysis techniques to validate the dimensions initially listed in the questionnaire. Other important dimensions concerning both enablers and deterrents of tacit knowledge transfer were derived from the responses to the open-ended questions. The surveys facilitated the identification of factors for successfully embracing knowledge transfer practices in universities. Analysis has also been performed looking at specific background variables (age, cultural background, experience, technology adoption) that have helped in ascertaining the enhancers and inhibitors of knowledge transfer. In order to use the Likert-scale for quantitative interpretation, weighted mean to represent each question has been computed. Although open-ended questions are typically analysed qualitatively, the responses are occasionally analysed qualitatively by counting the number of times a particular response was provided (Johnson & Christensen 2012).

3.9.2 Qualitative Data Analysis

Eight interviews (n=8) were transcribed and imported into the computer software NVivo, a qualitative analysis software. This software is considered a powerful tool in terms of thematic analysis (Gibbs 2006). Analysis of the data involved a set of techniques called template analysis, which refers to a way of thematically analysing qualitative data (King 2004). The process involved the development of a coding template that summarised the themes identified by the researcher and organised them in a meaningful format. Reporting of data was based on a structured approach drawing illustrative examples from each interview transcript as required. The use of direct quotes from the participants was essential. Short quotes were also included to aid in the understanding of specific points of interpretation and a smaller number of more extensive passages of quotations to provide a flavour of the original texts.

In order to deal with the large quantity of free-flowing text, interview transcripts were encoded. Coding is used to shrink the large quantities of text produced by in-depth interviews to a manageable form (Jackson & Trochim 2002). The Grounded Theory (Glaser & Strauss 1967) was the methodology applied for analysing the data in this research. In this methodology data is broken down, conceptualised and reassembled in new ways. It is vital to break down the collected qualitative data into pieces to closely examine and compare for relations, similarities and dissimilarities. This involves the creation of recurring themes, or categories from the data collected. Themes come from words, sentences or phrases containing a single concept, or from whole paragraphs (Carson et al. 2001). This condensation to single concepts facilitates categorisation, sorting and analysis so that each concept can be considered separately (Hussey &

Hussey 1997; Jackson & Trochim 2002; Miles & Huberman 1994). In qualitative data analysis the researcher sorts and sifts the data, searching for types, classes, sequences, processes, patterns or wholes. The aim of this analysis process is to assemble or reconstruct the data in a meaningful or comprehensible fashion (Jorgensen 1989, pg. 107).

The interview transcripts were codified so as to allow trends to emerge from the data. In exploratory studies, the researcher is interested in exploring the situational factors to understand the characteristics of the phenomena of interest (Cavana, Delahaye & Sekaran 2003). Due to the exploratory nature of this research and to identify the enablers, inhibitors and processes that affect knowledge transfer in a university, the Grounded Theory (GT) approach of data interpretation has been used. The GT approach is based upon the researchers' interpretation and description of phenomena based on the actors' subjective descriptions and interpretations of their experiences in a setting (Locke, 2001; Strauss & Corbin, 1998). In the GT approach, concepts and categories are identified and the responses to the interview open-ended questions are codified so that trends can emerge from the gathered data (Strauss & Corbin, 1998). Insight obtained from the universities' academics will allow the researcher to ground constructs of the identified dimensions and further link them to tacit knowledge exploration. The aim was to analyse a textual database (from the interview transcriptions) and discover variables relevant to tacit knowledge transfer and their interrelationships.

3.10 LIMITATIONS OF THE COLLECTED DATA

The data has been collected from a sample of academics who responded to the questionnaire and academics who readily consented for an interview. Hence this does not allow for too many different viewpoints. Based on an interview sample of 8 academics and 141 surveys, it would be inappropriate to generalise the findings to a larger population of academics. The data gained is not necessarily indicative of the universities but only indicative of the academics who responded. Academics who were intrinsically motivated responded while others did not. Therefore it is not advisable to assume that the analysis will reveal the view of all academics in Australia or universities but a view of the respondents only. It definitely represents how these people view the transfer of tacit knowledge. The data was analysed mainly by the researcher and was only reviewed by a few academic colleagues and the principal supervisor during the process of analysis. The researcher also acknowledges that the results may be more easily influenced by personal biases and idiosyncrasies.

3.11 CONCLUSION

This chapter includes the justification of the methodology that is used to address the research questions and aims. The chapter has also justified the selection of the interpretivist and positivist paradigm as being closely aligned to the needs of this research. It demonstrates why a mixed method research approach is appropriate for this study. The importance of utilising both online questionnaires and interviews has been

outlined in order to gain a holistic understanding of the issues in tacit knowledge transfer. Ethical considerations that may arise in this research have been adequately addressed. Steps that were taken in administering the online survey and conducting the interviews have also been highlighted in this chapter. The next chapter now focusses upon the design of the questionnaire and the interview questions.

4

One's first step in wisdom is to question everything - and one's last is to come to terms with everything - Georg Christoph Lichtenberg (1742-1799)

CHAPTER 4 DEVELOPMENT OF THE WEB-BASED SURVEY INSTRUMENT AND DESIGN OF INTERVIEW QUESTIONS

4.1 INTRODUCTION

The previous chapter considered the paradigms that underpin this research. Both positivist and interpretivist paradigms were considered suitable for this study; especially because a mixed methods research methodology was found to be justifiable to address the research questions. In order to effectively reach the aims of this research, two data collection instruments (questionnaires and interviews) were required. This chapter now firstly focusses upon the development of a web based survey instrument called the Tacit Knowledge Transfer Survey (TKTS) and then secondly upon the design of the interview questions.

The outline of chapter four is illustrated in figure 4.1.

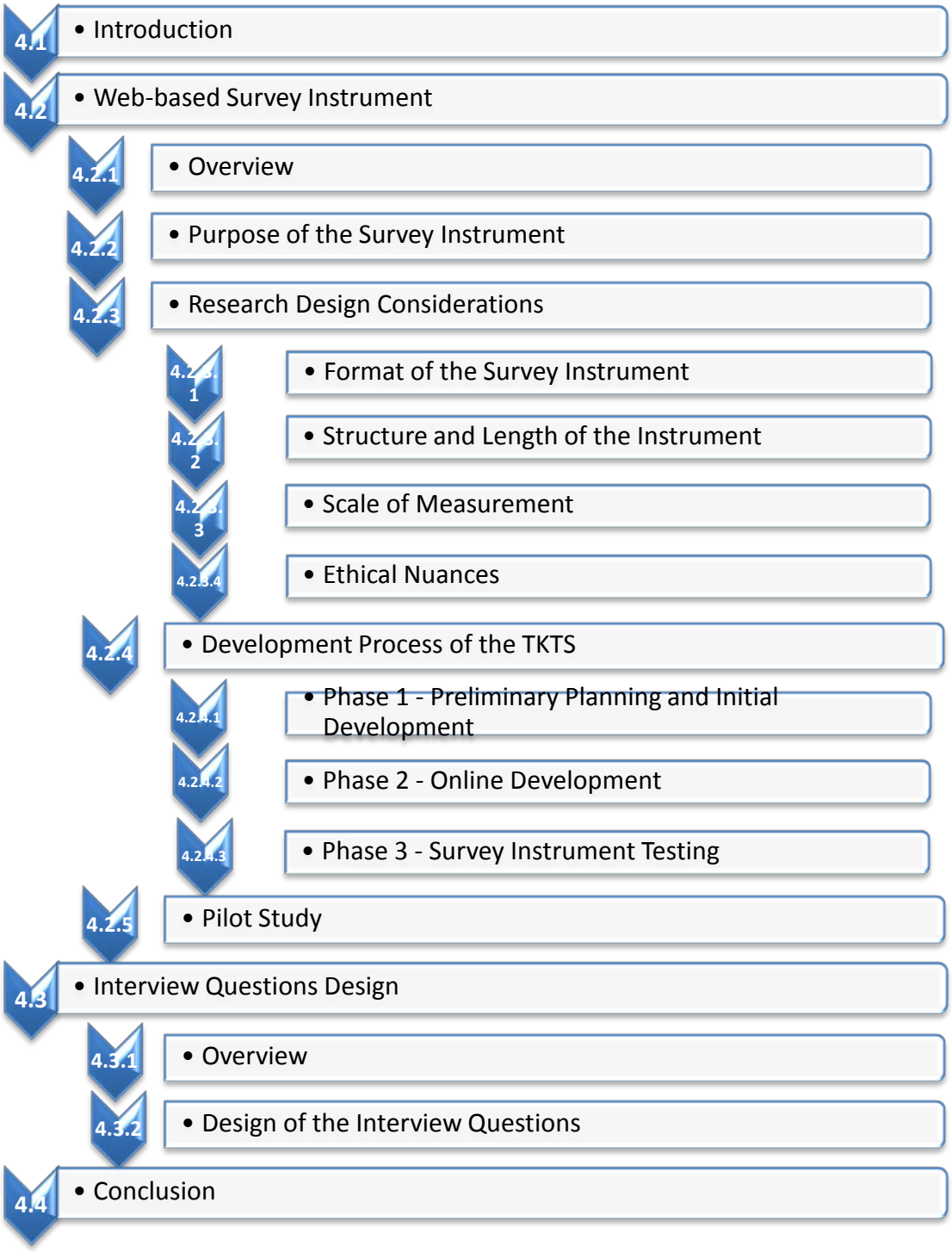

Figure 4.1 – Chapter four outline

4.2 WEB-BASED SURVEY INSTRUMENT

4.2.1 Overview

This section focusses upon the design and development of a web-based survey instrument called the Tacit Knowledge Transfer Survey (TKTS). The development of the survey instrument was deemed necessary for this research as such an instrument did not exist, especially one that focussed on the university environment. The questionnaire was designed to explore various dimensions of tacit knowledge transfer by university academics.

The survey was developed after an extensive review of existing knowledge management literature. There were no existing surveys that focussed on exploring tacit knowledge transfer by university academics hence a survey had to be designed from scratch. The goal was to produce a survey instrument which was easy to administer, which could be completed in a short time period, and which could help in addressing the research questions. The researcher considered the fact that the questionnaire should be purpose-built to adequately address the research questions and not the reverse. Thus, the questionnaire was designed to be as investigative as possible.

4.2.2 Purpose of the survey instrument

The survey instrument was designed to address the overarching research aim, understand the various dimensions of tacit knowledge transfer by university academics and gain responses to the ten research questions identified in Chapter 1. Due to the lack of any existing survey that specifically focussed on tacit knowledge transfer in universities; a

survey instrument was designed from scratch. Considering the nature of the data required and the research questions, the survey explored six dimensions:

1. **Workplace dimensions** - This focusses upon exploring how academics' workplace (university) encourages the transfer of tacit knowledge.
2. **Behavioural dimension** – This focusses upon assessing academics' personal traits and their thoughts on tacit knowledge sharing.
3. **Workplace expectation** – It focusses upon the expectations that the workplace (university) has from academics for tacit knowledge sharing.
4. **Technology dimension** – It explores the use of different information and communication technologies and academics' adaptability to ICT for tacit knowledge transfer at the workplace (university).
5. **Learning dimension** - It explores the academics' and their workplaces' (universities) conduciveness to be lifelong learners and learning organisations respectively.
6. **Cultural, age and gender dimensions** - This explores academics' willingness to share tacit knowledge based on cultural background, age and gender.

Selecting an appropriate research method is the core of the research design. As outlined in the previous chapter, this research has employed a mixed design methodology in order to acquire a better understanding of the nature of tacit knowledge transfer by academics in universities. Hence, interview questions were also designed which are discussed in section 4.3 of this chapter.

4.2.3 Research Design Considerations

In selecting an appropriate inquiry methodology, the approach was guided by the research questions and the topic under investigation. Kerlinger and Lee (2000, p.450) identified two fundamental purposes of research design:

1. to provide answers to research questions and
2. to control variance.

Good research design will assist in understanding and interpreting the results of the research. The survey design used in this study is of a cross-sectional nature. Cross sectional design involves the collection of data at one point in time from a random sample representing some given population at that time (Wiersma & Jurs 2005).

Designing and testing survey questions is a challenging exercise. The reliability and validity of a survey depend upon its planning and execution but more importantly the design of questions to elicit the right responses is crucial (Alreck & Settle 1995). Luck and Rubin (1987) have emphasised that a properly constructed instrument facilitates the gathering of accurate and complete information about the research problem. For the design of the TKTS instrument, the researcher considered the format of the instrument, its structure and length, scale of measurement and ethical nuances.

4.2.3.1 Format of the survey instrument

Considerations were given when choosing between mailed surveys or web-based online surveys. Undoubtedly, online surveys are a viable alternative to mailed surveys. For this

research, the Internet was considered a more appropriate way to administer the survey instrument for the following reasons:

- All the target audience (university academics) have access to the Internet at their workplaces. Academics are considered to possess adequate computer skills to respond and complete the online questionnaire.
- Reduction in response time; the recipients can respond almost immediately and no printing and mailing costs (Wiersma & Jurs 2005).
- Simplification of the data analysis process as data does not have to be coded manually.
- Web-based surveys provide faster response rates, easier processing of data, pop-up instructions for selected questions, error checking capability and a higher quality dataset that allows the pre-coding of answers and prevents inconsistency of answers and reduction in errors that often occur through transcription of the answers from paper to an electronic format (Gunn 2002).
- The reliability and accuracy of data is better in comparison to paper based surveys. Reaney, Pinder and Watts (2001) state that electronic surveys due to their 'highly structured forms' can prevent respondents 'from giving multiple responses to a particular question or submitting the questionnaire before all questions have been answered'(p. 3). The error checking feature of the online survey minimises the chances of erroneous responses and provides more usable data in comparison to paper based surveys.

4.2.3.2 Structure and length of the instrument

Survey instruments vary in length and complexity. The number and type of questions contained in the survey instrument were issues that need to be addressed in design. The number of questions in a survey can also relate to the length of the instrument. Hence obtaining a balance is very important. Garson (2008) has asserted that there is no correct length for a survey and the length should be determined considering the constraints of the respondents' attention span. The composition and design of the questions are vital to the success of any research. Dillman (2000) has claimed that the length of the survey depends on the nature of the sample and the topic under investigation. Short questionnaires may produce a low response rate because respondents may consider it too trivial or superficial (ibid).

Numerous studies (Burchell & Marsh 1992; Heberlein & Baumgartner 1978; Helgeson & Ursic 1994) have shown the significant effect of questionnaire length on response rates in mail surveys. It is safe to assume that the same also applies to the length of online surveys too. Hence it is important to have a shorter questionnaire that can be completed in approximately 20 minutes. Surveys of 20 minutes or less can produce better quality responses and also motivate and engage respondents (Cape 2010).

However, in the context of this research it was deemed important to have some detailed questions that would help in identifying the key research issues. The detailed questions were incorporated in spite of ensuring that the timelines did not exceed the approximate 20 minute duration. The survey was divided into sections to give the respondents a sense

of progress, and respondents were informed of their progress through a progress bar on the online questionnaire.

Close-ended questions, open-ended questions and vignettes were structured for the questionnaire. Closed-ended questions are useful 'when the questionnaire is long or people's motivation to answer is not high' and when the questionnaire is self-administered, as is the case in this research (de Vaus 2002, p. 100). Close-ended questions enable a researcher to conveniently compare responses and are also useful for sensitive questions as the respondents feel more comfortable knowing the parameters of the response options (Creswell 2005). In addition, close-ended questions provide a means for coding responses or assigning a numeric value and statistically analysing the collected data (ibid).

In studies like this there is a possibility that the respondents respond in a way that makes them look good i.e. rate higher or provide socially desirable responses, known as self-reported bias. It has been reported that vignettes help to reduce self-reported bias (Van Soest et al. 2007). Vignettes are 'brief stories or scenarios that describe hypothetical characters or situations to which a respondent is asked to react' (Martin 2006, pg. 2). Because vignettes portray hypothetical situations, they offer a less intimidating way to explore sensitive research subjects (Finch 1987). As a result, five vignettes were added in the middle of the questionnaire as 'vignette-based studies are superior to direct-question-based studies' (Wason, Polonsky & Hyman 2002, pg.42) and can also help in obtaining information about respondents' attitudes and beliefs (Hopkins & King 2010).

Open ended questions were also included towards the end as they provide the ability to probe in greater detail and explore the different possibilities that the respondents may have for a question (Johnson & Christensen 2012). Incorporating open ended questions can provide rich information in comparison to close-ended questions (ibid) and helps to identify what respondents are thinking about the topic.

4.2.3.3 Scale of measurement

There are different types of response categories available for close-ended questionnaire items. For the purposes of this questionnaire, a fully anchored rating scale was considered. In a fully anchored rating scale, all points are anchored with descriptors (Johnson & Christensen 2012). Anchors (such as Disagree, Neutral, and Agree) provide reference points that will help respondents to direct the expression of their opinions. Research has suggested that a rating scale should have between 4 to 11 anchor points (McKelvie 1978; Nunnally 1978). A Likert scale is considered to be a fully anchored rating scale. Typically a Likert scale is designed to examine how strongly respondents agree or disagree with statements (Cavana, Delahaye & Sekaran 2003). Likert scales are easy to read and complete, simple to construct and understand both for the respondents and researchers. Coding and interpretation is fairly easy too (Dillman 2000; Wiersma & Jurs 2005). The close ended questions were structured using the Likert-scale format using a 6-point rating scale. The response categories for the rating scale for the close-ended questions were ordered as strongly disagree, disagree, neither agree nor disagree, agree, strongly agree, and don't know. The middle category (neither agree nor disagree) was added to cater for respondents who hold a neutral opinion about the topic.

4.2.3.4 Ethical nuances

Ethics is not something that happens at any one stage but it needs to guide the entire process of planning, conducting and using research (Mertens 2010). The questionnaire was approved by the ethics committee of Victoria University and approval was also sought from the other participating universities before its administration. The proposed research project was accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Acting Chair of the Faculty of Health, Engineering and Science Human Research Ethics Committee. Approval for this research was obtained from this committee via Ethics Application No. HRETH 10/183 (Appendix 1).

The nature of the online survey precluded the signing of the consent form by participants however the online questionnaire contained a covering page where the respondents were required to enter their names after reading the appended consent form. This implied that informed consent was gained from the respondents. Other ethical issues associated with this research have been discussed in greater detail in the previous chapter.

4.2.4 Development process of the TKTS

The review of the literature in Chapter 2 identified six dimensions that were important to assess various characteristics of tacit knowledge transfer from a social, technical and organisational perspective. The six dimensions that were identified are as follows:

1. Workplace dimensions
2. Behavioural dimensions

3. Workplace expectations
4. Technology dimensions
5. Learning dimensions
6. Cultural, age and gender dimensions

The development process of the TKTS instrument comprised of the following 3 phases as shown in figure 4.2.

Phase 1: Preliminary planning and initial development

Phase 2: Online survey development

Phase 3: Survey instrument testing

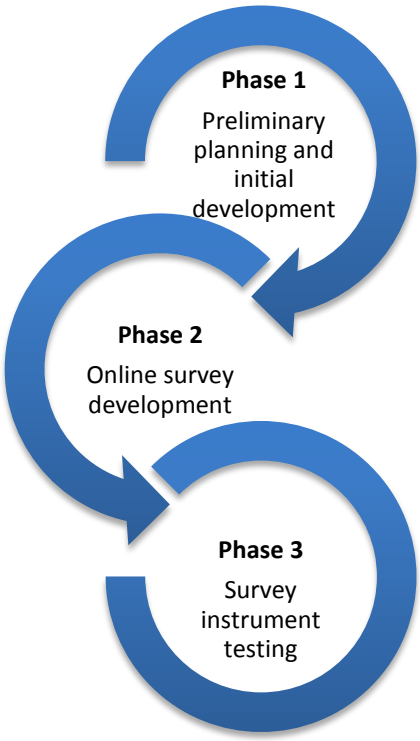

Figure 4.2 – Development process of the TKTS instrument

Details of the work undertaken in these three phases have been provided in the sections below.

4.2.4.1 Phase 1 - Preliminary planning and initial development

In this phase various dimensions related to tacit knowledge transfer were identified from the literature review and related to the research questions. It is important to be aware of the purpose of the proposed measurement instrument. For this research, a survey instrument that would be useful in the university environment was required so that it could assess tacit knowledge transfer from multiple dimensions. The development process of the questionnaire was carried out through the development of at least 3 different draft versions before the final one was approved by the supervisor and an external academic in the field. Different drafts were developed as the process was iterative in nature and improvements were made based on the feedback gathered from the supervisor and the external academic. The initial draft was developed based on the identified dimensions from the literature review. After identifying the broad six dimensions, preparation of the survey questions was done through two brainstorming sessions with the supervisor and a colleague.

Demographic questions were also added at the start of the survey because 'once respondents have said something about themselves at the very beginning, they may have psychologically identified themselves with the questionnaire and feel more committed to respond' (Cavana, Delahaye & Sekaran 2003, pg. 233). Demographic questions assess the personal characteristics of the respondents (Creswell 2005) and can help in understanding differences in the data and hence the demographic questions were related

to the current position of the respondent, number of years they have been working at their current workplace, gender, age, highest level of education and current employment status.

As part of the development phases, some questions that were considered to be complex were also clarified so that they were easier to understand for the respondent. The sequence of questions was shuffled so as to start with general questions focussing on the workplace then funnelling on to more specific behavioural ones.

However one of the evident issues that came out was the length of the survey. There were far too many questions hence extending the completion time. Thus some questions were culled to make the questionnaire of a manageable length and time frame. When the researcher, the supervisor and an external academic tried to complete the survey after redesign the time taken was between 15-20 minutes which was deemed to be adequate.

Once finalised the questions were transferred on to a Microsoft Word document that helped in addressing each of the dimensions. The close ended questions were structured using a Likert scale, the vignettes had multiple choice responses, and the open-ended questions had open space for the respondents to write. The close ended questions were broken down into six segments with each one exploring the identified six dimensions in greater detail. Each of the six segments contained between 5-12 questions that aimed to address the specific research questions. The open-ended questions aimed to explore the enablers and barriers of tacit knowledge transfer.

4.2.4.2 Phase 2 - Online survey development

The purpose of this phase was to further develop the survey instrument for online administration. At this stage the survey questionnaire was transferred into the SurveyGizmo website. SurveyGizmo is a web-based software giving researchers, powerful tools to create online surveys, questionnaires and forms – allowing capture and analysis of virtually any type of data (SurveyGizmo 2012). To ensure that an Internet survey proceeds smoothly, de Vaus (2002) recommends the use of a specially designed internet survey software package. These packages make the survey web compatible, easy to write the questionnaire, and easily placed on the Internet with minimal need to learn any programming language (ibid).

The SurveyGizmo website permits the researcher to customise the aesthetics of their survey with different backgrounds and colour schemes. It also enables the researcher to select from different question formats that range from multiple choice questions, close ended questions, open ended questions, ranking questions to rating scale questions and so forth.

Entering the questions on the SurveyGizmo website was a very straightforward process although knowing all the features and getting to use them optimally takes some time. In order to get the questionnaire up on the SurveyGizmo site, the researcher had to go through the following steps:

- Sign up for a student researcher account.
- Choose the survey type and a template for the aesthetics feel.

- Add questions to the survey using radio-buttons on the Likert scale. The Likert scale contains a range of responses as identified earlier.
- Create space for the responses of the open-ended questions.

The first page of the survey includes information for the participants whilst the second page had the consent form. On the first page, the researcher informs the respondents about the aim of the research, provides an explanation of the project and provides ethics-related information. The information on the first page clearly identifies that data will be collected from four universities and data will only be reported using pseudonyms. The consent form on the second page does not allow the respondents to proceed further till they have agreed with the terms of the form and put their name and suburb as a means of showing informed consent. The demographic questions on page three are also mandatory and respondents could not proceed further without having completed them.

In SurveyGizmo, when entering the questions, the researcher has to first select the type of question format from the different types available. The next step is to enter the question along with the applicable range of responses. This process is repeated until all questions have been entered into the site. The Likert scale anchors were made to appear on every page where there was a close ended question so that the respondents did not have to waste time in vertical scrolling. Respondents were not given the option of saving an incomplete survey and had to complete it in one sitting. The survey could only be taken once by the respondents. Like in paper-based surveys, the respondents were allowed to go back and forth between different pages. The online version of the questionnaire was divided into seven pages.

Whilst the survey was being configured online, the SurveyGizmo site enabled keeping its status as ‘testing’ stage. In the ‘testing’ stage, responses collected in this status are stored and marked as ‘test’. Once the survey was ready, the status was changed from ‘testing’ to ‘open’. In the ‘open’ status, web links are open to collect live data. After the questionnaire was made functional online, SurveyGizmo also provides a web link to the survey. The web link was very useful as it was embedded in the email soliciting participation from the prospective respondents. This ‘open’ status enables SurveyGizmo to store the collected data once it has been submitted by the respondents. The collected data can then be exported in Excel format, SPSS format or as a web-based document too. Screenshots of the online TKTS instrument are presented in Appendix 6.

Access to the survey was simple and recipients were directed to a uniform resource locator (URL) embedded in an email (Mertler & Earley 2003).

4.2.4.3 Phase 3 - Survey Instrument testing

Once the survey has been developed, it is vital to ensure that the instrument measures a particular concept accurately. Hence, it is important to establish whether the TKTS can provide the researcher with valid and reliable data.

In any research, there are two contexts in which to think about the validity and reliability of the data collected. The first pertains to scores from past use of the instruments and whether the scores were valid or reliable. The second relates to an assessment of validity and reliability of the collected data in the study that the researcher is currently undertaking (Creswell & Plano Clark 2007). This study chose the latter of the two

options because this instrument was exclusively custom-designed for this study and hence access to past data was not possible.

Reliability of an instrument indicates the extent to which the instrument is without bias and offers consistent measurement across time and across the various items in an instrument (Cavana, Delahaye & Sekaran 2003). de Vaus (2002) states that 'if people answer a question the same way on repeated occasions then it (the instrument) is reliable' (p. 54). If an instrument provides reliable scores, the scores will be similar on every occasion. Validity refers to the 'accuracy of the inferences, interpretations, or actions made on the basis of test scores' (Johnson & Christensen 2012, pg.143). A valid test should measure what is intended to be measured. Validation involves evaluating interpretations for their soundness and relevance. The best rule is to collect multiple sources of evidence (Johnson & Christensen 2012). According to Nunnally and Bernstein (1994), reliability is necessary but not a sufficient condition for validity, which would imply that both validity and reliability are important and both are required.

To place more confidence in the researcher's interpretation and to test the validity and reliability of the TKTS instrument the researcher first sought the feedback of the principal supervisor, associate supervisor and 2 other academics and then pilot tested the instrument with a small sample of academics (n=10).

4.2.5 Pilot Study

A small pilot study was conducted before the final administration of the surveys and the interviews. Pilot studies form an important part of the data collection process. Monette,

Sullivan and DeJong (2002, pg.9) have defined a pilot study as a 'small-scale trial run of all the procedures planned for use in the main study'. A pilot study addresses the concern whether the questionnaire appears to measure the concepts being investigated and also validates the theoretical constructs to be measured (Burns 1994). Hence, pilot runs will help to recognize redundant or poor questions and give an early indication of the reproducibility of the responses. The pilot study gives a chance to identify and correct any mistakes or ambiguity (Isaac & Michael 1995, pg. 38). Pilot testing of the survey instrument helped in reducing the risk that the questionnaire will not produce results.

Neuman (1997) has suggested a small set of respondents as the size of the group for the pilot study whereas Monette, Sullivan and DeJong (2002) have been more specific by specifying around 20 people or a small part of the sample. Hence a group of pilot participants was formed to provide feedback on the survey instrument before sending the questionnaire to the participants. Firstly feedback was sought from the principal supervisor, associate supervisor and two other academics from different universities and then the instrument was pilot tested with a small sample of academics (n=10). Due to lack of availability, the pilot group did not meet together as a group. However, their feedback on the questionnaire was sought individually before the instrument was submitted to the VUHREC for approval and then finally administered to the participants.

The focus of the pilot-test was two-fold: first, to ensure that the presentation of the instrument was clear, concise and easy to use; second, to ensure that the questions were

properly understood. In the pilot test, the researcher also asked the respondents to explain their understanding of the items and their reasons for answering as they did. This helped in ensuring that the questions were yielding the sought after information (Wiersma & Jurs 2005). The pilot test revealed certain necessary changes to the wording of the survey's introduction page and the need to clarify the definition of tacit knowledge and design layout. The pilot run also revealed the necessity of having a 'don't know' anchor on the Likert scale to cater for respondents who weren't aware of the topic. The pilot group also suggested the addition of a sample question in the instrument to guide the respondents. Typographical errors were detected and corrected. The overall response from the feedback received from the pilot study participants was largely positive apart from the issues identified above.

The pilot test permitted identifying any problems or built-in biases thus ensuring that the questions are clear and understandable to all. The questions were tested and retested to ensure validity. On the basis of the pilot run, the TKTS instrument was modified and put into final form. The pilot study also gave an opportunity to seek information from the respondents to determine the degree of clarity of questions and to identify problem areas that need attention (Neuman 1997).

The final TKTS instrument (Appendix 6) consists of:

- 6 demographic questions
- 52 close ended questions
- vignettes
- open ended questions

Administration of the survey has already been discussed in Section 3.8 of Chapter 3. After having considered the design and development of the TKTS instrument, the online questionnaire used to collect quantitative data, this chapter now considers the design of the interview questions.

4.3 INTERVIEW QUESTIONS DESIGN

4.3.1 Overview

Interviewing, 'has its own issues and complexities, and demands its own type of rigour' (O'Leary 2004, pg.162). Interviews can take different formats and include a wide range of practices (Rubin & Rubin 2005). Patton (1990) suggests three ways of conducting interviews: the informal conversational interviews, the general interview guide approach, and the standardized open-end interview while Cohen and Manion (1994) segregate interviews into structured interview, unstructured interview, non-directive interview and focused interview. Qualitative interviewing allows a researcher to gain an understanding of another person's inner perspective (Patton 1987). Kvale (1996) claims that the main difference among the different types of interview is in the structure of questions, which reflects the purpose of the interview. An in-depth interview is free-flowing interview, generally with one person, designed to probe more deeply into an issue than is possible with a survey (Ticehurst & Veal 1999).

Cavana, Delehaye and Sekaran (2003) have suggested that interviews can take three forms: unstructured, structured and semi-structured. In a structured interview the researcher pre-decides the structure of the interview and sets out with some

predetermined questions. In structured interviews the researcher knows at the outset what information is required. Each question is pre-planned and meant to explore a specific topic.

In an unstructured interview, the researcher has some general ideas about the topics of the interview but does not enter the interview with a planned sequence of questions. The real objective of these interviews is to cause some initial issues to surface based on which further in-depth investigation can be carried out.

The third form of interview is a semi-structured interview. Semi-structured interviews are non-standardized. In semi-structured interviews there are some pre-set questions, but allow more scope for open-ended answers. In this type of interview the sequence of questions can be changed depending on the direction of the interview (Corbetta 2003).

Qualitative interviews consist of open-ended questions and provide qualitative data (Johnson & Christensen 2012). Qualitative interviews can be used to gain in-depth information about the 'thoughts, beliefs, knowledge, reasoning, motivations and feelings' (pg.202) about the topic (Johnson & Christensen 2012). This research primarily conducted qualitative structured interviews as the researcher had already created a predetermined list of questions and each research subject was asked exactly the same questions in exactly the same order (Minichiello et al. 1990). Patton (1990) refers to these interviews as the standardized open-end interviews. A standardised open-end interview (also called structured interview) is more structured because the interviewer does not vary from the interview protocol (Johnson & Christensen 2012)

although probing questions were still utilised where necessary. The interviewer could ask follow-up questions that may naturally emerge during the qualitative interview (ibid). For the individual face-to-face interviews in this research, the interviews were conducted by following a checklist of questions but they are still comparable to normal conversations as the wording of the questions was quite rudimentary.

4.3.2 Design of the interview questions

The review of the literature has been used as the basis for formulating the interview questions. The interview questions were designed to assess:

- The importance of tacit knowledge transfer.
- Whether the workplace encouraged tacit knowledge transfer and in which ways.
- Technology used to aid tacit knowledge transfer.
- How tacit knowledge transfer would improve both the academics' and the universities' performance.
- Mandating and measuring tacit knowledge transfer.
- The academic as a lifelong learner.
- Willingness of academics to pass on/teach their skills to others.
- Academics' supervisor role in promoting tacit knowledge transfer.
- Barriers to tacit knowledge transfer.
- Processes/ways to capture and reuse tacit knowledge.

To assess these issues, the researcher developed a set of questions as shown in Appendix 11. Twelve open ended questions were included in the interview. These

questions enable the researcher to gather in-depth information that would validate and clarify the six dimensions identified previously in the data analysis of the survey instrument (TKTS).

Creswell (2007) has stated that in an explanatory design, a follow-up of the same individuals should be included in both data collections. The approach to be used in this research to capture data from the interviews is that of structured interviews where a list of open-ended questions have been prepared in advance. This form of interview was well suited to covering the sequence of questions to be discussed (Kvale 1996). It was also appropriate for exploring the perceptions and opinions of the interviewees regarding issues pertaining to tacit knowledge transfer. It also enabled probing for more information and clarification of responses too. The interview questions were primarily open-ended questions, designed to expose a diversity of opinions (Jackson & Trochim 2002), and allow the subject to follow their own line of thought (Dick 2000). The open ended questions enabled concentrating on a more in-depth analysis of the practices and behaviours that were raised in the survey instrument. Probe questions were used to elicit more information and to keep the discussion focussed when necessary. The interviews helped in identifying techniques to capture tacit knowledge from people before they disappear with a focus on process and performance improvements.

The interview questions were shown to a pilot group to identify their understanding and then reviewed and corrected. For this study a group of 10 voluntary pilot participants was formed to provide feedback on the interview questions before administering them to the target audience.

Interviews were typically conducted within 2-3 months after the surveys had been mailed out. The researcher found each academic to be highly cooperative and very generous with their time and information.

The procedures for ascertaining the right sample size, contacting the potential interviewees and conducting the interviews have been outlined in chapter 3 (section 3.8).

4.4 CONCLUSION

This chapter has expanded upon the processes involved in the development of the web based survey instrument (TKTS) and then secondly upon the design of the interview questions. The next chapter will now focus upon presenting the quantitative results and findings gained through the TKTS instrument.

5

If we value the pursuit of knowledge, we must be free to follow wherever that search may lead us - Adlai E. Stevenson Jr., 1952

CHAPTER 5 QUANTITATIVE RESULTS AND FINDINGS

5.1 INTRODUCTION

Chapter 4 discussed the design, development and administration of the Tacit Knowledge Transfer Survey (TKTS) to collect data to address the research questions presented in Chapter 1. This chapter however, is concerned with the analysis of the data collected via the TKTS. This chapter describes the quantitative results of the research project as described in Chapter 3. The major findings of the research drawn from descriptive statistics are interpreted and discussed. The findings are structured to answer the research questions using the quantitative (questionnaire) data. The discussion is structured around the outcomes relating to each of the research questions and previously published findings. In order to explore the extent to which tacit knowledge transfer

takes place in Australian universities, questionnaires were administered. The focus of this chapter is narrowed down to four universities in Australia that have evolved from colleges of advanced education and institutes of technologies.

This chapter presents the results from the administration of the web based survey instrument (TKTS). The results presented in this chapter were based on the descriptive and correlation analysis of the responses provided by the universities' academics. The end of the chapter provides a brief summary of the results.

For the analysis of the TKTS responses, SPSS (statistical analysis software) was used. The following steps were taken to convert the data into a format that SPSS could recognise. It also shows the statistical tests used to analyse the data.

1. Prepare Excel codebook
2. Coding of the data
3. Cleansing the data
4. Data analysis: Data was analysed using descriptive statistics and analytical statistics to explore relationships. The various statistical tests carried out have been cited in the next section.

The outline of chapter five is illustrated in figure 5.1.

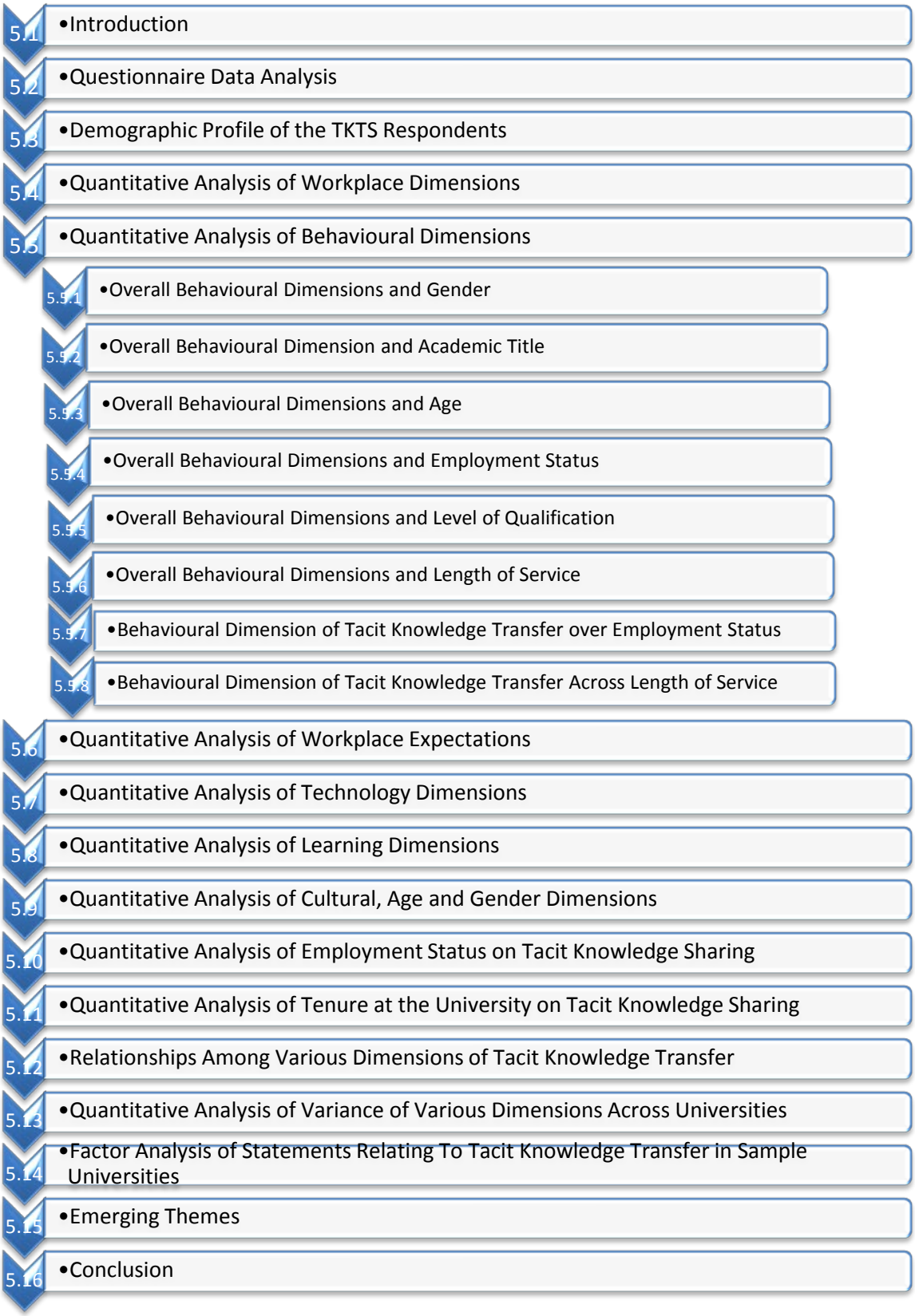

Figure 5.1 – Chapter five outline

5.2 QUESTIONNAIRE DATA ANALYSIS

Using a simple structured questionnaire (TKTS), the data was collected from key respondents (university academics) working at different levels. In analysing the data, the following statistical techniques have been used:

(i) Descriptive Statistics - Percentages, Mean, Standard Deviation, Skewness are used. Six point Likert scale for quantitative measurement of responses for analytical purposes was utilised.

(ii) Analytical Statistics - ANOVA test has been conducted to find out whether average response in one university differs from other universities. Independent sample t-test for equality of means is used to analyse the variations in behavioural dimension over gender. Correlations matrix of various dimensions of tacit knowledge sharing is employed to explore the dynamics of relationships between these dimensions.

(iii) Factor Analysis: It is a data reduction technique and it is used in this study to understand basic themes that might act as enablers, inhibitors, and processes of tacit knowledge transfer.

The questions used in TKTS (Appendix 6) provided a research tool to address the research aim. The relationship between the research aim and the questions in the questionnaire has been outlined in Chapter 1. Subsequent parts of this chapter now address each of the research questions individually by drawing on the results of the questionnaire.

Before looking at the analysis of responses to the questionnaires, the next section outlines the characteristics of the participants.

5.3 DEMOGRAPHIC PROFILE OF THE TKTS RESPONDENTS

This section presents the analysis of the demographic questions from the TKTS. 141 academics from four universities responded to the TKTS. Figure 5.2 below illustrates the percentage of respondents from each of the four participating universities.

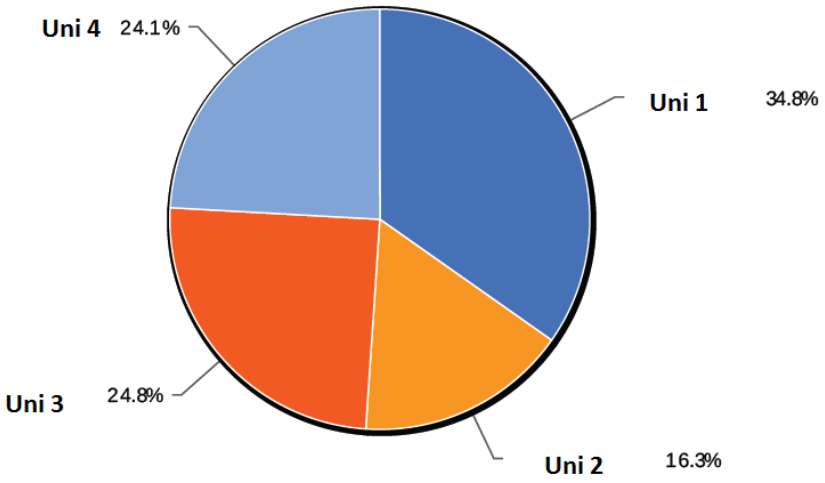

Figure 5.2 – Percentage of respondents from each university

Figure 5.3 illustrates the number of years the respondents have been working at their current university. 48 respondents have been working at their current university for 1 to 5 years, 25 respondents for 5 to 10 years, 23 respondents for 10 to 15 years, 13 respondents for less than 1 year and the remaining 9 respondents for 15 to 20 years.

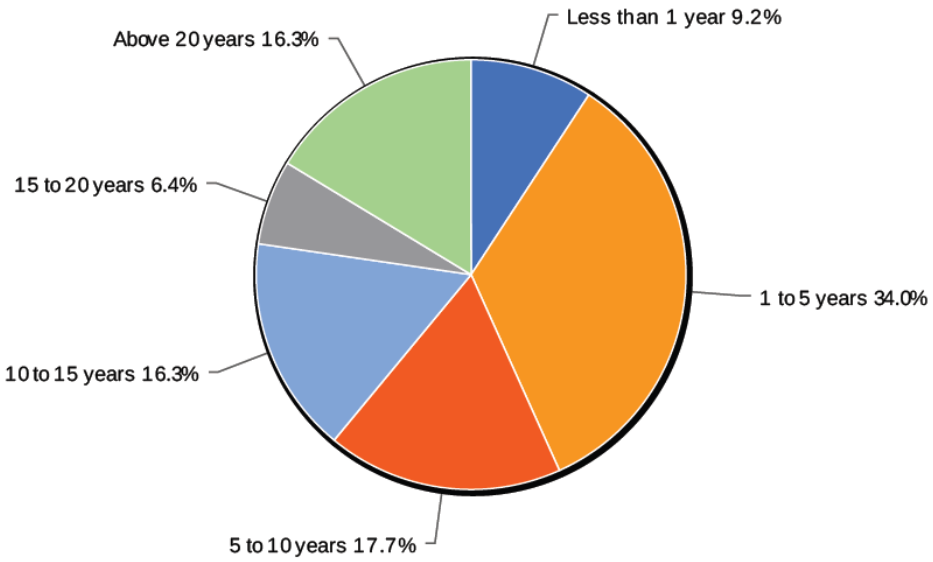

Figure 5.3 – Tenure of respondents at their current university

Figure 5.4 below illustrates the gender breakup of the respondents. 90 respondents were males and 51 were females.

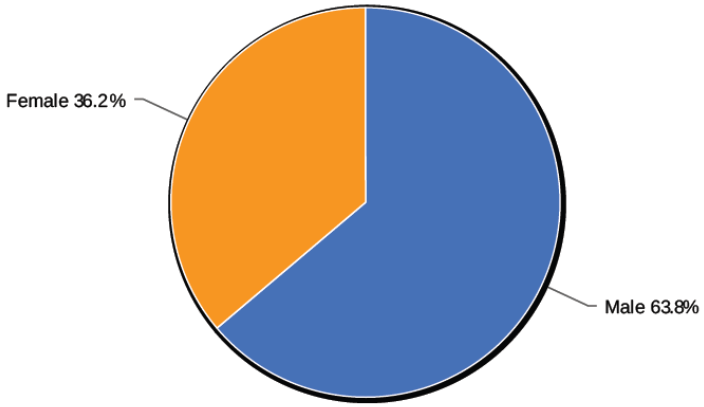

Figure 5.4 – Gender of respondents

Figure 5.5 summarises the respondents by age. The largest group of respondents were between 50 to 59 years (N =53). The other age groups with the second and third largest

group of respondents were the 40 to 49 year old group (N=31) and 30 to 39 year old group (N=28) respectively.

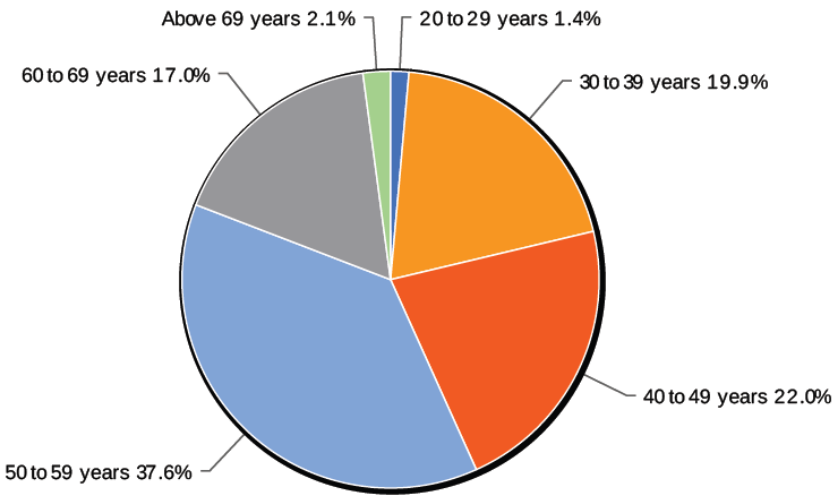

Figure 5.5 – Age of respondents

Figure 5.6 illustrates the highest level of qualifications of the respondents. 83 respondents had a PhD degree as their highest qualification, 47 respondents had a Master's degree whilst the remaining 11 had a Bachelor's degree.

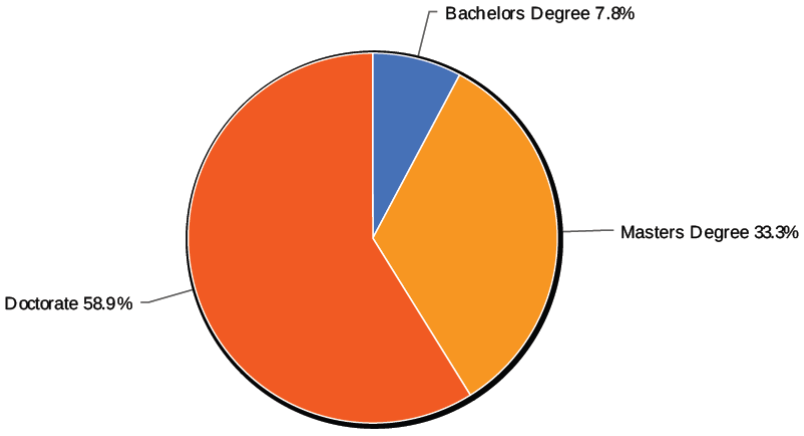

Figure 5.6 – Highest level of qualification of respondents

Figure 5.7 below illustrates the employment status of the academics who responded to the TKTS. 100 respondents were on-going full-time, 18 were on contracts, 15 were sessional/casual and the remaining 8 respondents were on-going part-time employees.

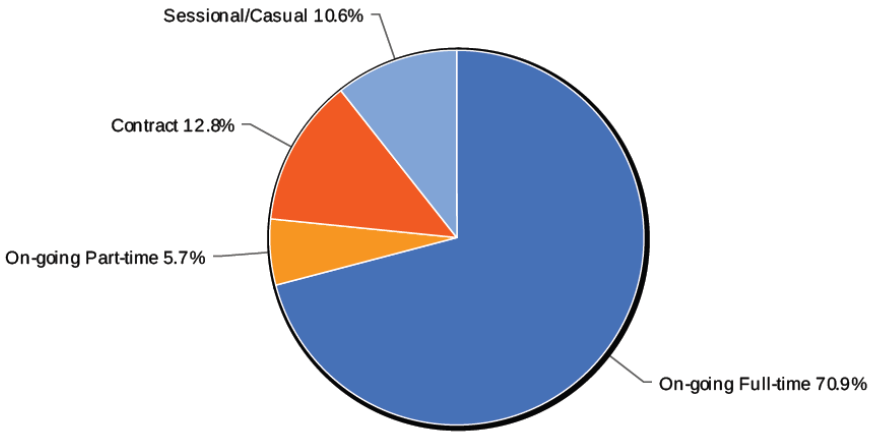

Figure 5.7 – Employment status of respondents

The following sections now present an analysis of the responses on the TKTS.

5.4 QUANTITATIVE ANALYSIS OF WORKPLACE DIMENSIONS

This section aims to address the first research question that aims to explore the extent to which academics' workplaces (university) encourage the transfer of tacit knowledge. In order to address the first research question, Q1-11 from the questionnaire have been analysed. Workplace dimensions that relate to encouragement, provision of time, rotation of courses/units/subjects, facilitation, formal and informal networks have been examined. Descriptive statistics of Q1-11 are provided in Table 5.1.

Before analysing the table 5.1, a brief description of the variables in the various tables is provided. Mean response which is the average response to a statement. The S.D. (standard deviation) is a measure of how well the mean represents the data. These figures are seen relative to the value of the mean itself. A large S.D. is an indication that data points are far from mean response, thus mean is not a precise representation of the data. Lack of symmetry in the distribution is called skewness and represents that most of the responses are clustered at the higher or lower end of the scale. Standard error (S.E.) is a measure of how well a sample represents the population. So S.E. is standard deviation of sample means. A large S.E. means high variability between means of various samples. % agreement shows what percentage of the selected academics have agreed or strongly agreed with the statement in question.

Table 5.1 – Descriptive statistics of perceptions of workplace dimensions on transfer of tacit knowledge

Statement	N statistics	Mean Statistic	Std. Error	S.D. Statistic	Skewness Statistic	% Agreement
Q1. My university encourages and facilitates sharing of my professional experiences, skills, and knowledge with others.	141	3.6454	.09342	1.10928	-.661	65.2
Q2. My university provides adequate time to document and share my tacit knowledge.	141	2.6667	.09896	1.17514	.703	24.1
Q3. My university encourages	141	2.9716	.09386	1.11447	.151	35.5

Statement	N statistics	Mean Statistic	Std. Error	S.D. Statistic	Skewness Statistic	% Agreement
transfer of my ideas, skills, and experiences through mentoring programs.						
Q4. My university encourages contribution of ideas, skills, and experiences through rotation of courses that I can teach i.e. different courses to teach every few terms.	141	3.1844	.10728	1.27393	.215	39.0
Q5. My university facilitates transfer of personal ideas, skills, and experiences through seminars, workshops and so forth.	141	3.6028	.09328	1.10763	-.600	66.0
Q6. My university has an up-to-date directory (like Yellow pages) of academics that can provide information about their work, skills, and experience.	141	3.1206	.12948	1.53751	.441	27.7
Q7. My university has a formal process of transferring best practices	141	3.1348	.10177	1.20842	.329	35.5

Statement	N statistics	Mean Statistic	Std. Error	S.D. Statistic	Skewness Statistic	% Agreement
through regular documentation (e.g. FAQs, administrative manuals, lessons learnt, conference reports and so forth)						
Q8. My university fosters formal networks, such as communities of practice, to encourage sharing of ideas amongst academics.	141	3.4539	.09887	1.17397	-.170	53.2
Q9. My university encourages sharing of ideas amongst academics. For instance, presentations of publications amongst peers	141	3.7021	.09321	1.10676	-.508	65.2
Q10. My university provides opportunities for employees to interact with one another on an informal basis.(For instance time off work, social gatherings)	140	3.0357	.10844	1.28304	.098	36.9
Q11. These opportunities (For instance time off work, social	140	3.8857	.09937	1.17581	-.179	55.3

Statement	N statistics	Mean Statistic	Std. Error	S.D. Statistic	Skewness Statistic	% Agreement
gatherings) that my university provides are important for sharing skills and experience.						
Valid N (listwise)	139					

Based on the information presented in table 5.1, 65.2% of the respondents have expressed the opinion that their workplace encourages and facilitates the sharing of professional experiences, skills and knowledge with others with a mean response of 3.6454. Skewness statistic is significant and negative at -.661. This shows that most of the responses are pointing towards agreement and strong agreement.

Merely 24.1% of respondents reported that their university provides adequate time to facilitate documentation and sharing of tacit knowledge. The mean response of 2.67 with positive and significant skewness equal to .703 suggests that most of the respondents disagree with the statement. In order to transfer tacit knowledge, respondents have articulated that their workplaces did not provide enough time to engage in such knowledge transfers.

The analysis has revealed a negative consent that universities encourage transfer of ideas, skills, and experiences through mentoring programs. The mean response to this statement is 2.9716 and this viewpoint is agreed by 35.5% of the respondents. A lot of studies by others (Karkoulian et al. 2008; Kets de Vries 2005) have suggested the use of mentoring to facilitate the sharing of organisational knowledge. However, coaching is

only possible when the mentor is ready to share. Mentoring will also help to promote trust thus indirectly promoting tacit knowledge sharing.

Table 5.1 shows that universities provide little encouragement to contribution of ideas, skills, and experiences through rotation of courses that various academics can teach i.e. different courses to teach every few terms. The mean response to this statement is 3.1844 and the viewpoint has been agreed by 39% of the respondents.

Two-thirds of the respondents (66%) agree, with a mean response of 3.6028, indicating that there is a high level of commitment from these universities towards the transfer of tacit knowledge university through seminars, workshops and so forth.

Respondents have shown a clear preference that their university needs to have an up-to-date directory (like Yellow pages) of academics to facilitate transfer of information about their work, skills, and experience. Only 27.7% of respondents agree that their university has an up-to-date directory of academics. The overall level of agreement with the statement is 3.1206. So, overall it can be interpreted that academics agree with this statement. With regard to the formal process of transferring best practices through regular documentation (e.g. FAQs, administrative manuals, lessons learnt, conference reports and so forth) in place, the mean response is 3.1348 and the viewpoint is agreed by 35.5 % of the participants. This indicates the need for a formal process of transferring best practices through regular documentation.

It is encouraging to note that 53.2% of the respondents have portrayed a strong belief in the commitment that their university fosters formal networks, such as communities of practice, to encourage sharing of ideas amongst academics with a mean response of 3.4539. It is concluded that academics have some agreement with the view that their university fosters formal networks, to encourage sharing of ideas amongst academics.

The strong belief portrayed by academics also demonstrates that nurturing Communities of Practice (COP) can be very helpful to promote knowledge sharing in organisations (Bate & Roberts 2002; McNurlin, Sprague & Bui 2000; Wenger 1998). COPs can help in managing organisational knowledge- capturing and sharing tacit knowledge in particular. Academics could be part of the COPs that could be responsible for promoting research, improving curriculum, internalisation of education and better teaching techniques to name a few. COPs can exist outside organisational boundaries too however the focus here is intra-organisational COPs and more specifically the ones promoted by academics. COPs are typically ad hoc in nature and often disband upon completion of the work activities. COPs will also provide its members with a sense of collective identity (Hislop 2009) and develop their own knowledge and understanding (Lesser and Storck 2001). Since COPs will possess some common knowledge and shared values, it is anticipated that tacit knowledge sharing within the group will be easier. The high level of trust within group members will also facilitate easier tacit knowledge sharing.

More positive overall response has been received to the statement that universities encourage sharing of ideas amongst academics for instance, by use of presentations of

publications amongst peers. This is shown by 65.2% consent by the respondents with overall response of 3.7021. This overall response of more than 3 represents that on an average sample respondents agree that their universities support sharing of ideas by presentations of publications among colleagues. Presentations are seen as a way of tacit knowledge sharing as ideas and experiences are shared with others. Academics painstakingly convert their tacit knowledge to explicit by writing publications (Externalisation). Then the ideas generated in the publications are further shared with their colleagues (Socialisation and Internalisation both).

Further, 55.3% of respondents agreed that informal opportunities at their workplace provides are important for sharing skills and experiences. The mean response to this statement is 3.8857. This overall response of more than 3 represents that participants have shown a preference for the use of informal settings and only 36.9% of the survey participants agreed that their university provides opportunities for employees to interact with peers on an informal basis. With the mean response equal to 3.0357, it can be interpreted as overall disagreement with this perspective.

Nonaka (1994) focusses upon socialisation being the starting point of knowledge creation, with knowledge creation then taking place in a clockwise mode, moving through the other different ways of knowledge conversion i.e. externalisation, combination and internationalisation. Thus, it is recommended that universities should provide effective informal platforms, for instance time off work and social avenues for transfer of tacit knowledge.

Though it seems that universities are providing some conditions that encourage tacit knowledge transfer to take place effectively, some respondents also felt that whether their university formally encouraged the transfer of tacit knowledge, it still takes place in informal settings.

From the survey, it is possible to derive a view that universities encourage and facilitate the sharing of professional experiences, skills and knowledge with others but do not provide adequate time to facilitate documentation and sharing of tacit knowledge and mentoring programs. Sharing of professional experiences, skills and knowledge needs to be encouraged through rotation of courses that various academics teach. Universities are committed towards the transfer of tacit knowledge university through seminars, workshops and so forth.

From the survey data, it can be seen that respondents prefer to have an up-to-date directory of academics to facilitate transfer of information about their work, skills, and experience. Universities do not provide adequate directory/profiles of academics; neither do they have an adequate formal process of transferring best practices through regular documentation (e.g. FAQs, administrative manuals, lessons learnt, conference reports and so forth) in place. Universities use presentations of publications amongst peers as a medium of transfer of tacit knowledge. Informal opportunities at their workplace are important for sharing skills and experiences but as the data indicates at the moment, universities are not providing sufficient opportunities for employees to interact with peers on an informal basis. However overall, it seems that universities are

providing some appropriate conditions for tacit knowledge transfer to take place effectively. It can be further improved by making systematic changes.

5.5 QUANTITATIVE ANALYSIS OF BEHAVIOURAL DIMENSIONS

This section aims to address the second research question that aims to explore academics' personal traits and their thoughts on tacit knowledge sharing. In order to address this research question, Q12-23 from the questionnaire have been analysed. All the analysed responses relate to tacit knowledge transfer and behavioural traits that are exhibited by the respondents. The analysis examines behavioural dimensions that relate to the notion of information gatekeeper and whether sharing of personal tacit knowledge leads to loss of academics' scholarly expertise, improved outcomes through sharing, impact on career prospects, readiness to share, acknowledging others' ideas and collaboration. Descriptive statistics of these questions are provided in table 5.2. In order to investigate whether significant differences exist in the overall responses between male and female academicians, the Levene's test (F value) for equality of variance and independent samples t- test has been conducted. Levene's test of variance is a prerequisite to t- test and is a measure of equality of variance of standard deviations. In t-test, equal variances are assumed. If equal variances do not exist (Levene's test sig. value is less than 0.05), a different value of t statistics need to be considered i.e. value of t if variances are not equal (not the one with equal variances) (Levene, 1960).

These are followed by independent samples t- test in table 5.3, which shows the t value and significance of variance for each statement. The t value/statistics explain ratio of

variance explained by the model to the variance not explained by the model. The bigger the value of statistics the lower the possibility that difference between means is due to chance. This possibility of getting difference between means of different samples by chance is measured by significance of variance. If this value of significance of variance is less than 0.05 it means there is 95% confidence in concluding that the means differ significantly in actual rather than just by chance. In case, the P-value (significance of variance) of the t-test is less than 0.05, there is a statistically significant difference between the means of the variables at the 95.0% confidence level. If the p-value is more than 0.05, it is not statistically significant at 95.0% or higher confidence level.

Table 5.2 – Descriptive statistics of individual statements of behavioural dimensions with gender

Gender		Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23
Male (N=90)	$\bar{x}$	1.92	4.46	2.05	4.24	2.42	4.20	3.02	3.20	3.73	4.574	4.206	2.363
	S.D	1.09	.640	1.09	.791	.998	.828	1.13	1.11	.793	.542	.649	1.12
	γ_1	1.55	.017	1.23	-.46	.451	-1.3	.002	-.01	-.58	-.7	-.2	.966
Female N=51)	$\bar{x}$	1.66	4.34	2.09	4.21	2.37	4.50	3.24	3.12	3.49	4.66	4.13	2.31
	S.D	.930	.745	1.11	.944	1.09	.674	1.07	1.09	.857	.553	.721	1.04
	γ_1	1.50	-.3	1.49	-1.3	.530	-1.4	-.304	-.438	-.9	-1.4	-.2	.301
Total(N=141)	$\bar{x}$	1.82	4.41	2.07	4.23	2.40	4.31	3.10	3.17	3.64	4.60	4.18	2.34
	S.D	1.04	.679	1.09	.848	1.03	.787	1.11	1.10	.822	.546	.675	1.09
	γ_1	1.56	-.19	1.31	-.92	.473	-1.4	-.10	-.15	-.73	-.99	-.25	.756
% Agreement		6.4	87.9	8.5	81.8	13.5	90.1	42.6	46.8	62.4	95.0	83.0	15.6

$\bar{x}$= mean, S.D= Standard deviation, $\gamma_{1=}$ skewness

Table 5.3 – Independent samples t- test for individual statements of behavioural dimensions with gender

	Levene's test for equality of variances		t-test for equality of means		
Statement	**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**
Q12 Equal variances assumed	.017	.897	1.389	137	**.167**
Equal variances not assumed			1.450	118.581	.150
Q13 Equal variances assumed	1.713	.193	1.004	137	**.317**
Equal variances not assumed			.962	89.525	.338
Q14 Equal variances assumed	.003	.955	-.217	138	**.829**
Equal variances not assumed			-.215	102.152	.830
Q15 Equal variances assumed	.061	.805	.171	136	**.864**
Equal variances not assumed			.163	90.721	.871
Q16 Equal variances assumed	.633	.428	.300	138	**.765**
Equal variances not assumed			.292	96.584	.771
Q17 Equal variances assumed	.146	.703	-2.257	138	**.026***
Equal variances not assumed			-2.385	121.986	.019
Q18 Equal variances assumed	.020	.886	-1.122	136	**.264**

		Levene's test for equality of variances		t-test for equality of means		
Statement		**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**
	Equal variances not assumed			-1.142	104.243	.256
Q19	Equal variances assumed	.057	.811	-2.257	137	**.676**
	Equal variances not assumed			.420	103.201	.675
Q20	Equal variances assumed	.680	.411	1.672	138	**.097**
	Equal variances not assumed			1.638	97.847	.105
Q21	Equal variances assumed	.916	.340	-.954	136	**.342**
	Equal variances not assumed			-.949	103.033	.345
Q22	Equal variances assumed	.446	.505	.583	136	**.561**
	Equal variances not assumed			.567	96.150	.572
Q23	Equal variances assumed	.001	.978	.258	137	**.797**
	Equal variances not assumed			.263	110.756	.793

*df= Degrees of Freedom, * significant at 5%*

None of the values of Levene's test for equality of variances is found to be statistically significant. Thus, equal variances are assumed and relevant t-values (shown in bold in table 5.3) have been considered for investigating existence of variations in behavioural

dimension across gender.

According to table 5.2 (Question 12), it is a very positive and encouraging indication that only a negligible percentage of people i.e. 6.4 % have an undesirable belief that sharing of personal tacit knowledge leads to erosion of their academic standing and by sharing knowledge they are no longer perceived as the information gatekeeper of their scholarly expertise. The rest of the participants (93.6 %) do not portray an image of information gatekeeper of their academic expertise, thus have shown belief in tacit knowledge sharing. Academics do not see themselves as information gatekeepers. As shown in table 5.2, the response does not vary across gender with (t value=1.389 and sig. 0.167) the mean response from male participants and female participants being 1.92 and 1.66 respectively.

This viewpoint is further strengthened by a high agreement rate on another statement that tacit knowledge leads to improved outcomes for everyone leading to improved performances. 87.9% of respondents have agreed that tacit knowledge leads to improved outcomes for everyone through enhanced performances. Both male and female participants feel that tacit knowledge sharing brings favourable outcomes for all (male mean response= 4.456 and female mean response 4.34). t- test (as shown in table 5.3) for Q13 with t= 1.004 and significance of .317 shows that the differences in mean responses are not significant at 5% level of significance. Overall mean response of 4.41 indicates strong agreement for positive outcomes of tacit knowledge transfer.

According to table 5.2 (Question 14), merely 8.5 % of the respondents agree that sharing of tacit knowledge, ideas and experiences could negatively affect their career

prospects. Overall mean response of 2.07 indicates disagreement for negative outcomes of tacit knowledge transfer in terms of their career. The feeling is the same across both genders as the differences in male mean response and female mean responses are insignificant (t= -.217 with significance = .829). This is a good indication that the others believe that sharing of tacit knowledge will not negatively impact their career prospects.

Table 5.2 shows that 81.8 % of the respondents believe the transfer of ideas, skills and experience encourages an autonomous work environment by providing more information to others enabling them to complete their tasks. The overall mean response is 4.23. The male and female respondents have expressed similar opinions on this issue, and differences in mean responses across gender are insignificant (t value = .171 with significance. = .864).

Further, mean impact of tacit knowledge sharing leading to plagiarism and false claims as perceived by female academics (mean 2.37) is less than males (mean 2.42) and overall mean response is 2.40. Male respondents are more fearful of plagiarism and false claims out of tacit knowledge sharing than female academics but these differences are not significant at a 5% level of significance. A small percentage (13.5 % of the sample only) has expressed this fear as an outcome of their tacit knowledge transfer.

90.1% of the people readily share their academic and administrative experience and knowledge with others with an overall mean response of 4.31. It is indicative of the fact that the university academics are ready to share tacit knowledge. The differences in readiness to share knowledge are significant at 5 % level of significance with t value

equal to -2.257 and significance equal to 0.026. This implies that female academics have a higher level of agreement showing they are more willing to share knowledge (mean response 4.50) than the male academics (4.20).

Though academics are ready to share knowledge, they are selective in their choice of persons with whom they share it. This shows that some flow of tacit knowledge transfer is not free of mental/psychological barriers as 42.6% of the surveyed academics are selective while sharing their knowledge. This feeling is not specific to any gender as the differences in mean response to this statement is not significant (t value= -1.122 with sig. = .264). Subramaniam and Venkatraman (2001) have suggested extensive social interactions should be developed based upon trust.

46.8% of surveyed academics share their ideas and knowledge with everyone with a mean level of agreement 3.17 indicative of neutral response towards knowledge sharing with everyone. The support of this viewpoint is same across the genders as the differences in mean responses are not significant at 5% level of confidence.

62.4% of respondents like to use other people's ideas indicating the transfer of tacit knowledge is useful and meaningful and 95% of the surveyed academics acknowledge other people's ideas in their work. On an average, female candidates are less likely to use ideas of other people than male academics with mean response equal to 3.49 and 3.73 respectively and the difference is statistically significant at 10% level of confidence (t=1.672 and Significance =.097). It is encouraging that both male and

female academics using the ideas of other people do prefer to acknowledge contribution of others in their work.

83% of the respondents prefer and like to collaborate with others. Male academics collaborate (Mean response= 4.20) more than female academics (4.13). Only 15.6% of the total participants believe that sharing ideas, experiences and skills is intrusive and extra workload. These opinions are valued/ shared equally by both male and female participants.

Thus, the overall analysis of behavioural dimensions indicates that academics do not want to be seen as an information gatekeeper of their academic expertise and believe in tacit knowledge transfer. However, they are selective with whom they share their knowledge. They believe that the transfer of ideas, skills and experience encourages an autonomous work environment by providing more information to others enabling them to complete their tasks and are not actually afraid of plagiarism and false claims if they partake in tacit knowledge sharing. Academics are ready to share knowledge and like to collaborate and use other ideas through acknowledging contribution of the ideas. Female academics have indicated a higher propensity to share knowledge than their male counterparts but are less likely to utilise the knowledge of others. They are more knowledge sharers than users of others' ideas. The majority of academics, in the sample universities, are convinced of positive outcomes of tacit knowledge sharing than any negative impacts of it on their careers. Most of them like to collaborate and do not perceive sharing of ideas, experiences and skills as intrusive and extra workload.

5.5.1 Overall Behavioural Dimensions and Gender

This sub-section provides the descriptive statistics of behavioural dimensions over gender in table 5.4. It is followed by independent samples test of overall behavioural dimensions (aggregate of responses in behavioural dimensions) over gender in table 5.5.

Table 5.4 – Descriptive statistics of overall behavioural dimensions over gender

Gender	Mean	N	S.D.	% of Total N	Skewness
Male	3.3601	90	.31555	63.8%	1.549
Female	3.3464	51	.26372	36.2%	.614
Total	3.3552	141	.29695	100.0%	1.333

Table 5.5 – Independent samples test of overall behavioural dimensions over gender

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**
Behavioural Dimension	Equal variances assumed	.254	.615	.263	139	.793
	Equal variances not assumed			.276	119.755	.783

df= Degrees of Freedom

For male participants the response to Behavioural Dimensions as a whole considering all statements in this dimension is 3.3601whereas response by female participants is 3.3464. It is worth considering whether this difference of mean responses of male and female participants is statistically significant or not. For this t value equal to 0.263 with 0.793 significance is calculated as shown in table 5.5. The significance of t-test is 0

.793, which is greater than 0.05, so it is not significant. It implies that in behavioural dimension the views of male and female participants do not differ significantly in transfer of tacit knowledge.

Overall behavioural dimensions are the same across both genders and significant differences do not exist across genders with t value equal to 0.263 with 0.793 significance. Thus, variations in behaviour dimensions on tacit knowledge transfer and sharing of ideas, skills and experiences are not explained by gender.

5.5.2 Overall Behavioural Dimension and Academic Title

This sub-section provides the descriptive statistics of overall behavioural dimensions over academic title in table 5.6. It is followed by values from ANOVA Table which shows the F value and significance of variance of this dimension in table 5.7. It is further followed by values of Eta and Eta squared in table 5.8 explaining the variance in behavioural dimensions explained by academic title.

Table 5.6 – Descriptive statistics of overall behavioural dimensions over academic title

Academic Title	Mean	N	S.D.	% of Total N	Skewness
Administrative roles	3.3359	15	.32765	10.9%	-.180
Professor	3.3141	13	.18369	9.4%	-.262
Associate Professor	3.3386	11	.43152	8.0%	.409
Senior Lecturer	3.4047	31	.27918	22.5%	.746
Lecturer - Level B	3.3445	58	.31263	42.0%	2.435
Casual lecturer	3.2917	10	.14299	7.2%	.330
Total	3.3499	138	.29612	100.0%	1.377

Table 5.7 – ANOVA table of overall behavioural dimension with academic title

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.358	5	.060	.657	.684
Within Groups	11.980	132	.091		
Total	12.338	138			

df= Degrees of Freedom, F= F test statistic, Sig= Significance of F value

Table 5.8 – Measures of association

	Eta	Eta Squared
Behavioural Dimensions and Academic Title	.112	.012

If the P-value in the ANOVA table is found to be greater or equal to 0.05, there is not a statistically significant relationship between overall behavioural dimensions and academic title at the 95.0% or higher confidence level. Table 5.8 shows that behavioural dimensions on knowledge, skills and experiences do not depend upon the level at which any particular university academic is serving. Eta and Eta-square is usually calculated for t-tests and ANOVA as part of the interpretive step of the process and is reported in the summary statement as in table 5.8. The correlation coefficient (Eta) equals 0.112, indicating a very weak relationship between the variables. Behavioural dimensions have very weak and insignificant correlation with academic title of university academics and only 1.2% variations (eta squared equal to 0.012) in behavioural dimension are explained by academic title.

5.5.3 Overall Behavioural Dimensions and Age

This sub-section provides the descriptive statistics of behavioural dimensions over age in table 5.9. It is followed by values from ANOVA Table which shows the F value and significance of variance of this dimension in table 5.10. It is followed by values of Eta and Eta squared in table 5.11 explaining the variance in behavioural dimensions explained by age.

Table 5.9 – Descriptive statistics of overall behavioural dimensions over age

Age	Mean	N	S.D.	% of Total N	Skewness
20 to 29 years	3.1250	2	.05893	1.4%	.186
30 to 39 years	3.3542	28	.24806	19.9%	.111
40 to 49 years	3.4234	31	.38826	22.0%	2.167
50 to 59 years	3.3298	53	.28982	37.6%	.148
Above 59 years	3.3446	27	.24044	19.1%	1.522
Total	3.3552	141	.29695	100.0%	1.333

Table 5.10 – ANOVA table of overall behavioural dimension with age

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.215	4	.054	.810	.521
Within Groups	12.130	136	.089		
Total	12.346	140			

df= Degrees of Freedom, F= F test statistic, Sig= Significance of F value

Table 5.11 – Measures of association

	Eta	Eta Squared
Behavioural Dimensions and Age	.153	.023

Respondents in all age groups have presented similar views on tacit knowledge transfer and sharing of knowledge of ideas, skills and experiences. The correlation between behavioural dimensions and age is weak and insignificant. According to table 5.11, age explains only 2.3% of the variations in behaviour based dimensions of tacit knowledge transfer. Hence, age does not hinder or facilitate the sharing or transfer of knowledge, ideas, skills and experiences of the university academics.

5.5.4 Overall Behavioural Dimensions and Employment status

This sub-section provides the descriptive statistics of overall behavioural dimensions over employment status in table 5.12 below. It includes values from ANOVA Table which shows the F value and significance of variance of this dimension in table 5.13. It is followed by values of Eta and Eta squared in table 5.14 explaining the variance in behavioural dimensions explained by employment status. This section has focussed on the mean of all statements under behavioural dimension whereas section 5.5.7 analyses each statement individually.

Table 5.12 – Descriptive statistics of overall behavioural dimensions over employment status

Employment status	Mean	N	S.D.	% of Total N	Skewness
On-going Full-time	3.3641	100	.32675	70.9%	1.404
On-going Part-time	3.4688	8	.13317	5.7%	-1.982
Contract	3.2789	18	.25180	12.8%	.125
Sessional/Casual	3.3263	15	.15698	10.6%	.113
Total	3.3552	141	.29695	100.0%	1.333

Table 5.13 – ANOVA table of overall behavioural dimension with employment status

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.038	2	.019	.214	.807
Within Groups	12.307	138	.089		
Total	12.346	140			

df= Degrees of Freedom, F= F test statistic, Sig= Significance of F value

Table 5.14 – Measures of association

	Eta	Eta Squared
Behavioural Dimensions and Employment status	.136	.019

It can be observed from table 5.12 that overall behavioural dimensions are same over the employment status of surveyed university academics and significant differences do not exist across the status of employment with F value from ANOVA table equal to 0.214 and 0.807 significance. According to table 5.14, the correlation between behavioural dimensions and employment status is weak and insignificant at 0.136. Thus, it can be concluded that behavioural dimension of tacit knowledge sharing is not associated with the employment status of academics. Employment status explains only 1.9% of the variations in behaviour based perceptions of tacit knowledge transfer.

5.5.5 Overall Behavioural Dimensions and Level of qualification

This sub-section provides the descriptive statistics of overall behavioural dimensions over level of qualification in table 5.15. It includes values from ANOVA Table which shows the F value and significance of variance of this dimension in table 5.16. It is followed by values of Eta and Eta squared in table 5.17 explaining the variance in behavioural dimensions explained by level of qualification.

Table 5.15 – Descriptive statistics of overall behavioural dimensions over level of qualification

Level of qualification	Mean	N	S.D.	% of Total N	Skewness
Bachelor's Degree	3.2652	11	.17004	7.8%	-.730
Master's Degree	3.3458	47	.24877	33.3%	-.786
Doctorate	3.3724	83	.33298	58.9%	1.717
Total	3.3552	141	.29695	100.0%	1.333

Table 5.16 – ANOVA table of overall behavioural dimension with level of qualification

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.040	2	.020	.226	.798
Within Groups	12.305	138	.089		
Total	12.346	140			

df= Degrees of Freedom, F= F test statistic, Sig= Significance of F value

Table 5.17 – Measures of association

	Eta	Eta Squared
Behavioural Dimensions and Level of qualification	.098	.010

The level of qualification of the respondents in universities does not affect their views on tacit knowledge transfer and sharing of knowledge of ideas, skills and experiences. According to table 5.17, the correlation between behavioural dimensions and level of qualification is weak and insignificant and age explains only 1% of the variations in behaviour based perspectives on tacit knowledge transfer. Hence, the level of qualification does not hinder or facilitate the sharing or transfer of knowledge, ideas, skills and experiences by the university academics.

5.5.6 Overall Behavioural Dimensions and Length of Service

This sub-section provides the descriptive statistics of overall behavioural dimensions over length of service in table 5.18. It includes values from ANOVA Table which shows the F value and significance of variance of this dimension in table 5.19. It is followed by values of Eta and Eta squared in table 5.20 explaining the variance in behavioural dimensions explained by level of service. This section has focussed on the mean of all statements under behavioural dimension whereas section 5.5.8 analyses each statement individually.

Table 5.18 – Descriptive statistics of overall behavioural dimensions over length of service

Length of Service	Mean	N	S.D.	% of Total N	Skewness
Less than 1 year	3.2436	13	.22939	9.2%	-.557
1 to 5 years	3.3547	48	.34344	34.0%	2.338
5 to 10 years	3.3306	25	.20853	17.7%	-.457
10 to 15 years	3.4002	23	.30376	16.3%	-.123
15 to 20 years	3.4226	9	.28091	6.4%	.189
Above 20 years	3.3745	23	.31569	16.3%	.844
Total	3.3552	141	.29695	100.0%	1.333

Table 5.19 – ANOVA table of overall behavioural dimension with length of service

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.273	5	.055	.611	.692
Within Groups	12.072	135	.089		
Total	12.346	140			

df= Degrees of Freedom, F= F test statistic, Sig= Significance of F value

Table 5.20 – Measures of association

	Eta	Eta Squared
Behavioural Dimensions and Length of Service	.149	.022

Respondents with different lengths of service have expressed almost similar views on tacit knowledge transfer and sharing of knowledge of ideas, skills and experiences. According to table 5.20, the correlation between behavioural dimensions and length of service is weak and insignificant at .149 and length of service explains only 2.2% of the variations in behaviour based perspectives on tacit knowledge transfer. It seems that length of service does not impact the sharing or transfer of knowledge, ideas, skills and experiences of the university academics favourably or unfavourably.

To understand the impact of various independent variables on behavioural dimension of tacit knowledge transfer, all individual statements are investigated. The responses to individual statements of behavioural dimensions have been investigated on the basis of various academics' personal traits. Not many significant differences could be found over age, level of qualification, length of service, employment status and so forth in their thoughts (see tables in Appendix 12). The tables in Appendix 12 provide analytical data for individual behavioural statements and various variables for the second research question. Just because no significant differences existed, these have been included in the appendix rather than in the chapter five.

Only two significant differences could be found. First, response to Q19 differs across employment status and second, response to Q18 differs across length of service. These are discussed in the following 4 sections particularly concentrating upon tables 5.21, 5.22, 5.23 & 5.24.

5.5.7 Behavioural dimension of tacit knowledge transfer over employment status

This sub-section provides the descriptive statistics of the statements in Q12-23 in the questionnaire over employment status in table 5.21. These are followed by ANOVA table (table 5.22) which shows the F value and Significance of variance for each of the statement.

Table 5.21 – Descriptive statistics of individual statements of behavioural dimensions over employment status

E. status		Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23
1	$\bar{x}$	1.92	4.42	2.13	4.23	2.38	4.34	3.13	3.15	3.57	4.61	4.20	2.35
	N	98	98	99	98	99	99	97	99	99	97	99	100
	S.D.	1.13	0.66	1.16	0.83	1.01	0.82	1.13	1.15	0.88	0.55	0.65	1.08
	γ_1	1.53	-0.2	1.39	-0.9	0.45	-1.6	-0.0	-0.1	-0.6	-1.0	-0.2	0.80
2	$\bar{x}$	1.38	4.75	1.63	4.50	2.63	4.75	2.88	3.50	4.38	5.00	4.50	1.75
	N	8	8	8	8	8	8	8	8	8	8	8	8
	S.D.	0.74	0.71	0.74	0.53	1.19	0.46	1.13	1.20	0.52	0.00	0.76	1.04
	γ_1	1.95	0.40	0.82	0.00	-0.4	-1.4	-0.4	0.00	0.64	0.00	-1.3	1.68
3	$\bar{x}$	1.72	4.11	2.00	4.00	2.61	4.22	2.94	3.29	3.72	4.39	4.00	2.31
	N	18	18	18	18	18	18	18	17	18	18	17	16
	S.D.	0.83	0.58	0.84	0.97	1.20	0.55	1.06	0.92	0.57	0.61	0.79	1.20
	γ_1	0.59	0.02	0.67	-1.7	0.64	0.16	-0.5	-0.6	-2.0	-0.4	0.00	0.91
4	$\bar{x}$	1.60	4.60	2.00	4.36	2.20	4.00	3.20	3.00	3.67	4.67	4.07	2.67
	N	15	15	15	14	15	15	15	15	15	15	14	15
	S.D.	0.74	0.83	1.13	0.93	0.94	0.85	1.15	1.07	0.62	0.49	0.62	1.11
	γ_1	0.84	-0.8	0.68	0.49	0.74	-0.8	-0.1	0.00	0.31	-0.7	-0.0	0.41
T	$\bar{x}$	1.83	4.42	2.07	4.23	2.41	4.31	3.10	3.17	3.64	4.61	4.18	2.35
	N	139	139	140	138	140	140	138	139	140	138	138	139
	S.D.	1.04	0.68	1.10	0.85	1.03	0.79	1.12	1.11	0.82	0.55	0.68	1.09
	γ_1	1.56	-0.1	1.32	-0.9	0.47	-1.4	-0.1	-.16	-.74	-.99	-.24	0.76

1= On-going Full time, 2= On-going part time, 3= Contract, 4=Sessional/Casual and T= Total

Table 5.22 – ANOVA table

		Sum of Squares	df	Mean Square	F	Sig.
Q12	Between Groups	3.423	3	1.141	1.052	.372
	Within Groups	146.433	135	1.085		
	Total	149.856	138			
Q13	Between Groups	3.074	3	1.025	2.278	.082
	Within Groups	60.725	135	.450		
	Total	63.799	138			
Q14	Between Groups	2.118	3	.706	.581	.628
	Within Groups	165.168	136	1.214		
	Total	167.286	139			
Q15	Between Groups	1.763	3	.588	.814	.489
	Within Groups	96.816	134	.723		
	Total	98.580	137			
Q16	Between Groups	1.826	3	.609	.567	.638
	Within Groups	145.967	136	1.073		
	Total	147.793	139			
Q17	Between Groups	3.237	3	1.079	1.769	.156
	Within Groups	82.934	136	.610		
	Total	86.171	139			
Q18	Between Groups	1.103	3	.368	.291	.832
	Within Groups	169.477	134	1.265		
	Total	170.580	137			
Q19	Between Groups	1.599	3	.533	.428	**.049***
	Within Groups	168.257	135	1.246		
	Total	169.856	138			
Q20	Between Groups	5.000	3	1.667	2.543	.733
	Within Groups	89.143	136	.655		
	Total	94.143	139			
Q21	Between Groups	2.145	3	.715	2.474	.064
	Within Groups	38.725	134	.289		

		Sum of Squares	df	Mean Square	F	Sig.
	Total	40.870	137			
Q22	Between Groups	1.583	3	.528	1.161	.327
	Within Groups	60.888	134	.454		
	Total	62.471	137			
Q23	Between Groups	4.404	3	1.468	1.231	.301
	Within Groups	161.021	135	1.193		
	Total	165.424	138			

**Significant at 5% level*

Employment status of academics does not impact the behavioural aspects of tacit knowledge transfer as no statistically significant differences exist in means of responses for Q 12 to Q 23 except Q 19 (I share my ideas and knowledge with everyone). Statistically significant differences exist in willingness to share ideas and knowledge with everyone without being selective. On-going Part-time academics are more willing to share their tacit knowledge with everyone (mean response =3.50), followed by Contract academics with a mean response of 3.29, and On-going Full-time with a mean response of 3.15 and finally Sessional/Casual with a mean response of 3.00 against an overall average response of 3.17.

It is concluded that employment status does affect/restrict the free flow of tacit knowledge to each and every one. This may be due to fact that part time academics may not have very long term interest/targets/motives attached with the universities and adopt a less competitive approach with their colleagues due to the part time nature of their role. They may not be very possessive about ideas and knowledge and skills and may be more willing to share it with everyone. Thus, knowledge, skills and experiences are

shared more by part time academics than other full time academics and sessional staff.

5.5.8 Behavioural dimension of tacit knowledge transfer across length of service

This sub-section provides the descriptive statistics of the statements in Q12-23 in the questionnaire over length of service and are provided below in table 5.23. These are followed by ANOVA Table (table 5.24) which shows the F value and Significance of variance for each statement.

Table 5.23 – Descriptive statistics of individual statements of behavioural dimensions over length of service

Length of Service		Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23
1	$\bar{x}$	2.00	4.38	1.77	4.23	1.77	4.38	2.77	3.31	3.38	4.38	4.31	2.23
	S.D	1.47	0.65	0.93	0.60	0.73	0.65	1.17	0.95	1.04	0.51	0.63	1.01
	γ_1	1.85	-0.57	1.27	-0.07	0.40	-0.57	-0.22	-0.73	-0.94	0.54	-0.31	0.60
2	$\bar{x}$	1.78	4.45	2.09	4.20	2.57	4.19	3.28	3.00	3.65	4.65	4.21	2.23
	S.D.	1.07	0.65	1.08	1.07	1.14	0.82	1.14	1.06	0.79	0.48	0.69	1.03
	γ_1	1.58	0.21	1.12	-1.10	0.64	-1.10	-0.30	-0.11	-0.92	-0.66	-0.31	0.89
3	$\bar{x}$	1.88	4.40	2.00	4.20	2.28	4.20	3.32	3.04	3.76	4.50	4.20	2.12
	S.D.	0.73	0.70	0.96	0.71	0.79	1.04	1.02	1.13	0.88	0.65	0.53	1.01
	γ_1	0.19	-0.77	1.24	-0.31	-0.02	-1.64	0.03	-0.08	0.11	-1.23	0.24	0.53
4	$\bar{x}$	2.00	4.22	2.30	4.17	2.48	4.26	3.09	3.26	3.65	4.48	4.00	2.87
	S.D.	1.12	0.85	1.32	0.89	0.99	0.75	0.87	0.96	0.78	0.59	0.79	1.39
	γ_1	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.17	0.16	0.17	0.17	0.17
5	$\bar{x}$	1.67	4.38	2.00	4.11	2.67	4.44	3.78	2.89	3.67	4.89	4.00	2.67

Length of Service		Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23
	S.D.	1.24	0.51	1.41	-0.37	0.07	-1.18	-0.19	0.09	-0.56	-0.62	0.00	0.48
	γ_1	1.12	0.74	0.87	0.78	1.12	0.53	0.83	1.36	0.71	0.33	0.71	0.87
6	$\bar{x}$	1.53	-0.82	0.00	-0.22	-0.54	0.27	-1.16	0.25	-2.12	-3.00	0.00	0.83
	S.D.	1.65	4.61	2.09	4.45	2.39	4.68	2.41	3.64	3.64	4.73	4.23	2.23
	γ_1	0.93	0.50	1.24	0.60	1.12	0.48	1.18	1.26	0.85	0.55	0.69	1.02
T	$\bar{x}$	2.25	-0.47	1.54	-0.55	0.41	-0.84	1.00	-0.66	-1.24	-1.90	-0.32	0.68
	S.D.	1.83	4.42	2.07	4.23	2.41	4.31	3.10	3.17	3.64	4.61	4.18	2.35
	γ_1	1.04	0.68	1.10	0.85	1.03	0.79	1.12	1.11	0.82	0.55	0.68	1.09

1= Less than 1 year, 2= 1 to 5 years,3= 5 to 10 years, 4= 10 to 15 years, 5=15 to 20 years, 6= Above 20 years, T= total and $\bar{x}$= mean, S.D= Standard deviation, γ_1= skewness

Table 5.24 – ANOVA table

		Sum of Squares	df	Mean Square	F	Sig.
Q12	Between Groups	2.173	5	.435	.391	.854
	Within Groups	147.683	133	1.110		
	Total	149.856	138			
Q13	Between Groups	1.838	5	.368	.789	.559
	Within Groups	61.960	133	.466		
	Total	63.799	138			
Q14	Between Groups	2.623	5	.525	.427	.829
	Within Groups	164.663	134	1.229		
	Total	167.286	139			
Q15	Between Groups	1.385	5	.277	.376	.864
	Within Groups	97.195	132	.736		
	Total	98.580	137			
Q16	Between	7.738	5	1.548	1.481	.200

		Sum of Squares	df	Mean Square	F	Sig.
	Groups					
	Within Groups	140.054	134	1.045		
	Total	147.793	139			
Q17	Between Groups	4.352	5	.870	1.426	.219
	Within Groups	81.819	134	.611		
	Total	86.171	139			
Q18	Between Groups	18.736	5	3.747	3.257	**.008****
	Within Groups	151.844	132	1.150		
	Total	170.580	137			
Q19	Between Groups	7.712	5	1.542	1.265	.283
	Within Groups	162.144	133	1.219		
	Total	169.856	138			
Q20	Between Groups	1.218	5	.244	.351	.881
	Within Groups	92.924	134	.693		
	Total	94.143	139			
Q21	Between Groups	2.206	5	.441	1.506	.192
	Within Groups	38.663	132	.293		
	Total	40.870	137			
Q22	Between Groups	1.466	5	.293	.634	.674
	Within Groups	61.005	132	.462		
	Total	62.471	137			
Q23	Between Groups	9.579	5	1.916	1.635	.155
	Within Groups	155.846	133	1.172		
	Total	165.424	138			

** *Significant at 1% level*

It is interesting to note that statistically significant differences exist in terms of people being selective with whom they share knowledge on the basis of length of service. In response to Q18, (*I am selective with whom I share my knowledge)*, the F statistics is equal to 3.257 and level of significance at .008. The mean response of academics with 15 to 20 years of service is higher than the academics in all other categories. Academics

with 15 to 20 years of service transfer their personal ideas, skills and experience with others in a much more selective manner with a mean response equal to 3.78. This may be due to the fact that by the time they reach this level of service, they are under pressure of completing university expectations and targets. As a consequence, they tend to become selective in sharing their ideas with only a few people whom they perceive to be more trustworthy and/ or capable of target achievement.

5.6 QUANTITATIVE ANALYSIS OF WORKPLACE EXPECTATIONS

This section aims to address the third research question that aims to explore the expectations that the workplace (university) has from academics for tacit knowledge sharing. In order to address this research question, Q24-28, Q53 from the TKTS questionnaire have been analysed. The analysis examines the workplace expectations that relate to managers' valuing new ideas, university expectations for knowledge sharing, senior management expectations, acknowledgement and rewards. Descriptive statistics of these questions are provided below in table 5.25.

Table 5.25 – Descriptive statistics of perceptions on workplace expectations relating to the transfer of tacit knowledge

	N Statistic	Mean Statistic	Std. Error	S.D. Statistic	% Agreement
Q24. My manager values new ideas and encourages innovation.	141	3.6454	.09818	1.16579	62.4
Q25. The senior management at my university expects me to share my personal knowledge and	141	3.5177	.09944	1.18082	48.9

	N Statistic	Mean Statistic	Std. Error	S.D. Statistic	% Agreement
experiences with others.					
Q26. Senior management should expect you to share your personal knowledge and experiences with others.	140	4.0571	.07571	.89581	73
Q27. Senior management at my university acknowledges and rewards staff who shares personal knowledge and experiences with rewards.	141	2.9078	.12241	1.45357	20.6
Q28. I feel that such rewards provide encouragement to share knowledge with others.	141	3.9291	.08755	1.03954	65.6
Q53. Perceptions regarding university response to retirement of highly experienced academics.	141	2.13	.052	.619	NA
Valid N (list wise)	137				

NA- Not applicable

As indicated in table 5.25, more than two-thirds of the respondents feel that their managers in universities value new ideas and encourage innovation by academics with a mean response of 3.64. A large majority of the academics (73%) expressed the opinion that senior management should expect them to share their personal knowledge and experiences with others. The mean response to this viewpoint is 4.0571. This overall mean response represents a clear-cut agreement that senior management should expect

academics to share knowledge. But expectations of the university senior management with regard to tacit knowledge are not very high. Only 48.9% of respondents agree that the senior management at their universities expect to share their personal knowledge and experiences with others. The statement received the mean response of 3.5177 showing neither agreement nor disagreement as the overall response. This statement indicates that one hurdle to tacit knowledge transfer is the low or no expectations of senior management with regard to transfer of tacit knowledge. An organisation cannot really exert any control over tacit knowledge. In fact, that is what makes an employee valuable. Exerting any control over tacit knowledge may exacerbate the knowledge sharing situation creating organisational tension. Whilst management may encourage employees to share, employees may exhibit reluctance owing to a perception of power and status diminishment. If employees perceive any negative consequences of knowledge sharing, their reluctance to share will be higher (Hislop 2009).

The responses to another statement highlight a serious concern as a potential hindrance to tacit knowledge transfer. The senior management in universities not only have low expectations concerning tacit knowledge transfer but also have very low tendencies by senior staff in universities to acknowledge and rewards staff members who share their knowledge, skills, and experiences with others. Merely 21% of the participants agree that the senior management at their universities acknowledge and reward staff who share personal knowledge and experiences with others. The mean response to this viewpoint is very low at 2.90 depicting overall disagreement with the statement.

66% of the respondents have presented their opinion that rewards for sharing knowledge could encourage academics to share knowledge with others with a mean response of 3.92. If tacit knowledge sharing can be linked to rewards and incentives then the uptake or sharing will be higher. The rewards could be intrinsic (self-motivated) or extrinsic (monetary benefits, status enhancement and improved performance). Adoption of rewards will potentially encourage employees to share and enhance organisational knowledge management efforts. Rewarding employees who share tacit knowledge and embedding assessment of such behaviour in annual performance reviews could also be an option (Oltra 2005). If an organisation adopts a codification strategy, then rewards should encourage staff to codify their tacit knowledge whilst an organisation that adopts a personalisation strategy should recognize and reward staff for sharing tacit knowledge. A survey conducted by Horowitz et al (2003) found that high salaries were ranked as an effective strategy to retain knowledge employees. Apart from financial rewards, non-financial rewards can also help in promoting the right knowledge sharing behaviour in employees (Nayir & Uzuncarsili 2008).

The responses to perceptions regarding response of the university to the issue of retirement of highly experienced academics indicates that universities should utilise the knowledge of highly experienced academics near retirement to mentor their peers with an overall response of 2.13. This would best utilize the rich knowledge of retiring people to help and mentor the young colleagues in different universities. Other options like universities trying to retain highly experienced people to document their best practices and letting them go without doing anything further, are not much favoured by

the academics. De Holan et al. (2004) have described the failure to capture new knowledge as a form of the accidental forgetting of new knowledge. If new knowledge acquired by employees is not captured or institutionalised, it is lost and forgotten. An example of this loss might be when an employee learns a new process which is not shared with others or documented. This scenario also applies when an employee leaves an organisation. This loss creates a void. Undoubtedly it is not possible to hold on to the employees but efforts need to be made to hold on to their organisational knowledge. This is where adequate KM processes can help.

5.7 QUANTITATIVE ANALYSIS OF TECHNOLOGY DIMENSIONS

This section aims to address the fourth aspect of the research question. It aims to explore the usage of information and communication technologies by universities and its academics to aid tacit knowledge transfer at the workplace (university) and academics' adaptability to ICT. In order to do so, responses to Q29-36, Q3, Q4, Q56, Q57 from the TKTS questionnaire have been analysed and evaluated. The analysis examines the use of technology for tacit knowledge sharing, training on new technologies, adaptation to information technology, accessibility to documentation and application software. Descriptive statistics of these questions are provided below in table 5.26.

Table 5.26 – Descriptive statistics of perceptions of technology dimensions relating to the transfer of tacit knowledge

Statement	N statistics	Mean Statistic	Std. Error	S.D.Statistic	Skewness Statistic	% Agreement
Q.29 My university makes effective use of information technology (e.g. e-mail, groupware, Internet, Intranet, learning management systems and videoconferencing) for developing better communication between staff, students and management.	141	3.5674	.09459	1.12316	-.554	61
Q.30 My university provides training and education on the use of new information technologies that they introduce to make us more adept at their usage.	140	3.4143	.09670	1.14418	-.459	56
Q31. I quickly adapt to information technologies implemented by the University.	141	3.8865	.07539	.89516	-.562	73
Q32. My university documents policies and procedures and makes it available through the staff Intranet.	139	4.1295	.06445	.75981	-1.127	86.5

Statement	N statistics	Mean Statistic	Std. Error	S.D.Statistic	Skewness Statistic	% Agreement
Q33. I feel that electronic transmission leads to an overload of information and encourages frequent changes in policies.	141	3.1915	.10601	1.25877	.111	37.6
Q34. It is easy to access the documents that I need within my university's databases i.e. information is well organised.	141	2.9362	.10275	1.22014	-.044	37.6
Q35. The policies and procedures on the staff Intranet at my university get rapidly and continually updated.	141	3.5816	.09767	1.15978	.203	47.5
Q36. My university provides a ready access to application software (e.g. chatting, discussion groups, bulletin boards) and hardware to help me in sharing my personal experiences.	140	3.2500	.10590	1.25305	.204	36.2
Q37. My university encourages transfer of my ideas, skills, and experiences through mentoring programs.	141	2.9716	.09386	1.11447	.151	35.5

Statement	N statistics	Mean Statistic	Std. Error	S.D.Statistic	Skewness Statistic	% Agreement
Q4. My university encourages contribution of ideas, skills, and experiences through rotation of courses that I can teach i.e. different courses to teach every few terms.	141	3.1844	.10728	1.27393	.215	39
Q56. Provision of higher level of technology shall facilitate sharing of knowledge	140	2.03	.100	1.165	1.128	NA
Q57. Willingness to share your knowledge if the university provides the right technology.	138	1.99	.073	1.070	1.589	NA
Valid N (list wise)	133					

NA: Not applicable

As shown in table 5.26, 61% of the surveyed academics believe that their universities make effective use of various means of information technology for developing better communication between staff, students and management with a mean response of 3.56. The response is negatively skewed at skewness statistics being -.554 showing most of the responses were on the side of agreement.

Moreover, the respondents presented the viewpoint that to facilitate the transfer of tacit knowledge, training and education on the use of new information technologies should be enhanced with a mean response equal to 3.4143. Overall, 56% of the participants felt

that training and education is provided to help in the use of new information technologies that universities introduce and makes them more adept in its usage.

Around three-quarters of the academics are quick to adapt to information technologies implemented by their university. The mean response to this statement is 3.8865 with a skewness value of -.562 showing that a lot of responses are towards agreement with the statement.

There is a high level of agreement with universities' tendency to document policies and procedures and then make them available through the staff Intranet with mean response of 4.129. Table 5.26 shows that the average response is negatively skewed and skewness coefficient being significant at -1.127, demonstrating that most of the respondents have given a high level of agreement to this statement. 86.5% of the participants have presented an appreciative attitude towards universities' keenness to document policies and procedures.

However, 37.6% of the participants feel that electronic transmission leads to an overload of information and encourages frequent changes in policies possibly due to the ease with which changes can be implemented electronically. The mean response of this statement is 3.19 which can be interpreted as overall disagreement with the statement. This may also imply that administrative goals are shifting.

37.6% of respondents agree that it is easy to access the documents they need within the university's databases i.e. information is well-organised. The mean response to this perspective is 2.93, showing overall disagreement with the statement. In comparison,

the situation is better with regard to rapid and continuous upgrading of policies and procedures on the staff Intranet in universities. However, only 47.5 % of the respondents agree with this viewpoint with a mean response of 3.58. Furthermore, only 36.2% respondents agree that their university provides ready access to application software (e.g. chatting, discussion groups, bulletin boards) and hardware to help them in sharing their personal experiences with a mean response of 3.25.

Mentoring programs are not encouraged in the transfer of ideas, skills, and experiences. Only 35.5% of the respondents find their university offering mentoring programs with a mean response of 2.9716.

Just 39% of respondents have expressed their opinion that universities encourage contribution of ideas, skills, and experiences through rotation of courses that they can teach i.e. different courses to teach every few terms with a mean response of 3.1844.

Table 5.27 analyses Question 56 of the questionnaire that aims to explore whether technology can help in tacit knowledge transfer. Table 5.28 analyses Question 57 of the questionnaire that aims to explore academics' willingness to use technology for sharing tacit knowledge. Both questions are related to tacit knowledge transfer.

The responses to a statement seeking views for those academics who do not have enough time to share their skills, ideas and experience with their peers and whether the provision and implementation of technology is going to be helpful or not, are presented in table 5.27.

Table 5.27 – Can technology help in tacit knowledge transfer

Response	*% agreement*
Yes	41.8
Cannot know	31.2
Probably not	15.6
No	5.0
Do not know	6.4

In response to time availability for sharing skills and ideas with their peers, 41.8% of respondents feel that willingness/ability to share knowledge will be enhanced with the right type of technology, when academics in universities do not have enough time to share their skills, ideas and experience (see table 5.27). This presents a lack of an overall confidence in whether higher technology will lead to better levels of tacit knowledge transfer. They may be skeptical because some behavioural dimensions as discussed in section 5.5 also influence tacit knowledge transfer. This may perhaps also reflect preference for face-to-face contact where ideas can flow more freely.

The response to a statement seeking views on using a lot of technology (discussion forums, web chat, and blogs) to share knowledge and whether technology would actually encourage people to share is presented in table 5.28.

Table 5.28 – Academics willingness to use technology for sharing tacit knowledge

	Response	*% agreement*
1	Definitely	33.3
2	Probably	48.9
3	Probably not	9.2
4	No	0.0
5	Do not know	7.8

Table 5.28 indicates that 33.3% of the academics are confident that if their university provided the right technology to them, they would be willing to share their knowledge, skills and ideas with others. About 49% of the participants feel that with right technology they 'may be' in a position to share their knowledge, skills and ideas. Other participants are either not sure or probably do not believe in better knowledge sharing with enhanced technology. Universities are trying to implement different technologies to enhance tacit knowledge transfer(such as video conferencing, online meetings, online chat rooms, discussion forums, intranet, portals) although an overall response to the statement indicates a lack of confidence in technology for tacit knowledge transfer with a mean response of 1.99. Subramaniam and Venkatraman (2001) found that effective transferral and sharing of tacit knowledge involved face-to-face interaction, often complemented and enhanced with the use of information technology. The use of ICT to convert tacit to explicit will be a good way of moving forward in KM efforts. Ruggles (1998) has suggested the creation of intranets, knowledge repositories, decision support tools and groupware as key KM initiatives for organisations. Pauleen & Yoong (2001) have reported that trusting relationships can be developed amongst people through the use of different ICT.

5.8 QUANTITATIVE ANALYSIS OF LEARNING DIMENSIONS

This section aims to address the fifth aspect of the research aim and explores the academics' and their workplaces' (universities) conduciveness to be lifelong learners and learning organisations respectively. For addressing the research question relating to learning dimensions, Q37-44, Q2, Q3, Q4, Q6, Q55 from the TKTS questionnaire have

been analysed. The analysis examines the respondents' propensity to be lifelong learners, criticality of failure, appreciation of feedback and other key aspects of universities as learning organisations. Descriptive statistics of these questions are provided below in table 5.29.

Table 5.29 – Descriptive statistics of perceptions of learning dimensions

Statement	N statistics	Mean Statistic	Std. Error	S.D. Statistic	Skewness Statistic	% Agreement
Q37. I consider myself to be a lifelong learner i.e. inquiring mind, committed to ongoing personal development, experiment with new ways of doing my work.	141	4.5887	.04509	.53547	-.786	97.9
Q38. My university is a learning organisation i.e. it provides continuous learning opportunities for staff, demonstrates and openness to change and adaptability, has a shared vision.	139	3.4748	.09095	1.07225	-.506	59.57
Q39. My university is very critical of failure and does not see it as a learning process.	140	3.0500	.10648	1.25992	.846	23.40
Q40. My inquiry and dialogue is seen as threatening.	141	2.8723	.10881	1.29201	.806	19.15
Q41. I am actively involved in curriculum development.	140	3.6214	.10411	1.23188	-.741	63.83
Q42. I am actively involved in assessment development.	140	3.7071	.10010	1.18441	-.835	66.67
Q43. I regularly provide feedback to my peers about their work.	140	3.4357	.08792	1.04027	-.604	56.03

Statement	N statistics	Mean Statistic	Std. Error	S.D. Statistic	Skewness Statistic	% Agreement
Q44. My peers are appreciative of the feedback that I provide to them about their work.	140	3.8071	.08832	1.04500	.165	54.61
Q2. My university provides adequate time to document and share my tacit knowledge.	141	2.6667	.09896	1.17514	.703	23.40
Q3. My university encourages transfer of my ideas, skills, and experiences through mentoring programs.	141	2.9716	.09386	1.11447	.151	35.46
Q4. My university encourages contribution of ideas, skills, and experiences through rotation of courses that I can teach i.e. different courses to teach every few terms.	141	3.1844	.10728	1.27393	.215	39.01
Q6. My university has an up-to-date directory (like Yellow pages) of academics that can provide information about their work, skills, and experience.	141	3.1206	.12948	1.53751	.441	27.66
Q55. The university Tim works for is very critical of failure. Every time Tim does something incorrect, he gets reprimanded for it. The university does not see failure as a learning process. As a result Tim does not want to experiment and try new ideas. What should Tim do?	137	1.78	.068	.793	.863	NA
Valid N (listwise)	133					

NA: Not applicable

As shown in table 5.29, 97.9 % of participants consider themselves to be lifelong learners i.e. inquiring mind, committed to ongoing personal development and experiment with new ways of doing their work. The mean response to this statement is 4.5887. It is very encouraging to note that such a high percentage of participants strongly believe themselves to be lifelong learners. This willingness to learn should facilitate the transfer of knowledge, skills and ideas in universities.

As lifelong learners and having an inquiring mind, being committed to ongoing personal development, is going to help academics in experimenting with new ways of doing their work. 59.57% of the respondents do believe that their university is a learning organisation. They also agree that their university provides continuous learning opportunities for staff, demonstrates openness to change and adaptability, and has a shared vision with a mean response of 3.4748. At the same time, universities need to show their tolerance towards failure because 23.4 % of respondents believe that their universities are very critical of failure and do not see it as a learning process. The mean response to this statement is 3.05. Organisational learning is a vital outcome of tacit knowledge transfer and lies at the foundation of organisational knowledge processes. Tacit to tacit knowledge transfer (Socialisation) is considered to be important for higher education as it enables learning and provides further stimulus for knowledge creation and life-long learning (Takwe & Sagsan, 2011). In every organisation, learning is characterised by different features, and learning takes place in a variety of distinct processes and ways. Learning could take place via formal training and education, via

the use of interventions in work processes and through day-to-day work activities (Hislop 2009).

Furthermore, universities do not perceive inquiry and dialogue by academics as threatening. A low but significant 19.1 % of the respondent academics have agreed to this threat being perceived by the universities with a mean response of 2.8723. The response shows overall uncertainty about the possible view point of the universities. This may raise an issue concerning academic freedom.

63.8% of the selected respondents are actively involved in curriculum development. This is a very encouraging trend followed in the universities where about 2 out of 3 people are involved in curriculum development where they can transfer their knowledge, skills and experiences. This also gives them an opportunity to update their knowledge in tandem with current trends. The mean response to this question is 3.6214, indicating a high level of agreement with the view point. Generally curriculum development relies on team processes where individuals provide their perspectives often residing in their tacit knowledge. This is often a process of sharing knowledge.

This is supported by 66.7% of the respondents who agree that universities are encouraging academics to get actively involved in assessment development, with a mean response of 3.7071 for this statement. It is interesting to note that 56.0 % of the respondents portrayed a strong belief in regularly providing feedback to their peers about their work. The mean response to this statement is 3.4357 which indicates an overall agreement to transfer knowledge, skills and ideas.

Since curriculum and assessment development is often a collaborative process, 54.6% of the respondents have expressed the opinion that their colleagues are appreciative of the feedback which they provide to them about their work. The mean response to this statement is 3.8071. This agreement indicates that the people in universities do value the feedback provided by the experienced academics. This certainly promotes the transfer of tacit knowledge.

Organisational processes and resources are important in promoting internal knowledge transfer. Merely, 23.4% of respondents have reported that their universities provide adequate time to document and share their tacit knowledge. The low overall response at 2.6667 is indicative of the fact that time is an inhibitor in transfer of knowledge, skills and ideas. Universities need to provide free time for the seamless flow of tacit knowledge.

A lack of organisational commitment to knowledge transfer is seen as universities do not encourage transfer of ideas, skills, and experiences of their academics through mentoring programs**.** The mean response to this statement is 2.9716. It indicates overall disagreement with the view point. Only 35.5% of the academics have consented to provision of the mentoring programs run by their respective universities. This may also be because academics are time-poor with high priority placed on research, administration and high contact teaching hours as well as face to face student consultations.

The respondents feel that their universities do not do much to encourage their contribution of ideas, skills, and experiences through rotation of courses that various academics can teach i.e. different courses to teach every few terms. The mean response to this statement is 3.1844 and the viewpoint has been agreed by 39% of the respondents. This may be seen as another demonstration of universities' lethargy to organisational learning.

Only 27.7% of agree that their university has a directory (like Yellow pages) of academics. The overall level of agreement with the statement is 3.1206. There is a need for access to an up-to-date directory (like Yellow pages) of academics to facilitate transfer of information about their work, skills, and experience of these academics.

With regard to the way universities respond to the failures by academics and specifically their approach to not look at failures as a learning process, the respondents' views as to how the employees should handle these situations is given below in table 5.30.

Table 5.30 – Academics' response when their university is very critical of failure

Response	% Agreement
Leave the university	39.7
Speak to management	44.0
Keep experimenting for self-development	11.3
Do nothing	3.5

Table 5.30 shows that 39.7% of the participants feel employees must leave the university if their workplace reprimands them for doing things incorrectly. The problem

gets exacerbated when a university does not see failure as a learning process. However, on the other hand, 44% of the respondents have taken a positive viewpoint on the issues and suggested that such employees must speak to management. Another 11.3% feel that they need to keep experimenting for self-development and only 3.5% of respondents' suggested doing nothing. This do-nothing attitude may actually hamper their willingness to try new ideas and share their knowledge, skills and experiences with others.

5.9 QUANTITATIVE ANALYSIS OF CULTURAL, AGE AND GENDER DIMENSIONS

This section aims to address the sixth aspect of the research inquiry and aims to explore a difference in willingness to share tacit knowledge based on educational qualification, age and gender of academics. For addressing this research question relating to cultural, age and gender dimension, Q45-52, Q3, Q4, Q5 from the TKTS questionnaire have been analysed. The analysis examines whether cultural background impacts tacit knowledge sharing, whether older staff are more willing to share tacit knowledge, and whether job security has an impact on tacit knowledge sharing. The gender aspect has not been explored in this section but has been done later in the qualitative analysis in section 6.8. Descriptive statistics of these questions are provided in table 5.31.

Table 5.31 – Descriptive statistics of perceptions of cultural, age and gender Dimensions for tacit knowledge sharing

Statement	N statistics	Mean Statistic	Std. Error	S.D. Statistic	Skewness	% of Agreement
Q45.Academics at my university readily share their ideas, experiences and skills in seminars and meetings.	141	3.510	.08	.9828	-.259	54.6
Q46.Knowledge (skills, ideas and experience) should be available for reuse.	140	4.300	.045	.5324	.133	95.0
Q47.Cultural background of people has an impact on their willingness to share ideas, skills and experiences.	140	3.892	.095	1.129	-.121	58.2
Q48.Training on cultural awareness can improve people's willingness to share ideas, experiences and skills.	141	3.886	.094	1.121	-.204	60.3
Q49.My experience is that the older experienced staffs is more willing to share ideas, experiences and skills.	141	3.014	.082	.9782	.296	27.0
Q50.My experience is that the younger novice staff is more willing to share ideas, experiences and skills.	141	3.177	.082	.9804	.374	28.4
Q51.I feel that trust plays an important part in the sharing of ideas and experience.	141	4.397	.052	.6196	-.697	92.9
Q52.I feel that job	141	3.929	.079	.9384	-.541	70.9

Statement	N statistics	Mean Statistic	Std. Error	S.D. Statistic	Skewness	% of Agreement
security plays an important part in the sharing of ideas and experience.						
Q3.My university encourages transfer of my ideas, skills, and experiences through mentoring programs.	141	2.971	.093	1.114	.151	35.5
Q4.My university encourages contribution of ideas, skills, and experiences through rotation of courses that I can teach i.e. different courses to teach every few terms.	141	3.184	.107	1.273	.215	39.0
Q5.My university facilitates transfer of personal ideas, skills, and experiences through seminars, workshops and so forth.	141	3.602	.093	1.107	-.600	66.0
Valid N (listwise)	139					

According to table 5.31, 54.6% of the respondents are in agreement that academics at their university readily share their ideas, experiences and skills in seminars and meetings with a mean response of 3.510. This certainly portrays a favourable attitude of academics towards transfer of knowledge, skills and experiences.

Tacit knowledge should be available for reuse in any organisation. A very high percentage of academics, expressly 95.0% of the total academics, feel that tacit knowledge in terms of skills, ideas and experience should be available for reuse. This statement has a mean response of 4.3 showing clear-cut agreement with the viewpoint. More than half i.e. 58.2% of the participants have held the opinion that cultural background of people has an impact on their willingness to share ideas, skills and experiences with a mean response of 3.89. Further, as willingness to transfer tacit knowledge is impacted by cultural background of the academics in universities, training of cultural awareness has an important role to play. Training of cultural awareness can improve people's willingness to share ideas, experiences and skills as agreed by 60.3% of the academics included in the survey. This statement has a mean response of 3.8 showing broad consent with the viewpoint.

It has also been noticed in the analysis of the survey that older experienced staff are more willing to share ideas, experiences and skills with mean response of 3.014 . But this point of view is not supported by many as only 27.0% of the respondents chose to agree with the statement. It is interesting to note that only 28.4% of the academics in universities feel that the younger novice staff members are more willing to share ideas, experiences and skills. The statement has a mean response of 3.177. Thus, the views are almost the same when it comes to willingness to share knowledge, skills and experiences from the perspective of older experienced staff or younger novice staff.

The opinion that trust plays an important part in the sharing of ideas and experience is definitely upheld by 92.9% of respondents with a mean response of 4.3 depicting extensive agreement with the statement. Trust plays an important role in knowledge

sharing. The higher the level of trust an employee has in another employee, the more willing they are to share knowledge with them (Andrews and Delahaye 2000). Since there is some degree of uncertainty about how knowledge is received by the recipient and utilised, it creates a more wary sharing environment. Trust also has to be reciprocal – if an employee trusts another employee, it doesn't imply that there necessarily might be the same levels of reciprocity, hence creating uncertainty and subsequently reluctance to share. This could also be a possible source of conflict - collaborative vs. competitive.

To reduce conflict and develop trust, Newell and Swan (2000) have defined three types of trust – companion based trust (developed over time and based on goodwill and friendship), competence based trust (based upon a person's capability to complete work related activities) and finally commitment (based upon commiting to a formal contractual obligation). In the university environment, trust with others could be in the form of all three. If an employee has worked with another employee for a long time and has developed goodwill and collegial relationships, then it is classified as companion-based trust. If an employee perceives someone to be performing their tasks effectively and correctly, then it classifies as competence based trust. A researcher who collaborates with another colleague (both have worked together on past projects, for extended durations and appreciate each other's working styles) might exhibit all the three types of trust making in a relationship that is positively conducive for tacit knowledge transfer.

Job security is another crucial factor which plays an important part in the sharing of ideas and experience with a mean response of 3.929. Overall 70.9% of the academics feel that job security has a crucial role to play in transfer of knowledge, skills and experiences in university settings. This also brings into the forefront issues such as promotion on a competitive basis.

Only 35.5% of the participating university academics agreed with the statement that their universities encourage transfer of ideas, skills, and experiences through mentoring programs. This viewpoint has found a mean response of 2.97. This implies that mentoring programs are highly valued and should be introduced formally by universities.

39% of the respondents agreed with the statement that their universities encourage contribution of ideas, skills, and experiences through rotation of courses that various academics can teach i.e. different courses to teach every few terms. The mean response to this statement is 3.18. This also indicates the need to rotate courses so that tacit knowledge sharing is further developed. Finally, universities facilitate and encourage transfer of personal ideas, skills, and experiences through seminars, workshops and so forth as 66.0% of the participants have echoed the same opinion with a mean response of 3.602.

Overall, it is found that trust and job security are two important factors influencing the transfer of knowledge, skills and experiences in a positive manner. Mentoring programs and rotation of courses also seem to play a major role in tacit knowledge transfer and

should be encouraged. But seminars, workshops and other similar initiatives do seem to encourage and provide a platform for sharing of skills, knowledge, and experiences. When it comes to willingness to share knowledge, skills and experiences from the perspective of older experienced staff or younger novice staff, there is no difference. Cultural background of the academics in universities has an influence on transfer of tacit knowledge so training of cultural awareness is recommended so that academics' willingness to share ideas, experiences and skills can be improved.

5.10 QUANTITATIVE ANALYSIS OF EMPLOYMENT STATUS ON TACIT KNOWLEDGE SHARING

This section aims to address the seventh aspect of the research aim and explores whether employment status has an impact on tacit knowledge sharing. For understanding the impact of employment status on tacit knowledge sharing, Q6, Q12-23 from the TKTS questionnaire have been analysed. Descriptive statistics of these questions are provided below in table 5.32.

Table 5.32 – Descriptive statistics of tacit knowledge sharing and employment status at university

Employment Status	N	Mean	Std. Deviation	Std. Error
On-going Full-time	100	3.3307	.31232	.03123
Sessional/Casual	15	3.3321	.25226	.06513
On-going Part-time	8	3.4327	.19258	.06809
Contract	18	3.3234	.24458	.05765
Total	141	3.3357	.29161	.02456

Figure 5.8 shows the overall means for tacit knowledge, skills and experiences transfer and employment status. The mean of tacit knowledge transfer is highest for on-going part-time at 3.4327 followed by sessional/casual at 3.3321, and then by on-going full-time at 3.3307. The academics with contract employment status have the lowest mean at 3.3234 in tacit knowledge transfer. It indicates that on-going part-time academics have a more favourable viewpoint on tacit knowledge sharing.

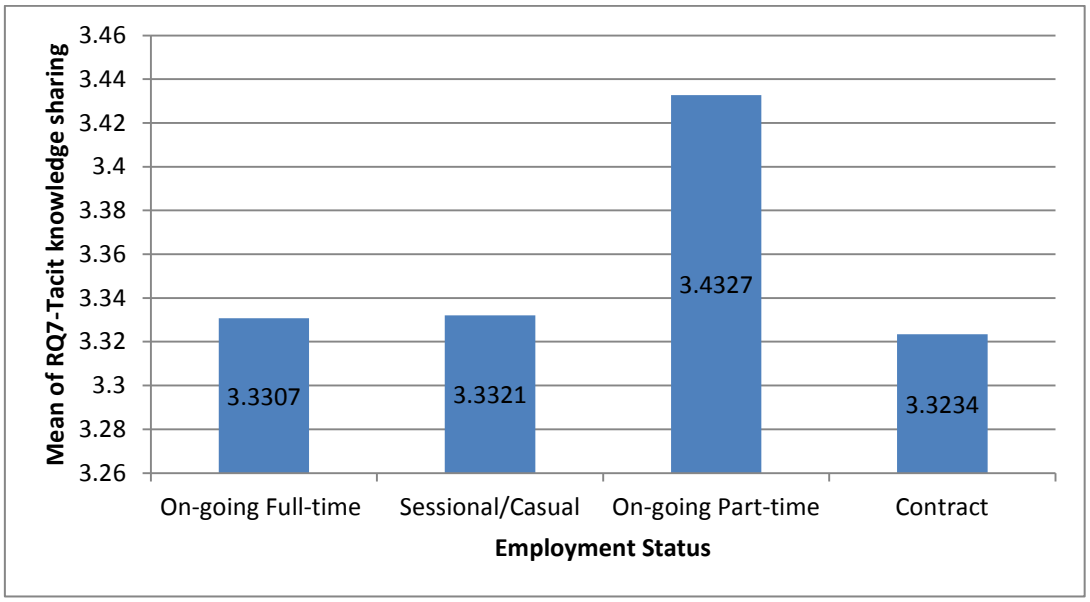

Figure 5.8 –Overall means for tacit knowledge, skills and experiences transfer for various levels of employment status.

Table 5.33 – ANOVA of RQ7 - Tacit knowledge sharing and employment status

	Sum of Squares	DF	Mean Square	F	Significance of variance
Between Groups	.081	3	.027	.312	.817
Within Groups	11.824	137	.086		
Total	11.905	140			

ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio is a ratio of the between-group estimate to the within-group estimate. In case, the P-value of the F-test is less than 0.05, there is a statistically significant difference between the means of the variables at the 95.0% confidence level. To investigate whether the mean overall tacit knowledge, skills and experiences transfer differ from one level of employment status to another, the ANOVA test (results in table 5.33) was conducted. The F-ratio, which in this case equals 0.312, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test (0.817) is greater than or equal to 0.05, there is not a statistically significant difference between the overall tacit knowledge from one level of employment status to another at the 95.0% confidence level. Perspectives on tacit knowledge sharing are similar irrespective of level of employment status. On-going full-time, on-going part-time and academics on contract/ sessional/casual basis share similar (not statistically different) views regarding tacit knowledge transfer.

5.11 QUANTITATIVE ANALYSIS OF THE EFFECT OF TENURE AT THE UNIVERSITY ON TACIT KNOWLEDGE SHARING

This section aims to address the eighth aspect of the research aim and explores whether academics' work tenure at the university has an impact on tacit knowledge sharing. For understanding the impact of tenure at the university on tacit knowledge sharing, Q1, Q2, Q12-23 from the TKTS questionnaire have been analysed. Descriptive statistics of these questions are provided below in table 5.34. Means of tacit knowledge sharing across various tenures at the sample universities have been shown in table 5.35.

Table 5.34 – Descriptive statistics of the impact of tenure at the university on tacit knowledge sharing

	Mean		S.D.
	Statistic	Std. Error	Statistic
Q1	3.6454	.09342	1.10928
Q2	2.6667	.09896	1.17514
Q12	1.8273	.08839	1.04207
Q13	4.4173	.05767	.67993
Q14	2.0714	.09272	1.09704
Q15	4.2319	.07221	.84827
Q16	2.4071	.08715	1.03114
Q17	4.3143	.06654	.78736
Q18	3.1014	.09499	1.11584
Q19	3.1727	.09410	1.10943
Q20	3.6429	.06955	.82297
Q21	4.6087	.04649	.54618
Q22	4.1812	.05748	.67527
Q23	2.3453	.09287	1.09486

Table 5.35 - Means of tacit knowledge sharing across various tenures at the sample universities

Tenure at the university	Mean	N	Std. Deviation
Less than one year	3.3407	13	.25280
1 to 5 years	3.3319	48	.33656
5 to 10 years	3.2796	25	.25823
10 to 15 years	3.3708	23	.30202
15 to 20 years	3.3376	9	.21837
More than 20 years	3.3082	23	.34131
Total	3.3262	141	.30184

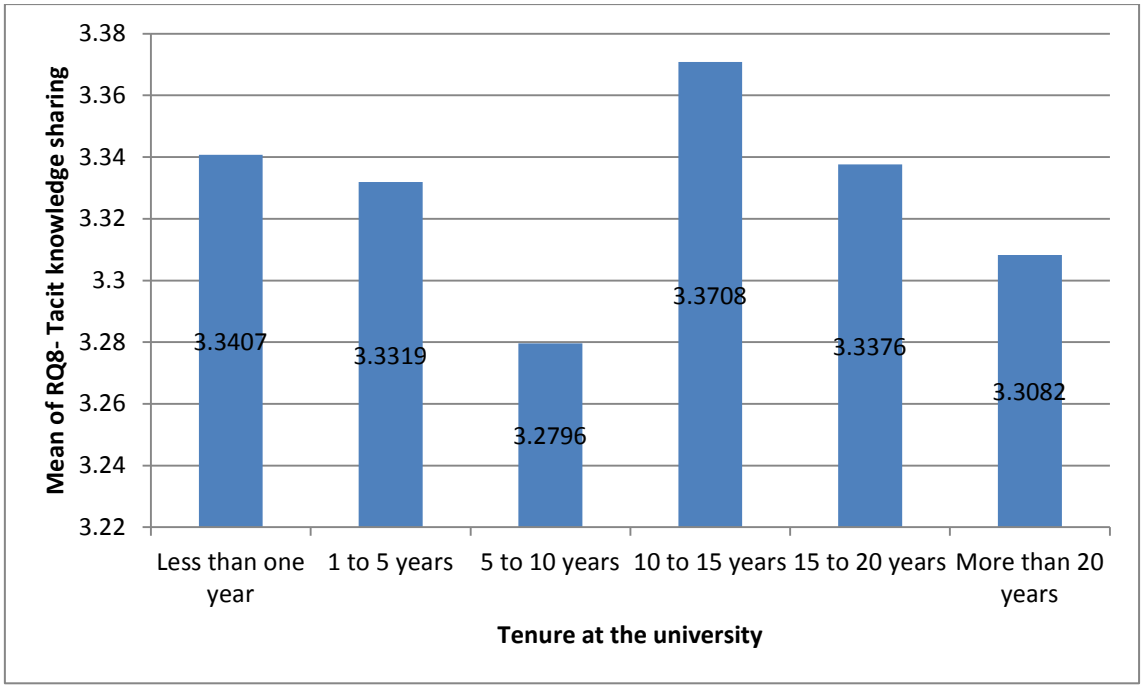

Figure 5.9 – Overall means for tacit knowledge, skills and experiences transfer for various tenures of service

The average of responses to the statements numbered as Q1, Q2, Q12-23 has been taken as tacit knowledge sharing and in order to understand whether the mean tacit knowledge sharing differs significantly for different tenures of service, the ANOVA test has been conducted.

Table 5.36 – ANOVA of RQ8- Tacit knowledge sharing and tenure at university

	Sum of Squares	DF	Mean Square	F	Significance of variance
Between Groups	.113	5	.023	.241	.944
Within Groups	12.642	135	.094		
Total	12.755	140			

Df= Degrees of Freedom, F= F test statistic, Sig= Significance of F value

There are six different groups of sample academics on the basis of levels of length of service of academics. Table 5.36 attempts to establish whether mean response to the tacit knowledge sharing is diferent on the basis of tenure of academics at universities. According to table 5.36, the F-ratio which in this case equals 0.241, is a ratio of the between-group estimate to the within-group estimate. Since the significance of the F-test is greater than 0.05, there is not a statistically significant difference between the overall tacit knowledge sharing for six different levels of length of service of academics at the 95.0% confidence level.

5.12 RELATIONSHIPS AMONG VARIOUS DIMENSIONS OF TACIT KNOWLEDGE TRANSFER

Table 5.37 shows Pearson correlations between the coefficients of the various dimensions. These correlations can be used to understand dynamics of relationships among various dimensions of tacit knowledge transfer. In this case, there are some significant correlations with absolute values greater than 0.5.

Table 5.37 – Correlations matrix of various dimensions of tacit knowledge sharing

Dimension		Behavioural Dimensions	Workplace expectations	Technology Dimensions	Learning Dimensions	Cultural, Age and Gender Dimensions
Workplace Dimensions	Pearson Correlation	**-.063**	.573(**)	.632(**)	.773(**)	.717(**)
	Sig. (2-tailed)	.460	.000	.000	.000	.000
Behavioural Dimensions	Pearson Correlation	1	.120	**-.107**	.063	.086
	Sig. (2-		.155	.205	.460	.308

Dimension		Behavioural Dimensions	Workplace expectations	Technology Dimensions	Learning Dimensions	Cultural, Age and Gender Dimensions
	tailed)					
Workplace expectations	Pearson Correlation		1	.296(**)	.526(**)	.529(**)
	Sig. (2-tailed)			.000	.000	.000
Technology Dimensions	Pearson Correlation			1	.732(**)	.515(**)
	Sig. (2-tailed)				.000	.000
Learning Dimensions	Pearson Correlation				1	.693(**)
	Sig. (2-tailed)					.000
Cultural, Age and Gender Dimensions	Pearson Correlation					1
	Sig. (2-tailed)					0

**Correlation is significant at the 0.01 level (2-tailed).

Workplace dimensions are positively and significantly correlated with workplace expectations, technology dimensions, learning dimensions, cultural, age and gender dimensions with respective correlations at .573, .632, .773 and .717. This high degree of correlation indicates that universities cannot just focus on a single dimension of tacit transfer of knowledge, skills and ideas ignoring other dimensions. In a similar manner, workplace expectations are positively and significantly correlated to technology dimensions, learning dimensions, cultural, age and gender dimensions with correlation equal to 0.296, 0.526 and 0.529 in sequence. It is also interesting to note that

behavioural dimensions are not correlated with any other dimension of tacit knowledge transfer. Technology enhances the learning dimension impact and also impacts cultural, age and gender perspectives of tacit transfer of knowledge, skills and ideas. This may be due to the fact that learning and cultural, age and gender dimensions are highly and significantly correlated with correlation equal to 0.693. All dimensions are positively correlated except those behavioural dimensions which are negatively correlated with workplace dimensions and technology dimensions. But these negative relationships are weak and statistically non-significant.

5.13 QUANTITATIVE ANALYSIS OF VARIANCE OF VARIOUS DIMENSIONS ACROSS UNIVERSITIES

To understand whether various dimensions namely workplace dimension, behavioural dimension, workplace expectations, technology dimension, learning dimension, culture, age and gender dimensions differ across various universities, means have been calculated and variance is analysed.

Descriptive statistics of the all the six dimensions over four universities in the sample are provided below in table 5.38. These are followed by ANOVA in table 5.39 showing the F value and significance of variance for each of the dimension across universities.

Table 5.38 – Analysis of Variance of various dimensions across universities

Dimensions	UNI	N	Mean	S.D.	Std. Error	Minimum	Maximum
Workplace Dimensions	1	49	3.5000	.76513	.10930	2.00	5.20
	2	23	3.4217	.65084	.13571	1.50	4.50

Dimensions	UNI	N	Mean	S.D.	Std. Error	Minimum	Maximum
	3	36	3.3389	.87645	.14607	1.20	5.60
	4	33	2.9091	.70016	.12188	1.50	4.70
	Total	141	3.3078	.79003	.06653	3.4393	5.60
Behavioural Dimensions	1	49	3.2858	.23971	.03424	2.67	3.83
	2	23	3.3633	.24896	.05191	2.73	3.92
	3	36	3.4495	.37101	.06184	3.00	5.00
	4	33	3.3495	.29830	.05193	2.83	4.17
	Total	141	3.3552	.29695	.02501	2.67	5.00
Workplace Expectations	1	49	3.4830	.71301	.10186	2.00	4.67
	2	23	3.2826	.51599	.10759	2.17	4.17
	3	36	3.3657	.54163	.09027	2.50	4.83
	4	33	3.2323	.65609	.11421	1.83	5.00
	Total	141	3.3617	.63087	.05313	1.83	5.00
Technology Dimensions	1	49	3.3214	.50375	.07196	2.33	4.33
	2	23	3.1558	.48935	.10204	1.92	3.83
	3	36	3.1187	.47367	.07895	1.67	4.17
	4	33	3.0386	.47244	.08224	1.92	3.75
	Total	141	3.1764	.49448	.04164	1.67	4.33
Learning Dimensions	1	49	3.3450	.46344	.06621	2.39	4.39
	2	23	3.2177	.37418	.07802	2.33	3.78
	3	36	3.2841	.36933	.06156	2.56	4.33
	4	33	3.1801	.31727	.05523	2.67	3.89
	Total	141	3.2701	.39639	.03338	2.33	4.39
Culture, age and Gender Dimensions	1	49	3.7143	.46019	.06574	2.82	4.73
	2	23	3.6047	.36426	.07595	2.82	4.18
	3	36	3.6253	.42796	.07133	2.82	4.91
	4	33	3.4950	.39651	.06902	2.82	4.36
	Total	141	3.6224	.42663	.03593	2.82	4.91

1, 2, 3, 4 are pseudonyms - university 1, university 2, university 3 and university 4

Table 5.39 – ANOVA with various dimensions on universities

		Sum of Squares	DF	Mean Square	F	Sig.
Workplace Dimensions	Between Groups	7.389	3	2.463	4.219	.007**
	Within Groups	79.992	137	.584		
	Total	87.381	140			
Behavioural Dimensions	Between Groups	.559	3	.186	2.164	.095
	Within Groups	11.787	137	.086		
	Total	12.346	140			
Workplace Expectations	Between Groups	1.418	3	.473	1.192	.315
	Within Groups	54.302	137	.396		
	Total	55.720	140			
Technology Dimensions	Between Groups	1.787	3	.596	2.516	.061
	Within Groups	32.444	137	.237		
	Total	34.231	140			
Learning Dimensions	Between Groups	.612	3	.204	1.307	.275
	Within Groups	21.385	137	.156		
	Total	21.997	140			
Culture, age and Gender Dimensions	Between Groups	.956	3	.319	1.781	.154
	Within Groups	24.525	137	.179		
	Total	25.482	140			

Figure 5.10 shows the means plot of workplace dimension. In workplace dimension, university 1 has the highest tacit knowledge transfer at 3.5000 followed by university 2 at 3.4217, then by university 3 with a mean knowledge transfer of 3.3389 and lastly by university 4 at 2.909. As demonstrated in table 5.39, the F-ratio in workplace dimension equals 4.219 and the P-value of the F-test is less than 0.01 demonstrating there is a statistically significant difference between the overall tacit knowledge sharing of academics in various universities at the 95.0% confidence level. Except for workplace dimension, no other dimension such as behavioral dimension, workplace expectations, technology dimension, learning dimension, culture, age and gender dimensions on tacit knowledge transfer differs from one university to another.

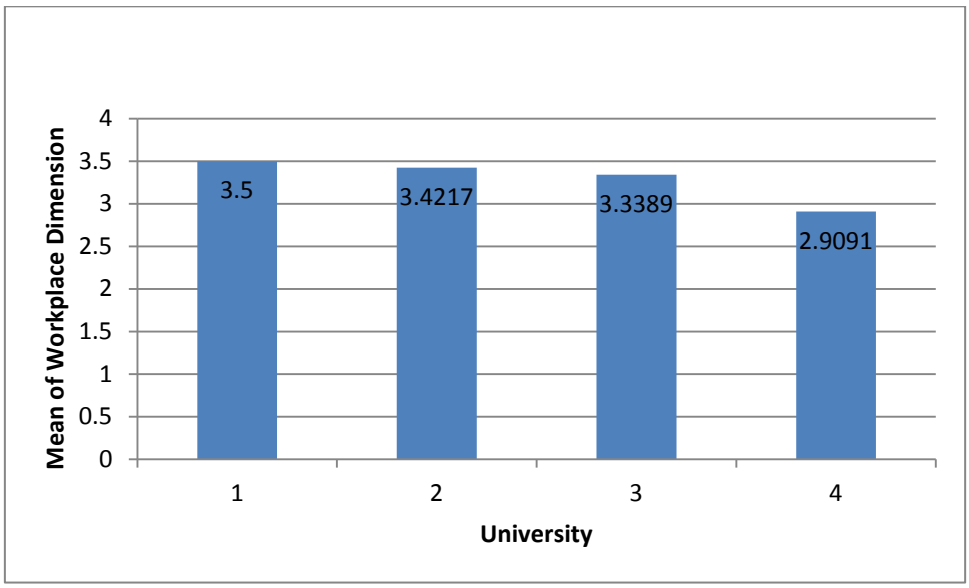

Figure 5.10 – Means plots of workplace dimension

Figure 5.11 shows the means plot of the behavioural dimension. In the behavioural dimension, university 1 has a mean knowledge, skills and ideas transfer at 3.2858, while other universities 2, 3, 4 have means equal to 3.3633, 3.4495, and 3.3495 respectively.

As demonstrated in table 5.39, the F-ratio in behavioral dimension equals 2.164 and the P-value of the F-test is more than 0.05 demonstrating there is no statistically significant difference between the overall tacit knowledge sharing of academics considered in various universities at the 95.0% confidence level.

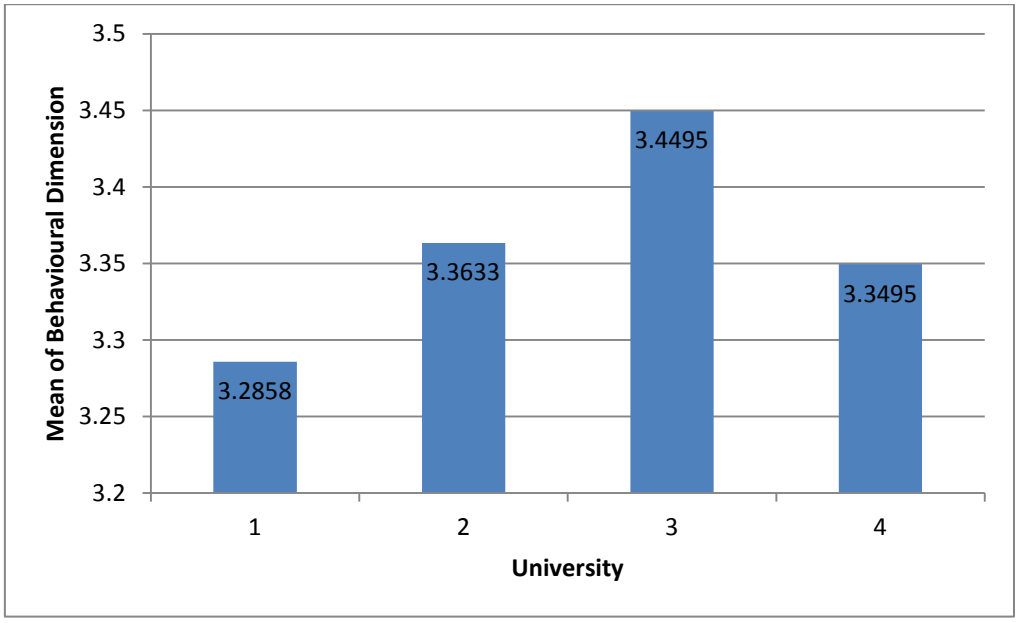

Figure 5.11 – Means plots of behavioural dimension

Figure 5.12 shows the means plot of workplace expectations. In workplace expectations, university 1 has again highest mean at 3.4830, followed by university 3 at 3.3657. In university 2, mean knowledge transfer is 3.2826 and in university 4 mean is 3.2323. As demonstrated in table 5.39, the F-ratio in Workplace dimension equals 1.192 and the P-value of the F-test is more than 0.05 demonstrating there is no statistically significant difference between the overall tacit knowledge sharing of academics considered in various universities at the 95.0% confidence level.

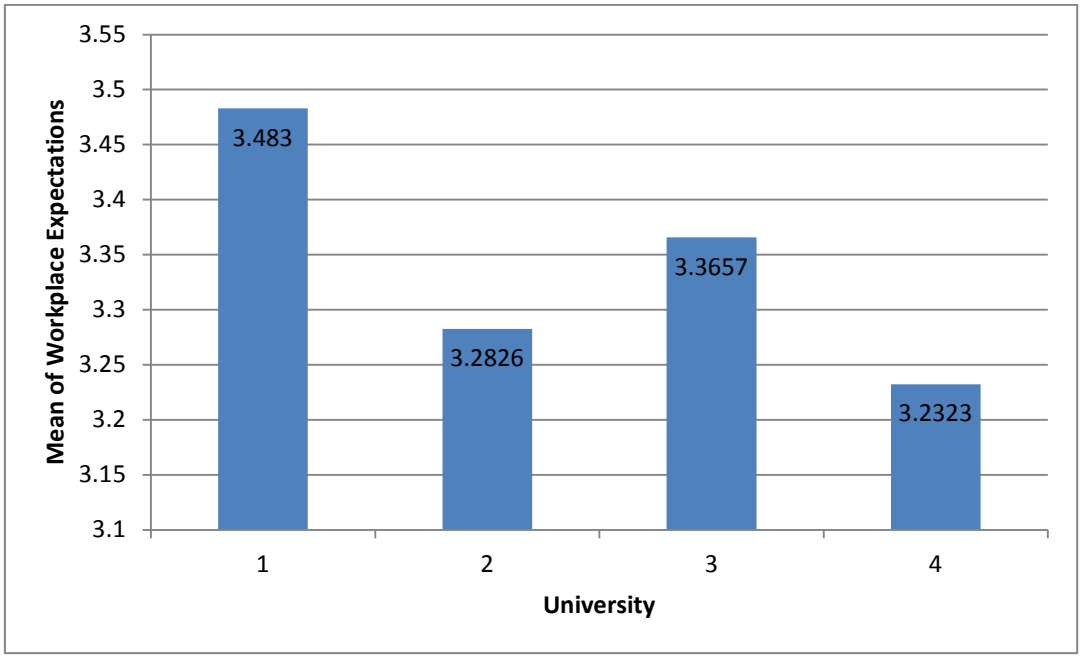

Figure 5.12 – Means plots of workplace expectations

Figure 5.13 shows the means plot of the technology dimension. In the technology dimension, universities 1, 2, 3, 4 have descending means at 3.3214, 3.1558, 3.1187 and 3.0386 respectively. These means indicate that universities do not differ in a significant manner in the technological dimension in transfer of knowledge, skills and ideas at 95% level of confidence.

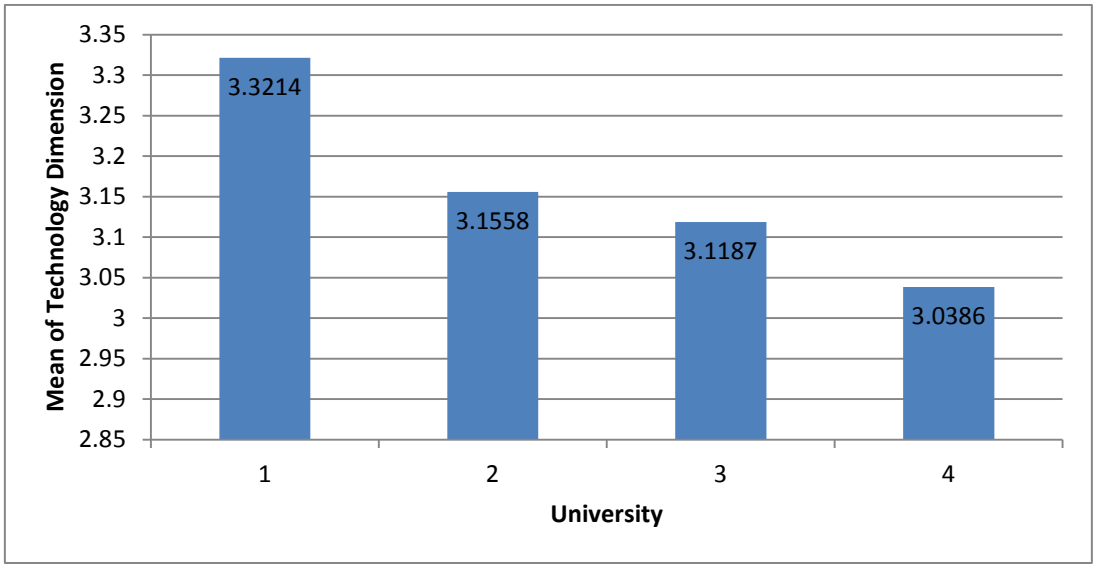

Figure 5.13 – Means plots of technology dimension

Figure 5.14 shows the means plot of the learning dimension. In the learning dimension, university 1 is highest mean at 3.3450, followed by university 3 at 3.2841, then by university 2 at 3.2177 and finally by university 4 at 3.1801. As demonstrated in table 5.39, the F-ratio in learning dimension equals 1.307 and the P-value of the F-test is more than 0.05 demonstrating there is no statistically significant difference between the overall tacit knowledge sharing of academics considered in various universities at the 95.0% confidence level.

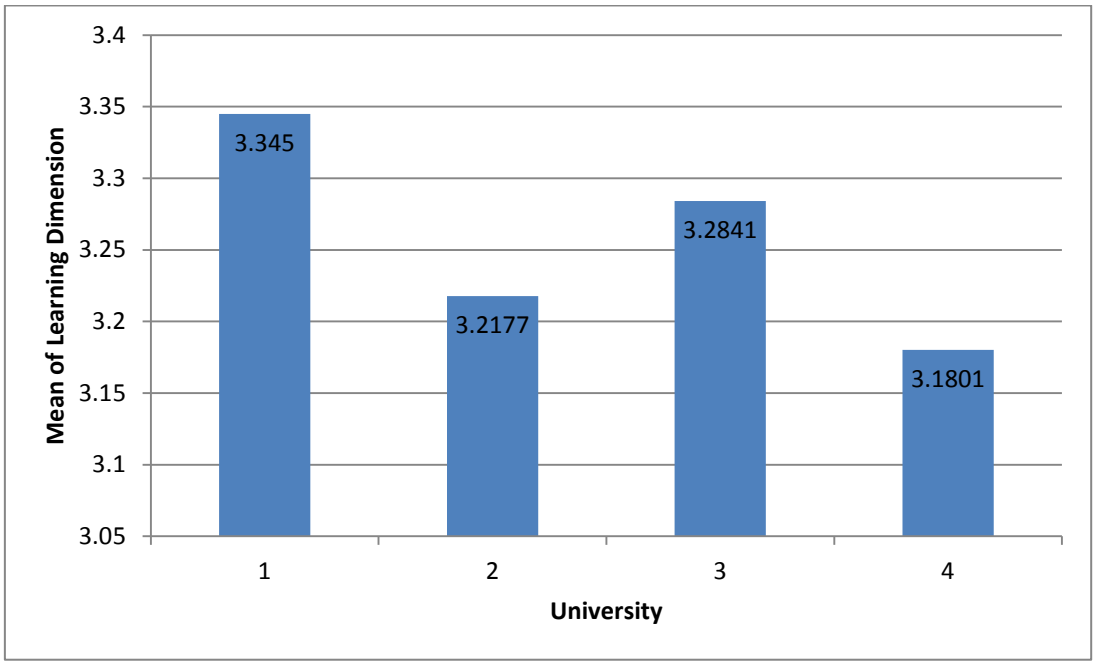

Figure 5.14 – Means plots of learning dimension

Figure 5.15 shows the means plot of the culture, age and gender dimension. For culture, age and gender dimension, university 1 is best with a mean of 3.7143, followed by university 3 with a mean response of 3.6253. The other two universities, universities 2 and 4 have means of 3.6047 and 3.4950 respectively. As shown in table 5.39, the F-ratio in culture, age and gender dimension equals 1.781 and the P-value of the F-test is more than 0.05 demonstrating there is no statistically significant difference between the

overall tacit knowledge sharing of academics considered in various universities at the 95.0% confidence level.

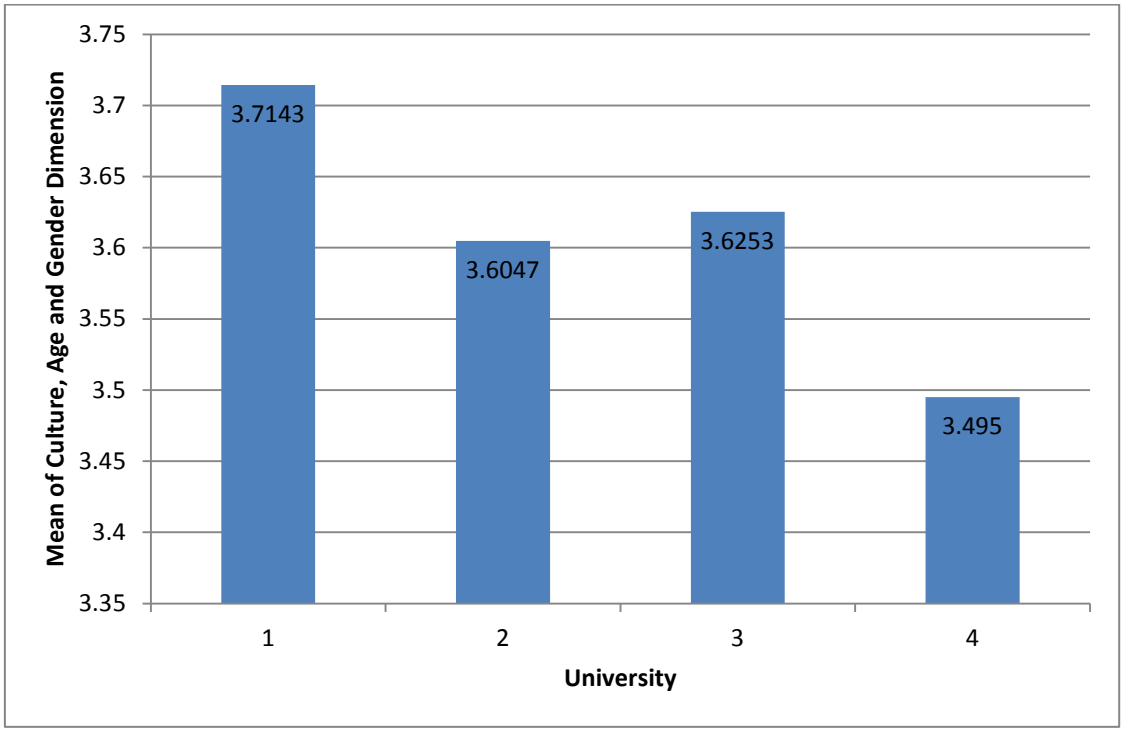

Figure 5.15 – Means Plots of culture, age and gender dimension

The overall conclusion is that in all other dimensions of tacit knowledge transfer (except behavioural dimension) i.e. workplace dimensions, workplace expectations, technology dimension, learning dimension and cultural, age and gender dimensions, university 1 has been doing the best. Tacit knowledge transfer is preeminent at university 1. The other universities can analyse the knowledge management processes at university 1 and they can try to use same techniques/processes and procedures to enhance sharing of ideas, skills and knowledge in their universities as well. University 1 needs to look clearly at the behavioural aspects where all other universities in the sample are doing better, although the differences in mean responses in this aspect are not significant.

Investigation and improvement in tacit knowledge transfer processes is most warranted in university 4 which consistently has the lowest mean response in the behavioural dimension, workplace expectations, technology dimension, learning dimension and cultural dimensions. University 4 needs to revisit various knowledge transfer processes and communication and technology techniques (both formal and informal) it has put in place. University 2 and university 3 are performing moderately so far as the tacit knowledge transfer in universities is concerned because the mean responses for various dimensions in these universities lie in between university 1 and university 4.

In the six dimensions of tacit knowledge, the F-ratio and the P-values of the F-test are greater than 0.01, so there is not a statistically significant difference between the overall tacit knowledge sharing of academics in various universities at the 95.0% confidence level except for workplace dimension where significant differences exist across the four selected universities. So, specific focus is required on the workplace dimension because statistically significant differences exist in all four universities in this dimension.

5.14 FACTOR ANALYSIS OF STATEMENTS RELATING TO TACIT KNOWLEDGE TRANSFER IN SAMPLE UNIVERSITIES

Factor analysis focusses on identifying 'underlying variables, or factors, that explain the pattern of correlations within a set of observed variables' (IBM 2011, pg.1). This is a data reduction technique employed for identification of a small number of factors that describe most of the variance that is detected in a much larger number of evident

variables (ibid). Inter-correlation between variables needs to checked as a first step before using factor analysis. For initial data screening, the inter-correlation between various dimensions was checked. R-Matrix determinant was found to be greater than the necessary value of 0.00001. In this test, correlation matrix of all variables was created to check if the variables correlate too highly. This is called singularity problem meaning that variables are perfectly correlated. Therefore, the multi-co linearity or singularity is not counted as a serious concern for this data. It is noted that all questions concerning tacit knowledge, skills and experiences transfer are fairly correlated. None of the variables is correlated very highly with other, thus there are no serious concerns with regards to singularity.

Table 5.40 – KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.577
Bartlett's Test of Sphericity	Approx. Chi-Square	3,320.673
	DF	1,596
	Sig.	0.000

Table 5.40 presents two important parts of factor analysis i.e. the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. According to Pek (2008), the Kaiser-Meyer-Olkin measure of sampling adequacy 'tests whether the partial correlations among variables are small' (pg.3). Bartlett's test of sphericity tests 'whether the correlation matrix is an identity matrix, which would indicate that the factor model is inappropriate' (ibid). Field (2005) recommends that if the value of KMO is greater than 0.5, then the sample is considered adequate for factor analysis. The KMO value in table 5.40 is greater than 0.05 (that is mediocre). Thus, it is acceptable to

indicate that factor analysis should provide reliable factors which are distinct from other factors. Thus, the suitability of factor analysis is checked for this data. Bartlett's Test of Sphericity has a value less than 0.05 and is highly significant ($p < 0.001$), indicating there are some significant relationships between the data. This test again confirms that factor analysis is an appropriate statistical tool for this data.

The Eigen values which are associated with each factor presents the variance explained by that particular linear component. For 'Eigenvalues over' option in SPSS software 'Eigen values over 1' which is a default option in factor analysis is used.

Table 5.41 – Eigen values associated with each linear component (factor/question) before extraction, after extraction and after rotation

Component (factor/question)	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.34	14.63	14.63	8.34	14.63	14.63	4.69	8.23	8.23
2	4.49	7.88	22.50	4.49	7.88	22.50	4.20	7.36	15.59
3	2.99	5.25	27.75	2.99	5.25	27.75	2.88	5.06	20.65
4	2.68	4.70	32.45	2.68	4.70	32.45	2.60	4.56	25.21
5	2.41	4.23	36.68	2.41	4.23	36.68	2.55	4.48	29.69
6	2.10	3.69	40.37	2.10	3.69	40.37	2.32	4.08	33.77
7	1.86	3.26	43.62	1.86	3.26	43.62	2.15	3.77	37.53
8	1.77	3.11	46.73	1.77	3.11	46.73	2.12	3.71	41.24
9	1.65	2.89	49.62	1.65	2.89	49.62	2.04	3.57	44.82
10	1.57	2.75	52.37	1.57	2.75	52.37	1.92	3.37	48.19
11	1.51	2.65	55.02	1.51	2.65	55.02	1.91	3.35	51.54
12	1.43	2.52	57.53	1.43	2.52	57.53	1.55	2.72	54.26
13	1.28	2.25	59.78	1.28	2.25	59.78	1.52	2.66	56.93
14	1.23	2.15	61.93	1.23	2.15	61.93	1.49	2.61	59.5
15	1.18	2.07	64.00	1.18	2.07	64.00	1.48	2.59	62.13

Component (factor/question)	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
16	1.13	1.97	65.98	1.13	1.97	65.98	1.47	2.58	64.72
17	1.07	1.89	67.86	1.07	1.89	67.86	1.43	2.50	67.22
18	1.05	1.84	69.70	1.05	1.84	69.70	1.41	2.48	69.70
19	0.99	1.73	71.44						
20	0.95	1.66	73.10						
21	0.90	1.58	74.68						
22	0.86	1.51	76.19						
23	0.80	1.40	77.59						
24	0.75	1.31	78.90						
25	0.74	1.30	80.21						
26	0.71	1.24	81.44						
27	0.66	1.16	82.60						
28	0.65	1.13	83.74						
29	0.63	1.11	84.85						
30	0.60	1.05	85.90						
31	0.58	1.01	86.91						
32	0.57	1.00	87.91						
33	0.52	0.91	88.82						
34	0.51	0.90	89.72						
35	0.45	0.79	90.51						
36	0.44	0.77	91.28						
37	0.41	0.71	91.99						
38	0.39	0.69	92.68						
39	0.38	0.67	93.35						
40	0.35	0.62	93.97						
41	0.34	0.60	94.57						
42	0.33	0.58	95.15						
43	0.31	0.54	95.69						

Component (factor/question)	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
44	0.28	0.48	96.17						
45	0.27	0.48	96.65						
46	0.25	0.45	97.09						
47	0.23	0.40	97.49						
48	0.22	0.38	97.88						
49	0.21	0.37	98.25						
50	0.19	0.33	98.58						
51	0.17	0.30	98.88						
52	0.16	0.28	99.16						
53	0.14	0.24	99.41						
54	0.12	0.21	99.62						
55	0.10	0.18	99.80						
56	0.06	0.11	99.91						
57	0.05	0.09	100.00						
Extraction Method: Principal Component Analysis.									

Table 5.41 shows the Eigen values in terms of the percentage of variance explained, so factor 1 explains 14.63% of the total variance. It should be noted that the first few factors always explain more variance than the others. In this case, first 18 factors cumulatively explain 69.70% of the total variance. The subsequent factors explain relatively small amount of variance. Table 5.41 lists the Eigen values associated with each linear component (factor/question) before extraction, after extraction and after rotation. 57 factors have been identified by SPSS before extraction (same as the number of variables i.e. 57). These Eigen values associated with each question/factor explain the variance explained by each factor so, factor 1 explains 14.63% of the total variance. Similarly,

factor 2 and factor 3 explain the 7.88 % and 5.25% of the total variance in transfer of tacit knowledge, skills and ideas. Other sets of factors namely 4 to 15 explain more than 2% but less than 5% of the total variance in tacit knowledge transfer. Extraction sums of squared loadings explain the same values as before extraction , but the values for the discarded factors are not reported (the table is blank after 18^{th} factor). To improve the interpretation of the factors, and assuming the factors to be independent, Varimax rotation has been conducted. In the third part of the table, (the last three columns named as *Rotation Sums of Squared Loadings*) the Eigen values of the factors after rotation are displayed. This rotation is expected to equalize the relative importance of the 18 selected factors. It shows that factor 1 accounted for considerably more variance than the remaining factors (14.63%) as compared to factors 2, 3, and 4 (at 7.88%, 5.25% and 4.70%). After extraction it accounts for only 8.23% only. This variance explanation is not a lot higher than the other factors accounting for 7.36%, 5.06% and 4.56% for factors 2, 3, 4 respectively. The importance of all other extracted factors has increased as these explain little more variance than before rotation. Overall, it can be said that 69.70% of the variance in tacit knowledge transfer in universities is explained by the 18 extracted components.

Figure 5.16 provides the Scree plot for all the 57 components. It is a plot of the variance which is associated with each factor. Scree plot is used to determine how many factors should be kept.

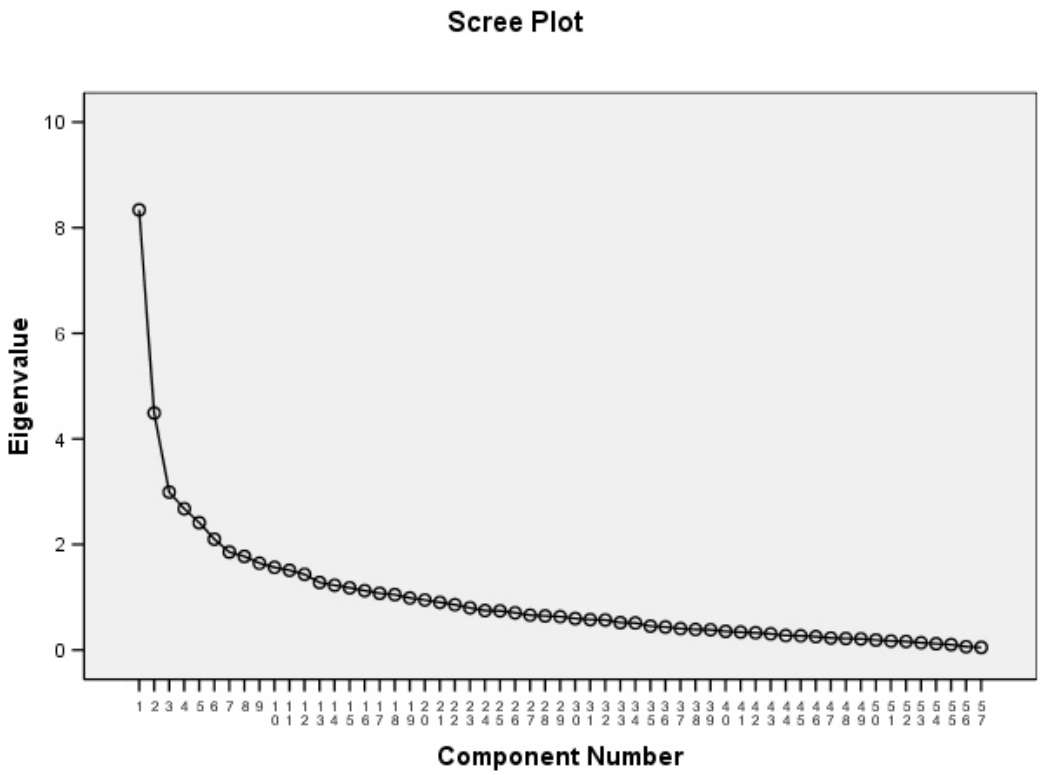

Figure 5.16 – Scree plot for 57 components

According to Soliman (2011), the scree plot shows a distinct break between the steep slope of the large factors and the gradual trailing off of the rest of the factors (the scree). It is evident from the plot that the curve begins to tail off after the first seven factors, but there is yet another drop that can be seen after these seven factors before a stable plateau is formed. After six more factors, the Scree plot line is mostly flat, meaning that each successive factor is accounting for smaller and smaller amounts of the total variance.

5.15 EMERGING THEMES

Table 5.42 presents an abridged version of Rotated component matrix. Three themes have emerged comprising questions 1, 24, 3, 5, 2, 38, 27, 6 in theme 1(Eigen values in

bold and italics), questions 7, 4, 8, 9, 10, 45, 29 in theme 2 and questions 30, 36, 35 in theme 3.

Table 5.42 – Rotated component matrix

Part 1- Set of statements in theme 1

Q no.	Statement	***Theme 1***	Theme 2	Theme 3
1	My university encourages and facilitates sharing of my professional experiences, skills, and knowledge with others.	***0.817***	0.130	0.150
24	My manager values new ideas and encourages innovation.	***0.754***		
3	My university encourages transfer of my ideas, skills, and experiences through mentoring programs.	***0.750***		
5	My university facilitates transfer of personal ideas, skills, and experiences through seminars, workshops and so forth.	***0.670***	0.253	0.169
2	My university provides adequate time to document and share my tacit knowledge.	***0.590***	0.374	
38	My university is a learning organisation i.e. it provides continuous learning opportunities for staff, demonstrates and openness to change and adaptability, has a shared vision.	***0.586***	0.333	0.214
27	Senior management at my university acknowledges and rewards staff who share personal knowledge and experiences with rewards (e.g. Conference funds, Promotion, higher salary).	***0.440***	0.245	0.342
6	My university has an up-to-date directory (like Yellow pages) of academics that can provide information about their work, skills, and experience.	***0.408***	0.393	0.122

Part 2- Set of statements in theme 2

Q no.	Statement	Theme 1	***Theme 2***	Theme 3
7	My university has a formal process of transferring best practices through regular documentation (e.g. FAQs, administrative manuals, lessons learnt, conference reports and so forth)		***0.751***	
4	My university encourages contribution of ideas, skills, and experiences through rotation of courses that I can teach i.e. different courses to teach every few terms.	0.239	***0.722***	0.207
8	My university fosters formal networks, such as communities of practice, to encourage sharing of ideas amongst academics.	0.104	***0.668***	0.103
9	My university encourages sharing of ideas amongst academics. For instance, presentations of publications amongst peers	0.356	***0.605***	0.113
10	My university provides opportunities for employees to interact with one another on an informal basis.(For instance time off work, social gatherings)	0.371	***0.588***	0.117
45	Academics at my university readily share their ideas, experiences and skills in seminars and meetings.	0.282	***0.572***	0.247
29	My university makes effective use of information technology (e.g. e-mail, groupware, Internet, Intranet, learning management systems and videoconferencing) for developing better communication between staff, students and management.	0.431	***0.551***	

Part 3- Set of statements in theme 3

Q no.	Statement	Theme 1	Theme 2	***Theme 3***
30	My university provides training and education on the use of new information technologies that they introduce to make us more adept at their usage.	0.172	0.197	***0.800***
36	My university provides a ready access to application software (e.g. chatting, discussion groups, bulletin boards) and hardware to help me in sharing my personal experiences.	0.229	0.197	***0.714***
35	The policies and procedures on the staff Intranet at my university get rapidly and continually updated.	0.196	0.316	***0.592***

All of those statements which affect transfer of tacit knowledge can be grouped in three themes. Themes based on the Eigen values of various statements as given by factor analysis are discussed below:

Theme 1: University approach and vision of senior management

(a) General and specific approaches prevalent in different universities: On the basis of factor analysis, it is concluded that transfer of tacit knowledge, skills and ideas transfer depends upon universities being encouraging, and facilitation in general. In addition, there are some specific aspects that universities should take care of because these issues also help in transfer of tacit knowledge. These aspects are:

1. Conducting of various mentoring programs, seminars, workshops and so forth.

2. Universities need to provide adequate time to document and share tacit knowledge of their academics.

3. The approach of university: university being a learning organisation i.e. provision of continuous learning opportunities for staff.

4. Universities need to demonstrate openness to change and adaptability.

5. Universities need to have a shared vision and provide facilities like maintaining up-to-date directories of academics. These directories are expected to have information about work, skills, and experience of the academics. The easy availability of such information about academics may assist in the transfer of tacit knowledge, skills and experiences in the universities.

(b) Viewpoints of senior staff members: Besides universities, there are some important perspectives or viewpoints held by the senior management which help in transfer of knowledge and skills in universities. These viewpoints are:

1. Tacit knowledge transfer should be valued and recognized by senior management. If new ideas and innovation find the encouragement of senior staff in universities, this kind of motivation shall lead to more people working on new ideas and innovating efforts by the academics. If new ideas and innovations are not given due importance by senior staff, the transfer of knowledge will be suppressed and will not be active.

2. Acknowledgement of knowledge transfer efforts and rewards to staff members for sharing personal knowledge and experiences can help impact tacit knowledge, skills and ideas transfer favorably. These rewards and

acknowledgements can be given in terms of various financial and non-financial incentives e.g. conference funds, recognition, promotion, higher salary and so forth.

Theme 2: Formal and informal processes for the transfer of tacit knowledge

Three formal processes in universities act as tacit knowledge transfer enablers:

1. The formal process of transferring best practices through regular documentation through various tools like FAQs, administrative manuals, lessons learnt, conference reports and encouraging formal networks, such as communities of practice.
2. Through rotation of courses various academics can teach i.e. teaching different courses every few terms are expected to have enhanced levels of tacit knowledge transfer.
3. Presentations of publications amongst peers

In addition to these two formal processes, informal processes enabling tacit knowledge transfer are:

1. Informal opportunities for employees to interact with one another - for instance time off work, social gatherings.
2. Willingness of academics in various universities to readily share their ideas, experiences and skills in seminars and meetings impacts the transfer of tacit knowledge, skills and experiences in a favourable manner. To enhance this

willingness, universities can provide an enabling environment for academics to share their knowledge, such as informal research/ teaching meetings at department or inter-department levels.

Theme 3: Use of technology

The level of technology used in universities also impacts the transfer of tacit knowledge. Universities need to:

1. Encourage effective use of information technology (e.g. e-mail, groupware, Internet, Intranet, learning management systems and videoconferencing) for developing better communication between staff, students and management.
2. Provide training and education on the use of new information technologies with a view to making academics more adept at their usage.
3. Provide ready access to application software (e.g. chatting, discussion groups, bulletin boards) and adequate supporting hardware.
4. Have policies and procedures on the staff Intranet for easy access and usage.

5.16 CONCLUSION

This chapter has analysed the results of the data collected via the TKTS. The results presented in this chapter were based on the descriptive and correlation analysis of the responses provided by the universities' academics.

The findings have revealed a positive consensus that the surveyed universities are generally very favourable to tacit knowledge transfer. The results indicate a high level of commitment from these universities towards the transfer of tacit knowledge. Time seemed to be one of the deterrents towards tacit knowledge transfer and universities need to address this issue by providing staff time or a reduction in their regular teaching loads. Expertise finder directories should be developed so that it is easy to identify staff that specialise in particular areas of expertise. Formal processes of transferring best practices should be explored and implemented. Where possible, academics should be encouraged to document their tacit knowledge. Universities should also explore opportunities to develop more mentoring programs for staff especially given that this will be a valuable tool in transferring tacit knowledge.

After analysing the responses of the TKTS, the next chapter now focusses on the qualitative analysis of the interview responses.

6

Not everything that can be counted counts, and not everything that counts can be counted - Albert Einstein (1879-1955)

CHAPTER 6 QUALITATIVE RESULTS AND FINDINGS

6.1 INTRODUCTION

Chapter 5 discussed the results of the TKTS. This chapter now presents an analysis of the interviews conducted as part of this research. This chapter describes the qualitative results of the research project as described in Chapter 3. In order to better understand the extent to which tacit knowledge transfer takes place in Australian universities, interviews were conducted. The end of the chapter provides a brief summary of the results.

For the analysis of the interview responses, eight interviews (n=8) were transcribed and imported into the computer software NVivo, a qualitative analysis software. Data was then coded using NVivo. The coding involved different iterations to provide details as

the data was reviewed. The process involved the development of a coding template that summarised the themes identified by the researcher and organised them in a meaningful format. The iterations involved reviewing the interview transcripts and coding relevant information that would be useful in investigating and reaching upon potential findings. Together the analyses involved the use of the whole data while subsequent analyses looked at data by the required dimensions. The reporting of data is based on a structured approach drawing illustrative examples from each interview transcript as required. Direct quotes from the participants have been provided to provide a flavour of the original texts. Short quotes were included to aid in the understanding of specific points of interpretation and a smaller number of more extensive passages of quotations to provide a flavour of the original texts were also added. The aim was to analyse a textual database (from the interview transcriptions) and discover variables relevant to tacit knowledge transfer and their interrelationships.

The findings are structured to answer the research questions utilising the qualitative (interview) data.

The outline of chapter six is illustrated in figure 6.1.

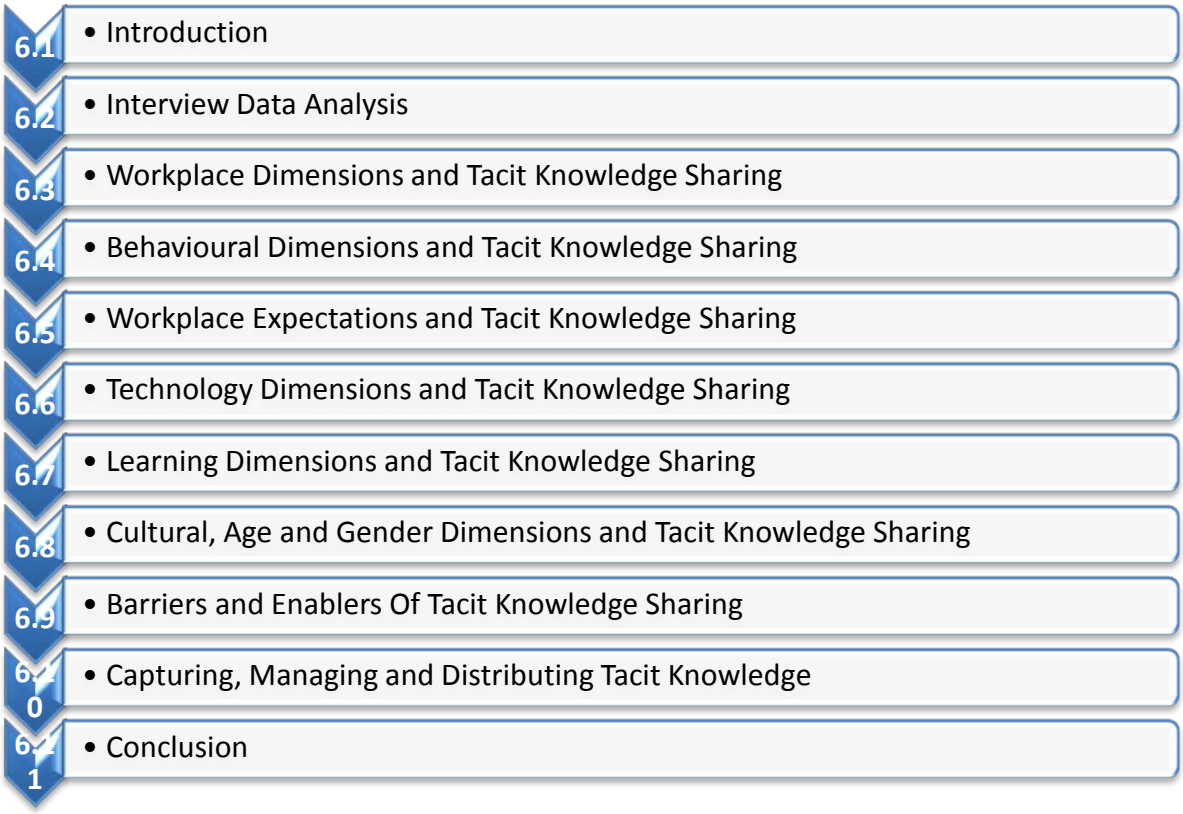

Figure 6.1 – Chapter six outline

6.2 INTERVIEW DATA ANALYSIS

After the administration of questionnaires, interviews were subsequently conducted with 8 academics who responded affirmatively to the interview request. The respondent profile considered ideal for the interviews was a lecturer or senior lecturer and an associate professor or professor from each university. 2 academics were interviewed from each of the four universities and they were either a lecturer or senior lecturer and an associate professor or professor. The total of 8 interviews amounted to 321 minutes of audio, which were transcribed by an external transcription services provider.

The interview questions (Appendix 11) were directly related to the various aspects of the research questions. The research questions focussed on the following aspects:

1. **Workplace dimensions** - This focusses upon exploring how academics' workplace (university) encourages the transfer of tacit knowledge.
2. **Behavioural dimension** – This focusses upon assessing academics' personal traits and their thoughts on tacit knowledge sharing.
3. **Workplace expectation** – It focusses upon the expectations that the workplace (university) has from academics for tacit knowledge sharing.
4. **Technology dimension** – It explores the use of different information and communication technologies and academics' adaptability to ICT for tacit knowledge transfer at the workplace (university).
5. **Learning dimension** - It explores the academics' and their workplaces' (universities) conduciveness to be lifelong learners and learning organisations respectively.
6. **Cultural, age and gender dimensions** - This explores academics' willingness to share tacit knowledge based on cultural background, age and gender.
7. **Barriers and enablers of tacit knowledge transfer in universities**
8. **Measures to capture, manage, and distribute tacit knowledge**

Before analysing the interview responses with each dimension individually, it was felt important to assess whether all the interviewees/respondents had a good understanding of tacit knowledge. The first question of the interview asked the respondents to define tacit knowledge. The various responses that were gathered have been highlighted in italics below:

'Knowledge that's passed from one to the other informally. It's a sort of experientially-based knowledge, that's passed to people informally.'

'the knowledge which is not visible, which we cannot see but people hold them and people share them informally in staff rooms, in discussions, in lunches and dinners.'

'Tacit knowledge means to me the kind of knowledge that is not easy to transfer to another person by means of writing it down or verbalising it and, therefore, tacit knowledge is difficult to be shared and can become personal knowledge only'

'tacit knowledge is a person's understanding, skills, intuitions, experience that they derive from practising a particular – acquiring or practising a particular knowledge set.'

'the knowledge that is difficult to quantify and transfer. It is the knowledge in your head. Tacit knowledge comes from personal experience, skills and other experiences in life. One could also say that it's intangible knowledge. It's an intangible asset for you.'

'knowledge which is in the subconscious, but maybe even as an individual I have never probed it - what all do I know? And we all have in fact when we take some decisions and we think that was an instant decision. It is not an instant decisions, it is a decision based on years and years of subconscious knowledge which has been building up in our brain.'

The responses for the meaning of tacit knowledge confirm that the respondents had a good understanding of tacit knowledge. These responses also confirm the respondents' understanding of the questionnaire before proceeding with interviews as the respondents were recruited from academics who had completed the questionnaire earlier.

Subsequent parts of this chapter now address each of the research questions individually by drawing on the results of the interview. The relationship between the research questions and the interview questions has been outlined in Chapter 1(figure 1.2). The qualitative analysis in the following sections embeds excerpts of the interviewees' responses in italics.

6.3 WORKPLACE DIMENSIONS AND TACIT KNOWLEDGE SHARING

This section aims to qualitatively address the first research question that aims to explore the extent to which academics' workplaces (university) encourage the transfer of tacit knowledge. In order to address this research question, three interview questions (2, 8 & 9) were analysed. These three interview questions focussed on assessing the role of universities/workplaces in encouraging tacit knowledge transfer, role of the academic supervisor in promoting or hampering tacit knowledge transfer and value given to new ideas and innovation.

Workplaces play an important role in providing the right environment for tacit knowledge transfer. The role of a manager is also crucial in providing the right conditions for tacit knowledge transfer to take place effectively. As one respondent

pointed out that the transfer of tacit knowledge is *'a pretty tough gig. It's a tough, tough call and it's easier said than done.'* This interviewee also remarked that *'I don't believe they've got a formal strategy for transfer of tacit knowledge.'*

It seems that universities have gone in a much mechanised direction in recent times with little emphasis on rooting out tacit knowledge. In support of this one of the interviewee's revealed that *'universities are more bent upon bean-counting these days, which is totally contrary to the philosophy of transfer of the top player of tacit knowledge.'* This feeling also touches on the way universities should value altruism, and how the current feelings are incorporated into employment, promotion, rewards and so forth.

However some respondents also felt that whether their university formally encouraged the transfer of tacit knowledge, it does take place in informal settings. From a systematic perspective, changes need to be made to encourage the transfer of tacit knowledge in universities. A lack of openness in communication was also seen as a deterrent with one interviewee pointing out that *'everyone is playing safe and playing safe leads to disaster'.*

Interviewees from one university felt that there are certain cultural traits which in fact work against tacit knowledge transfer. An interviewee noted that *'the culture of the university – both at the faculty level and at the university level totally undervalued, and it did not trust, experience gained elsewhere.'* The whole idea of tacit knowledge transfer is utilising the skills and experience of people which they have gained over their

lifetime and it is these skills and experience that can be used to provide value for universities.

Managers (senior academics responsible for academic matters) play an important role in facilitating the transfer of tacit knowledge. Apart from being facilitators, they are themselves in an important position of transferring tacit knowledge to others below them. However, most interviewees saw their managers (academic supervisors) as being a deterrent in the transfer of tacit knowledge. They perceived their managers as information gatekeepers who were mostly very reluctant to impart their tacit knowledge to others. One of the interviewee remarked that their manager lacked skills that would have promoted tacit knowledge transfer. To this effect, the interviewee remarked that *'Managers like these create a very tense work environment. Which then doesn't allow us to believe in tacit knowledge transfer because if you're going to be reprimanded for every small thing that you are trying to do, why would you do it?'* Undoubtedly different types of leaders make different decisions that can either hamper or enhance the sharing of knowledge. Transformational leadership style is considered a key driver of knowledge management initiatives in an organisation. Transformational leadership places greater emphasis on motivating people and develops long term strategic visions and further inspires people to work towards achieving the vision (Hislop 2009; Vera & Crossan 2004). Nonaka et al. (2006) have argued that leaders need to enable the creation of knowledge. Transformational leaders can be seen as enablers of knowledge management initiatives in an organisation. Pan and Scarbrough (1999) have stated that senior management can help to create a valuable knowledge sharing culture by being proactive and driving a cultural change. Micromanagement is not seen as conducive to

knowledge management efforts. The focus of micro-management is towards day-to-day activities, short term goals and operationally focussed rather than being strategically focussed as in transformational leadership.

The display of the information gatekeeper characteristics by a manager (academic supervisor) led one interviewee to comment that *'I just couldn't get anything out from him and that frustrated me a lot and lured me into a few mistakes I made, which I could have avoided if information was passed on to me, even just a little bit of it.'* This implies that frustration and unnecessary mistakes can be reduced if staff is provided access to information and managers freely share their knowledge with staff below them. One of the interviewees commented that displaying the traits of an information gatekeeper by a manager as '*the antithesis to creativity. When people feel humiliated there isn't a worse emotion to kill and curb motivation than humiliation.'*

The issue of power was also evident in the responses provided by the interviewees. Managers see themselves as the power-holders and are hence prone to say that *'Don't come to me, I don't want to tell you, you do it on your own'* (Interviewee). This notion of information gatekeeper could be seen *'as a red flag in communication. This could also imply that tacit skills are not being passed'* (Interviewee). Knowledge sharing can sometimes be seen as threatening and managers may be reluctant to share as it impacts their status, esteem and power in the university. Baumard and Starbuck (2005) have argued that senior management are often responsible for creating an unconducive environment for employees' unwillingness to share knowledge. Some of the conditions in an unconducive environment could be a culture where employees are reprimanded for

sharing, experimentation and risk taking is not encouraged and inquiry of existing business practices is seen as a threat.

In the case of an interviewee who saw their manager as being a person who wasn't an information gatekeeper, it was evident that trust was an important part in the display of this trait. This interviewee noted that *'my manager would pass any information to others, especially me, provided that I keep it confidence, which I'll always do. So I do prefer this practice because it means I'm a trustworthy person. More importantly, it certainly helps me to make decisions and better or do my job more efficiently and effectively. It especially helps me to increase the accuracy of the work when information is clear, is right in front of you.'* One of the interviewees very aptly put that being an information gatekeeper *'depends from person to person"* and managers need to *"understand the importance of the dissemination of information.'* Information here implies both tacit and explicit knowledge.

The interviewees displayed a very equally divided response to the value that their managers' displayed towards new ideas and innovation. One on the interviewee remarked that *'it is rhetoric in reality and theory in practice.'* However it is evident that academics generally prefer an open door policy that promotes communication. One of the interviewees noted that *'We don't see the managers. We don't - there's no interaction. They take advice from a select few people, which means that you don't get the chance.'* This comment could also imply that managers need to involve more staff in decision making rather than a select few and create a more democratic work process.

Hence, the general notion was that most universities provide a mixture of facilitating conditions however there are areas of improvement. These findings are consistent with the findings of the quantitative analysis too. To conclude this section, the words of an interviewee are quoted who believes that *'The whole purpose of an educational institution is to spread knowledge - that is the fundamental purpose of educational institutions. So the ethos should be exactly the same, otherwise subconsciously the people you are teaching will learn as if information is to be hidden.'*

6.4 BEHAVIOURAL DIMENSIONS AND TACIT KNOWLEDGE SHARING

This section aims to address the second aspect of the research aim that focusses on academics' personal traits and their thoughts on tacit knowledge sharing. In order to address this research question, three interview questions (3, 4 & 7) were analysed. These three interview questions focussed on assessing whether academics freely shared their knowledge with others, how tacit knowledge transfer can improve performance and willingness to pass on tacit knowledge to others.

Apart from a conducive work environment, the personal traits of academics also play an important part in tacit knowledge sharing. In order to identify their personal traits, a question about their willingness to share was asked. All the interviewees responded positively and remarked that they all freely share their knowledge with others. Reasons for why they share freely were also explored. Table 6.1 outlines some of the key reasons that the interviewees provided.

Table 6.1 – Reasons for tacit knowledge sharing

Reasons why academics freely share their tacit knowledge
1. Experienced hence people want to listen
2. Love to share
3. Knowledge sharing is closely tied to identity
4. Allows peers to view you as knowledgeable and skilful
5. Not to get siloed and get a depth in functional disciplinary specialisms

It is important that these reasons are identified and possibly ingrained in all academics. One of the interviewees remarked that the *'love for sharing should be nurtured.'* If universities do not want to hear and to leverage from the tacit knowledge of others, and if it wants *'to constrain and narrow things, then you're just going to get a lot of very frustrated people who basically are constrained in their capacity to share their ideas.'*(Interviewee)

The literature review in Chapter 2 has already pointed out that tacit knowledge transfer can be used to improve employee and workplace productivity, the interview asked academics to reflect on how tacit knowledge transfer can improve their and their university's performance.

In response to this question, one of the interviewees responded that *'It can make you aware of different ways of approaching problems, the different ways of approaching situations. It can make you aware of different capacities of dealing with learning difficulties.'* Since tacit knowledge transfer is not one way transfer and can be bidirectional, it can provide advantages for both parties in the exchange process. An

interviewee remarked that *'I gain a lot by engaging into sharing my knowledge, because other people share their knowledge. So it's not a one-way traffic, it's a two-way traffic.'* This also implies that tacit knowledge sharing leads to enhanced engagement and opinions are *'tested and challenged'* (interviewee). Sharing of tacit knowledge can also be seen as value addition. This has been endorsed by an interviewee who stated that tacit knowledge transfer *'adds value to my work. I feel I freely share my tacit knowledge with others to get better ideas and more improvements in my work, and sometimes to improve their work as well.'* This also corroborates the bi-directional nature of tacit knowledge transfer as it can help both parties in knowledge interchange.

An interviewee also answered that *'you can become more culturally aware, especially in a situation dealing with conflict.'* Sharing tacit knowledge could also imply that you become more culturally sensitive and aware as you increase your knowledge about other cultures. In terms of the usefulness of tacit knowledge transfer for universities, one of the interviewee responded that *'tacit knowledge definitely will help them in making a right move. Strategically, again, we will make a better decision, particularly in today's competitive world. That certainly can gain the university some competitive advantages over others.'*

There is undoubtedly a lot of competition in every organisation. Interestingly all the academics who were interviewed believed that they share knowledge freely however an interviewee commented that *'A lot of academics do not want to share and I can't believe the competitiveness within academia. So these gate-keepers of knowledge, they keep that knowledge to themselves and they don't want to share that with others, which*

I find a bit strange, but also I find that strange because that's our job, isn't it, to distribute that sort of stuff as academics, as educators. There's a pedagogical issue there.'

Converting tacit to explicit knowledge is vital in order to retain tacit knowledge in an organisation and make it available for reuse. To this effect, an interviewee commented that *'by making tacit knowledge explicit, the knowledge is available for re-use and to be used by others, and so knowledge is not tied to a single person. It's tied to the system.'* The real value of tacit knowledge transfer is that it is available for reuse and passed on between different individuals. Tacit knowledge is like *'a guru sitting with disciples and talking about life and experiences'* (Interviewee). It can only be encouraged by making the environment conducive to tacit knowledge transfer.

The real focus of tacit knowledge transfer is ensuring that staff experience and skills are transferred to others. An interviewee's comments to this effect are that *'Tacit knowledge transfer is important because people with experience with all sorts of different things can pass that experience on to people who are starting their jobs.'* Hence it is also assumed that older more experienced employees will pass on their tacit knowledge to much younger and often inexperienced staff. Another interviewee who believed in the importance of transferring tacit knowledge stated that *'in any organisation, tacit knowledge is unspoken know-how. If managers can draw and then effectively use it, tacit knowledge is amongst the organisation's, potentially, most valuable assets and, therefore, it is important for tacit knowledge transfer to happen. It's a very important asset and organisations, including universities.'*

The umpteen anecdotes provided above prove that all the interviewees recognise that tacit knowledge transfer can improve their and their university's performance.

Since the interviewed academics are experts in their field, it was logical to assess whether they would be willing to pass/teach their skills to others in the university. Irrevocably, the answer from all the academics was positive. This led to the assessment of how their skills could be transferred. Overwhelmingly the response was to utilise both formal and informal methods for imparting their skills to others. Formal methods identified by the interviewees were lectures, training sessions, meetings, discussion forums, and seminars. Informal methods mostly focussed upon the provision of social venues (staff room, cafes) where tacit knowledge could be exchanged. Whilst discussing the availability of support for these informal sessions, one of the interviewees exhibited some concern about the availability of resources by commenting that *'I am more than willing to pass my skills to others, whether I have resources to do it is the main issue, main question.'*

An interviewee commented that *'I am willing to offer my help without any time delay. This can be done anywhere suitable to the seekers or anywhere they put you.'* On the other end, one of the interviewee exhibited some reluctance that is evident in this comment *'I will leap in and do, in the programs that I do – only when invited; I don't push myself in there, only when invited.'*

It definitely seems that the scenario is changing and there is definitely willingness towards tacit knowledge sharing (at least from the employees' perspective). One of the

interviewees commented that *'what I know today, I've learned from others. If others had hidden their knowledge - which used to be the paradigm many years ago - only a few people had knowledge and they didn't want the others to have it.'* As evident from the analysis earlier, it is this mindset of an information gatekeeper that needs to be totally eliminated for tacit knowledge transfer to take place successfully.

An interesting perspective from an interviewee has been quoted to conclude this section *'Tacit knowledge transfer involves experience but it doesn't necessarily mean age. I remember a teacher saying to us once that if people say they've got 20 years' experience, have they had one year's experience 20 times over or have they really had 20 years' experience? So age isn't necessary. I mean, it's about how you articulate the experience you've had in the time that you've had.'* University academics need to be supported to be able to deliver and share their tacit knowledge. In reality as one of the interviewees commented that *'When anybody goes into a job you bring 90 per cent of the last job you're in.'* That 90 percent is realistically tacit knowledge. Sharing of tacit knowledge is crucial from both a personal and organisational level as this comment from an interviewee notes *'Knowledge is power and we're in a knowledge economy, supposedly, so it's a commodity, isn't it, really, so it's certainly going to help the university and the individual.'*

Academics have demonstrated a keenness to freely share their knowledge with others. All the interviewed academics recognise that tacit knowledge transfer can improve their and their university's performance.

6.5 WORKPLACE EXPECTATIONS AND TACIT KNOWLEDGE SHARING

This section aims to address the third research aspect of tacit knowledge transfer that attempts to explore the expectations that the workplace (university) has from academics for tacit knowledge sharing. In order to address this research question, question 5 from the interviews was analysed. This interview question focussed on assessing whether transfer of tacit knowledge can be made mandatory and a key performance indicator in the annual performance appraisal/review of academic staff.

Since tacit knowledge transfer is advantageous from both employees' perspective and organisational perspective, it was important to review whether the transfer of tacit knowledge could be made mandatory and a key performance indicator (KPI) in the annual performance appraisal/review for academic staff.

None of the interviewees liberally agreed to this expectation. An interviewee said that *'anything mandatory becomes a pain.'* Another interviewee stated that tacit knowledge transfer is often done *'without knowing it and that's the natural way of tacit management share - and let's encourage that natural way, don't put any barrier to that - and that itself is better than mandatory.'* The reluctance also came out clearly in the following statement by an interviewee who said that *'Mandating anything for academics is very difficult.'* The interviewees provided different options under which it could be included as a key performance indicator however the reluctance was very evident in the responses given. One of the option provided by an interviewee was *'develop a mentoring system which was part of the deal, part of your employment that*

you had to be attached to somebody of experience for a period of time, then I think you could.'

Another interviewee preferred the need to explore putting tacit knowledge transfer as a KPI however focussed more on the need to recognise staff for their efforts. The interviewee exemplified that *'if we are honest enough we can actually figure out a way of putting it into KPI in a way not greatly weighted, but recognising people for their efforts.'* Another interviewee was concerned about the lack of communication skills and saw that as a deterrent to tacit knowledge transfer and including it as a key performance indicator. The interviewee remarked that *'people often have different communication skills so some people may not possess the necessary transferable ability to do so.'* An interviewee also cited concerns about contractual obligations which are exemplified in this statement *'If it is made mandatory then inclusion as KPI would be good, but there will be contractual obstacles, and these need to be well considered.'*

Developing some sort of measurable benchmarks was also an evident issue and academics did not want to be held responsible for tacit knowledge transfer especially if it was not measurable or difficult to measure. An interviewee stated that *'the question is how do we measure the transfer of tacit knowledge?'* In order to know that knowledge has actually been transferred there need to be ways to measure it. To this effect an interviewee commented that *'if you are going to set an objective then you need to have a measurement that is going to adequately measure whether the tacit knowledge has been transferred.'* Another interviewee remarked that tacit knowledge transfer *'is*

something that has to be spontaneous and it will become quasi mandatory really through voluntary participation and that is much better than making it mandatory.'

Considering that the overall consensus from all the interviewees was the non-inclusion of tacit knowledge transfer as a key performance indicator, it seems that other ways of measuring tacit knowledge transfer should be explored. However measurable benchmarks could include a set number of research outcomes, seminar presentations, documenting organisational processes, developing best practice manuals, and participation in communities of practice and so forth. If employees are not willing to part with their sticky tacit knowledge, it has to be cultivated by developing a sharing culture. At this stage, an interviewee's remarks help in concluding this section '*tacit knowledge transfer should be encouraged rather than made as mandatory, as compulsory.'*

6.6 TECHNOLOGY DIMENSIONS AND TACIT KNOWLEDGE SHARING

This section aims to address the fourth research aspect that focusses on the different information and communication technologies used by universities to aid tacit knowledge transfer at the workplace (university) and academics' adaptability to ICT. In order to address this research question, two interview questions (question 10 and part of question 2) were analysed. These two interview questions focussed on assessing whether there were any technology/systems in the universities that aid tacit knowledge transfer and academics' adaptation to information technology implemented by the universities.

Majority of the interviewees were not aware of any information and communication technologies used by their universities to aid tacit knowledge transfer. In fact some of the interviewees even commented about the lack of any such technology in their workplace. Some excerpts from the interviews have been reproduced below to illustrate these facts:

'I don't see any systems or technology actually specifically for knowledge management.'

'There isn't any technology or computerised systems at this place that can assist tacit knowledge transfer.'

'Technology used in the university-None come to mind.'

'Only in the extent of the expertise guide. The expertise guide simply tells people which people have this knowledge.'

'No, there are no technologies or systems in this University that aid in knowledge transfer.'

'Technology should be used, yes. That's right. We are living in the IT world. Why don't we capture this potential? I am not aware of any IT usage not that I'm aware of.'

Since information and communication technologies can be used to improve tacit knowledge transfer, it was imperative to assess how academics adopted to any

information technology implemented by their university. Universities are implementing different technologies to enhance learning and teaching activities although as evident from the statements above, there is lack of technology in the area of tacit knowledge transfer. An interviewee commented that *'there's a lot of technology floating around and I think that's happening in all universities'.*

In this arena of adaptation to information technology, academics were definitely not laggards although it was evident that they were slow adopters. Putting a perspective on the adoption of technology, an interviewee remarked that *'informally is the way I'm thinking of it.'* However this interviewee also highlighted that *'I find it very slow and time-consuming and I've talked to people at other universities about it, too, and they've said the same thing.'* On the other hand, an interviewee felt that he *was 'a quick learner, but a lonely learner.'* The lonely learner adage was used because this interviewee was able to access ICT support through phone only and hence felt that geographical distance was a limitation. Lack of training to the academics was a problem that came out clearly in the interviews. One interviewee exemplified that *'I did figure it out by trial and error, trial and error. But I wouldn't claim that I'm on top of things, but I can get by with the changes in technology.'* Another interviewee echoed similar thoughts on the adoption of information technology by saying that *'I'm certainly not the first out there, I can tell you. I'm the third, probably – the third or fourth – and I need to find out its social benefit before I leap into it.'* However an interviewee who was more confident in the use of technology commented that *'I can't consider myself a digital native but, certainly, I feel comfortable with any IT systems.'*

As evident from the interviewees' comments, there is currently a dearth of systems in universities that support tacit knowledge transfer however in anticipation that such technology will be made available in the future, academics have to rapidly adapt to it. To conclude this section, it is important to say that ICT is here to stay and academics will have to use it in the near future (if they haven't already begun). In fact the sooner they leap, the easier it will become. There will definitely be a learning curve for every new technology. This interviewee's comment helps to conclude this section- *'We have to do it - no choice. Being a slow learner, medium learner, quick learner depends on your operational use of that technology.'*

6.7 LEARNING DIMENSIONS AND TACIT KNOWLEDGE SHARING

This section aims to address the fifth research aspect that examines the academics' and their workplaces' (universities) conduciveness to be lifelong learners and learning organisations respectively. In order to address this research question, question 6 from the interviews was analysed. This interview question focussed on assessing academics' propensity to be a lifelong learner and universities as learning organisations.

The issue of university workplaces as learning organisations has been explored extensively using data provided by the questionnaire's respondents. This section analyses academics' conduciveness to be lifelong learners using data collected from the interviews. Specifically identifying the traits that lifelong learners exhibit was the main motive. Undoubtedly all the academics identified themselves as being lifelong learners.

An interviewee observed that *'When you're an academic you can't escape it. Learning never ends.'*

The traits that interviewees identified as lifelong learners have been summarised in table 6.2 below.

Table 6.2 – Traits of a lifelong learner

Traits of a lifelong learner
1. Curiosity, interest, being exposed to different ideas.
2. An open and inquisitive mind
3. Challenged by new ideas
4. Aims for goals
5. Evaluates choices and makes judgements
6. Passion for sharing
7. Desire
8. Ability to admit ignorance
9. Enjoys change

The curious and inquisitive nature of academics was also identified through a statement by an interviewee who said that *'Do not discard any opinion outright - Dig it out, find out why this person said this. It probably looks like out of the blue, but there must be some reason - okay? If that reason is that that person has some personal problem or something, then you put it in a different basket, but if there is some logic, look into that logic.'* Other traits of lifelong learners come out in these remarks by an interviewee who

said that a lifelong learner *'looks for new challenges, evaluates and solves problems, and also applies knowledge to create new knowledge.'*

As some of the interviewees recognised that lifelong learning means a critical capacity to make judgements then staff have to be given that space to be lifelong learners and to make judgements in organisations. An interviewee commented on how some managers reprimand staff for making mistakes by saying that *'And if they're going to be punished for that – you know, I don't care how many times they use the sort of – the jargon, it's not going to happen.'* One of the critical traits of lifelong learners that came out in the literature review was learning from mistakes. Reprimanding will not help however it is important to learn from those mistakes so that they do not occur in the future. Vince (2001) has stated that learning is about developing and using knowledge, hence the issue of power is organisations needs to be addressed too. Coopey (1998) has suggested that the non-separability of power and knowledge is related to the authority managers possess. A sceptical view of a learning organisation does not focus on providing employees opportunities for creativity and self-development rather subjects them to increased control (Kunda 1992) that stymies tacit knowledge transfer. In such control based learning organisations, an effective communication process should be developed that allows staff to communicate without fear and communication is a two-way process (Hislop 2009).

With the fast pace of changes taking place in academia, it has become more important to be lifelong learners. One of the interviewees recognised that *'most importantly to survive in academia it is important to be a lifelong learner. Especially when new*

developments take place all around.' Another interviewee reverberated similar thoughts although they were more aligned towards the need to change and adapt continually and not just a one-time effort. This interviewee said that *'in order to adapt ourselves to continual change, we also need to learn continually.'*

Being a lifelong learner is a positive attribute for academics and obviously their workplaces. The analysis reveals that academics are open to lifelong learning. This will help to take universities in the right direction as things evolve. Lifelong learners also display a great passion for sharing. The sharing could be for tacit knowledge too. An interviewee also remarked that *'One is never too old to learn'* hence learning really never stops and as another interviewee put it *'You learn from your kids, you learn from a football match, you learn from your colleagues, you learn from the students'*. Hence learning is also a form of tacit knowledge sharing and an endless journey.

6.8 CULTURAL, AGE AND GENDER DIMENSIONS AND TACIT KNOWLEDGE SHARING

This section aims to address the sixth research aspect that explores whether there is a difference in willingness to share tacit knowledge based on educational qualification, age and gender of academics. In order to address this research question, two interview questions (11 and 12) were analysed along with the qualitative data from the comments section of the questionnaire. These two interview questions focussed on identifying whether educational qualification, age and gender of academics were barriers to tacit knowledge transfer.

It may be possible that academics with valuable knowledge and experience will be lost if universities do not act to retain such assets. To emphasise the importance of people in tacit knowledge sharing, Drucker (2001 p.287) states 'knowledge is always embodied in a person; carried by a person; created, augmented or improved by a person; applied by a person; taught and passed on by a person; used or misused by a person. The shift to the knowledge society therefore puts the person in the centre.' Hence retaining people is important. Since it is not always possible to retain older staff, a sustainable approach to preserve tacit knowledge is required. Various authors (Jamrog 2004; Ready & Conger 2008; Somaya & Williamson, 2008) have argued that retention of employees' knowledge is important especially when the knowledge has high competitive value. The threat of losing organisational knowledge would be enigmatic after organisations have invested their resources in nurturing it. There is definitely a need to tap into the tacit knowledge of older much experienced employees. *A* questionnaire respondent commented that *'See what works/has worked for me on the basis of extended experience and personal maturation. As you get older and more experienced, your outlook and perspectives change. Thus your reservoir of communicable knowledge also grows.'* However this does not seem to be the case as the interviewees mentioned age as being a limiting factor.

Two interviewees explicitly focussed on age and gender being barriers to tacit knowledge transfer. To this effect an interviewee commented that *'I have people who are in their 60's, now they're counting retirement days. They wouldn't be interested in transferring or receiving anything.'* Another interviewee reverberated similar thoughts by saying that *'I guess other barriers could be age, definitely, we have a large portion*

of academics, particularly, who are in – what's called seniors in the late '60s.' It seems that these remarks imply that older aged employees are less reluctant to share.

However the quantitative analysis of this study revealed no difference and it seems that when it comes to willingness to share knowledge, skills and experiences from the perspective of older experienced staff or younger novice staff, there is no difference. It is important to note that the quantitative analysis revealed that the correlation between behavioural dimensions and gender, academic title, age, and level of qualification is weak and insignificant, implying that gender, academic title, age, and level of qualification do not hinder or facilitate the sharing or transfer of knowledge, ideas, skills and experiences by university academics. However further in the correlation of behavioural dimensions with employment status, it was found that employment status affects/restricts the free flow of tacit knowledge to each and every one. Knowledge, skills and experiences are shared more by part time academics than other full time academics and sessional staff. Also, this study revealed that statistically significant differences exist in terms of people being selective with whom they share knowledge on the basis of length of service.

An interviewee commented on the gender imbalance but did not specifically mention anything about the reluctance of any particular gender in transferring tacit knowledge. An interviewee commented that *'The other thing, you may have observed in our place on this campus, we do have a gender imbalance. There's more females than male. Now, whether this is a barrier of tacit knowledge transfer, many people may not prefer to admit it but I do feel it is a barrier.'* A female questionnaire respondent saw *'Male*

bullying' being common in their workplace and saw that as a deterrent towards tacit knowledge sharing.

Another female questionnaire respondent focused on seniority and gender as being deterrents of tacit knowledge sharing. The respondent commented that *'Senior staff, particularly professors are often the worst. Worse of all are male professors.'*

A respondent of the questionnaire added that *'my age (28) -the fact that I am an ex-student, now undertaking a PhD -the fact that as a sessional staff member our stake in the role of the university is perceived as very little.'* Another respondent of the questionnaire who was also concerned about gender being a deterrent added that *'I do not have the opportunity to do so as I am a casual lecturer. I rarely see other lecturers as most come in, lecture and leave. And I don't try because they are an old boy's club anyway, there is no chance for a younger woman to get ahead.'* Yet another questionnaire respondent focused on the age factor by stating that *'I mentor young tutors as the older staff think they know everything and are against sharing.'*

The qualitative responses gave no specific clue about educational qualifications being a deterrent towards tacit knowledge sharing however age and gender did appear to be a concern as evident from the quotes provided above. However drawing from the above, it seems that higher the age the lower is the level of sharing. It also seems that males are less reluctant to share than females. It is important to add here that the quantitative analysis of the questionnaire has portrayed contrasting results where it is evident that educational qualification, age and gender do not hinder or facilitate the sharing or

transfer of knowledge, ideas, skills and experiences of the university academics.

6.9 BARRIERS AND ENABLERS OF TACIT KNOWLEDGE SHARING

This section addresses the ninth research aspect that aims to explore the different barriers and enablers of tacit knowledge transfer in universities. In order to address this research question, three interview questions (11, 12 and part of 2) were analysed along with the qualitative data from the comments section of the questionnaire. These three interview questions focussed on identifying the barriers and enablers of tacit knowledge sharing and steps that universities can take to encourage tacit knowledge transfer.

There are several barriers that make the transfer of tacit knowledge difficult. It is vital to identify the barriers so that corrective action can be initiated. An interviewee illustrated differing barriers that deter the transfer of tacit knowledge *'Politics, mind sets, personalities'* to name a few. Other barriers that were identified by another interviewee were *'Lack of leadership, and lack of knowledge management technology in the university'*. Communication was big on the list of barriers that most interviewees provided. One of the interviewee remarked that *'communication issues, and cultural issues - personal - culture of the person and the organisational culture both. The person who is coming from a different background who's not willing to share on the forums, if we go for coffee he will share more than writing which is available to public.'* It is evident from this comment that providing an informal means of communication may be more suitable to tacit knowledge transfer rather than strictly formalising it or making it mandatory.

An interviewee who identified culture as a barrier remarked that *'on this campus, we have different background people. Again, that's my – we have different agenda only in people's mind. It could be an advantage, it could be a barrier but, again, if the culture is correct, barrier could become an incentive. So different ways, two sides of the coin.'* This implies that if universities cultivated the right sharing culture, it could actually be an incentive and academics would be more willing to share.

Age and gender as barriers to tacit knowledge sharing have already been identified in the section 6.8. Another barrier was the lack of interest that was resonated by a questionnaire respondent in the comment that *'some staff are not interested in my ideas my intentions may be misinterpreted as criticism.'* Moving away from these personal characteristics, an interviewee identified *'Job insecurity as another one'* Work overload was also cited as a barrier by a questionnaire respondent who stated that *'people are often too tired and overburdened with admin and bureaucracy to engage in meaningful sharing and reflection.'* Another questionnaire respondent remarked that *'Realistically, we are overloaded with work and the flow of information. This can often prevent sharing of ideas, experiences and skills because you need to prioritise your work and the basics (research, teaching, administration) take precedence.'* In fact the issue of high staff workload being a barrier was cited a number of times by various questionnaire respondents. This issue was certainly high on the agenda for the respondents.

Table 6.3 outlines the barriers that were identified from the interviews and questionnaires.

Table 6.3 – Barriers of tacit knowledge sharing

Barriers of Tacit Knowledge Transfer
1. Culture – personal and organisational
2. Inadequate Communication
3. Lack of resources – time, money
4. Inadequate documentation mechanisms
5. Lack of peer openness/trust
6. Job instability/insecurity
7. Lack of leadership
8. Organisational Politics
9. Lack of incentives
10. Lack of technology and technology incompetence
11. Age and gender
12. Lack of avenues for informal interactions
13. Work overload

Organisational instrumentalist philosophy or bean-counting is seen as being detrimental to tacit knowledge transfer. The problem with bean counting is that it solely comes down to profit and loss and neglects the people aspect. As one of the interviewee exemplifies that '*the barrier is this: everything bean-counted - bean-counting mechanism is the basic barrier. Every time you are doing something you are thinking -*

am I fulfilling - am I ticking a box or not? And most people are just coping with the ticking the boxes. The answer is we are academics, we do not separate between week day and weekend and then we're a sliding scale - you do more work on the weekday, less on weekend - but you can't turn yourself off and if you do, then you're not an academic. So as soon as you even start thinking that as an academic we only work five days a week, it's contrary to being an academic' Academics have echoed a conscientious notion that tacit knowledge transfer should not be made mandatory otherwise it will lead to a further decline in tacit knowledge transfer rather than encouraging it. In fact to make it work more incentives need to be provided.

It is imperative that the identified barriers are eliminated or at least reduced so that tacit knowledge transfer can take place effectively. To support this claim an interviewee very appropriately commented that *'I guess if all the barriers I mentioned could be turned into – really examined or turned to the table around, that would be a way of capturing the tacit knowledge.'* However the interviewees also specifically identified various enablers of tacit knowledge transfer so that it can be captured and reused.

One of the interviewee remarked that it is important *to 'create an atmosphere of encouraging people'* so that tacit knowledge transfer can take place. This interviewee also focussed on the need to create more avenues for informal sharing. The interviewee said that *'I actually personally enjoy the coffee room for knowledge sharing - we help each other, advise each other, so I think it's just great. There's no bossing in there - we are all equal - and that's just the kind of environment probably - very good.'* This is a good example of collegiality and possibly posits a departure from academic hierarchy!

Quite a few interviewees focussed on the provision of more resources so that tacit knowledge transfer could take place. An interviewee remarked that *'the rules of the resource allocation right from the top is not conducive of tacit knowledge transfer at all.'* Apart from monetary resources, lack of time was another concern. A questionnaire respondent commented on the reason for not engaging in sharing knowledge was that *'Without sufficient time, with fulltime teaching and part time researching, sharing my ideas, experiences and skills are not on my priority list. I am struggling to have sufficient time to teaching and research on everyday basis.'* Time as a prohibiting factor was definitely very high on the responses provided by the questionnaire respondents. Another questionnaire respondent said that *'There is absolutely no time provided. Everything we do is on top of our other duties.'* A questionnaire respondent added that *'I teach between 12 and 15 hours per week (including online offshore student teaching). This drains personal energy and provides little opportunity or motivation to reflect and share ideas, experiences and skills.'* The lack of time was a common problem and hence to enable the transfer of tacit knowledge, senior management in universities need to look into this issue and explore how staff can be encouraged to share tacit knowledge. A fine line between the economics of academics' day-to-day operations and sharing of knowledge can only be achieved if some sort of time-release is provided. Below are some excerpts from the questionnaire respondents about a reduction in teaching time so that more time for tacit knowledge transfer is available:

'reduce teaching related load so that I can have time to do other things.'

'Reduce teaching load'

'create time for such activities'

'free time to focus on information transfer'

Cultivating a culture that encourages and promotes tacit knowledge sharing is also vital. One of the interviewee's commented that *'there's a challenge in tempering someone's tacit understanding in a culturally contextual sort of environment.'* It is this sort of challenge that senior managers need to reduce so that the university environment can become more conducive to knowledge sharing. Another interview stated that *'cultivate a sharing culture, it's a good way to start with.'* Yet another interviewee focussed upon the importance of an open culture by saying that *'develop a knowledge sharing culture, so that people come forward and share their good and maybe sometimes bad experience. A learning organisation is one that allows people to take risks.'* A questionnaire respondent said that *'Culture of blame, Fear of failure, Putting people down in public meetings'* are not conducive to sharing ideas, experiences and skills within any university. Another questionnaire respondent exemplified that *'the bureaucratic mindsets and often controlling culture operates antithetically in regard to the notion of building social capital in dynamic and boundaried interfaces and spaces where new paradigms, ideas and solutions might emerge. Control and standardisation can be inhibitive concerning creative thought and sharing ideas'* This comment also aligns with the notion of too much control from senior management as being a prohibitive factor in tacit knowledge sharing. A questionnaire respondent commented that *'Cultural change often needed lead by management encouraging the sharing of ideas.'* Hence a cultural shift is required which needs to be promoted by top

management. Developing a knowledge sharing culture is possible but that can be a difficult and time consuming process (Pan and Scarbrough 1999). Pan and Scarborough (ibid) have emphasised that senior management play an important role in bringing about and facilitating a cultural change. Senior management plays an important role because their behaviour influences that of people working under them. Senior management who exhibit positive leadership traits can motivate their team and have a positive impact on enhancing organisational performance. One of the behaviour influences that senior management can have on their staff is increasing the willingness of employees to share tacit knowledge.

Senior management's commitment in enabling the transfer of tacit knowledge is important. The role of senior management is very crucial in ensuring that staff understand the importance of tacit knowledge transfer. Apart from that, the funding for such activities to take place have to come from senior management. A questionnaire respondent remarked that *'I would have the top-management to announce formally and encourage the sharing.'*

Knowledge worker retention is enhanced when an organisation cultivates an active learning culture, its human resource program and practices support knowledge management initiatives and its senior management supports and understands the importance of knowledge management (Ho 2008). This also leads to an important factor of developing a learning culture that promotes and supports innovation, creativity and risk taking rather than admonish it.

Technology has also been identified as an enabler of tacit knowledge sharing by five interviewees who see ICT playing an important role in capturing, sharing and applying the tacit knowledge. An interviewee focussed on developing expertise finder directories that *'they could set that up so it's sort of a knowledge bank of saying these are the topics that people have the skills in.'* Expertise finder directories are available at some universities. It can be argued that access to academic staffs' expertise does not necessarily translate to a knowledge sharing culture. It may, though, help.

The role of technology in promoting the transfer of tacit knowledge has been explored in the next research question. However, academics must take the first step in trying to codify their knowledge. Then, IT staff must find a way of indexing and structuring the codified knowledge so that it is easily accessible. The stored codified knowledge is of little use if employees are not willing to search for this knowledge when required (Bock et al. 2006). Alternatively universities can adopt push systems where the codified knowledge is pushed out to employees rather than waiting for them to pull it. It can be argued that a push-based system may not be favoured as it can be intrusive and employees may not need the information at that instant. A searchable repository of academics' expertise and know-how can also be seen as a starting step towards knowledge sharing – once tacit knowledge is codified, it becomes, easy to transfer and share between other employees through the use of ICT.

Table 6.4 outlines the enablers that were identified from the interviews and questionnaires.

Table 6.4 – Enablers of tacit knowledge sharing

Enablers of Tacit Knowledge Transfer
1. Cultivate a sharing culture
2. Encourage open communication (both formal and informal)
3. Provide adequate resources (time and monetary)
4. Motivation
5. Introduce and encourage documentation
6. Promote openness and trust
7. Provide job stability/security
8. Senior management commitment
9. Reduce unnecessary organisational politics
10. Provide incentives
11. Introduce technology and provide training
12. Encourage older staff to share
13. Provide more avenues for informal interactions

Nothing can really be done about the age and gender issue except that these staff need to be encouraged to share more freely. The advantages that are there in sharing for them have to be highlighted to them. An interviewee stated that *'motivate people to make people realise how tacit knowledge is so important.'*

For any successful knowledge management initiative in organisation, it is vital that human, social and cultural factors are addressed to ensure success. However, all organisational initiatives towards knowledge sharing will be futile if employees are not motivated to share. Employees' willingness to share will depend upon their perception of the pros and cons of sharing knowledge. If the sharing of knowledge does not produce any good for the employees themselves, the reluctance will be higher and vice-versa.

6.10 CAPTURING, MANAGING AND DISTRIBUTING TACIT KNOWLEDGE

This section addresses the tenth research aspect that focusses on measures to capture, manage, and distribute tacit knowledge. In order to address this research question, three interview questions (11, 12 and part of 2) were analysed along with the qualitative data from the comments section of the questionnaire. These three interview questions focussed on identifying the processes that universities could take to capture, manage, and distribute tacit knowledge.

Mentoring, as means of transferring tacit knowledge, was high on the list for most interviewees. An interviewee remarked that *'I would want to see mentoring as a procedure, introduced in all universities.'* Another interviewee reverberated similar thoughts by stating that *'some mentoring programs might be a good way to start with and that people want to be mentor or some people want to be mentored would be great.'* The value of mentoring was very evident in this interviewee's comments who said that *'I think mentoring people is a very fine way to articulate that sort of thing. I'm very*

much in favour of mentoring. I think people can be mentored, particularly young people who are joining an organisation.' Another questionnaire respondent resonated similar thoughts on the value of mentoring programs in transferring knowledge from an experienced to an unexperienced staff by stating that *'University can create a knowledge sharing culture by attaching junior staff with senior staff who should work as a mentor to junior staff to foster knowledge creating and sharing culture.'* A questionnaire respondent also suggested that *'Setting up and monitoring a mentoring program'* will be a good way to improve the current situation. One of the interviewee's university already has a mentoring program in place but suggested that *'Developing mentoring programs. We have that system, I already told you, but it can be made more effective by more resource allocation.'* Hence the focus on adequate resource allocation (both time and money) is vital so that knowledge transfer can take place successfully.

Universities already have students from diverse cultural backgrounds hence they should also hire staff from diverse cultural backgrounds. One of the interview commented *that 'working with people from a variety of different cultures would also be a great advantage.'* Another interviewee remarked that *'We have to value the diversity. We have to value opinions from all walks of the place.'*

In order to make tacit knowledge available for reuse, it is important to convert it into an explicit form i.e. document/record it. To this effect an interview exemplified that *'Because tacit knowledge is informal, it's in your mind all this time. You're sharing it in your informal networks, in the lunch room or when you're going out for informal chats but maybe documenting might help.'* Another interviewee suggested that

'developing best practice manuals, so that people can learn from those resources.' A questionnaire respondent echoed similar thoughts by saying that *'I would record and codify best practice for future references.'* Another questionnaire respondent remarked that *'promote journalising and documenting activities and events.'* Documentation will enable easy access and distribution of knowledge too. Technology can be used to enable documentation. A knowledge portal/hub could be developed where organisational policies, standard operating manuals, best practices are stored. The portal could also have an online discussion forum built into it along with a café style chat room where staff could discuss ideas and share experiences freely. Video conferencing is useful when employees are geographically dispersed as in multi-campus operations. In geographically dispersed environments, virtual knowledge cafes that support and facilitate knowledge sharing could be developed (Alavi, Kayworth & Leidner 2006).

A system, such as a wiki, could be developed that allowed brief ideas to be captured as they occur to staff. Any system that has a low barrier to entry (i.e., the idea does not have to conform to a standard policy template nor be very detailed) would be helpful. A wiki or other collaborative system that allows groups of documents to be tagged or otherwise grouped based on the areas to which they relate would facilitate sharing of ideas across different areas of the university. That is, common themes that transcend specific teaching and research areas could be identified and different staff could contribute to them, while techniques specific to particular fields could also be identified.

However, it is vital to note that knowledge management initiatives that utilise ICT are necessarily not going to be successful unless accompanying socio-cultural factors are

investigated and addressed. Employees need to address the usefulness of the suggested ICT, if implementation and usage has to succeed. Knowledge sharing in an online space is likely to be more successful in instances, where there is a pre-existing positive social relationship amongst employees (McLoughlin & Jackson 1999). It is possible that ICT combined with face-to-face interactions will be more successful than ICT alone.

Incentives and rewards should be developed for staff who take the time to document their knowledge and/or share their knowledge with others. An interviewee stated that *'incentivise people who share knowledge.'* A questionnaire respondent commented that *'by introducing some sort of acknowledgement or reward on the one's participation/contribution in those knowledge sharing activities'*, it is possible to achieve some level of tacit knowledge sharing. Another questionnaire respondent echoed similar thoughts by stating that universities should *'Really reward collaboration and sharing, collective work.'*

The issue of inadequate time has been highlighted earlier however it is important to reiterate it again here because if staff do not have sufficient time, they will not engage in tacit knowledge sharing. A questionnaire respondent remarked that *'the heavy workload often prevents a proper scholarly exchange.'* Another questionnaire respondent remarked that *'the workload model rewards individual efforts so there is little incentive to share.'* Hence staff workloads should definitely be evaluated if tacit knowledge sharing is to be achieved.

Technology plays an important part in the capturing, managing and distribution of tacit knowledge. As an interviewee commented that *'developing computerised systems such as knowledge-management systems, even developing blogs, with several discussion forums, chat rooms, all this will help, certainly'*, it is important that such technology is explored and implemented by universities not just for access by students but also for tacit knowledge transfer to take place between staff. Another interviewee commented on the usefulness of an online medium in relation to curriculum content by saying that *'develop learning objects within curriculum, particularly for online because it only works best online, which capture people's perspectives and experience in relation to curriculum content.'* The key focus of this interviewee's statement was on capturing people's perspectives and experience hence capturing tacit knowledge and making it available for reuse. Similar thoughts were echoed by another interviewee who stated that *'implement technology and application of technological tools that promote tacit knowledge sharing - Blogs, discussion forums, wikis, expert directories.'*

Table 6.5 identifies key processes to capture, manage and distribute tacit knowledge.

Table 6.5 – Tacit Knowledge Processes

Processes through which tacit knowledge be captured, managed, and distributed
• Mentoring
• Hiring staff from diverse cultural backgrounds
• Documentation
• Develop best practice manuals
• Implement ICT

Processes through which tacit knowledge be captured, managed, and distributed
• Training – soft skills and technology skills
• Develop Communities of Practice
• Balanced workload
• Encourage more seminar and workshops

Since one of the barrier that came out earlier focused on the lack of leadership, an interviewee remarked that *'executive training might not be too bad, and a bit of really well thought out org behaviour, development and such like, just to broaden people's tolerance and understanding of the perspectives and their value contribution.'* Hence adequate training should be provided to widen senior management perspective on the importance of tacit knowledge sharing.

It is crucial to create an environment that can encourages staff to share more freely. An interviewee commented that *'You can only create an environment which encourages people to talk more, have more discussions. They're not necessarily formal, in fact lots of these are informal discussions.'* This interviewee also focussed upon *'one thing we are doing is very interesting - what's called now this community of practice'* In fact communities of practice are also a very good way of tacit knowledge sharing and often provide an informal environment over which such ideas can be brought out and discussed. A questionnaire respondent stated that *'creating right environment and mediums for knowledge transfer to flourish, involve champions, identify a process that works for the uni and incrementally develop it.'*

To conclude this section, an interviewee's comments brilliantly resound the whole point of this research that *'I do feel positive and I think we're on the way that tacit knowledge is going to be captured and should be reused. Otherwise, it's a pity for university, for any other organisation, to lose those people who have experiential knowledge. Once they go, they go. That's not good. Their knowledge should be in-house and your organisation, whatever it is, will definitely maintain competitive advantage.'* However all the resources and support that a workplace will provide will be inadequate if staff do not feel intrinsically motivated to share their tacit knowledge. A questionnaire respondent commented that *'These are useful, but the true motivation comes from my own drive.'* Another questionnaire respondent echoed similar thoughts that focussed on intrinsic motivation by commenting that *'My university relies on self-motivation in the sharing of ideas, experiences and skills.'* No level of technology and support will help as a questionnaire respondent commented that *'It comes down to an individual's personal attitudes and practices in relation to dissemination of such things.'* Hence tacit knowledge transfer efforts should be made by academics too by focussing on how it will improve their and the university's performance.

6.11 CONCLUSION

This chapter has analysed the results of the data collected during the interviews. The results presented in this chapter were based on qualitative analysis of the responses provided by the universities' academics.

As pointed out in the discussion, analysis of most of the qualitative responses was quite consistent with the quantitative analysis responses. Whilst age, gender and culture did not come out as barriers in the quantitative research, they evidently appeared as barriers in the qualitative research.

However, adopting a mixed method research has provided a far greater perspective and better understanding of tacit knowledge sharing than would have been achieved through solely one method. Johnson & Onwuegbuzie (2004) have stated that 'in many cases the goal of mixing is not to search for corroboration but rather to expand on our understanding' (pg.19).

The findings have also revealed various enablers and barriers of tacit knowledge transfer and importantly some key processes to capture, manage and distribute tacit knowledge. The last chapter will now focus on presenting a summary of the research, its contributions and limitations, as well as the directions for future research.

7

If you have knowledge, let others light their candles at it - Margaret Fuller (1810-1850)

CHAPTER 7 CONCLUSION

7.1 INTRODUCTION

This research has attempted to advance the understanding of tacit knowledge transfer in Australian universities. The complex nature of tacit knowledge challenges every organisation and different approaches to retain and transfer tacit knowledge have been attempted in practice with varying levels of success and failure. The research began with identification of the research aim and questions and the selection of a research methodology. The research questions of this study were geared towards achieving an overriding aim. The research aim of the study was to explore the extent to which transfer of tacit knowledge takes place in Australian universities. Four Australian universities (CQUniversity, RMIT, Swinburne and Victoria University) were selected based on their long history in the education sector thus providing a lot of scope for

analysing tacit knowledge transfer. These four universities are undergoing a lot of change, both in terms of organisational structure and introduction of new programs, and are rapidly strengthening their position towards the provision of learning and teaching services to national and international students. It is their uniqueness in the education sector that made them ideal for this study. The four universities were also chosen based on their program offerings to undergraduate and postgraduate students. Student cohorts in the chosen universities exceed 20,000 students. One of the focus in choosing a representative sample was also to spread out over research and training intensive universities. All four universities are public universities.

The empirical findings for this study were drawn from the responses to the specifically designed questionnaires and interviews. The survey instrument was designed to understand the various dimensions (workplace, behavioural, workplace expectations, technology, learning, and cultural, age and gender) of tacit knowledge transfer by university academics and to address the research questions. The development of the survey instrument was deemed necessary for this research as such previously used and validated instrument did not exist, especially one that focussed on the university environment. The interview questions enabled the researcher to gather in-depth information that helped in exploring and corroborating the six dimensions identified in the data analysis of the survey instrument.

This chapter firstly summarizes the findings and implications of this study and provides some key recommendations that may encourage and contribute towards the transfer of tacit knowledge in universities. It then focuses on the main contributions of this

research. This chapter also discusses the limitations of the study, together with some suggestions for future research directions in this area. This chapter finally wraps up with concluding thoughts for the study. The outline of chapter seven is illustrated in figure 7.1.

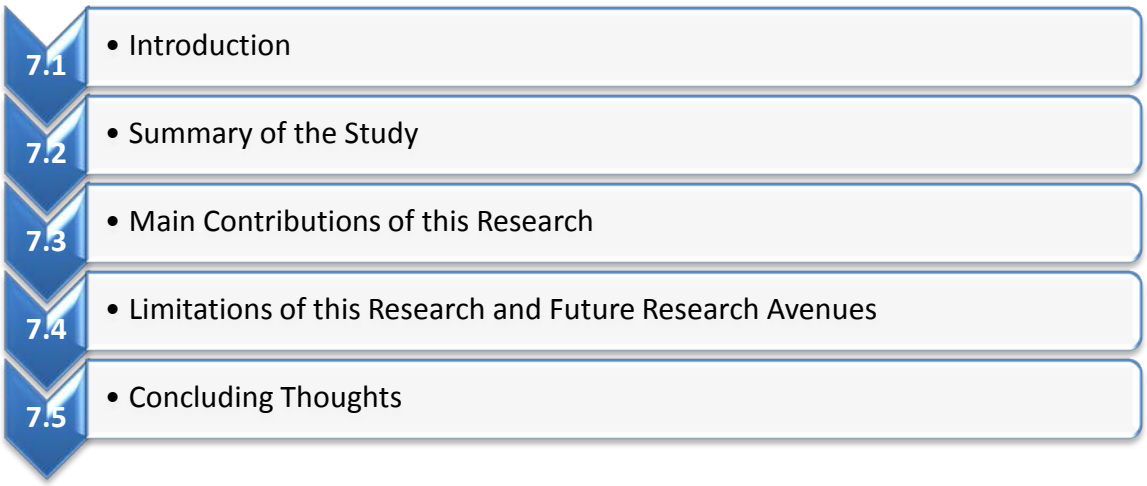

Figure 7.1 – Chapter seven outline

7.2 SUMMARY OF THE STUDY

A recapitulation of the key findings of this study can be found below as they relate to the research questions. The first aspect of enquiry aimed to focus on workplace dimensions was 'the extent to which academics' workplaces (university) encourages the transfer of tacit knowledge.' The key findings were:

1. The selected universities generally encourage and facilitate the sharing of professional experiences, skills and knowledge with others however this is incongruent with some other findings in this dimension such as inadequate provision of time.

2. Universities provided inadequate time to facilitate documentation and sharing of tacit knowledge.
3. Universities do not encourage transfer of ideas, skills, and experiences through mentoring programs.
4. Universities do not encourage contribution of ideas, skills, and experiences through rotation of courses. Getting academics to teach different courses in their discipline area will help in rooting out tacit knowledge from the minds' of academics.
5. Universities facilitate the transfer of tacit knowledge university through seminars, workshops and so forth.
6. There was a lack of up-to-date directory of academics to facilitate transfer of information about their work, skills, and experience.
7. A lack of formal process of transferring best practices through regular documentation was evident.
8. Formal networks are fostered by universities to encourage sharing of ideas amongst academics.
9. A lack of informal settings to facilitate sharing of tacit knowledge was indicated by the respondents.

The second aspect of enquiry aimed to focus on behavioural dimensions was 'academics' personal traits and their thoughts on tacit knowledge sharing.' The key findings were:

1. Most academics believe in sharing of tacit knowledge and sharing does not lead to the erosion of their academic standing. However managers were seen as

information gatekeepers who were reluctant to participate in tacit knowledge sharing.

2. There is a high agreement from the surveyed academics that tacit knowledge sharing leads to improved outcomes for everyone.
3. Sharing of tacit knowledge will not negatively impact academics' careers prospects however academics are selective with whom they share their knowledge.
4. Most respondents believe that the transfer of ideas, skills and experience encourages an autonomous work environment by providing more information to others enabling them to complete their tasks.
5. There is no significant difference between male and female respondents about plagiarism and false claims out of tacit knowledge sharing although male respondents are more fearful of plagiarism and false claims out of tacit knowledge sharing than female academics. Most academics readily share their academic and administrative experience and knowledge with others. Female academics have indicated a higher level of propensity to share knowledge than their male counterparts. Most respondents prefer and like to collaborate with others however male academics collaborate more than female academics.

The third aspect of enquiry aimed to focus on workplace expectations was 'expectations that the workplace (university) has from academics for tacit knowledge sharing.' The key findings were:

1. More than two-thirds of the respondents feel that their managers value new ideas and encourage innovation.

2. Low expectations of senior management towards the transfer of tacit knowledge. The respondents felt that managers should have a higher expectation of tacit knowledge sharing.
3. Respondents generally felt that their senior management does not acknowledge and reward staff for sharing personal knowledge and experiences. Rewards for sharing knowledge could encourage academics to share tacit knowledge with others.
4. Respondents felt that it is important to utilise the knowledge of near retirement highly experienced academics to mentor their peers.
5. None of the interviewees liberally agreed to the expectation that the transfer of tacit knowledge could be made mandatory and a key performance indicator (KPI) in the annual performance appraisal/review for academic staff. This may imply the development of a more collegial and scholarly structure.

The fourth aspect of enquiry aimed to focus on technology dimensions was 'the different information and communication technologies used by universities to aid tacit knowledge transfer at the workplace (university) and academics' adaptability to ICT.' The key findings were:

1. Universities make effective use of various means of information technology (e.g. e-mail, groupware, Internet, Intranet, learning management systems and videoconferencing) for developing better communication between staff, students and management. Majority of the interviewees were not specifically aware of any ICT used by their universities to aid tacit knowledge transfer. In fact some

of the interviewees even commented about the lack of any such technology in their workplace.

2. Academics are can easily adapt to information technologies implemented by their university but adoption can be slow. On the other hand respondents showed scepticism towards the use of a lot of technology (discussion forum, web chat, blogs) to share tacit knowledge.
3. Electronic transmission of information does not lead to an overload of information.
4. Access to the documents academics need within their university's databases is not very easy.
5. Access to application software (e.g. chatting, discussion groups, bulletin boards) and hardware to help in sharing personal experiences is low.

The fifth aspect of enquiry aimed to focus on learning dimensions was 'the academics' and their workplaces' (universities) conduciveness to be lifelong learners and learning organisations respectively.' The key findings were:

1. An overwhelming majority of academics consider themselves to be lifelong learners i.e. inquiring mind, committed to ongoing personal development, experiment with new ways of doing their work.
2. Most respondents also believe that their university provides continuous learning opportunities for staff, demonstrates and openness to change and adaptability, has a shared vision. However, on the other end, respondents believe that universities are very critical of failure and do not see it as a learning process.
3. Peers are appreciative of the feedback provided about their work.

The sixth aspect of enquiry aimed to focus on culture, age and gender dimensions was 'to identify a difference in willingness to share tacit knowledge based on educational qualification, age and gender of academics.' Key findings were:

1. Academics strongly feel that tacit knowledge in terms of skills, ideas and experience that has been acquired over a number of years should be available for reuse.
2. More than half of the participants have held the opinion that cultural background of people has an impact on their willingness to share ideas, skills and experiences. Respondents felt that training of cultural awareness can improve people's willingness to share ideas, experiences and skills.
3. When it comes to willingness to share knowledge, skills and experiences from the perspective of older experienced staff or younger novice staff, there is no difference. All share equally. However the views reflected differently in the qualitative analysis, where age and gender were seen as being deterrents of tacit knowledge sharing. Male academics are less likely to share than females.
4. Qualitative responses gave no specific clues about educational qualifications being a deterrent towards tacit knowledge sharing.
5. Trust plays an important part in the sharing of ideas and experience. This also ties in with the notion of being selective of people with whom knowledge is shared. Respondents indicated that job security has a major role to play in transfer of knowledge, skills and experiences in universities settings. Job security promotes tacit knowledge sharing.

The seventh aspect of enquiry aimed to identify whether 'employment status has an impact on tacit knowledge sharing.' The key findings were:

1. On-going part-time academics have a more favourable viewpoint on tacit knowledge sharing.

The eighth aspect of enquiry aimed to identify whether 'tenure at the university has an impact on tacit knowledge sharing.' The key findings were:

1. No statistically significant difference between the overall tacit knowledge sharing for six different levels of length of service was found.

The ninth aspect of enquiry aimed to identify 'the different barriers and enablers of tacit knowledge transfer in universities.' The key findings were:

1. Barriers: culture (personal and organisational), inadequate communication, lack of resources, inadequate documentation mechanisms, lack of peer openness/trust, job instability/insecurity, lack of leadership, organisational politics, lack of incentives, lack of technology and technology incompetence, age and gender, lack of avenues for informal interactions and work overload.
2. Enablers: cultivate a sharing culture, encourage open communication, provide adequate resources, motivation, introduce and encourage documentation, promote openness and trust, provide job stability/security, senior management commitment, reduce unnecessary organisational politics, provide incentives, introduce technology and provide training, encourage older staff to share and provide more avenues for informal interactions.

The tenth aspect of enquiry aimed to identify 'ways to capture, manage, and distribute tacit knowledge.' The key findings were:

1. The processes through which tacit knowledge be captured, managed, and distributed are: mentoring, hiring staff from diverse cultural backgrounds, documentation, developing best practice manuals, implementing ICT, training (soft skills and technology skills), developing communities of practice, balancing workload, and encouraging more seminar and workshops.

Perhaps the most unexpected finding of this study was the high degree of participation in tacit knowledge transfer exhibited by academics. The data revealed that most academics readily share tacit knowledge with others and majority also agreed that sharing of tacit knowledge leads to improved outcomes for everyone through enhanced performance. Based on the data analysis, there is reasonable certainty that for the population of academics surveyed and interviewed, a positive perception exists that tacit knowledge transfer takes place however there are key areas where the selected universities can provide procedural and social support to encourage further tacit knowledge transfer.

This study contributes to the literature by providing a more integrative view of various tacit knowledge transfer enablers and barriers; as both driven by individuals (academics) and the expectations of workplaces (universities).

Since tacit knowledge is elusive in nature, it is vital to retain tacit knowledge that is highly valuable although the retention comes with its own unique challenges.

Increasing job mobility in the workforce is a growing concern. This problem is exacerbated with the baby boomers retiring. These problems are not necessarily unique to any particular industry since it is a trend across all industries. However university academics are an increasingly aging populace and hence retaining their tacit knowledge is paramount.

Since knowledge is often embedded in practice, the practices or processes adopted by academics and the tacit knowledge they possess is localised and context specific. It is becoming very vital that universities need to make all attempts to convert tacit knowledge to explicit. In order to enhance any university's performance, it is crucial that the knowledge, skills and experience of staff are retained.

However implementation of tacit knowledge sharing practices should be seen as only the first step in an evolving management process that will eventually include more formal and systematic practices.

Senior management needs to play a more important role in facilitating the management and sharing of tacit knowledge. To do this, open communication needs to be encouraged and social processes need to be developed that are conducive to tacit knowledge transfer.

The enablers and processes identified earlier will require considerable monetary investments especially if staff teaching loads are varied so that tacit knowledge transfer can take place. It really is a catch-22 position since currently universities are at doldrums to reduce their spending. However, it is crucial that universities acknowledge

the value of their intellectual capital and develop channels that allow the transfer of tacit knowledge. There is no doubt that to usher such a tacit knowledge sharing attitude organisationally would require significant investment in resources from different levels of a university. Any direction that universities will take will require some level of experimentation to see what works best for them. A one-size-fits-all shoe may not be suitable.

7.3 MAIN CONTRIBUTIONS OF THIS RESEARCH

This research is important in the evolution of learning organisations and presents a number of original contributions to research in the area of tacit knowledge transfer. This research focussed on the level of tacit knowledge transfer analysis largely untouched by current academic literature. Although most of the tacit knowledge transfer within organisations lacks focus on people, the transfer of tacit knowledge transfer cannot be explored without understanding the perceptions of people.

The research incorporated a qualitative and quantitative analysis approach to the data gathered to analyse the extent to which tacit knowledge transfer takes place in four Australian universities. A questionnaire was specifically developed for this study and the questionnaire itself represents a research tool that has practical applications in multiple domains.

Most significantly, the research has taken place using academics as the main sample as they deal with tacit knowledge on a daily basis. They are involved in tacit knowledge

creation, distribution and application. This research is the first to explore the transfer of tacit knowledge by university academics. Previous research explored the notion of tacit knowledge transfer within universities but ignored academics. This research has allowed the findings to be better placed with regard to the university environments in which they were discovered. The collection and analysis of empirical data in this research supplements the current limited understanding of tacit knowledge transfer specifically in university settings. The results of this research highlight the barriers that need to be addressed and areas where universities need to make improvements in order to encourage and facilitate tacit knowledge sharing. It focuses attention on important areas that are often neglected but are significant for tacit knowledge transfer.

In the broader context of universities, there a number of significant implications for tacit knowledge transfer from an organisational perspective. Some practices that can be adopted to improve tacit knowledge transfer are:

- Develop and nurture communities of practices
- Develop online discussion forums
- Promote a knowledge sharing culture
- Develop rewards that encourage sharing
- Develop a mentoring system that pairs experienced and inexperienced academics
- Develop avenues that encourage more social interactions (both formally and informally)

Universities also need to take steps to motivate their staff, invest in training and reward staff for sharing their tacit knowledge with others in the university. Tacit knowledge transfer should be valued and recognized by senior management.

The findings of the research will have both theoretical and practical implications for information science, knowledge management and business management. Possible beneficiaries of the research will include universities that will be able to implement the findings towards the adoption of knowledge management in their organisational culture with an aim to improve processes and performance. The findings can assist universities by concentrating their resources in dimensions that are currently inadequate. The evidence that was revealed from the academics provides insights for universities that should help in improving tacit knowledge transfer. It will also provide a valuable resource to my professional peers who wish to conduct further study into this field since limited quantitative research has been accomplished in this field. It is hoped that the findings open up further avenues and opportunities for future research into the area of tacit knowledge transfer in a diverse range of organisations.

7.4 LIMITATIONS OF THIS RESEARCH AND FUTURE RESEARCH AVENUES

Like any study, this study also has a number of limitations and areas where further study could be conducted. The study has identified a few limitations that hindered it from obtaining more conclusive results. A prime limitation of the research and the underlying survey was that the questions were very mono-directional on "sharing" of

tacit knowledge only. There are other dimensions such as idea/skill generation, unforeseen problem solving skills, impromptu help, voluntarism and interests in cross-discipline areas that can be further explored in research ahead.

The second limitation involves the scope of empirical investigations, which was conducted in selected four universities (higher education). The results must therefore be validated against other types of organisations.

Thirdly further research could be undertaken by performing a longitudinal study of tacit knowledge transfer within a single university in order to track the transfer. A longitudinal study is likely to indicate changes in the way tacit knowledge is transferred and the research could be of benefit to track how actively academics are engaging in tacit knowledge transfer.

The fourth limitation is that the scope of the investigation of knowledge objects focused solely on individuals (academics) and excluded any assessment at collective levels such as those of teams, functional groups, and inter-organisational level. The conversion processes of knowledge objects at the collective level may not be the same as at the individual level. Hence there is considerable scope for future research into the tacit knowledge transfer dimensions between knowledge objects at the collective level.

The fifth limitation of this study is that it was conducted in Australian universities. It is plausible that universities in other countries with different cultures may demonstrate dissimilar results.

Finally, owing to the current sample size, it would also be deemed inappropriate to generalise the findings to a larger population of academics. However, like any survey this study also provides a picture of the reality. The data gained is not necessarily indicative of the universities but only indicative of the academics who responded. It is also not advisable to assume that the analysis revealed the view of all academics in Australia or universities but a view of the respondents only. It definitely represents how these people view the transfer of tacit knowledge.

The limitations described above may affect the interpretation and generalisation of the results. Hence, it is important that the findings are interpreted and applied with care.

This study was primarily explorative as it sought to understand various dimensions that impact on tacit knowledge transfer. The findings have contributed to the existing body of tacit knowledge transfer by providing a deeper insight into universities specifically and more importantly transfer of tacit knowledge by academics. However the findings should preferably be used as a research foundation to trigger further future investigation into the following potential areas:

- Assess tacit knowledge transfer against other philosophical and theoretical dimensions.
- Assess the role of ICT in the transfer of tacit knowledge.
- Assess the transfer of tacit knowledge in other professional departments of a university.
- Explore inter-university tacit knowledge transfer.

- Replicate this study and utilise the TKTS and interview questions in other organisations. Future research could broaden the applicability of the findings of this study.

7.5 CONCLUDING THOUGHTS

The research questions raised as part of this research have been addressed. This final chapter provided a summary of the research, followed by key findings. The chapter concluded with the contributions made by this research and the impact it will have on theory and practice, followed by suggestions for further research stemming from the identified limitations.

Tacit knowledge in general is an abstract concept and hard to measure. The importance of knowledge transfer cannot be inconspicuous and effort needs to be made to retain it. Bringing about any change in universities is not going to be easy but it is hoped that some of the concrete ideas presented would lead to practical implementations in the future. The ineffability of tacit knowledge does not imply that universities or any other organisation should not expend resources to encourage tacit knowledge transfer. It is through encouragement, allocation of resources and elimination of barriers that tacit knowledge transfer will take place successfully.

The most basic step for every organisation is to realise the importance of creating and applying tacit knowledge as a primary rationale. Tacit knowledge transfer is important for all organisations and universities are unique since they are knowledge organisations.

Tacit knowledge is an intangible asset for any organisation which is ingrained in their employees and leaves the company once the employee decides to leave. This research has emphasised that tacit knowledge is elusive and fluid in nature but has to be disseminated and internalised to create new knowledge in the form of explicit knowledge. For any knowledge management effort to be effective within an organisation, an assortment of different approaches is required to deal with the diversity of knowledge types and differences.

The findings have revealed that universities are consciously trying to capture, retain and transfer tacit knowledge although there are some areas where further improvement is possible. Whilst the analysis in this research is limited to the higher education sector, it can be argued that the vast majority of such tacit knowledge transfer characteristics are embedded within other organisations in diverse sectors too.

For any organisation, tacit knowledge is an intangible asset which is ingrained in their employees and leaves the company once the employee decides to leave. In conclusion, universities should continue to provide ample opportunities for tacit knowledge transfer. This will enable them to have a competitive advantage and also ensure that tacit knowledge is readily available for reuse.

On a more cautious note, it is important to remember that simply by implementing the recommendations, employees may not necessarily respond to these initiatives. Appropriate training will need to be structured to create an awareness of the final aims

of tacit knowledge sharing and how it will take universities into the future by making them more competitive and a place where learning culture thrives.

REFERENCES

Adams, GR & Schvaneveldt, JD 1991, *Understanding research methods*, 2nd edn. Longman, New York.

Alavi, M & Leidner, DE 2001, 'Review: knowledge management and knowledge management systems: conceptual foundations and research issues', *MIS Quarterly*, vol. 25, no. 1, pp. 107-136.

Alavi, M 2000, 'Managing organizational knowledge', in R. Zmud (ed.), *Framing the domains of IT management: Projecting the future through the past*, Pinnaflex Educational Resources, Cincinnati, pp. 15-28.

Alavi, M, Kayworth, TR & Leidner, EL 2006, 'An empirical examination of the influence of organizational culture on knowledge management practices', *Journal of Management Information Systems*, vol. 22, no. 3, pp.191-224.

Allan, G 2003, 'A critique of using grounded theory as a research method', *Electronic Journal of Business Research Methods*, vol. 2, no. 1, pp. 1-10.

Alvesson, M & Karreman, D 2001, 'Odd couple: making sense of the curious concept of knowledge management', *Journal of Management Studies*, vol. 38, no.7, pp. 995-1018.

Alvesson, M 2000, 'Social Identity and the problem of loyalty in knowledge-intensive companies', *Journal of Management Studies*, vol.37, no.8, pp. 1101-1123.

Anderson, JR 1983, *The architecture of cognition*, Harvard University Press, Cambridge, MA.

Andrews, KM & Delahaye, BL 2000, 'Influences on knowledge processes on organisational learning: The psychosocial filter', *Journal of Management Studies*, vol. 37, no.6, pp.797-809.

Antonacopoulou, EP 2006, 'The relationship between individual and organizational learning: New evidence from managerial learning practices', *Management Learning*, vol.37, no.4, pp. 455-473.

Argote, L, McEvily, B & Reagans, R 2003, 'Introduction to the special issue on managing knowledge in organizations: Creating, Retaining, and Transferring knowledge', *Management Science*, vol. 49, no. 4, pp. 571-582.

Aurum, A, Daneshgar, F, &Ward, J 2007, 'Investigating knowledge management practices in software development organisations – an Australian experience', *Information and Software Technology* (in press).

Babbie, E 1990, *Survey research methods*,2nd edn, Wadsworth, Belmont.

Bartol, K & Srivastava, A 2002, 'Encouraging knowledge sharing: the role of organizational reward systems', *Journal of Leadership and Organization Studies*, vol. 19, no. 1, pp. 64-76.

Bate, SP & Roberts, G 2002, 'Knowledge management and communities of practice in the private sector: lessons for modernising the National Health Service in England and Wales', *Public Administration*, vol. 80, no.4, pp.643-663.

Baumard, P 1999, *Tacit knowledge in organisations*, Sage Publications, Thousand Oaks.

Baumard, P & Starbuck, WH 2005, 'Learning from failures: why it may not happen', *Long Range Planning*, vol. 38, no.3, pp. 281-298.

Benbya, H, Passiante, G, & Belbaly, NA 2004, 'Corporate portal: a tool for knowledge management synchronization', *International Journal of Information Management*, vol. 24, no. 3, pp. 201-220.

Bender, S & Fish, A 2000, 'The transfer of knowledge and the retention of expertise: the continuing need for global assignments', Journal of Knowledge Management, vol.4, no.2, pp.125-37.

Bishop, J 2006, *Knowledge transfer and engagement forum*, viewed 12 November 2012, http://www.chass.org.au/speeches/SPE20060616JB.php

Blair, DC 2002, 'Knowledge management: hype, hope, or help?', *Journal of the American Society for Information Science and Technology*, vol. 53, no.12, pp. 1019-1028.

Blumentritt, R & Johnston, R 1999, 'Towards a strategy for management', *Technology Analysis & Strategy Management*, vol. 11, no. 3, pp. 287-300.

Bock, GW, Kankanhalli, A, & Sharma, S 2006, 'Are norms enough? The role of collaborative norms in promoting organisational knowledge seeking', *European Journal of Information Systems*, vol.15, no. 4, pp.357-367.

Bogner WC & Bansal P 2007, 'Knowledge management as the basis of sustained high performance', *Journal of Management Studies*, vol.44, no. 1, pp. 165-188.

Bollinger, AS & Smith, RD 2001, 'Managing organizational knowledge as a strategic asset', *Journal of Knowledge Management*, vol. 5, no. 1, p. 8-18.

Botha, A, Kourie, D & Snyman R 2008, *Coping with continuous change in the business environment, knowledge management and knowledge management technology*, Chandos Publishing, Oxford.

Bradburn, N.M 1978, 'Respondent burden', Paper presented at the *138th Annual Meetings of the American Statistical Association*, San Diego.

Bryman, A 2004, *Social research methods*, 2nd edn, Oxford University Press, Oxford.

Burchell, B & Marsh, C 1992, 'The effect of questionnaire length on survey response', *Quality and Quantity*, vol. 26, pp. 233-244.

Busch, P 2008, *Tacit knowledge in organizational learning*, IGI-Global, Hershey.

Cape P. (2010), 'Questionnaire Length, Fatigue Effects and Response Quality Revisited', ARF Re:think 2010, viewed 15 March 2012, http://www.surveysampling.com/ssi-media/Corporate/white_papers/SSI_QuestionLength_WP.image

Carson, D, Gilmore, A, Perry, C & Gronhaug, K 2001, *Qualitative market research*, Sage Publications, London.

Cavana, RY, Delahaye, BL & Sekaran, U 2003, *Applied business research: qualitative and quantitative methods*, John Wiley & Sons, Milton Queensland.

Cepeda G 2006, 'Competitive advantage of knowledge management', in DG Schwartz (ed.), *Encyclopedia of Knowledge Management*, Idea Group Reference, Hershey, pp. 34-43.

Chiva, R & Allegre, J 2005, 'Organisational learning and organisational knowledge:towards the integration of two approaches', *Management learning*, vol. 36, no. 1, pp. 49-68.

Chong, SC 2005, 'Implementation of knowledge management among Malaysian ICT companies: An empirical study of success factors and organisational

performance', *Unpublished academic dissertation*. Multimedia University, Malaysia.

Choo, CW, 2000 'Working with knowledge: how information professionals help organizations manage what they know', *Library Management*, vol. 21, no. 8, pp. 395-403.

Cohen, L, & Manion, L 1994, *Research methods in education*, 4th edn, Routledge, London.

Cohen, L, Manion, L, & Morrison, K 2003, *Research methods in education*, 5th edn, Routledge, London.

Coleman, JS1988, 'Social capital in the creation of human capital', American *Journal of Sociology*, vol. 94, pp. S95-S120.

Comley, P 1996, Internet surveys: the use of the Internet as a data collection method, *ESOMAR/EMAC: Research Methodologies for "The New Marketing" Symposium*, ESOMAR Publication Services, vol. 204, pp. 335–346.

Connelly, CE & Kelloway, EK 2003, 'Predictors of employees' perceptions of knowledge sharing culture', *Leadership & Organization Development Journal*, vol. 24, no. 5, pp. 294-305.

Converse, PD, Wolfe, EW, Huang, X, & Oswald, FL 2008, 'Response rates for mixed-mode surveys using mail and email/web', *American Journal of Evaluation*, vol. 29, pp. 99-107.

Cook, J & Brown, JS 1999, 'Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing', *Organization Science*, vol. 10, no.4, pp. 381-400.

Coopey, J 1998, 'Learning to trust and trusting to Learn: a role for radical theatre', *Management Learning*, vol. 29, no. 3, pp. 365-382.

Corbetta, P 2003, *Social research theory, methods and techniques*. Sage Publications, London.

Cortada, J (ed.)1998, *Rise of the knowledge worker, Resources for the knowledge-based economy*, Butterworth-Heinemann, Boston.

Creswell JW & Plano Clark VL 2007, *Designing and conducting mixed methods research*, Sage, Thousand Oaks.

Creswell, JW 1994, *Research design: qualitative and quantitative approaches*, Sage Publications, Thousand Oaks.

Creswell, JW 2003, *Research design: qualitative, quantitative and mixed methods approaches*, Sage, Thousand Oaks.

Creswell, JW 2005, *Educational research: planning, conducting, and evaluating quantitative and qualitative research*, 2nd edn, Pearson Education, New Jersey.

Curlette, W 2006, 'A framework for research studies: mixed methods through combining Bayesian statistics and qualitative research in individual psychology', *The Journal of Individual Psychology*, vol. 62, no.3, pp.338-349.

Davenport, TH 2005, *Thinking for a living: how to get better performance and results from knowledge workers*, Harvard Business School Press, Boston.

Davenport, TH & Prusak, L 1998, *Working knowledge: how organizations manage what they know*, Harvard Business School Press, Boston.

Davenport, TH & Prusak, L 2000, *Working knowledge: how organisations manage what they know*, Harvard Business School Press, Boston.

de Heer, WF & Israels, AZ 1992, 'Response trends in Europe', *ASA Proceedings of the Section on Survey Research Methods*, pp. 92-101.

de Holan, PM, Phillips, N & Lawrence, TB 2004, 'Managing organizational forgetting', *MIT Sloan Management Review*, vol. 42, no. 5, pp. 45-51.

DeLong, DW 2004, *Lost knowledge: confronting the threat of an aging workforce*, Oxford University Press, Oxford.

de Vaus, DA 2002, *Surveys in social research*, 5th edn, Allen & Unwin, Sydney.

Deholan, PM, Phillips, N & Lawrence, T B 2004, 'Managing organizational forgetting', *MIT Sloan Management Review*, vol. 45, no. 2, pp. 45-51.

DeLong, DW, & Fahey, L 2000, 'Diagnosing cultural barriers to knowledge management', *Academy of Management Executive*, vol. 14, no.4, pp. 113-127.

Denzin, NK 1989, *The research act: a theoretical introduction to sociological methods*, 3rd edn, Prentice Hall, Englewood Cliffs.

Dewberry C 2004, *Statistical methods for organisational research*, Routledge, London.

Dick, B 2000, '*A beginner's guide to action research'* viewed 19 July 2012, http://www.scu.edu.au/schools/gcm/ar/arp/guide.html

Dillman, DA 2000, *Mail and Internet surveys-the tailored design method*, 2nd edn, John Wiley & Sons, New York.

Douglas, D 2003, 'Inductive theory generation: A grounded approach to business inquiry', *Electronic Journal of Business Research Methods*, vol. 2, no. 1, pp. 47-54.

Droege, SB, & Hoobler, JM 2003, 'Employee turnover and tacit knowledge diffusion: a network perspective', *Journal of Managerial Issues*, vol.15, no.1, pp. 50-64.

Drucker, PF1998, 'Management's new paradigms', *Forbes*, vol. 162, no.7, pp. 152-177.

Drucker, PF 1999, 'Beyond the information revolution', *The Atlantic Monthly*, pp. 47-57.

Drucker, PF 2001, *The essential Drucker*, Harper Collins, New York.

Drucker, PF 1993, *Post capitalist society*, Harper Business, New York.

Einstein A, F n.d., *Quotation Details - Quotation #26950*, viewed 12 February 2014, http://www.quotationspage.com/quote/26950.html

Empson, L 2001, 'Introduction: knowledge management in professional service firms', *Human Relations*, vol. 54, no. 7, pp. 811-817.

Field, AP 2005, *Discovering Statistics using SPSS* , 2nd edn, Sage publications, London.

Finch, J 1987, 'Research note: the vignette technique in survey research', *Sociology*, vol. 21, pp.105-114.

Firestone, JM & McElroy, MW 2003, *Key issues in the new knowledge management*, Butterworth-Heinemann, Boston.

Flemming, G, & Sonner M 1999, Can Internet polling work? Strategies for conducting public opinion surveys online. Paper prepared for the *May annual meeting of the American Association for Public Opinion Research*, Montreal, Que.

Flick, U 1998, *An introduction to qualitative research: Theory, method, and applications*, Sage, London.

Fontana, A & Frey, J 1998, 'Collecting and interpreting qualitative materials', in Denzin, N & Lincoln, Y(eds.), *Interviewing: The Art of Science*, Sage, Thousand Oaks, pp. 47-78.

Foos, T, Schum, G, & Rothenberg, S 2006, 'Tacit knowledge transfer and the knowledge disconnect', *Journal of Knowledge Management*, vol. 10, no. 1, pp. 6-18, (online Emerald).

Frappaolo, C & Wilson, LT 2003, 'After the gold rush: harvesting corporate knowledge resources', *Intelligent KM*, viewed 19 July 2012, http://www.intelligentkm.com/feature/feat1.shtml

Fuller, M n.d., *Quotation Details - Quotation #2658*, viewed 12 February 2014, http://www.quotationspage.com/quote/2658.html

Gall, MD, Gall, JP & Borg, WR 2002, *Educational research: an introduction* ,7th edn, Allyn & Bacon.

Garavelli, AC, Gorgoglione, M, & Scozzi, B 2002, 'Managing knowledge transfer by knowledge technologies', *Technovation*, vol. 22. pp.269-279.

Garson, GD 2012, *Survey research*, Statistical Associates Publishers, Blue Book Series, Amazon Digital Services.

Gibbs, GR 2006, *Qualitative data analysis: explorations with NVivo*, Open Univeristy Press, Berkshire.

Giga Information Group 1997, *Best practices in knowledge management*, Norwell, MA.

Glaser, B & Strauss, A 1967, *The discovery of grounded theory - strategies for qualitative research*, Weiderfield and Nicholson, London.

Goh, SC 2002, 'Managing effective knowledge transfer: an integrative framework and some practice implications', *Journal of Knowledge Management*, vol. 6, no. 1, pp. 23-30.

Grant, RM 1991, 'The resource-based theory of competitive advantage: implications for strategy formulation', *California Management Review,* vol. 33, no. 3, pp. 114–135.

Grant, KA 2007, 'Tacit knowledge revisited – we can still learn from Polanyi', *The Electronic Journal of Knowledge Management,* vol. 5, no. 2, pp. 173-180.

Guba, EG & Lincoln, YS 1994,'Competing paradigms in qualitative research', in NK Denzin & YS Lincoln (eds.), *Handbook of Qualitative Research,* Sage, Thousand Oaks.

Gummesson, E 2000, *Qualitative methods in management research,* Sage Publications, Thousand Oaks.

Gummesson, E.2003, 'All research is interpretive!', *Journal of Business & Industrial Marketing*, vol. 18, no. 6/7, pp. 482-492.

Gunn, H 2002, 'Web-based surveys: changing the survey process', *First Monday*, vol. 7, no.12.

Gupta, AK & Govindarajan, V 2000, 'Knowledge flows within multinational corporations', *Strategic Management Journal*, vol. 21, no. 4, pp. 473-96.

Gupta, B, Iyer LS, & Aronson JE 2000, 'Knowledge management: practices and challenges', *Industrial Management and Data Systems*, vol. 100, no.1, pp.17-21.

Hansen, MT, Nohria, N & Tierney, T 1999, 'What's your strategy for managing knowledge?', *Harvard Business Review*, vol. 77, no. 2, pp.106-116.

Healy, M. & Perry, C. 2000, 'Comprehensive criteria to judge validity and reliability of qualitative research within the realism paradigm', *Qualitative Market research*, vol. 3, no. 3, pp. 118-126.

Heberlein, T & Baumgartner, R 1978, 'Factors affecting response rates to mailed questionnaires: A quantitative analysis of the published literature', *American Sociological Review*, vol.43, no.4, pp. 447-462.

Helgeson, JG & Ursic, ML, 1994, 'The role of affective and cognitive decision-making processes during questionnaire completion', *Public Opinion Quarterly*, vol. 11, no. 5, pp. 493-510.

Hendriks PHJ 2001, 'Many rivers to cross: from ICT to knowledge management systems', *Journal of Information Technology*, vol 16, no. 2, pp 57-72.

Herbert, F n.d., *Quotation Details - Quotation #26173*, viewed 12 February 2014, http://www.quotationspage.com/quote/26173.html

Heron, J & Reason, P 1997, 'A participatory inquiry paradigm', *Qualitative Inquiry*, vol.3, no.3, pp. 274-294.

Heron, J 2001, 'The placebo effect and a participatory world view', in D Peters (ed.), *Understanding the placebo effect in complementary medicine: theory, practice, and research*, Churchill Livingstone, New York, pp. 189-212.

Hertog, JFD & Huizenga, E 2000, *The knowledge enterprise: implementation of intelligent business strategies*, Imperial College Press, London.

Hislop, D 2009, *Knowledge management in organizations: a critical introduction*, 2nd edn, Oxford University Press, New York.

Ho, LA 2008, 'What affects organizational performance? The linking of learning and knowledge management', *Industrial Management + Data Systems*, vol. 108, no. 9, pp. 1234-1254.

Hopkins, DJ & King, G 2010, 'Improving anchoring vignettes: designing surveys to correct interpersonal incomparability', *Public Opinion Quarterly*, vol. 74, no. 2, pp. 201-222.

Horwitz, FM, Heng, CT, & Quazi, HA 2003, 'Finders, keepers? attracting, motivating and retaining knowledge workers', *Human Resource Management Journal*, vol. 13, no.4, pp. 23-44.

Housel, TJ & Bell, AH 2001, *Measuring and managing knowledge*, McGraw-Hill Irwin, Boston.

Huang, JC & Wang SF 2002, 'Knowledge conversion abilities and knowledge creation and innovation: a new perspective on team composition', *Proceedings of the Third European Conference on Organizational Knowledge, Learning, and Capabilities*, 5-6 April 2002, Athens, Greece.

Hunter, L, Beaumont, P & Lee, M 2002, 'Knowledge management practice in Scottish law firms', *Human Resource Management Journal*, vol. 12, no. 2, pp. 4-21.

Hussey, J & Hussey, R 1997, *Business research*, Macmillan, London.

Hussain, F, Lucas, C, & Ali, MA 2004, 'Managing knowledge effectively', *Journal of Knowledge Management Practice*, pg.1-12, viewed 19 July 2012, http://www.tlainc.com/articl66.htm.

Hutley, S & Solomons, T 2004, 'Generational change in Australian librarianship: viewpoints from generation X', *ALIA 2004 Biennial Conference: Challenging Ideas*, viewed 11 November 2011, http://conferences.alia.org.au/alia2004/pdfs/hutley.s.paper.pdf

IBM 2011, '*Factor analysis'*, viewed 14 June 2013, http://publib.boulder.ibm.com/infocenter/spssstat/v20r0m0/index.jsp?topic=%2Fcom.ibm.spss.statistics.help%2Fidh_fact.htm

Ichijo, K, & Nonaka, I 2007, *Knowledge creation and management: new challenges for managers*, Oxford University press, New York.

Isaac, S & Michael, WB 1995, *Handbook in research and evaluation*, 3rd edn, EdITS, San Diego.

Jackson, SE, Hitt, MA & DeNisi, AS 2003, *Managing knowledge for sustained competitive advantage: designing strategies for effective human resource management*, Jossey-Bass, San Francisco.

Jackson, KM & Trochim, WMK 2002, 'Concept mapping as an alternative approach for the analysis of open-ended survey responses', *Organizational Research Methods*, vol. 5, no. 4, pp. 307-336.

Jacobson, R 1990, 'Unobservable effects and business performance', *Marketing Science*, vol. 9, no. 1, pp.74-85.

James, P 2005, 'Knowledge asset management: the strategic management and knowledge management nexus', *DBA thesis*, Southern Cross University.

Jamrog, J 2004, 'The perfect storm: the future of retention and engagement', *Human Resource Planning*, vol. 27, no. 3, pp. 26-33.

Jasimuddin, SM 2007, 'Exploring knowledge transfer mechanisms: the case of a UK-based group within a high-tech global corporation', *International Journal of Information Management*, vol. 27, no. 4, pp. 294-300.

Johnson B & Christensen L 2012, *Educational research: quantitative, qualitative and mixed approaches*, 4th edn, Sage Publications, Thousand Oaks.

Johnson, MJ 2002, 'In-depth interviewing', in JE Gubrium & JA Holstein (eds.), *Handbook of interview research: Context and method*, Sage, Thousand Oaks, pp. 103-109.

Johnson, RB & Onwuegbuzie, AJ 2004, 'Mixed methods research: A research paradigm whose time has come', *Educational Researcher*, vol. 33, no. 7, pp. 14–26.

Jorgensen, DL 1989, *Participant observation: a methodology for human studies*, Sage Publications, Newbury Park.

Kakabadse, NK, Kouzmin, A & Kakabadse, A 2001, 'From tacit knowledge to knowledge management: leveraging invisible assets', *Knowledge and Process Management*, vol. 8, no. 3, pp. 137-154.

Kakabadse, NK, Kakabadse, A, & Kouzmin, A 2003, 'Reviewing the knowledge management literature: towards a taxonomy', *Journal of Knowledge Management*, vol. 7, no. 4, pp. 75-91.

Karkoulian, S, Halawi, LA & McCarthy, RV 2008, 'Knowledge management formal and informal mentoring: an empirical investigation in Lebanese banks', *The Learning Organization*, vol. 15, no. 5, pp. 409-420.

Karlsen, JT & Gottschalk, P 2004, 'Factors affecting knowledge transfer in IT projects', *Engineering Management Journal*, vol. 16, no. 1, pp. 3-10.

Kets de Vries, MFR 1991, 'Whatever happened to the philosopher-king? The leader's addiction to power', *Journal of Management Studies*, vol. 28, no. 4, pp. 339-351.

Kidwell,JJ, Vander Linde, KM & Johnson SL, 2000, 'Applying corporate knowledge management practices in higher education', *Educause Quarterly*, no. 4, pp. 28-33.

Kinash, S 2010, Paradigms, methodology and methods, Bond University, Australia , viewed 21 February 2014,http://www.bond.edu.au/prod_ext/groups/public/@pub-tls-gen/documents/genericwebdocument/bd3_012336.pdf

Kogut, B & Zander, U 1996, 'What firms do? Coordination, identity and learning', *Organization Science*, vol.7, no. 5, pp. 502–518.

KPMG 2000, *Knowledge management research report*, KPMG Consulting.

KPMG 2003, *Insights from KPMG's European knowledge management survey 2002/2003*, KPMG Knowledge Advisory Services, Netherlands.

Krauss, SE 2005, 'Research paradigms and meaning making: A primer', *The Qualitative Report*, vol.10, no. 4, pp. 758-770.

Kunda, G, 1992, *Engineering culture: control and commitment in a high-tech corporation*, Temple University Press, Philadelphia.

Kvale, S 1996, *Interviews: An introduction to qualitative research interviewing*, Sage Publications, London.

Laupase, R 2003, 'Rewards: do they encourage tacit knowledge sharing in management consulting firms? case studies approach', in E.Coakes(ed.), *Knowledge management: current issues And challenges*, Idea Group Inc., Hershey, PA, USA, pp. 92-103.

Leech, SA & Sutton, SG 2002, 'Knowledge management issues in practice: opportunities for research', *International Journal of Accounting Information Systems*, vol. 3, no. 2, pp. 69-73.

Lehaney, B, Clarke, S, Coakes, E & Jack, G 2004, *Beyond knowledge management*, Idea Group Publishing, London.

Leonard, D1998, *Wellsprings of knowledge: building and sustaining the sources of innovation*, Harvard Business School Press, Boston.

Lesser, EL & Storck, J 2001, 'Communities of practice and organisational performance', *IBM Systems Journal*, vol. 40, no.4, pp 831-841.

Levene, H 1960, 'Robust tests for equality of variances', in I Olkin, SG Ghurye, W Hoeffding, WG Madow & HB Mann (eds.), *Contributions to Probability and Statistics: Essays in Honor of Harold Hotelling*, Stanford University Press, Menlo Park, CA, pp. 278-92.

Lichtenberg GC n.d., *Quotation Details - Quotation #2933*, viewed 12 February 2014, http://www.quotationspage.com/quote/2933.html

Lim, D & Klobas, J 2000, 'Knowledge management in small enterprises', *The Electronic Library*, vol. 18, no. 6, pp. 420-32 (Online Emerald).

Lin, C, Yeh, J, & Tseng, S 2005, 'Case study on knowledge-management gaps', *Journal of Knowledge Management*, vol. 9, no. 3, pp. 36-50(Online Emerald).

Lincoln, YS & Guba, EG 1985, *Naturalistic inquiry*, Sage, Beverly Hills.
Locke, K 2001, *Grounded theory in management research*, Sage, Thousand Oaks.

Loermans, J 2002, 'Synergizing the learning organization and knowledge management', *Journal of Knowledge Management*, vol. 6, no. 3, pp.285-294.

Loshin, P 2001, October 22, Knowledge management. *ComputerWorld*, 56, viewed 19 July 2012, http://www.computerworld.com/databasetopics/data/story/0,10801,64911,00.html

Lubit, R 2001, 'Tacit knowledge and knowledge management: the keys to sustainable competitive advantage', *Organizational Dynamics*, vol. 29, no.4, pp.164 178.

Luck, DJ, & Rubin, SR 1987, *Marketing research*, 7th edn, Prentice-Hall, EnglewoodCliffs.

Mackenzie, N & Knipe, S 2006, 'Research dilemmas: paradigms, methods and methodology', *Issues in Educational Research*, vol. 16, no. 2, pp. 193-205.

Majchrzak, A, Cooper, LP, & Neece, OE 2004, 'Knowledge reuse for innovation', *Management Science*, vol.50, no.2, pp 174-189.

Management Review & AMA Research 1999, Survey on knowledge management, *Management Review*, April, pp. 20-26.

Marshall, MN 1996, 'Sampling for qualitative research', *Family Practice*, vol. 13, no.6, pp. 522-525.

Martin E 2006, Vignettes and respondent debriefings for questionnaire design and evaluation, *Research Report Series: Survey Methodology #2006-8*, U.S. Bureau of Census, viewed 19 July 2012, http://www.census.gov/srd/papers/pdf/rsm2006-08.pdf

McDermott, R & O'Dell, C 2001, 'Overcoming cultural barriers to sharing knowledge', *Journal of Knowledge Management*, vol. 5, no. 1, pp.76-85.

McKelvie, SJ 1978, 'Graphic rating scales: how many categories?', *British Journal of Psychology*, vol. 69, pp. 185-202.

McKinlay, A 2002, 'The limits of knowledge management', *New Technology, Work and* Employment, vol. 17, no. 2, pp. 76–88.

McLoughlin, I & Jackson, P 1999, 'Organisational learning and the virtual organisation' in P. Jackson (ed.), *Virtual working: social and organisational dynamics*, Routledge, London, pp. 178-192.

McNurlin,BC, Sprague Jr, PH & Bui,T 2009, *Information systems management in practice* 8th edn, Pearson Education, Upper Saddle River.

Mertens, DM 2010, *Research and evaluation in education and psychology: integrating diversity with quantitative, qualitative, and mixed methods*, 3rd edn, Sage, Thousand Oaks.

Mertler, CA, & Earley, MA 2003, A Comparison of the psychometric qualities of surveys administered by web and traditional Methods, Paper presented at the *April annual meeting of the American Educational Research Association*, Chicago.

Miles, MB, & Huberman, AM 1994, *Qualitative data analysis: an expanded sourcebook*, 2nd edn, Sage, Newbury Park.

Miller W 1996, Capitalizing on knowledge relationships with customers, in *Proceedings Knowledge Management '96*, Business Intelligence Inc. London.

Mingers, J 2006, 'A critique of statistical modelling in management science from a critical realist perspective: its role within multimethodology', *Journal of the Operational Research Society*, vol. 57, no. 2, pp. 202-219.

Minichiello, V, Aroni, R, Timewell, E & Alexander, L 1990, *In-Depth interviewing: researching people*, Longman Cheshire, Melbourne.

Monette, DR, Sullivan TJ & DeJong, CR 2002, *Applied social research*, Harcourt Press, Orlando.

Morse, JM 1995, 'The significance of saturation', *Qualitative health research*, vol. 5, pp. 147-149.

Muralidhar, S 2000, Knowledge management: a research scientist's perspective, in TK Srikantaiah & MED Koenig (eds.), *Knowledge Management For the Information Professional*, ASIST Monograph Series, Information Today, Medford, NJ.

Nayir, DZ, & Uzuncarsili, U 2008, 'A cultural perspective on knowledge management: the success story of Sarkuysan company', *Journal of Knowledge Management*, vol. 12, no.2, pp. 141–155.

Neuman, WL 2003, *Social research methods: qualitative & quantitative approaches*, 5th edn, Pearson Education, USA.

Neuman, WL 1997, *Social Research Methods: qualitative and quantitative approaches*, 3rd edn, Allyn and Bacon, Boston.

Nevis, E, DiBella, A, & Gould, J 1995, 'Understanding organizations as learning systems', *Sloan Management Review*, vol. 36, no. 2, pp. 73-85.

Newell, SM & Swan, J 2000, 'Trust and inter-organizational networking', *Human Relations*, vol. 53, no. 10, pp.1287-1328.

Newell,S, Bresnen, M, Edelman,L, Scarbrough,H, & Swan,J 2006, 'Sharing knowledge across projects: limits to ICT-led project review practices', *Management Learning*, vol.37, no.2, pp.167-185.

Newman,I & Benz, CR 1998, *Qualitative-quantitative research methodology: exploring the interactive continuum*. Southern Illinois University Press, Cardondale.

Nidumolo S, Subramani M, & Aldrich A 2005, 'Situated learning and situated knowledge web: exploring the ground beneath knowledge management', *Journal of Management Information System*, vol. 18, no. 1, pp.115-150.

Nissen, ME 2005, 'Dynamic knowledge patterns to inform design: a field study of knowledge stocks and flows in an extreme organization', *Journal of Management Information Systems*, vol. 22, no.3, pp. 225-263.

Nonaka, I 1991, 'The knowledge creating company', *Harvard Business Review*, vol.69, no.6, pp. 96-104.

Nonaka, I 1994, 'A dynamic theory of organizational knowledge creation', *Organization Science*, vol. 5, no. 1, pp. 14-37.

Nonaka, I & Takeuchi, H 1995, *The knowledge-creating company: how Japanese companies create the dynamics of innovation*, Oxford University Press, New York.

Nonaka, I, Toyama, R & Konno, N 2000, 'SECI, Ba and leadership-A unified model of dynamic knowledge creation', *Long Range Planning*, vol. 33,no. 1 pp. 5-34.

Nonaka, I, von Krogh ,G, & Voelpel S 2006, 'Organizational knowledge creation theory: Evolutionary paths and future advances,' *Organisation Studies*, vol. 27, no. 8, pp. 1179–1208.

Nunnally, JC & Bernstein, LH 1994, *Psychometric theory*, McGraw-Hill, New York.

Nunnally, JC 1978, *Psychometric theory*, McGraw-Hill, New York.

O'Dell, C 2002, Knowledge management new generation, presented at the *APQC's 7th Knowledge Conference*, Washington DC.

O'Leary, A 2004, *The essential guide to doing research*, Sage Publications, London.

O'Neal, S 2005, 'Total rewards and the future of work', *Workspan*, vol. 48, no. 1, pp.18-26.

Oltra, V 2005, 'Knowledge management effectiveness factors: The role of HRM', *Journal of Knowledge Management*, vol. 9, no. 4, pp. 70-86.

Onwuegbuzie, AJ & Leech, NL 2007, 'Sampling designs in qualitative research: making the sampling process more public', *The Qualitative Report*, vol.12, no. 2, pp.238-254.

Owen, J, Burstein, F, & Mitchell, S 2004, 'Knowledge reuse and transfer in a project management environment', *Journal of Information Technology Cases and Applications*, vol. 6, no. 4, pp. 21-35.

Pan, SL & Scarbrough, H 1999, 'Knowledge management in practice an exploratory case study', *Technology Analysis & Strategic* Management, vol.11, no.3, pp.359-374.

Parlby, D & Taylor, R 2000, '*The power of knowledge: a business guide to knowledge management*', viewed 19 July 2012, www.kpmgconsulting.com/index.html

Pasternack, BA & Viscio, AJ 1998, *The centerless corporation: a new model for transforming your organization for growth and prosperity*, Simon & Schuster, New York.

Patton, MQ 1987, *How to use qualitative methods in evaluation*, Sage, Newbury Park.

Patton, MQ 1990, *Qualitative evaluation and research methods*, Sage Publications, Newbury Park.

Patton, MQ 2001, *Qualitative research and evaluation Methods*, 2nd edn, Sage Publications, Thousand Oaks.

Pauleen, DJ & Yoong, P 2001, 'Relationship building and the use of ICT in boundary-crossing virtual teams: a facilitator's perspective', *Journal of Information Technology*, vol. 16, no. 4, pp. 205-220.

Peariasamy, T & Mansor, NNA 2008, 'On-the-job knowledge sharing: how to train employees to share job knowledge', *Jurnal Kemanusiaan bil*, vol. 12, pp. 88-101.

Pedler, M, Burgoyne, J & Boydell, T 1997, *The learning company: a strategy for sustainable development*, 2nd edn, McGraw-Hill, London.

Pek, J 2008, *'A brief introduction to SPSS factor analysis'*, viewed 14 June 2013, http://www.yorku.ca/pek/index_files/quickstart/SPSSQuickStart.pdf

Pemberton, JD & Stonehouse, GH 2000, 'Organisational learning and knowledge assets – an essential partnership', *The Learning Organization*, vol. 7, no. 4, pp. 184-93.

Perry, C, Riege, A & Brown, L 1999, 'Realism's role among scientific paradigms in marketing research', *Irish Marketing Review*, vol. 12, no. 2, pp. 16-23.

PhillipsKPA 2006, Knowledge transfer and Australian universities and publicly funded research agencies, *A report to the Department of Education, Science and Training*, viewed 10 August 2012, http://ict-industry-reports.com/wp-content/uploads/sites/4/2009/02/2006-knowledge-transfer-australian-universities-report-philips-kpa-dest.pdf

Polanyi, M 1958, *Personal knowledge: towards a post-critical philosophy*, University of Chicago Press, Chicago.

Polanyi, M 1966, *The tacit dimension*, M. E. Sharp Inc, New York.

Prat N 2006, 'A hierachical model for knowledge management', in DG Schwartz (ed.), *Encyclopedia of Knowledge Management*, Idea Group Reference: Hershey, PA, pp. 848- 854.

Prusak, L 1997, *Knowledge in organizations*, Butterworth-Heinemann, Boston.

Prusak L 2006, 'Foreword', in DG Schwartz (ed.), *Encyclopedia of Knowledge Management*, Idea Group Reference: Hershey, PA.

Ready, DA, & Conger, JA 2007, 'How to fill the talent gap: global companies face a perfect storm when it comes to finding the employees they need', *The Wall Street Journal Online*, September 15: R1. viewed 10 February 2012, http://online.wsj.com/article/SB118841695428712511.html

Reaney, M, Pinder, J & Watts, J 2001, The use of internet questionnaires in construction and building research, *COBRA, RICS*, Glasgow Scotland, 3-5 September 2001.

Reich, RB 1991, *The work of nations: preparing ourselves for 21st century capitalism*, Alfred A. Knopf , New York.

Renzl, B 2008, 'Trust in management and knowledge sharing: the mediating effects of fear and knowledge documentation', *Omega*, vol. 36, no. 2, pp. 206-220.

Riege, A 2007, 'Actions to overcome knowledge transfer barriers in MNCs', *Journal of Knowledge Management*, vol. 11, no. 1, pp.48-67.

Rifkin, J 2000, *The end of work: the decline of the global workforce and the dawn of the post market era*, Penguin, London.

Robbins, S, Bergman, R, Stagg, I & Coulter, M 2000, *Management*, Prentice Hall, New Jersey.

Rubin, HJ & Rubin, IS 1995, *Qualitative interviewing: the art of hearing data*, Sage, Thousand Oaks.

Rubin, HJ, & Rubin, IS 2005, *Qualitative interviewing: the art of hearing data*, 2nd edn, Sage, Thousand Oaks.

Ruggles, R 1998, 'The state of the notion: knowledge management in practice', *California Management Review*, vol 40, no. 3, pp 80-89.

Sandelowski, M 1995, 'Sample size in qualitative research', *Research in Nursing and Health*, vol. 18, no.2, pp. 179-183.

Schillewaert, N, Langerak F, & Duhamel T 1998, 'Non-probability sampling for www surveys: A comparison of methods', *Journal of the Market Research Society*, vol. 40, pp. 307–322.

Schonlau, M, Asch, BJ, & Du, C 2003, 'Web surveys as part of a mixed mode strategy for populations that cannot be contacted by e-mail', *Social Science Computer Review*, vol. 21, pp. 218-222.

Senge, P 1990, *The fifth discipline*, Doubleday, New York.

Shankar, R, Singh, MD, Gupta, A & Narain, R 2003, 'Strategic planning for knowledge management implementation in engineering firms', *Work Study*, vol. 52, no. 4, pp. 190-200.

Sharkie, R 2003, 'Knowledge creation and its place in the development of sustainable competitive advantage', *Journal of Knowledge Management*, vol. 7, no.1, pp. 20-31.

Soliman, F 2011, 'Could one transformational leader convert the organization from knowledge based into learning organization, then into innovation?', *Journal of Modern Accounting and Auditing*, vol. 7, no. 12, pp. 1352-1361.

Somaya, D, & Williamson, IO 2008, "Rethinking the 'War for Talent'', *MIT Sloan Management Review*, Vol. 49, no. 4, pp. 29-34.

Soon, L, Kerr, D & Fraser, C, 2006, 'Making tacit knowledge explicit: designing an export trading knowledge portal', in A Ruth, (ed), *Quality and Impact of Qualitative Research.* 3rd annual QualIT Conference, Brisbane: Institute for Integrated and Intelligent Systems, Griffith University, pp 148-162.

Spiegler I 2003, 'Technology and knowledge: bridging a "generating" gap', *Information & Management*, vol. 40, no. 6, pp. 533-539.

StatSoft Inc 1997, *Electronic Statistics*, ebook, Tulsa, OK, viewed 18 February 2014, http://www.statsoft.com/textbook/stathome.html

Sternberg, RJ 1984, 'Toward a triarchic theory of human intelligence', *Behavioral and Brain Sciences*, vol. 7, no. 2, pp. 269–287.

Sternberg, RJ 1997, *Successful intelligence*, Plume, New York.

Sternberg, RJ 2004, 'Culture and intelligence', *American Psychologist*, vol. 59, no. 5, pp. 325-338.

Sternberg, RJ & Horvath, JA (eds.) 1999, *Tacit knowledge in professional practice: researcher and practitioner perspectives*, Lawrence Erlbaum, Mahway, NJ.

Sternberg, RJ, Forsythe, GB, Hedlund, J, Horvath, J, Snook, S, Williams, WM, Wagner, RK & Grigorenko, EL 2000, *Practical intelligence in everyday life*, Cambridge University Press, New York.

Stenmark, D 2002, Information vs knowledge: the role of intranets in knowledge management, *35th Hawaii International Conference on System Sciences*, 7-10 January 2002, Hawaii.

Stevenson Jr , AE 1952, *Quotation Details - Quotation #3224*, viewed 12 February 2014, http://www.quotationspage.com/quote/3224.html

Storey, J & Barnett, E 2000, 'Knowledge management initiatives: learning from failure', *Journal of Knowledge Management*, vol.4, no.2, pp. 145-156.

Strauss, A & Corbin, J 1998, *Basics of qualitative research: techniques and procedures for developing grounded theory*, 2nd edn, Sage, Thousand Oaks, CA.

Stover, M 2004, 'Making tacit knowledge explicit: the ready reference database as codified knowledge', *Reference Services Review*, vol. 32, no. 2, pp. 164-73.

Strauss, A & Corbin, J 1990, *Basics of qualitative research: grounded theory procedures and techniques*, Sage, Newbury Park, CA.

Subramaniam, M & Venkatraman N 2001, 'Determinants of transnational new product development capability: testing the influence of transferring and deploying tacit overseas knowledge', *Strategic Management Journal*, vol. 22, no. 4, pp.359-378.

Suddaby, R &Greenwood, R 2001, 'Colonizing knowledge: commodification as a dynamic of jurisdictional expansion in professional service firms', *Human Relations*, vol. 54, no. 7, pp. 933–953.

SurveyGizmo, 2012, *About us*, viewed 10 April 2011, http://www.surveygizmo.com/company/about/

Sveiby, KE 1997, *The new organizational wealth: managing and measuring knowledge- based assets*, Berrett-Koehler, San Francisco.

Swart, J & Kinnie, N 2003, 'Sharing knowledge in knowledge-intensive firms', *Human Resource Management Journal*, vol. 13, no. 2, pp. 60-75.

Syed-Ikhsan, SOS & Rowland, F 2004, 'Knowledge management in a public organization: a study on the relationship between organizational elements and the

performance of knowledge transfer', *Journal of Knowledge Management*, vol. 8, no. 2, pp. 95-111.

Takwe, YF & Sagsan, M 2011, Tacit to tacit knowledge transfer within the informal environment of higher education, *International Congress of Educational Research*, 4-7 May 2011, Northern Cyprus.

Tashakkori, A & Creswell, JW 2007, 'The new era of mixed methods', *Journal of Mixed Methods Research*, vol. 1, no. 1, pp. 3-7.

Tashakkori, A & Teddlie, C 1998, *Mixed methodology: Combining qualitative and quantitative approaches*, Sage, London.

Teddlie, C & Tashakkori, A 2003, 'Major issues and controversies in the use of mixed methods in the behavioral and social sciences,' in A Tashakkori & C Teddlie (eds.), *Handbook of mixed methods in social and behavioral research*, Sage, Thousand Oaks, CA. pp. 3 -50.

Teddlie, C & Tashakkori, A 2009, *Foundations of mixed methods research: integrating quantitative and qualitative approaches in the social and behavioral sciences*, Sage Publications, London.

Terrett, A 1998, 'Knowledge management and the law firm', *Journal of Knowledge Management*, vol. 2, no. 1, pp. 67-76.

Ticehurst, GW &Veal, AJ 1999, *Business research methods - a managerial approach*, Longman, Sydney.

Trochim, W & Donnelly, JP 2007, *The research methods knowledge base*, 3rd edn, Cengage Learning.

Tuomi I 2000, 'Data is more than knowledge: implications of the reversed hierarchy for knowledge management and organizational memory,' *Journal of Management Information Systems*, vol.16, no. 3, pp.103-117.

Turban, E, & Aronson, JE 2001, *Decision support systems and intelligent systems*, Prentice-Hall, Upper Saddle River.

Van der Spek R & Spijkervert, A 1997, 'Knowledge management: dealing intelligently with knowledge', in J Liebowitz & L Wilcox (eds.), *Knowledge management and its integrative elements*, CRC Press, London.

van Manen, M 1990, *Researching lived experience*, Althouse Press, London.

Van Soest, A, Delaney, L, Harmon, C, Kapteyn, A & Smith, JP, 2007, *Validating the use of vignettes for subjective threshold scales*, RAND Labor and Population working paper WP-501.

Venkitachalam, K & Busch, P 2012, 'Tacit knowledge: review and possible research directions', *Journal of Knowledge Management*, vol. 16, no. 2, pp. 357 – 372.

Vera, D & Crossan, M 2004, 'Strategic leadership and organization learning', *Academy of Management Review*, vol. 29, no. 2, pp. 222-240.

Vince, R 2001, 'Power and emotion in organizational learning', *Human Relations*, vol.54, no.10, pp.1325-1351.

Wason, KD, Polonsky, MJ, & Hyman, MR, 2002, 'Designing vignette studies in marketing', *Australasian Marketing Journal*, vol. 10, no.3, pp. 41-58.

Weiser, M & Morrison, J 1998, 'Project memory: information management for project teams', *Journal of management Information Systems*, vol. 14,no. 4, pp.149- 66.

Wenger, E 1998, *Communities of practice: learning, meaning and identity*, Cambridge University Press, Cambridge.

Werr, A &Stjenberg, T 2003, '*Exploring management consulting firms as knowledge* systems', *Organization Studies*, vol. 24, no.6, pp.881-908.

Wickramasinghe N 2003, 'Do we practise what we preach?', *Business Process Management Journal*, vol. 9, no. 3, pp. 295-316.

Wiersma, W & Jurs, SG, 2005, *Research methods in education*, 8th edn, Allyn & Bacon, Boston.

Wigg, K 1993, *Knowledge management foundations*, Schema Press, Arlington.

Wiig, KM 1997, 'Knowledge management: an introduction and perspective', *The Journal of Knowledge Management*, vol. 1, no. 1, pp. 6-14.

Willman, P, O'Creevy, F, Nicholson, N & Soanne, E 2001, 'Knowing the risks: theory and practice in financial market trading', *Human Relations*, vol. 54, no.7, pp.887-910.

Winter, SG 1987, *Knowledge and competence as strategic assets, The Competitive Challenge*, Ballinger, Cambridge.

Witte, JC, Amoroso LM, & Howard PEN, 2000, 'Research methodology—method and representation in Internet-based survey tools', *Social Science Computer Review*, vol.18, pp. 179–195.

Yin, RK 2003, *Case study research - design and methods*, Sage, Thousand Oaks.

Zack, MH 1998, 'Developing a knowledge strategy', *California Management Review*, vol. 41, no. 3, pp. 125-145.

Zikmund, WG 2000, *Business research methods*, Dryden, Fort Worth.

Zikmund, WG 2003, *Business research methods*, 7th edn, Thompson South-Western, Ohio.

APPENDICES

Appendix 1 - Ethics Approval

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

MEMO

TO	Dr Josef Rojter School of Engineering and Science Footscray Park Campus Dr George Messinis Centre for Strategic Economic Studies City Flinders Campus	DATE	2/05/2011
FROM	A/Prof Liza Heslop Acting Chair Faculty of Health, Engineering and Science Human Research Ethics Committee		
SUBJECT	Ethics Application – HRETH 10/183		

Dear Dr Rojter and Dr Messinis,

Thank you for submitting this application for ethical approval of the project:

HRETH 10/183 Knowledge Ubiquity through the Transfer of Tacit Knowledge in Australian Universities

The proposed research project has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Acting Chair of the Faculty of Health, Engineering and Science Human Research Ethics Committee. Approval has been granted from 3rd June 2011 to 3rd June 2012.

Continued approval of this research project by the Faculty of Health, Engineering and Science Human Research Ethics Committee is conditional upon the provision of a report within 12 months of the above approval date (by 3rd June 2012) or upon the completion of the project (if earlier). A report proforma may be downloaded from the VUHREC web site at: http://research.vu.edu.au/hrec.php

Please note that the Human Research Ethics Committee must be informed of the following: any changes to the approved research protocol, project timelines, any serious events or adverse and/or unforeseen events that may affect continued ethical acceptability of the project. In these unlikely events, researchers must immediately cease all data collection until the Committee has approved the changes. Researchers are also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment.

If you have any further queries please do not hesitate to contact me on 9919 2252.

On behalf of the Committee, I wish you all the best for the conduct of the project.

Kind Regards,

A/Prof Liza Heslop
Acting Chair
Faculty of Health, Engineering and Science Human Research Ethics Committee

Appendix 2 - Letter for gaining approval from participating universities

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

Email: Sample letter to gain approval from participating universities

Date: XX Month 2010

To: PVC (Learning and Teaching)

Dear Sir/Madam,

As someone currently responsible for the learning and teaching activities in your university, I would greatly appreciate a few minutes of your time towards my request. My name is Ritesh Chugh and I am undertaking research for a Doctor of Philosophy Program from Victoria University under the supervision of Dr. Josef Rojter. The research will explore the enablers and inhibitors of tacit knowledge transfer in Australian universities for improving processes and performance by revealing various knowledge transfer mechanisms. The specific aims of the research are to create a model that will combine various knowledge management enablers from both a social and institutional perspective to enable the creation, acquisition and distribution of knowledge.

I intend to gather data from Four Australian universities (Victoria University, Swinburne, RMIT and CQUniversity) and your university has been selected based on its long history in the education sector thus providing a lot of scope for analysing tacit knowledge transfer. All these four universities are undergoing a lot of change, both in terms of organisational structure and introduction of new programs, and are rapidly strengthening their position towards the provision of learning and teaching services to national and international students. It is their uniqueness in the education sector that makes them ideal for this study.

In order to meet this aim, I have designed a questionnaire that will need to be administered to all academic staff in your university that will take approx. 15-20 minutes to complete. Also, at a later stage in the research I intend to conduct interviews with 5 academics. Please find attached a plain language statement that sheds more light on this project.

In conclusion, I request you to provide me approval to gather data from your university's academics.

I look forward to hearing back from you with a positive response.

Thank you for your time and contribution.

Regards.

Ritesh Chugh

Appendix 3 - Recruitment letter for the questionnaire

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

Email: Recruitment Letter for Questionnaire

Dear Sir/Madam,

My name is Ritesh Chugh and I am undertaking research for a Doctor of Philosophy Program from Victoria University under the supervision of Dr. Josef Rojter.

It would be greatly appreciated if you (as a higher education academic staff) could kindly spare 15-20 minutes of your valuable time towards our research and complete an online questionnaire (**Click here**). Clicking the link will also show you an Information Sheet, which provides more details about this research.

The purpose of this questionnaire is to collect data on the transfer of tacit knowledge (tacit knowledge is skills, ideas and experiences that people have in their minds and is, therefore, difficult to access and not necessarily able to be easily expressed e.g. putting together pieces of a complex jigsaw puzzle, interpreting a complex statistical equation) within Australian universities towards the fulfilment of a Doctor of Philosophy program. The research will explore the enablers and inhibitors of tacit knowledge transfer in Australian universities for improving processes and performance by revealing various knowledge transfer mechanisms. The specific aims of the research are to create a model that will combine various knowledge management enablers from both a social and institutional perspective to enable the creation, acquisition and distribution of knowledge.

The questionnaire solicits data on the tacit knowledge enablers and inhibitors at your work place. The results of the questionnaire are confidential and the identity of the participant and university will remain anonymous. If you wish, a summary of the findings of the research that is not identified against you or your university can be made available to you. Data will be stored at Victoria University for a period of 5 years.

This project has ethical clearance from Victoria University and the administration of the survey at Swinburne has been approved by Swinburne's Deputy Vice-Chancellor (Research). Please contact Victoria University's Office for Research (Ph.03 9919 5577) should there be any concerns about the nature and/or conduct of this research project.

I sincerely thank you for your time and contribution towards this research. Your help is greatly appreciated.

Regards,

Ritesh Chugh
and
Dr. Josef Rojter

Appendix 4 - Information sheet for the questionnaire

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

You are invited to participate

You are invited to participate in a research project entitled "Knowledge Ubiquity through the Transfer of Tacit Knowledge in Australian Universities".

This project is being conducted by a student researcher (Ritesh CHUGH) as part of a PhD study at Victoria University under the principal supervision of Dr. Josef Rojter from Faculty of Health, Engineering and Science.

Project explanation

This project is concerned with the study of universities as learning organisations. Some organisations are based solely in the business of knowledge, where they focus on creating, transferring and putting meaning to knowledge. Universities are the epitome of learning that exhibit many characteristics of learning organisations. Universities are, also, an inseparable part of our growing society and play a key role in tacit knowledge transfer. Tacit knowledge is skills, ideas and experiences that people have in their minds and is, therefore, difficult to access and not necessarily able to be easily expressed e.g. putting together pieces of a complex jigsaw puzzle, interpreting a complex statistical equation. The resources that universities provide to academics are largely unknown especially resources that encourage tacit knowledge transfer. It can be argued that universities would enhance their status as learning organisations by facilitating internal tacit knowledge transfer.

The initial literature review has not revealed any existing studies that focus on tacit knowledge transfer within Australian universities. The lack of a particular mechanism for knowledge transfer, both explicit and tacit, has prompted the researcher to identify ways of tacit knowledge transfer by analysing knowledge management enablers, inhibitors, processes that will aid in the creation, retention and distribution of tacit knowledge. Such a study would strengthen the claim that universities exhibit characteristics of learning organisations and their academics are involved in the transfer of tacit knowledge.

This research will explore different types of knowledge and knowledge management practices of four Australian universities in order to aid tacit knowledge transfer. This research will explore and expand issues of knowledge management adoption towards improving organisational processes in different universities as previous papers have limited themselves to a marginal sample and thus provide neither a comparison nor a single model for its adoption. The research will also explore how knowledge management can be helpful in support of the sharing and creation of knowledge and how it can act as a catalyst for improved organisational processes. The specific aims of the research are to create a model that will combine various knowledge management enablers from both

a social and technological perspective to understand the creation, acquisition and distribution of knowledge.

Four Australian universities (Victoria University, Swinburne, RMIT and CQUniversity) have been selected based on their long history in the education sector thus providing a lot of scope for analysing tacit knowledge transfer. These four universities are undergoing a lot of change, both in terms of organisational structure and introduction of new programs, and are rapidly strengthening their position towards the provision of learning and teaching services to national and international students. It is their uniqueness in the education sector that makes them ideal for this study.

The research outcomes from this study will assist university academics in creating a systematically driven collaborative environment by capturing tacit knowledge and making it available for reuse. Given the increased interest in knowledge management by organisations such a study is timely and relevant.

What will I be asked to do?

Participation in this research will involve answering a questionnaire that will take approximately 15-20 minutes to complete.

What will I gain from participating?

Please note that participation is entirely voluntary and you are free to discontinue at any time, without the need for reason or explanation. You will not gain any personal benefit from the project, but you will contribute to the development of knowledge in the area of tacit knowledge transfer.

How will the information I give be used?

The information that you provide will be used to understand the enablers and inhibitors of tacit knowledge transfer in Australian universities for improving processes and performance. The findings of this research will mainly be documented in the student researcher's thesis submitted to Victoria University as a requirement of the doctoral program and may also be published in academic journals, or presented at conferences.

What are the potential risks of participating in this project?

There are virtually no risks, side effects or discomforts associated with your participation in this research.

The results of the questionnaire will remain confidential and the identity of the participant and university will remain anonymous. No information gained will enable you or your university to be identified to anyone other than the research team and data will only be reported using pseudonyms. All information gathered will be coded to prevent identification. Participation in this research will not affect your relationship with your employer in any way. The data will be stored in a secure computer or file storage in the office of the principal researcher (Dr. Josef Rojter) in Faculty of health, Engineering and Sciences at Victoria University and will be held for 5 years post-publication, after which it will be destroyed.

How will this project be conducted?

Four Australian universities (Victoria University, Swinburne, RMIT and CQUniversity) have been selected based on their long history in the education sector thus providing a lot of scope for analysing tacit knowledge transfer.

The survey is being administered to academics from each university through email.

Who is conducting the study?

Principal Researcher
Dr Josef Rojter
Faculty of Health, Engineering and Science
Victoria University PO Box 14428 MC
Melbourne VIC 8001
Tel. 61 3 99194745
Fax 61 3 99194139
Email. Josef.Rojter@vu.edu.au

Associate Researcher
Dr. George Messinis
Centre for Strategic Economic Studies
Level 13, 300 Flinders St
Melbourne VIC 3000
Tel. 61 3 9919 1339
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Student Researcher
Ritesh Chugh
Victoria University PO Box 14428 MC
Melbourne VIC 8001
Australia
Tel. 0430 161 401
Email ritesh.chugh@live.vu.edu.au

I thank you in advance for assisting in this study. Any queries about your participation in this project may be directed to the Principal Researcher listed above. If you have any queries or complaints about the conduct of this study, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781.

Appendix 5 - Consent form for the questionnaire

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study that will explore the enablers and inhibitors of tacit knowledge transfer in four Australian universities for improving processes and performance by elucidating various knowledge transfer mechanisms. The specific aims of the research are to create a model that will combine various knowledge management enablers from both a social and institutional perspective to understand the creation, acquisition and distribution of knowledge.

CERTIFICATION BY SUBJECT

I, _____ (Print Participant Name)

of _____(Print Suburb)

certify that I am at least 18 years old and that I am voluntarily giving my consent to participate in the study "Knowledge Ubiquity through the Transfer of Tacit Knowledge in Australian Universities" being conducted at Victoria University by Dr. Josef Rojter, Principal Researcher.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by Ritesh Chugh, Student Researcher and that I freely consent to participation involving the below mentioned procedures:

- Filling out the attached questionnaire
- Have no objection in the findings of the research being used to complete the student researcher's doctoral thesis and published in journals, or presented at conferences

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential and anonymity will be maintained.

Signed:_____ Date:_____

Any queries about your participation in this project may be directed to Ritesh Chugh on 0430 161 401 or alternatively emailed to ritesh.chugh@live.vu.edu.au

If you have any queries or complaints about the conduct of this study, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781

Appendix 6 - Questionnaire

Demographic information

1. Which University do you work for? *

- CQUniversity
- RMIT University
- Swinburne University of Technology
- Victoria University

2. Please write your current position(academic title) in the box below: *

3. How long have you been working at this university? *

Less than 1 year | 1 to 5 years | 5 to 10 years | 10 to 15 years | 15 to 20 years | Above 20 years

4. What is your gender? *

Male | Female

5. What is your age? *

20 to 29 years | 30 to 39 years | 40 to 49 years | 50 to 59 years | 60 to 69 years | Above 69 years

6. What is your highest level of qualification? *

Bachelors Degree | Masters Degree | Doctorate

7. What is your employment status? *

On-going Full-time | On-going Part-time | Contract | Sessional/Casual

Page Four

INSTRUCTIONS FOR COMPLETING THE QUESTIONNAIRE

For each question, please indicate your level of agreement or disagreement by pressing one of the buttons against each questions, as in the example provided below:

My university encourages and facilitates sharing of my professional experiences, skills, and knowledge with others.

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

Now please complete the questions below:

Workplace Dimensions

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
1. My university encourages and facilitates sharing of my professional experiences, skills, and knowledge with others.	○	○	○	○	○	○
2. My university provides adequate time to document and share my tacit knowledge.	○	○	○	○	○	○
3. My university encourages transfer of my ideas, skills, and experiences through mentoring programs.	○	○	○	○	○	○
4. My university encourages contribution of ideas, skills, and experiences through rotation of courses that I can teach ie. different courses to teach every few terms.	○	○	○	○	○	○
5. My university facilitates transfer of personal ideas, skills, and experiences through seminars, workshops and so forth.	○	○	○	○	○	○
6. My university has an up-to-date directory (like Yellow pages) of academics that can provide information about their work, skills, and experience.	○	○	○	○	○	○
	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
7. My university has a formal process of transferring best practices through regular documentation (eg. FAQs, administrative manuals, lessons learnt, conference reports and so forth)	○	○	○	○	○	○
8. My university fosters formal networks, such as communities of practice, to encourage sharing of ideas amongst academics.	○	○	○	○	○	○
9. My university encourages sharing of ideas amongst academics. For instance, presentations of publications amongst peers.	○	○	○	○	○	○
10. My university provides opportunities for employees to interact with one another on an informal basis (For instance time off work, social gatherings).	○	○	○	○	○	○
11. These opportunities (For instance time off work, social gatherings) that my university provides are important for sharing skills and experience.	○	○	○	○	○	○

Behavioural Dimensions

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
12. I believe that sharing of personal tacit knowledge leads to erosion of my academic standing because I am not seen as the information gatekeeper anymore in terms of my scholarly expertise.	○	○	○	○	○	○
13. I believe that sharing my tacit knowledge leads to improved outcomes for everyone because they can perform better.	○	○	○	○	○	○
14. I feel that sharing my ideas and experiences could negatively	○	○	○	○	○	○

affect my career prospects.						
15. I believe that the transfer of ideas, skills and experience encourages an autonomous work environment by providing more information to others enabling them to complete their tasks.						
16. I believe that sharing one's personal ideas, skills and experience with others can lead to plagiarism and false claims.						
	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
17. I readily share my academic and administrative experience and knowledge with others.						
18. I am selective with whom I share my knowledge.						
19. I share my ideas and knowledge with everyone.						
20. I like to use other people's ideas.						
21. I acknowledge other people's ideas in my work.						
	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
22. I prefer and like collaborating with others.						
23. I believe that sharing ideas, experiences and skills can be seen as intrusive and extra workload.						

Workplace expectations

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
24. My manager values new ideas and encourages innovation.						
25. The senior management at my university expects me to share my personal knowledge and experiences with others.						
26. Senior management should expect you to share your personal knowledge and experiences with others.						
27. Senior management at my university acknowledges and rewards staff who share personal knowledge and experiences with rewards (eg. Conference funds, Promotion, higher salary).						
28. I feel that such rewards provide encouragement to share knowledge with others.						

Technology Dimensions

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
29. My university makes effective use of information technology (eg. e-mail, groupware, Internet, Intranet, learning management systems and videoconferencing) for developing better communication between staff, students and management.						
30. My university provides training and education on the use of new information technologies that they introduce to make us more adept at their usage.						
31. I quickly adapt to information technologies implemented by the University.						
32. My university documents policies and procedures and makes it available through the staff Intranet.						

33. I feel that electronic transmission leads to an overload of information and encourages frequent changes in policies.	○	○	○	○	○	○
	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
34. It is easy to access the documents that I need within my university's databases ie. information is well organized.	○	○	○	○	○	○
35. The policies and procedures on the staff Intranet at my university get rapidly and continually updated.	○	○	○	○	○	○
36. My university provides a ready access to application software (eg. chatting, discussion groups, bulletin boards) and hardware to help me in sharing my personal experiences.	○	○	○	○	○	○

Learning Dimensions

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
37. I consider myself to be a lifelong learner ie. inquiring mind, committed to ongoing personal development, experiment with new ways of doing my work.	○	○	○	○	○	○
38. My university is a learning organization ie. it provides continuous learning opportunities for staff, demonstrates and openness to change and adaptability, has a shared vision.	○	○	○	○	○	○
39. My university is very critical of failure and does not see it as a learning process.	○	○	○	○	○	○
40. My inquiry and dialogue is seen as threatening.	○	○	○	○	○	○
			Neither			
	Strongly Disagree	Disagree	agree nor disagree	Agree	Strongly Agree	Don't Know
41. I am actively involved in curriculum development.	○	○	○	○	○	○
42. I am actively involved in assessment development.	○	○	○	○	○	○
43. I regularly provide feedback to my peers about their work.	○	○	○	○	○	○
44. My peers are appreciative of the feedback that I provide to them about their work.	○	○	○	○	○	○

Cultural, Age and Gender Dimensions

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
45. Academics at my university readily share their ideas, experiences and skills in seminars and meetings.	○	○	○	○	○	○
46. Knowledge (skills, ideas and experience) should be available for reuse.	○	○	○	○	○	○
47. Cultural background of people has an impact on their willingness to share ideas, skills and experiences.	○	○	○	○	○	○
48. Training on cultural awareness can improve people's willingness to share ideas, experiences and skills.	○	○	○	○	○	○
	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't Know
49. My experience is that the older experienced staff is more willing to share ideas, experiences and skills.	○	○	○	○	○	○
50. My experience is that the younger novice staff is more						

willing to share ideas, experiences and skills.	○	○	○	○	○	○
51. I feel that trust plays an important part in the sharing of ideas and experience.	○	○	○	○	○	○
52. I feel that job security plays an important part in the sharing of ideas and experience.	○	○	○	○	○	○

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For the statements given below, please choose the response that you feel is the most appropriate.

53.John has been working at the university for 20 years with extensive research, teaching and academic administrative experience. His peers can readily approach him whenever required. He is retiring soon. What should the university do?

- ○ Try to retain him
- ○ Get John to mentor his peers
- ○ Get John to document his best practices
- ○ Let John go without doing anything further

54.Kumar is an active researcher but very reluctant to share his ideas and knowledge with others. Is Kumar's practice of non-sharing:

- ○ Very good
- ○ Good
- ○ Moderate
- ○ Bad
- ○ Very bad

55.The university Tim works for is very critical of failure. Every time Tim does something incorrect, he gets reprimanded for it. The university does not see failure as a learning process. As a result Tim does not want to experiment and try new ideas. What should Tim do?

- ○ Leave the university
- ○ Speak to management
- ○ Keep experimenting for self-development
- ○ Do nothing

56.Chan does not have enough time to share his skills, ideas and experience with his peers. If his university implements technology that enables Chan to transfer his knowledge, will it be helpful?

- ○ Yes
- ○ Cannot know
- ○ Probably not
- ○ No
- ○ Do not know

57.Thanh uses a lot of technology (discussion forums, web chat, blogs) to share knowledge and feels that technology encourages people to share. If your university also provided the right technology to you, would you be willing to share your knowledge?

- Definitely
- Probably
- Probably not
- No
- Do not know

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OPEN ENDED QUESTIONS

(The questions below can be answered in bullet points, if that is convenient for you. **Regardless of how you put your thoughts below they are much appreciated)**

1. How do you identify, create and share your skills, ideas and experiences with others in the university?

2. How does the university motivate and encourage you to share your ideas, experiences and skills?

3. Can you think of some barriers that stop you from sharing ideas, experiences and skills within your university?

4. If you were to improve the situation, what would you do?

5. How can your university create a knowledge sharing culture?

6. Other comments:

Thank You!

That concludes this survey. **Thank you** for giving your time and assistance to this study. It is greatly appreciated.

Appendix 7 - Follow-up reminder email for the questionnaire

Email: Reminder - Recruitment Letter for Questionnaire

Dear Sir/Madam,

I really apologise to be intruding upon your time again however you can understand how important it is to explore the enablers and inhibitors of tacit knowledge transfer in Australian universities. The email (appended below) that that was sent to you about a month ago requested you to complete a survey. Pls. ignore my email if you have already completed the survey and a big thank you for taking the time out from your busy schedules. If **you haven't done the survey yet,** can I kindly request you to take 15-20 minutes of your valuable time in providing me with your views. Completing the survey itself constitutes a form of tacit knowledge transfer! The survey can be accessed by clicking HERE.

I look forward to your responses to the survey. Thank you for your time and contribution towards this research.

Regards,
Ritesh

Appendix 8 - Recruitment letter for the interview

Email: Recruitment Letter for Interview

Dear Sir/Madam,

Thank you for completing my research survey (Knowledge Ubiquity through the Transfer of Tacit Knowledge in Australian Universities) earlier last month. I am currently soliciting your participation for an interview. Given your interest and knowledge in this topic, it would be really great to have your views.

This project has ethical clearance from Victoria University.

Please find attached an Information Sheet, which provides greater details about this research.

I would be very grateful if you could agree to be interviewed. If I have an affirmative response from you, then we can work out mutually suitable timings for the interview.

I look forward to hearing back from you.

Thank you for your time and contribution. Your help is greatly appreciated.

Kind regards,

Ritesh

Appendix 9 - Information sheet for the interview

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

You are invited to participate

You are invited to participate in a research project entitled "Knowledge Ubiquity through the Transfer of Tacit Knowledge in Australian Universities".

This project is being conducted by a student researcher (Ritesh CHUGH) as part of a PhD study at Victoria University under the principal supervision of Dr. Josef Rojter from Faculty of Health, Engineering and Science.

Project explanation

This project is concerned with the study of universities as learning organisations. Some organisations are based solely in the business of knowledge, where they focus on creating, transferring and putting meaning to knowledge. Universities are the epitome of learning that exhibit many characteristics of learning organisations. Universities are, also, an inseparable part of our growing society and play a key role in tacit knowledge transfer. Tacit knowledge is skills, ideas and experiences that people have in their minds and is, therefore, difficult to access and not necessarily able to be easily expressed e.g. putting together pieces of a complex jigsaw puzzle, interpreting a complex statistical equation. The resources that universities provide to academics are largely unknown especially resources that encourage tacit knowledge transfer. It can be argued that universities would enhance their status as learning organisations by facilitating internal tacit knowledge transfer.

The initial literature review has not revealed any existing studies that focus on tacit knowledge transfer within Australian universities. The lack of a particular mechanism for knowledge transfer, both explicit and tacit, has prompted the researcher to identify ways of tacit knowledge transfer by analysing knowledge management enablers, inhibitors, processes that will aid in the creation, retention and distribution of tacit knowledge. Such a study would strengthen the claim that universities exhibit characteristics of learning organisations and their academics are involved in the transfer of tacit knowledge.

This research will explore different types of knowledge and knowledge management practices of four Australian universities in order to aid tacit knowledge transfer. This research will explore and expand issues of knowledge management adoption towards improving organisational processes in different universities as previous papers have limited themselves to a marginal sample and thus provide neither a comparison nor a single model for its adoption. The research will also explore how knowledge management can be helpful in support of the sharing and creation of knowledge and how it can act as a catalyst for improved organisational processes. The specific aims of the research are to create a model that will combine various knowledge management enablers from both

a social and technological perspective to understand the creation, acquisition and distribution of knowledge.

Four Australian universities (Victoria University, Swinburne, RMIT and CQUniversity) have been selected based on their long history in the education sector thus providing a lot of scope for analysing tacit knowledge transfer. These four universities are undergoing a lot of change, both in terms of organisational structure and introduction of new programs, and are rapidly strengthening their position towards the provision of learning and teaching services to national and international students. It is their uniqueness in the education sector that makes them ideal for this study.

The research outcomes from this study will assist university academics in creating a systematically driven collaborative environment by capturing tacit knowledge and making it available for reuse. Given the increased interest in knowledge management by organisations such a study is timely and relevant.

What will I be asked to do?

Participation in this research will involve taking part in a 30-40 minute face to face interview. With your permission, the interview will be digitally audio-recorded and transcribed for analysis so that we can ensure to have an accurate record of what you choose to say. You reserve the right to refuse to answer any specific question and you can terminate the interview at any time.

What will I gain from participating?

Please note that participation is entirely voluntary and you are free to discontinue at any time, without the need for reason or explanation. You will not gain any personal benefit from the project, but you will contribute to the development of knowledge in the area of tacit knowledge transfer.

How will the information I give be used?

The information that you provide will be used to understand the enablers and inhibitors of tacit knowledge transfer in Australian universities for improving processes and performance. The findings of this research will mainly be documented in the student researcher's thesis submitted to Victoria University as a requirement of the doctoral program and may also be published in academic journals, or presented at conferences.

What are the potential risks of participating in this project?

There are virtually no risks, side effects or discomforts associated with your participation in this research.

The results of the questionnaire will remain confidential and the identity of the participant and university will remain anonymous. No information gained will enable you or your university to be identified to anyone other than the research team and data will only be reported using pseudonyms. All information gathered will be coded to prevent identification. Participation in this research will not affect your relationship with your employer in any way. The data will be stored in a secure computer or file storage in the office of the principal researcher (Dr. Josef Rojter) in Faculty of health, Engineering and Sciences at Victoria University and will be held for 5 years post-publication, after which it will be destroyed.

How will this project be conducted?

Four Australian universities (Victoria University, Swinburne, RMIT and CQUniversity) have been selected based on their long history in the education sector thus providing a lot of scope for analysing tacit knowledge transfer.
Academics from each university have been invited to participate in an interview. The interview solicits data on the tacit knowledge enablers and inhibitors at your work place.

Who is conducting the study?

Principal Researcher
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Student Researcher
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Victoria University PO Box 14428 MC
Melbourne VIC 8001
Australia
Tel. 0430 161 401
Email ritesh.chugh@live.vu.edu.au

I thank you in advance for assisting in this study. Any queries about your participation in this project may be directed to the Principal Researcher listed above. If you have any queries or complaints about the conduct of this study, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781.

Appendix 10 - Consent form for the interview

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

CONSENT FORM
FOR PARTICIPANTS
INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study that will explore the enablers and inhibitors of tacit knowledge transfer in four Australian universities for improving processes and performance by elucidating various knowledge transfer mechanisms. The specific aims of the research are to create a model that will combine various knowledge management enablers from both a social and institutional perspective to understand the creation, acquisition and distribution of knowledge.

CERTIFICATION BY SUBJECT

I, _____ (Print Participant Name)

of _____(Print Suburb)

certify that I am at least 18 years old and that I am voluntarily giving my consent to participate in the study "Knowledge Ubiquity through the Transfer of Tacit Knowledge in Australian Universities" being conducted at Victoria University by Dr. Josef Rojter, Principal Researcher.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by Ritesh Chugh, Student Researcher and that I freely consent to participation involving the below mentioned procedures:

- Participate in an interview
- Have no objection in the findings of the research being used to complete the student researcher's doctoral thesis and published in journals, or presented at conferences
- Give permission for the interview to be digitally audio-recorded

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential and anonymity will be maintained.

Signed:_____ Date:_____

Any queries about your participation in this project may be directed to Ritesh Chugh on 0430 161 401 or alternatively emailed to ritesh.chugh@live.vu.edu.au

If you have any queries or complaints about the conduct of this study, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781

Appendix 11 - Interview questions

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

INTERVIEW QUESTIONS

1. What does tacit knowledge mean to you? Why is tacit knowledge transfer important?

2. Does the university encourage tacit knowledge transfer? If yes, how? If not, what can the university do to encourage tacit knowledge transfer? Are there technology/systems in the university that aid tacit knowledge transfer?

3. Do you freely share your knowledge with others? Why / Why not? Can you give me some examples?

4. How will tacit knowledge transfer improve your and the university's performance?

5. Do you think transfer of tacit knowledge can be made mandatory and a key performance indicator in the annual performance appraisal/review? Why/Why not?

6. How do you consider yourself to be a lifelong learner?

7. You are an expert in your field. Would you be willing to pass/teach these skills to others in the university? When? Where? Why/why are you not willing to teach them to others?

8. Do you perceive your manager as the information gatekeeper who does not pass information to others? Do you prefer this practice?

9. How does your manager value new ideas and innovation?

10. How do you adapt to information technology implemented by the university?

11. Can you think of some barriers to tacit knowledge transfer in your university?

12. What processes/ways would you suggest in your university so that tacit knowledge can be captured and reused?

Appendix 12 – Statistical analysis tables

These tables provide analytical data for individual behavioural statements and various variables in the second research question (Section 5.5 - Quantitative Analysis of Behavioural Dimensions). Just because no significant differences existed, these have been included in the appendix rather than in the chapter five. Moreover, in chapter five, aggregative analysis of behavioural dimensions has been included.

Descriptive statistics of Individual Statements of Behavioural Dimension and Academic Title

Academic Title		Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23
Academic Administration	Mean	1.7333	4.285	1.9333	4.333	2.2667	4.500	3.1538	3.2143	3.857	4.785	4.214	2.2667
	N	15	14	15	15	15	14	13	14	14	14	14	15
	S.D.	.883	.726	.703	.816	.798	.854	.987	1.36	1.02	.425	.699	1.16
	% of Total N	10.8%	10.1%	10.7%	10.9%	10.7%	10.0%	9.4%	10.1%	10.0%	10.1%	10.1%	10.8%
	Skewness	1.317	-.516	1.511	-1.649	.415	-2.155	-.353	-.028	-1.663	-1.566	-.321	.344
Professor	Mean	1.30	4.7	1.3846	4.6154	1.9231	4.7692	2.5385	3.6923	3.6154	4.6923	4.4615	2.0000
	N	13	13	13	13	13	13	13	13	13	13	13	13
	S.D.	.85485	.43853	.65044	.50637	1.03775	.43853	.96742	1.03155	.76795	.48038	.51887	1.29099
	% of Total N	9.6%	9.6%	9.5%	9.6%	9.5%	9.5%	9.6%	9.6%	9.5%	9.6%	9.6%	9.6%
	Skewness	3.078	-1.451	1.576	-.539	.704	-1.451	.525	-.882	-.456	-.946	.175	1.373
Associate Professor	Mean	2.0909	4.3636	2.0000	4.1000	2.4545	4.3636	2.4545	3.4545	3.5455	4.5000	4.4000	2.5556
	N	11	11	11	10	11	11	11	11	11	10	10	9
	S.D.	1.22103	.67420	1.00000	.99443	1.03573	.67420	1.03573	1.29334	.82020	.70711	.51640	1.01379
	% of Total N	8.1%	8.1%	8.0%	7.4%	8.0%	8.0%	8.1%	8.1%	8.0%	7.4%	7.4%	6.6%
	Skewness	1.405	-.593	.733	-1.085	.147	-.593	.147	-.048	-.176	-1.179	.484	.270
Senior Lecturer	Mean	1.6333	4.3226	2.3548	4.3548	2.6452	4.2258	3.3226	2.9677	3.7097	4.7097	4.1333	2.4516
	N	30	31	31	31	31	31	31	31	31	31	30	31
	S.D.	.80872	.54081	1.27928	.66073	1.17042	.66881	1.22167	1.07963	.86385	.46141	.73030	1.20661
	% of Total N	22.1%	22.8%	22.6%	23.0%	22.6%	22.6%	22.8%	22.8%	22.6%	23.0%	22.2%	22.8%
	Skewness	1.211	.105	1.010	.207	.492	-1.006	-.672	.068	-1.036	-.972	-.214	1.095
Lecturer - Level B	Mean	2.0000	4.4035	2.0702	4.1250	2.3860	4.2414	3.2069	3.1404	3.6034	4.5263	4.1034	2.3276
	N	57	57	57	56	57	58	58	57	58	57	58	58
	S.D.	1.11803	.70355	1.06670	.97351	.95906	.86471	1.13568	1.07635	.81520	.60075	.69306	.99803

	% of Total N	41.9%	41.9%	41.6%	41.5%	41.6 %	42.3%	42.6 %	41.9 %	42.3%	42.2%	43.0%	42.6%
	Skewness	1.589	-.122	1.137	-.872	.526	-1.509	.023	-.378	-.547	-.872	-.140	.826
Casual lecturer	Mean	1.6000	4.4000	2.0000	4.0000	2.4000	4.0000	3.3000	2.9000	3.7000	4.6000	4.0000	2.6000
	N	10	10	10	10	10	10	10	10	10	10	10	10
	S.D.	.84327	.96609	.94281	.81650	1.07497	.94281	.82327	.87560	.48305	.51640	.66667	.96609
	% of Total N	7.4%	7.4%	7.3%	7.4%	7.3%	7.3%	7.4%	7.4%	7.3%	7.4%	7.4%	7.4%
	Skewness	1.001	-.111	.994	.000	.322	-.994	-.687	.223	-1.035	-.484	.000	.111
Total	Mean	1.8015	4.4044	2.0438	4.2370	2.3942	4.3066	3.1103	3.1691	3.6569	4.6148	4.1704	2.3529
	N	136	136	137	135	137	137	136	136	137	135	135	136
	S.D.	1.00973	.67086	1.05627	.84824	1.01719	.79115	1.12001	1.11259	.81744	.54616	.67515	1.08546
	% of Total N	100.0 %	100.0%	100.0%	100.0%	100.0 %	100.0%	100.0 %	100.0 %	100.0%	100.0%	100.0%	100.0 %
	Skewness	1.592	-.242	1.203	-.923	.505	-1.420	-.124	-.144	-.764	-1.027	-.219	.774

ANOVA Table- Individual Statements of Behavioural dimension and academic title

		Sum of Squares	df	Mean Square	F	Sig.
Q12	Between Groups	7.661	5	1.532	1.533	.184
	Within Groups	129.97	130	1.000		
	Total	137.64	135			
Q13	Between Groups	2.154	5	.431	.955	.448
	Within Groups	58.604	130	.451		
	Total	60.757	135			
Q14	Between Groups	8.911	5	1.782	1.635	.155
	Within Groups	142.82	131	1.090		
	Total	151.73	136			
Q15	Between Groups	3.883	5	.777	1.083	.373
	Within Groups	92.532	129	.717		
	Total	96.415	134			
Q16	Between Groups	5.126	5	1.025	.991	.426
	Within Groups	135.58	131	1.035		
	Total	140.71	136			
Q17	Between Groups	4.731	5	.946	1.542	.181
	Within Groups	80.393	131	.614		
	Total	85.124	136			
Q18	Between Groups	11.304	5	2.261	1.860	.106
	Within Groups	158.04	130	1.216		
	Total	169.34	135			
Q19	Between Groups	6.512	5	1.302	1.054	.389
	Within Groups	160.59	130	1.235		
	Total	167.11	135			
Q20	Between Groups	.991	5	.198	.289	.918
	Within Groups	89.885	131	.686		
	Total	90.876	136			

Q21	Between Groups	1.346	5	.269	.899	.484
	Within Groups	38.624	129	.299		
	Total	39.970	134			
Q22	Between Groups	2.248	5	.450	.986	.429
	Within Groups	58.834	129	.456		
	Total	61.081	134			
Q23	Between Groups	3.050	5	.610	.508	.770
	Within Groups	156.00	130	1.200		
	Total	159.05	135			

Descriptive statistics Individual statements of Behavioural dimension and Age

		Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23
20 to 29 years	Mean	1.5000	3.5000	3.0000	3.5000	2.0000	3.5000	3.0000	3.0000	3.5000	4.5000	4.0000	2.5000
	N	2	2	2	2	2	2	2	2	2	2	2	2
	S.D.	.70711	.70711	1.41421	.70711	.00000	.70711	.00000	.00000	.70711	.70711	.00000	.70711
	% of Total N	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
30 to 39 years	Mean	2.0714	4.3571	2.0714	4.3214	2.3571	4.1071	3.2143	3.0357	3.5357	4.5556	4.1786	2.5000
	N	28	28	28	28	28	28	28	28	28	27	28	28
	S.D.	1.30323	.62148	.85758	.72283	1.02611	.83174	1.06657	.88117	.96156	.50637	.66964	1.07152
	% of Total N	20.1%	20.1%	20.0%	20.3%	20.0%	20.0%	20.3%	20.1%	20.0%	19.6%	20.3%	20.1%
	Skewness	1.589	-.407	.995	.049	.527	-1.042	-.658	-.073	-.782	-.237	-.219	.973
40 to 49 years	Mean	2.0000	4.3000	2.1667	4.0000	2.4333	4.3548	3.3548	3.0323	3.8065	4.6774	4.2258	2.6129
	N	29	30	30	30	30	31	31	31	31	31	31	31
	S.D.	1.06904	.65126	1.14721	.98261	1.10433	.79785	1.19857	1.13970	.74919	.54081	.66881	1.20215
	% of Total N	20.9%	21.6%	21.4%	21.7%	21.4%	22.1%	22.5%	22.3%	22.1%	22.5%	22.5%	22.3%
	Skewness	1.130	-.385	1.120	-.935	.674	-1.594	-.254	-.067	-.169	-1.457	-.292	.331
50 to 59 years	Mean	1.7170	4.5577	2.1509	4.3529	2.3585	4.3654	3.1000	3.1731	3.5577	4.6078	4.0800	2.1538
	N	53	52	53	51	53	52	50	52	52	51	50	52
	S.D.	.92772	.66902	1.26181	.79558	1.07586	.81719	1.09265	1.24808	.72527	.56845	.66517	1.07347
	% of Total N	38.1%	37.4%	37.9%	37.0%	37.9%	37.1%	36.2%	37.4%	37.1%	37.0%	36.2%	37.4%
	Skewness	1.357	-.014	1.436	-.486	.382	-1.901	-.010	-.215	-1.010	-1.124	-.089	1.165
Above 59 years	Mean	1.6296	4.4074	1.7407	4.2222	2.5556	4.4444	2.7037	3.5000	3.7407	4.5926	4.3333	2.2308
	N	27	27	27	27	27	27	27	26	27	27	27	26
	S.D.	.92604	.74726	.85901	.89156	.93370	.64051	1.10296	1.02956	.94432	.57239	.73380	1.03180
	% of Total N	19.4%	19.4%	19.3%	19.6%	19.3%	19.3%	19.6%	18.7%	19.3%	19.6%	19.6%	18.7%
	Skewness	2.100	-.256	.943	-1.880	.438	-.726	.273	-.238	-.912	-1.055	-.631	.444
Total	Mean	1.8273	4.4173	2.0714	4.2319	2.4071	4.3143	3.1014	3.1727	3.6429	4.6087	4.1812	2.3453
	N	139	139	140	138	140	140	138	139	140	138	138	139

	S.D.	1.04207	.67993	1.09704	.84827	1.03114	.78736	1.11584	1.10943	.82297	.54618	.67527	1.09486
	% of Total N	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Skewness	1.562	-.186	1.316	-.902	.473	-1.429	-.107	-.155	-.743	-.989	-.235	.756

ANOVA Table- Individual Statements of Behavioural dimension and Age

		Sum of Squares	df	Mean Square	F	Sig.
Q12	Between Groups	4.448	4	1.112	1.025	.397
	Within Groups	145.408	134	1.085		
	Total	149.856	138			
Q13	Between Groups	3.225	4	.806	1.783	.136
	Within Groups	60.574	134	.452		
	Total	63.799	138			
Q14	Between Groups	5.284	4	1.321	1.101	.359
	Within Groups	162.001	135	1.200		
	Total	167.286	139			
Q15	Between Groups	3.659	4	.915	1.282	.280
	Within Groups	94.921	133	.714		
	Total	98.580	137			
Q16	Between Groups	1.142	4	.286	.263	.901
	Within Groups	146.651	135	1.086		
	Total	147.793	139			
Q17	Between Groups	3.172	4	.793	1.290	.277
	Within Groups	83.000	135	.615		
	Total	86.171	139			
Q18	Between Groups	6.639	4	1.660	1.347	.256
	Within Groups	163.941	133	1.233		
	Total	170.580	137			
Q19	Between Groups	3.982	4	.995	.804	.525
	Within Groups	165.874	134	1.238		
	Total	169.856	138			
Q20	Between Groups	1.828	4	.457	.668	.615
	Within Groups	92.315	135	.684		
	Total	94.143	139			
Q21	Between Groups	.253	4	.063	.207	.934
	Within Groups	40.616	133	.305		
	Total	40.870	137			
Q22	Between Groups	1.265	4	.316	.687	.602
	Within Groups	61.206	133	.460		
	Total	62.471	137			
Q23	Between Groups	5.185	4	1.296	1.084	.367
	Within Groups	160.239	134	1.196		
	Total	165.424	138			

Descriptive statistics Individual statements of Behavioural dimension and Level of qualification

		Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q 23
Bachelor's Degree	Mean	1.9091	4.0909	2.0909	3.9091	2.1818	4.2727	2.7273	3.3636	3.8182	4.5455	4.0909	2.1818
	N	11	11	11	11	11	11	11	11	11	11	11	11
	S.D.	.83121	.70065	.94388	.70065	.75076	.64667	1.34840	1.02691	1.16775	.68755	.70065	.75076
	% of Total N	7.9%	7.9%	7.9%	8.0%	7.9%	7.9%	8.0%	7.9%	7.9%	8.0%	8.0%	7.9%
	Skewness	.190	-.123	.663	.123	-.329	-.291	.304	-.229	-1.420	-1.324	-.123	1.404
Master's Degree	Mean	1.6957	4.5217	2.0217	4.2609	2.2826	4.2391	3.2667	3.0667	3.6739	4.6522	4.1304	2.4255
	N	46	46	46	46	46	46	45	45	46	46	46	47
	S.D.	.75629	.65791	.99976	.90516	.95831	.94715	1.05313	1.15601	.92025	.52567	.71829	1.11793
	% of Total N	33.1%	33.1%	32.9%	33.3%	32.9%	32.9%	32.6%	32.4%	32.9%	33.3%	33.3%	33.8%
	Skewness	.902	-.083	.932	-1.117	.500	-1.657	-.079	.050	-.898	-1.134	-.200	.536
Doctorate	Mean	1.8902	4.4024	2.0964	4.2593	2.5060	4.3614	3.0610	3.2048	3.6024	4.5926	4.2222	2.3210
	N	82	82	83	81	83	83	82	83	83	81	81	81
	S.D.	1.19677	.68240	1.17509	.83333	1.09737	.70846	1.11497	1.10165	.71465	.54263	.65192	1.12724
	% of Total N	59.0%	59.0%	59.3%	58.7%	59.3%	59.3%	59.4%	59.7%	59.3%	58.7%	58.7%	58.3%
	Skewness	1.545	-.234	1.472	-.922	.410	-1.074	-.123	-.251	-.474	-.861	-.257	.836
Total	Mean	1.8273	4.4173	2.0714	4.2319	2.4071	4.3143	3.1014	3.1727	3.6429	4.6087	4.1812	2.3453
	N	139	139	140	138	140	140	138	139	140	138	138	139
	S.D.	1.04207	.67993	1.09704	.84827	1.03114	.78736	1.11584	1.10943	.82297	.54618	.67527	1.09486
	% of Total N	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Skewness	1.562	-.186	1.316	-.902	.473	-1.429	-.107	-.155	-.743	-.989	-.235	.756

ANOVA Table - Individual statements of Behavioural dimension and Level of qualification

		Sum of Squares	df	Mean Square	F	Sig.
Q12	Between Groups	1.196	2	.598	.547	.580
	Within Groups	148.660	136	1.093		
	Total	149.856	138			
Q13	Between Groups	1.692	2	.846	1.852	.161
	Within Groups	62.107	136	.457		
	Total	63.799	138			
Q14	Between Groups	.169	2	.085	.069	.933
	Within Groups	167.116	137	1.220		
	Total	167.286	139			
Q15	Between Groups	1.245	2	.623	.864	.424
	Within Groups	97.334	135	.721		

	Total	98.580	137			
Q16	Between Groups	2.083	2	1.042	.979	.378
	Within Groups	145.709	137	1.064		
	Total	147.793	139			
Q17	Between Groups	.463	2	.232	.370	.691
	Within Groups	85.708	137	.626		
	Total	86.171	139			
Q18	Between Groups	2.903	2	1.451	1.169	.314
	Within Groups	167.677	135	1.242		
	Total	170.580	137			
Q19	Between Groups	.993	2	.496	.400	.671
	Within Groups	168.864	136	1.242		
	Total	169.856	138			
Q20	Between Groups	.518	2	.259	.379	.685
	Within Groups	93.625	137	.683		
	Total	94.143	139			
Q21	Between Groups	.152	2	.076	.252	.778
	Within Groups	40.718	135	.302		
	Total	40.870	137			
Q22	Between Groups	.345	2	.172	.374	.688
	Within Groups	62.126	135	.460		
	Total	62.471	137			
Q23	Between Groups	.644	2	.322	.266	.767
	Within Groups	164.780	136	1.212		
	Total	165.424	138			

Notes