

# **Key Determinants of Research-Knowledge Sharing In UK Higher Education Institutions**



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*In the name of Allah, the Most Gracious, the Most Merciful*

“The rare a thing, the more its value increases,  
except knowledge: the more diffused it is the more  
valuable.”

Imam Ali (r.a)

# **Key Determinants of Research-Knowledge Sharing in UK Higher Education Institutions**

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## **Abstract**

Knowledge sharing (KS) has attracted increasing attention in business circles. Links between knowledge sharing practice and organisational performance have long been demonstrated. Knowledge sharing is driven by three key enablers, i.e. people (Fliaster, 2004; Jayasingam et al., 2010; Kulkarni, et al., 2006); organisation (Bartlett & Ghoshal, 1998; Tsai, 2002; Van den Hoof & Huysman, 2009); and information technology (Robinson et al., 2010; Tseng, 2008). Despite the breadth of research into the practice of knowledge sharing in commercial sectors, there is a lack of research into research-knowledge sharing (RKS) in higher education (HE). The practice of knowledge sharing in higher education institutions (HEIs) is critical, particularly in relation to RKS, which could influence university research activity and performance. However, the nature of research-knowledge and the process of sharing research-knowledge have not been practically explored. Most importantly, the relationship between RKS and university research performance has not yet been fully examined.

This study attempts to ascertain the nature and the process of sharing research-knowledge in HEIs in general, and to examine the influence of the desired key determinants on RKS in particular. Eight UK universities are selected for this study, which are examined in two sub-groups: the Pre-1992 and the Post-1992 universities. Both qualitative and quantitative approaches are used to conduct the study. The study found that RKS is influenced by the three enablers, but implicit research culture is critical in determining the differences between Pre-1992 and Post-1992 University's research performance. In addition, RKS follows a distinctive process – knowledge hoarding-knowledge seeking-knowledge sharing. Furthermore, there is a positive relationship between research-leadership and research-knowledge sharing, which is centred on interactive relationship with professors. The findings of this study provide original insight into the specific field of knowledge sharing which adds knowledge to the body of knowledge management and organisational culture. They are of great importance to research-leaders in HEIs to develop and implement research strategies.

# CONTENT

<b>ABSTRACT.....</b>	<b>iii</b>
<b>CONTENT LIST.....</b>	<b>iv</b>
<b>DECLARATION.....</b>	<b>viii</b>
<b>LIST OF TABLES.....</b>	<b>ix</b>
<b>LIST OF FIGURES.....</b>	<b>xi</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>xiii</b>
<b>DISSEMINATION.....</b>	<b>xiv</b>
<b>DEDICATION.....</b>	<b>xvi</b>

## CHAPTER 1 INTRODUCTION

Introduction.....	1
1.1 Research context.....	2
1.2 The need to study knowledge sharing in HEIs.....	4
1.3 Objectives and research questions.....	7
1.4 Definition of terms.....	8
1.5 An overview of research methodology.....	9
1.6 Organisation of chapters.....	10
1.7 Summary.....	12

## CHAPTER 2 CRITICAL ISSUES IN KNOWLEDGE SHARING

Introduction.....	14
2.1 The concept of knowledge.....	15
2.2 Types of knowledge.....	16
2.3 Evolution of knowledge management.....	18
2.4 Overview of knowledge sharing.....	20
2.5 Knowledge sharing behaviour.....	21
2.5.1 Knowledge sharing behaviour theories.....	21
2.5.2 Knowledge sharing enablers.....	26
2.5.3 Knowledge sharing process model.....	36
2.6 Roles of leaders in supporting knowledge sharing.....	38
2.7 Channels of communication for knowledge sharing.....	44
2.8 Summary.....	47

## CHAPTER 3 KNOWLEDGE SHARING IN HEIS

Introduction.....	50
3.1 The UK HEIs categorisations.....	51
3.2 Research paradigm in the UK HEIs.....	53
<i>The roles of professors in HEIs.....</i>	<i>57</i>
3.2.1 Research performance: Research Assessment Exercise.....	59
3.3 Knowledge sharing in HEIs.....	61

3.4	Research problems and the gap.....	65
3.5	Research model.....	67
3.6	Summary.....	68

## **CHAPTER 4 RESEARCH METHODOLOGY**

	Introduction.....	70
4.1	Nature of study.....	71
	4.1.1 Philosophical orientation.....	71
	4.1.2 Mixed method approach.....	74
4.2	Research process.....	78
	4.2.1 Qualitative approach.....	79
	4.2.2 Quantitative approach.....	81
	4.2.3 Research spectrum.....	82
4.3	Sampling.....	82
	4.3.1 Sampling procedure.....	83
	<i>Participants</i> .....	85
	<i>Sampling in the pilot study</i> .....	85
	<i>Sampling in the main phase</i> .....	87
	<i>Ethics</i> .....	89
4.4	Data collection.....	89
	4.4.1 Interviews.....	90
	<i>Transcribing</i> .....	91
4.5	Data analysis.....	91
	4.5.1 The use of CAQDAS for qualitative data analysis.....	92
	<i>NVivo application</i> .....	94
4.6	Validity and reliability.....	95
4.7	Summary.....	96

## **CHAPTER 5 QUALITATIVE FINDINGS: PRE-1992 UNIVERSITIES**

	Introduction.....	98
5.1	Why sharing.....	100
	5.1.1 Motivator factor.....	100
	<i>Intrinsic reward</i> .....	102
	<i>Extrinsic reward</i> .....	110
5.2	When sharing (or not).....	124
5.3	What to share.....	130
5.4	How to share.....	136
5.5	The influence of KS enablers on RKS.....	140
	5.5.1 People as an enabler.....	141
	5.5.2 Organisation as an enabler.....	145
	<i>Research strategy</i> .....	146
	<i>Research event</i> .....	150

5.5.3	IT as an enabler.....	152
5.6	The influence of research-leaders on RKS behaviour.....	154
5.7	Summary.....	163

## **CHAPTER 6 QUALITATIVE FINDINGS: POST-1992 UNIVERSITIES**

Introduction.....	166
6.1 Why sharing.....	167
6.1.1 Motivator factor.....	167
<i>Intrinsic reward</i> .....	168
<i>Extrinsic reward</i> .....	176
6.1.2 Inhibitor factor.....	179
6.2 When sharing (or not).....	190
6.3 What to share.....	194
6.4 How to share.....	198
6.5 The influence of KS enablers on RKS.....	202
6.5.1 People as an enabler.....	202
6.5.2 Organisation as an enabler.....	206
<i>Research strategy</i> .....	207
<i>Research event</i> .....	211
6.5.3 IT as an enabler.....	212
6.6 The influence of research-leaders on RKS behaviour.....	215
6.7 Summary.....	221

## **CHAPTER 7 QUANTITATIVE ANALYSIS: PRE-1992 VS. POST-1992 UNIVERSITIES**

Introduction.....	224
7.1 Key differences.....	225
7.1.1 Why sharing.....	225
7.1.2 When sharing (or not).....	228
7.1.3 The influence of KS enablers on RKS behaviour.....	230
7.2 What to share and how to share.....	232
7.3 ANOVA Test.....	233
7.3.1 Responses from research-academics.....	233
7.3.2 Responses from research-leaders.....	236
7.4 Summary.....	238

## **CHAPTER 8 DISCUSSIONS & IMPLICATIONS**

Introduction.....	241
8.1 Key determinants of RKS.....	242
8.1.1 Motivator and inhibitor factors.....	242
8.1.2 RKS process and types of knowledge.....	243
8.1.3 Channels of communication.....	248
8.1.4 The influence of KS enablers on RKS behaviour.....	249

8.1.5	The influence of research-leaders on RKS behaviour.....	258
8.2	Associated issues.....	264
8.2.1	The impact of the REF on RKS behaviour.....	264
8.2.2	The impact of university workload system on RKS behaviour.....	266
8.3	Theoretical contributions.....	269
8.3.1	Motivation theory.....	269
8.3.2	KM theory.....	271
8.3.3	Organisational culture theory.....	273
8.3.4	Leadership theory.....	275
8.4	Practical implications.....	277
8.5	Summary.....	282
 <b>CHAPTER 9 SUMMARY</b>		
	Introduction.....	287
9.1	Summary of the findings.....	288
9.1.1	University research culture.....	288
9.1.2	Research-leadership.....	292
9.2	A context-specific RKS model.....	296
9.3	Summary.....	297
 <b>CHAPTER 10 CONCLUSION &amp; FUTURE WORK</b>		
	Introduction.....	300
10.1	Concluding remarks.....	301
10.2	Accomplishment of research objectives.....	303
10.3	Original contributions.....	306
10.4	Limitations of study.....	308
10.5	Directions for future work.....	309
10.6	Summary.....	312
	<b>References.....</b>	<b>315</b>
<b>Appendices</b>		
Appendix 1	List of universities for different university groups.....	349
Appendix 2	An example of the recruitment email.....	355
Appendix 3	An example of participant consent form.....	356
Appendix 4	Semi-structured interview questions.....	357
Appendix 5	Likert scale questions.....	358
Appendix 6	An example of transcription files stored in Nvivo.....	359
Appendix 7	An example of tree nodes in NVivo.....	360
Appendix 8	Research timeline.....	361
Appendix 9	Abstracts of journal papers.....	362
Appendix 10	Quantitative results.....	365

## **DECLARATION**

“Whilst registered as a candidate for the above degree, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award.”



## LIST OF TABLES

Table 4.1	Differences between positivist and interpretive perspective.....	73
Table 4.2	Quantitative, qualitative and mixed research methodology.....	75
Table 4.3	The strategies of qualitative, quantitative and mixed methods.....	77
Table 4.4	Spectrum of research approaches on the basis of different philosophical perspectives and empirical research method.....	82
Table 4.5	Participations of research-academics in pilot study.....	86
Table 4.6	Sample profiles of research-academics.....	88
Table 4.7	Sample profiles of research-leaders.....	88
Table 5.1	Motivator factors in Pre-1992 universities.....	101
Table 5.2	Inhibitor factors in Pre-1992 universities.....	118
Table 5.3	Research-leaders' comments on the fear of stealing ideas issue in Pre-1992 universities.....	121
Table 5.4	When sharing (or not) issue in Pre-1992 universities.....	125
Table 5.5	Types of knowledge shared in Pre-1992 universities.....	131
Table 5.6	Communication channels in Pre-1992 universities.....	136
Table 5.7	People enabler in Pre-1992 universities.....	141
Table 5.8	Research-leaders' comments about being an inspirer for RKS.....	143
Table 5.9	Organisation enabler in Pre-1992 universities.....	145
Table 5.10	IT enabler in Pre-1992 universities.....	152
Table 5.11	Research-leaders' comments in Pre-1992 universities on the influence of research-leaders in RKS.....	162
Table 6.1	Motivator factors in Post-1992 universities.....	167
Table 6.2	Inhibitor factors in Post-1992 universities.....	180
Table 6.3	Research-leaders' comments on the fear of stealing ideas issue in Post-1992 universities.....	182
Table 6.4	When sharing (or not) issue in Post-1992 universities.....	190
Table 6.5	Types of knowledge shared in Post-1992 universities.....	195
Table 6.6	Communication channels in Post-1992 universities.....	199
Table 6.7	People enabler in Post-1992 universities.....	203
Table 6.8	Comments from research-leaders about being an inspirer for RKS.....	204
Table 6.9	Organisation enabler in Post-1992 universities.....	207
Table 6.10	IT enabler for RKS in Post-1992 universities.....	213
Table 6.11	Research-leaders' comments in Post-1992 universities on the influence of research-leaders in RKS.....	220
Table 7.1	Key differences in motivator factors in Pre-1992 and Post-1992 universities.....	225
Table 7.2	Key differences in Pre-1992 and Post-1992 universities for when sharing (or not).....	228
Table 7.3	Key differences in Pre-1992 and Post-1992 universities concerning KS...	231

Table 7.4	What to share and how to share issues in Pre-1992 and Post-1992 universities.....	233
Table 7.5	Descriptive analysis for Pre-1992 and Post-1992 universities in ANOVA gained from research-academics.....	234
Table 7.6	Descriptive analysis for Pre-1992 and Post-1992 universities in ANOVA gained from research-leaders.....	237
Table 8.1	Implicit culture in Pre-1992 vs. Post-1992 universities.....	252

## LIST OF FIGURES

Figure 2.1	Literature boundary.....	14
Figure 2.2	The SECI model.....	18
Figure 3.1	Research model.....	68
Figure 4.1	Research process.....	79
Figure 4.2	Number of participants in Pre-1992 and Post-1992 universities.....	85
Figure 5.1	Critical issues of RKS in UK HEIs.....	99
Figure 5.2	Motivator factors.....	101
Figure 5.3	Academic aspect in Pre-1992 universities and number of sources coded..	102
Figure 5.4	Personal aspect in Pre-1992 universities and number of sources coded....	107
Figure 5.5	Extrinsic reward in Pre-1992 universities and number of sources coded...	111
Figure 5.6	Inhibitor factors.....	117
Figure 5.7	Inhibitor factors in Pre-1992 universities and number of sources coded...	118
Figure 5.8	When sharing (or not) in Pre-1992 universities and number of sources coded.....	125
Figure 5.9	Sharing only research result in Pre-1992 universities and the number of sources coded.....	127
Figure 5.10	Sharing across all research phases in Pre-1992 universities and the number of sources coded.....	128
Figure 5.11	Types of knowledge shared in Pre-1992 universities and number of sources coded.....	131
Figure 5.12	Communication channels in Pre-1992 universities and number of sources coded.....	136
Figure 5.13	People enabler in Pre-1992 universities and number of sources coded.....	141
Figure 5.14	Research strategies in Pre-1992 universities and the number of sources coded.....	146
Figure 5.15	Research events in Pre-1992 universities and the number of sources coded.....	150
Figure 5.16	IT enabler in Pre-1992 universities and the number of sources coded.....	153
Figure 6.1	Academic category in Post-1992 universities and number of sources coded.....	168
Figure 6.2	Personal aspect in Post-1992 universities and number of sources coded..	173
Figure 6.3	Extrinsic rewards in Post-1992 universities and number of sources coded	176
Figure 6.4	Inhibitor factors in Post-1992 universities and number of sources coded.....	180
Figure 6.5	When sharing (or not) issue in Post-1992 universities and number of sources.....	191
Figure 6.6	Types of knowledge shared in Post-1992 universities and number of sources coded.....	195
Figure 6.7	Channel of communications in Post-1992 universities and number of sources coded.....	199

Figure 6.8	People enabler in Post-1992 universities and number of sources coded....	203
Figure 6.9	Research strategies in Post-1992 universities and the number of sources coded.....	208
Figure 6.10	Research events in Post-1992 universities and the number of sources coded.....	211
Figure 6.11	IT enabler in Post-1992 universities and the number of sources coded.....	213
Figure 7.1	Comparative results between Pre-1992 and Post-1992 universities for motivated by the REF.....	227
Figure 7.2	Comparative results between Pre-1992 and Post-1992 universities for university expectation issue.....	228
Figure 7.3	Comparative results between Pre-1992 and Post-1992 universities for when sharing (or not).....	230
Figure 8.1	Academic and personal motivator factors.....	242
Figure 8.2	The link between inhibitor factors and trust.....	243
Figure 8.3	Process-oriented RKS (PORKS) model.....	244
Figure 8.4	Knowledge sharing management (KSM) model.....	247
Figure 8.5	Research culture-earth model.....	255
Figure 8.6	Link between research culture-earth model and roles of formal and informal research-leaders.....	260
Figure 8.7	Types of research-academics across career phase.....	268
Figure 9.1	RKS engagement style in Pre-1992 universities vs. Post-1992 universities.....	290
Figure 9.2	Interactive research-leadership structures in Pre-1992 universities.....	293
Figure 9.3	A context-specific RKS model.....	297

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## DISSEMINATION

This thesis is about the work carried out by the author at the Portsmouth Business School, under the supervision of Dr Mark Xu, Dr Michael Wood, and Dr Christine Welch from October 2008 until March 2012. I declare that this thesis has not been submitted for any other qualification to this or any other universities. The material is original, except where due reference is made to other sources.

Accounts of part of this work have been published in the following papers:

1. Mahamed Ismail, N. A., Xu, M., Wood, M., & Welch, C. (2012). To share or not to share? Research-knowledgesharing in higher education institution: preliminary results. *Int. J. Information Technology and Management*, Vol. X, No. Y, xxxx 1.
2. Mahamed Ismail, N.A., and Welch, C. (2010, September). Leader Engagement and Its Impact upon Knowledge Sharing Behaviour in a Higher Education Context, *Proceedings of the 11th European Conference on Knowledge Management, Vol. 2* (pp.1084-1094). Universidade Lusiana de Famalicão, Portugal.

The work has also been presented in the following conferences.

1. Mahamed Ismail, N.A. (2010, July). *The Development of Leadership Capacity for Knowledge Sharing Behaviour in UK Higher Education*. Paper presented at the 2nd Developing Leadership Capacity Conference, University of the West England, UK.
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Following the work of this study, two other papers will be submitted to the following journals:

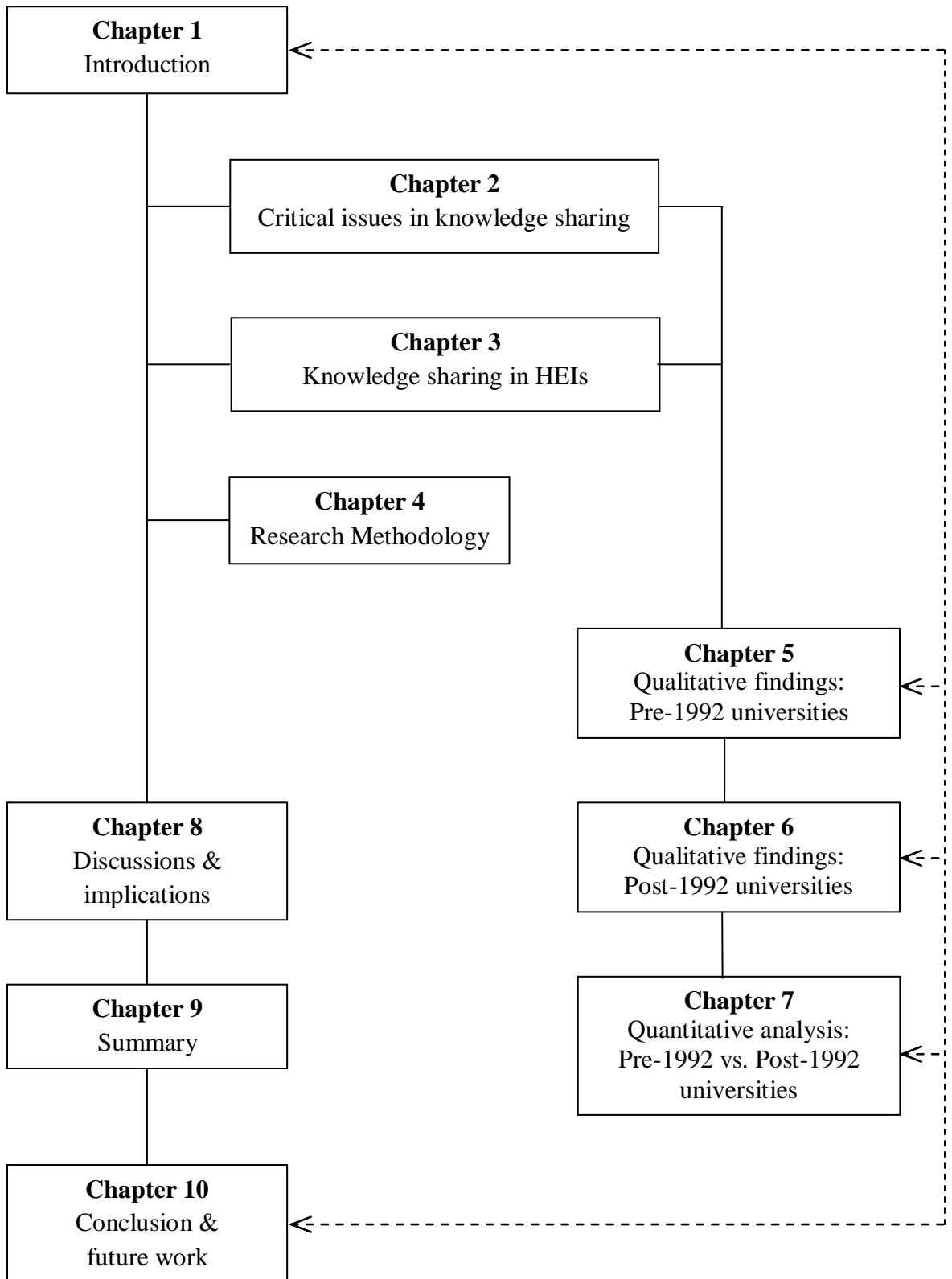
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***Dedicated to...***

my daddy, Hj. Mahamed Ismail Mohamed Yusoff  
and  
my mummy, Hjh. Bibi Asha Hukum Khan  
and also,  
my sisters, Nor Ashila and Noor Ashfarina  
my brothers, Mohamed Ashref and Muhammad Adam

***“Thank you all for your prayers and endless supports and patience”***





# Chapter 1

*“A journey of a thousand miles must begin  
with a single step”  
Lao-tzu (604BC-531BC)*

## **Introduction**

### **Introduction**

This chapter gives an account of the research conducted and the nature of the thesis. It briefly reviews the contexts of research concerning knowledge sharing in the relevance of HEIs settings. Moreover, it clarifies the terminology used in this thesis and outlines the aims of this study with specific research objectives. It presents an overview of the thesis structure of this study, and ends with a summary for the chapter.

## 1.1 Research context

Knowledge is very well known as a critical organisational resource that provides a sustainable competitive advantage in a dynamic economy (Davenport & Prusak, 1998; Foss & Pedersen, 2002; Spender & Grant, 1996). As a knowledge-centred activity, knowledge sharing is an essential means, by which employees can contribute to knowledge application, innovation, and ultimately the competitive advantage of the organization (Jackson, et al., 2006; Mesmer-Magnus and DeChurch, 2009). The success of knowledge management (KM) initiatives depends on knowledge sharing (Hasanali, 2002). Knowledge sharing becomes a necessary means for achieving organisational performance. Since knowledge sharing is crucial for productivity growth, it is assumed that people are sharing knowledge as part of their job duties. However, many organisations have experiences that knowledge sharing does not always happen in practice, regardless of its critical role (Cromity and de Stricker, 2011; Hansen et al., 1999; Swift et al., 2010).

Previous research has reviewed variety elements that affecting knowledge sharing. The first element is the characteristics of knowledge either explicitness or tacitness (Chen et al., 2011; Ipe, 2003). The type of knowledge and the value attributed to knowledge have a significant influence on the way knowledge is shared within organisations (Ipe, 2003, pp. 343). Ipe explains that tacit is the “know-how” knowledge, which includes experience-based knowledge that is mostly subjective, whereas explicit is the “know-what” knowledge is the task-related knowledge that is objective in nature. Many authors have built up ideas on tacit and explicit knowledge following Polanyi’s (1966) and Nonaka and Takeuchi’s (1995) perspectives – e.g. Jasimuddin et al., 2005; Mooradian, 2005; Tsoukas, 1996. Nonaka and Takeuchi (1995) argued that tacit and explicit knowledge are two separate types, which are contradicting with Polanyi’s ideology that tacit and explicit knowledge are inseparable. The sharing of explicit knowledge is much easier as it is mainly consists of standard knowledge like official document or methodologies as compared to tacit knowledge which is more risky (Huang et al., 2010).

The second element is the characteristic of the organisational context like culture (Issa and Haddad, 2008). Organisational culture has been considered as a key

element of effective knowledge sharing activities (Jo and Joo, 2011; Jones et al., 2006). Organisations with a knowledge sharing culture enable employees share ideas and insights as they see it as natural and not something they are forced to do (McDermott and O'Dell, 2001). According to Lam and Lambermont-Ford (2010) normative motivation for sharing knowledge is possibly influenced by how the organisation reinforce the individual's current motivational stance towards knowledge sharing, where it is not depending solely on "promoting an ethos of knowledge sharing through organisational values" (pp.55), but also the necessity to alter "the value set of the individual members to the extent that it became an unconscious norm of action" (Ahmed, 1998, pp. 32).

The third element is the characteristic of the personal context such as leadership (Lee et al., 2010). Knowledge sharing is frequently linked to leadership support and commitment. Leadership has shown a particularly strong influence on knowledge sharing processes (Lee et al., 2010; Politis, 2001, 2002; Srivastava, et al., 2006). A leader is identified as "knowledge builder" by Mann et al. (2005), i.e. someone who provide their own advice on technical issues, develop the employees' expertise, scan the environment for new ideas, monitor the quality of the employees' work performance and initiate new approaches to employees' tasks. Since knowledge sharing is unlikely automatic, the leaders' roles is critical to strongly influence the extent of knowledge being shared (Srivastava et al., 2006). Leaders also potentially influence knowledge sharing behaviour through leading by example – signalling that the open sharing of ideas is important (Lee et al., 2010; Riege, 2005); role modelling – leading through ethical behaviour and personal involvement (Schweitzer and Gudergan, 2010; Vora, 2002); mentoring or coaching (Smith and McKeen, 2002; Yang, 2007); and inspiring – encouraging followers to achieve higher level of innovation and effectiveness, (Liu and Phillips, 2011; Ribiere and Sitar, 2003).

The fourth element is, based on the process view, key determinants of knowledge sharing is explored from the perspectives of intention and motivation, both extrinsic and intrinsic and behaviour during the process (Lin, 2007). Extrinsic motivation (e.g. monetary incentives, praise, or self-recognition) has been exposed to significantly affect employees' participation towards knowledge sharing (Lam and Lambermont-

Ford, 2010). However, previous studies suggest that intrinsic motivation is more effective to enhance knowledge sharing participations than extrinsic motivation. Intrinsic motivation is essentially integrated with employees' willingness to create a positive mood, resulting in inclination to voluntary share knowledge (Amin et al., 2011; Lin, 2007). Other determinants that influence knowledge sharing includes characteristics of the sender and receiver such as personality, emotion, and capability (Cyr and Choo, 2010; Liu and Chen, 2005); characteristic of their relationship such as the level of trust (Panteli and Sockalingam, 2005; Renzl, 2008); characteristics of communication channels such as written, printed, or computer-mediated (Cummings, 2004; Koskinen et al., 2003; Pulakos et al., 2003; Yu et al., 2010); and characteristics of information technologies (Jeon et al., 2011).

In accordance to the above discussions, it can be argued that when any of the aforementioned elements do not exist, knowledge sharing is unlikely to take place. At the very least, it occurs in an ineffective or inefficient way. It is generally agreed upon that knowledge sharing is a crucial process within organisational settings, either for project team-based, formal or informal work groups or communities of practice (Boer, 2005). Although enormous research has explored knowledge sharing in commercial sectors, there is a dearth of research emphasising on knowledge sharing in HEIs settings. Specifically, in the relevance of knowledge sharing, previous research has not paid attention investigating one of the key activities in most of the British universities, i.e. research. Thus, this study aims to bridge this gap by examining the sharing of research-knowledge in HEIs.

## **1.2 The need to study knowledge sharing in HEIs**

The problem concerned by this study is in three facets: Firstly, there is a lacking of knowledge sharing research in HE settings. Knowledge sharing is a social phenomenon and thus, the process where knowledge is shared among people is vital. There are heavy research examined the practice of knowledge sharing in commercial sectors, which is disproportionate with HE settings. Therefore, it is interesting to explore knowledge sharing practice in HE settings.

Secondly, there is a lacking of research on context-specific knowledge sharing. The practices of knowledge sharing vary across contexts. Since research is now becoming the core activity in most British universities in the UK (Bai, et al., 2008), a specific context of knowledge, i.e. research-knowledge is arguably critical in HEIs. Research-knowledge can be useful to support research activity and research output of a particular university, which then lead to better research performance. Therefore, an in depth research is important to explore this context-specific knowledge sharing in HEIs. Thirdly, the aforementioned problems may be exuberated by the different types of university in the UK. According to Locke (2011), HEIs in the UK are varied based on their origin, status, mission, resources, research activity and income, educational provision and student characteristics. Given the different types of universities, e.g. research leading university vs. teaching leading university, the nature of RKS might be complex and different, hence, an in depth study examining different types of universities as to how research-knowledge is shared are critically needed.

The aforementioned problems remain interesting and worthily explored areas. There is an urgency to explore the best practice of research-knowledge sharing in HEIs that may lead to better research performance. The results may shed lights to revising theoretical models of knowledge sharing in this very specific context, which then underpin some future contributions. This study aims to explore RKS in two different types of universities in the UK, i.e. Pre-1992 and Post-1992 universities. Eight universities ranging from Pre-1992 and Post-1992 universities have been selected, emphasising on two different groups of people, i.e. research-academics and research-leaders. There are six key determinants of RKS addressed in this study, including: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS.

Some of the key determinants are informed by the review of literature and theories in relation to knowledge sharing. There is a progressive coherence portrays the building up of an area of knowledge in knowledge sharing literature, in which there is

considerable consensus in terms of factors affecting knowledge sharing behaviour. This includes the identification of motivator and inhibitor factors of knowledge sharing, the enablers of knowledge sharing (i.e. people, organisation, IT), and the influence of leaders in supporting knowledge sharing. In light of this, it is crucial to explore the impact of these factors on a more context-specific field. Therefore, alternative perspectives have been introduced for this study through which the first three key determinants are specifically designed for a context-specific knowledge sharing (i.e. RKS) in UK HEIs. This includes the motivator and inhibitor for or against sharing research-knowledge; the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and the influence of research-leaders on RKS. Those determinants are recognised as significant controversies in knowledge sharing literature, which affecting knowledge sharing behaviour.

Since this study aims to explore context-specific knowledge sharing that has not been explored before, the researcher believes it is crucial to understand the process of knowledge sharing in a more precise way, which is intertwined with the types of knowledge used for sharing; and also to recognise the channels of communication use for sharing context-specific knowledge. These elements are also discussed in prior studies in relation to knowledge sharing. As a consequence, another three determinants have been developed, i.e. the RKS process; types of knowledge shared; and channels of communications use for sharing research-knowledge. Therefore, six key determinants have been adopted for this study. Discussions of these determinants are made in Chapter 2. The literature review is supported by referring to prominent writings in the desired field. These six key determinants are not used so as to presume the nature and the process of RKS in UK HEIs. Rather they act as a foundation through which the RKS is explored in this study. As mentioned by Dey (1999, p. 251), "Prior conceptions need not become preconceptions".

This study aims to compare the Pre-1992 and Post-1992 universities with regard to RKS activity within the boundary of the desired key determinants. This study also compares the relationship between research-leaders and research-academics in relation to RKS activity. This study is not looking at generic knowledge sharing. Knowledge sharing in this study is not simply an activity where a person, group, or

organisation transfer or disseminate both tacit and explicit knowledge to one another. Rather, this study focus on context-specific knowledge sharing, i.e. RKS, which is defined as “individual research-academics sharing and seeking tacit or explicit knowledge to other people either through publications (Starkey and Madan, 2001), collaborations (Kim and Ju, 2008), books or formal and informal conversations”. Following this perspective, research-knowledge is clearly consisted of tacit and explicit knowledge possesses by an individual research-academics within the boundary of research ideas, research proposals, research designs, research methodologies, and research results.

### **1.3 Objectives and research questions**

This study aims to examine the key determinants affecting research knowledge sharing that lead to better research performance, and the relationship between leadership and knowledge sharing behaviour. Six key determinants of knowledge sharing in HEIs settings are examined, including: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. This study has six specific objectives:

- 1) To explore all the six key determinants concerning RKS in Pre-1992 and Post-1992 universities.
- 2) To examine the commonalities and differences between Pre-1992 and Post-1992 universities concerning the RKS.
- 3) To study the relationship between research-leaders and research-academics in terms of RKS.
- 4) To review the current literature with regard to knowledge sharing in commercial sectors.
- 5) To reveal the distinctive characteristics of RKS in HE settings.
- 6) To develop a theoretical framework of context-specific RKS process in HE settings.



Within the boundary of these research objectives, six research questions have been developed:

- 1) What makes research-academics willing or reluctant to share research-knowledge?
- 2) When do research-academics not share research-knowledge?
- 3) What is the type of knowledge shared in RKS?
- 4) What is the most preferred channel of communication use for RKS?
- 5) What is the functionality of KS enablers on RKS (i.e. people, organisation, and IT)?
- 6) How do research-leaders influence RKS behaviour among research-academics?

#### **1.4 Definition of terms**

There are several terms that are used in this study. Explanations on these terms are crucial in order to reduce confusion. They are explained as follows:

***“Research-knowledge”*** refers to both tacit and explicit knowledge possesses by an individual research-academics within the boundary of research ideas, research proposals, research designs, research methodologies, and research results.

***“Research-knowledge sharing”*** or “RKS” refers to the process where individual research-academics pass out and/or seek tacit or explicit knowledge; to or from other people either through publications, collaborations, books or formal and informal conversations.

***“Research-academics”*** refers to academics appointed on teaching and research employment at universities in the UK.

***“Research-leaders”*** refers to: (1) formal research-leaders, including those at the top university level (i.e. Pro Vice Chancellor of Research and Director of Research), middle level (i.e. Dean of Research and Associate Dean of Research); and (2) informal research-leaders at the low university level (i.e. professors).

*“Pre-1992 universities”* refers to universities before the abolition of the “binary divide” between polytechnics and universities in 1992 (Locke, 2011).

*“Post-1992 universities”* refers to universities that had previously been polytechnics (Locke, 2011).

## **1.5 An overview of research methodology**

In order to answer the research questions and achieve the research objectives, empirical data were collected within eight universities in the UK, ranging from Pre-1992 and Post-1992 universities. These universities were selected based on the different research performance, which is measured by RAE Power Ranking 2008, using the Unit of Assessment (UoA) 36, i.e. Business and Management Studies. The UoA 36 is chosen due to the acute pressures to achieve high performance in publication rankings for both reputational purposes and financial incentives; as compared to other STEM (i.e. Science, Technology, Engineering, and Mathematics) subjects. The data were collected using semi-structured interviews, involving 60 participants. During the pilot study, 11 research-academics and 7 research-leaders were interviewed. In the main phase, 16 research-academics and 10 research-leaders were recruited from Pre-1992 universities, whereas 11 research-academics and 5 research-leaders were recruited from Post-1992 universities. In order to deal with very rich text-based data, computer assisted qualitative data analysis software (CAQDAS), i.e. NVivo (version 8) was employed. Triangulation through the application of quantitative method (i.e. Fisher Exact Test and ANOVA) has been used to establish consistency and comparison between the qualitative data.

## **1.6 Organisation of chapters**

The structure of this thesis is as follows:

### ***Chapter 1: Introduction***

This chapter provides an overview of the study, including its background, definition of terms, the research aims and objectives, the overview of research methodology, the organisation of chapters in this thesis. The chapter ends with a summary for the chapter.

### ***Chapter 2: Critical issues in knowledge sharing***

This chapter reviews the literature with regard to knowledge sharing. It highlights the literature boundary for this study. The first boundary shows critical issues in knowledge sharing. It starts with discussions on the concept of knowledge and the types of knowledge, the evolution of KM and also knowledge sharing in commercial sectors. This chapter also portrays relevant theories concerning knowledge sharing behaviours. It continues to discuss the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT), and follows with the review of knowledge sharing process model. This chapter presents the discussion on the channels of communication for knowledge sharing, and ends with a summary for the chapter.

### ***Chapter 3: Knowledge sharing in HEIs***

This chapter presents the second literature boundary, where the area of knowledge sharing in HEIs setting is reviewed. It introduces the different categories of HEIs in the UK and the importance of research in the UK HEIs as well as the Research Assessment Exercise (RAE). It then reviews critical issues of knowledge sharing in HEIs, where specific issues related to knowledge sharing are highlighted, including the roles of leaders in supporting knowledge sharing. This chapter signifies the research problems for this study, where the research gap is justified and a research model is developed. The chapter ends with a summary for the chapter.

### ***Chapter 4: Research methodology***

This chapter is devoted to the consideration of choosing the methodology and conducting field investigation. It explains the nature of the study and also discusses

the application of the qualitative data analysis approach used in this study. The chapter describes the sample frame, sampling techniques, data collection and data analysis procedure. It then presents a discussion on the validity and reliability of study and ends with a summary for the chapter.

#### ***Chapter 5: Qualitative findings: Pre-1992 universities***

This chapter reports the results generated from Pre-1992 universities. The chapter contains discussions for six key determinants, including (1) what makes research-academics willing or reluctant to share research-knowledge; (2) when do research-academics not share research-knowledge; (3) what is the type of knowledge involved in RKS; (4) what is the most preferred channels of communication use for RKS; (5) what are the predictors of RKS within a university; and (6) how do research-leaders influence RKS engagement among research-academics. It mainly confers evidences from research-academics and research-leaders. This chapter presents qualitative results using the application of NVivo. The chapter ends with a summary for the chapter.

#### ***Chapter 6: Qualitative findings: Post-1992 universities***

This chapter follows identical format of Chapter 4, but reports results found in Post-1992 universities. It portrays discussions for the six key determinants. The evidences from research-academics and research-leaders are presented. This chapter also presents qualitative results using the application of NVivo and ends with a summary for the chapter.

#### ***Chapter 7: Quantitative Analysis: Pre-1992 vs. Post-1992 universities***

This chapter presents a quantitative comparison between Pre-1992 and Post-1992 universities. The findings reinforce the qualitative analysis. The Fisher Exact Test in Chi-square was used to test the  $p$  value for the first five key determinants: (1) why sharing; (2) when sharing (or not); (3) what to share; (4) how to share; (5) the influence of KS enablers on RKS behaviour. The Analysis of Variance (ANOVA) was employed to analyse the last critical issue, i.e. the influence of research-leaders on RKS behaviour among research-academics. This chapter discusses both key

differences and commonalities with regard to RKS activity between the two types of universities and ends with a summary for the chapter.

### ***Chapter 8: Discussions & implications***

This chapter synthesises the main findings for Chapter 5, 6 and 7. It draws out the key differences and commonalities concerning the six key determinants of RKS between Pre-1992 and Post-1992 universities, and developed four theoretical models. The chapter also discusses two associated issues emerged from the findings: (1) the impact of university workload system on RKS behaviour; and (2) the impact of research-academic's career phase on RKS behaviour. This chapter also explains the theoretical contributions and practical implications of this study and ends with a summary for the chapter.

### ***Chapter 9: Summary***

This chapter summarises the findings for this study in the perspectives of three enablers of knowledge (i.e. people, organisation and IT). A context-specific RKS model has been developed based on the results found in this study. The chapter also signifies the original contributions of this study to the body of knowledge. It then ends with a summary for the chapter.

### ***Chapter 10: Conclusion and future work***

This is the final chapter of the study. It draws out the concluding remarks of the study, where an overview of research rationale, aims, research method used, and the overall findings of this study. The chapter also highlights the accomplishment of research objectives is explained. It also highlights the limitations of study and finally provides the suggestions for future research work. The chapter ends with a summary for the chapter.

## **1.7 Summary**

This chapter provides an overall picture of the study. It introduces the research context of the study, emphasising on the key elements that affecting knowledge sharing, which includes: 1) the characteristics of knowledge either explicitness or

tacitness; 2) the characteristic of the organisational context (e.g. culture); 3) the characteristic of the personal context such (e.g. leadership); and 4) the process view (e.g. motivator and inhibitor factors). It also explains the need of the study by looking at the three specific problems, including lacking of knowledge sharing research in HE settings, lacking of research on context-specific knowledge sharing, the nature of knowledge sharing might be different in different types of universities. In light of this, six research objectives and research questions are developed. This chapter also explains the key terms that will be used in this thesis, followed an overview of research methodology for this study. Lastly, it briefly describes the structure of the thesis starting from Chapter 1 to Chapter 10.

## **Critical issues in knowledge sharing**

### **Introduction**

Research and innovation activities fuelled by HEIs have converged and become increasingly essential to all countries, particularly with the inexorable advancement of the knowledge economy. Following the notion of this study, the review of literature is divided into two separate chapters – 2 and 3. Figure 2.1 represents a literature boundary for this study. This chapter discusses recent literature within the A area, concerning critical issues in knowledge sharing. Chapter 3 will discuss the B area, relating to literature on knowledge sharing in HE settings. This study is specifically narrowed down into C area, where the research gap is found, which is discussed in Chapter 3. Particularly, this chapter starts with discussions on the concept of knowledge and the types of knowledge, the evolution of KM and also knowledge sharing in commercial sectors. It continues with discussions on knowledge sharing behaviours, highlighting the relevant theories. This chapter then discusses the influence of KS enablers on RKS behaviour, (i.e. people, organisation, and IT), and also knowledge sharing process model as well as the channels of communication for knowledge sharing. It ends with a summary for the chapter.

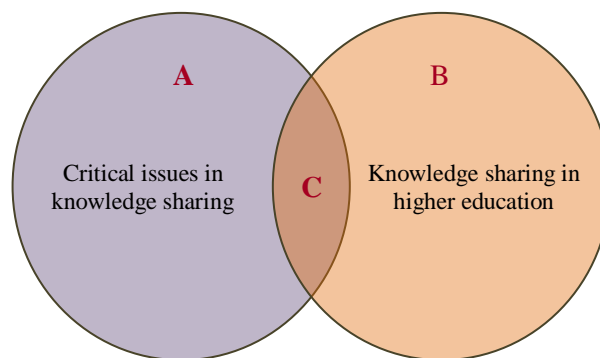


Figure 2.1 Literature boundary

## 2.1 The concept of knowledge

The new economy stands out with a distinctively characteristics since it deals with a unique resource called “knowledge”. Knowledge is an elusive concept that has been numerously defined on various ways. Researchers defined knowledge in different context but none of these can be universally used. It is however useful to consider the manifold views of knowledge as this will enable us to understand the knowledge-based theory of the firm and KM processes. In contrast with other traditional resources like land, labour, and capital, knowledge to a certain extent, becomes a public good, once it is distributed and shared. Davenport and Prusak’s (1998, p. 5) definition of “knowledge” captures this complexity.

“Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms.”

Unlike “data” and “information”, the concept of “knowledge” is more elusive to understand due its intangible and fuzzy nature. Blair (2002) clearly distinguishes knowledge from data and information using the following examples:

People might say,  
“Put the *data* on the desk”, or  
“Get the *data* and fax it to New York”, or  
“Bill had the *data*, but he lost it”  
or,

“Put the *information* on the desk”, or  
“Get the *information* and fax it to New York”, or  
“Mary had the *information*, but she misplaced it”

But would people ever say,  
“Put the *knowledge* on the desk”, or  
“Get the *knowledge* and fax it to New York”, or  
“Chris had the *knowledge* yesterday, but lost it”



Blair makes it clear that knowledge is one's ability to do something or to exercise a kind of expertise. He concludes that a computer can have data (e.g. facts and figures stored in the data base), a report can have information (informative) but only a person can be knowledgeable, have and exercise knowledge. In short, Blair sees knowledge as an intangible human asset that can be exchanged when two or more people interact.

## **2.2 Types of knowledge**

The type of knowledge has been seen as a two side coin, on one side is explicit knowledge, and on the other is tacit knowledge. Explicit knowledge is the type of knowledge that can be formally and systematically stored, articulated, and disseminated into certain codified forms and records such as databases, libraries (Polanyi, 1966 cited in Nonaka, 1994), manual or computer files (Becerra-Fernandez & Sabherwal, 2001; Choi & Lee, 2003; Akgun et al., 2005). Tacit knowledge is defined as knowledge that is highly personal and is embedded in a person's daily life or work practice (Polanyi, 1966 cited in Nonaka, 1994). Klein (2008) suggests the subjective insights and intuitions of tacit knowledge make it hard to be passed, communicated or shared among individuals. Such knowledge is deeply rooted in a human's action and experience. Such knowledge, according to Barth (2002) is obtainable through practical application and work practices, and can be transferred and demonstrated by observing. Haldin-Herrgard's (2000) on the other hand states that tacit knowledge can neither given in lectures nor found in databases, textbooks, manuals or internal newsletters for diffusion.

Originally, Polanyi (1966) argued that the concept of tacit knowledge was not a separate category of knowledge - rather it is an integral part of all knowing. However, Nonaka & Takeuchi (1995) critiqued Polanyi's ideas and claimed that tacit and explicit knowledge are two separate types of knowledge. And this was supported by Mooradian (2005) who commented that tacit knowledge is intrinsically different from explicit knowledge and in making tacit knowledge explicit is to change it following the process of converting tacit into explicit knowledge as suggested by Nonaka & Takeuchi. Building on Polanyi's original ideas, Tsoukas (1996) however

argued that tacit and explicit knowledge are mutually constituted and should not be viewed at two separate types of knowledge, contrary to what Nonaka & Takeuchi argued. In fact, Tsoukas debated that separating tacit and explicit knowledge is impractical. More recently, in a conceptual paper exploring extensive literature on tacit and explicit knowledge, Jasimuddin et al. (2005) concluded that tacit and explicit knowledge are inseparable. Interestingly, they used the portions of an iceberg above and below the waterline as an analogy to describe the linkage between tacit and explicit knowledge, in which the ‘exposed’ explicit knowledge is supported by the ‘hidden’ tacit knowledge.

Nonaka & Takeuchi’s (1995) SECI spiral model: Socialisation-Externalisation-Combination-Internalisation; is a robust effort to develop ways of converting tacit knowledge into explicit and back again in a cycle mode. SECI model involves four modes of knowledge transformation. Figure 2.2 illustrates SECI model adapted from Nonaka & Takeuchi. Socialisation is the “tacit-to-tacit” knowledge transformation, in which experiences or actions are shared in social ways or informal interactions. Externalisation is the “tacit-to-explicit” knowledge transformation, where an individual captures the “know-how” knowledge by writing it down or capturing it using information technologies. Combination is the “explicit-to-explicit” knowledge transformation, which happens when multiple sources of explicit knowledge are converted into more systematic sets of tangible or codified knowledge. Internalisation is the “explicit-to-tacit” knowledge transformation, which often occurs when explicit knowledge is often practiced and incorporated within an individual.

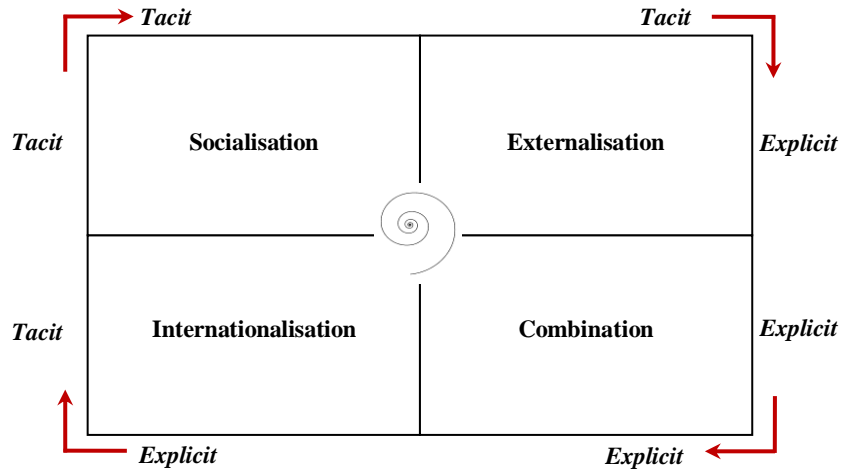


Figure 2.2 The SECI model (Nonaka & Takeuchi, 1995)

### 2.3 Evolution of Knowledge Management

Knowledge management (KM) is a term that has existed in the business glossary for many years. Since knowledge is one of the key strategic resources, the notion of KM is considered crucial in an organisation (Jones, 2003; Lee & Yang, 2000b). KM portrays the strategies and processes of acquiring, converting, applying, and protecting knowledge that can produce and improve sustained long term organisational competitive advantage (Lin, 2007b). KM practice is a process, where all knowledge is managed in order to meet the existing and emerging needs, identify and exploit existing and acquired knowledge assets and develop new opportunities (Jarrar, 2002). Although KM has been discussed in many different ways, it is generally concerned with how create (i.e. learning process), disseminate (i.e. knowledge sharing) and measure (i.e. intellectual capital) knowledge related assets (Argote, 1999; Bontis & Serenko, 2009; Huber, 1991; Liao & Wu 2010; Sveiby and Risling, 1986; Yousif Al-Hakim & Hassan, 2011).

KM engages individuals and groups both within and between organisations, managing tacit and explicit knowledge for making better decisions, taking systematic actions and delivering effective results in order to support the underlying business strategy (Horwitch & Armacost, 2002). Extensive studies were launched to define and describe KM. Nonaka & Takeuchi (1995) discussed KM within the boundary of the four knowledge conversion processes, known as SECI model (i.e. socialisation,

externalisation, combination and internalisation). Bhatt (2001) on the other hand, illustrated five steps in KM process activities, including knowledge creation, knowledge validation, knowledge formatting, knowledge distribution, and knowledge application. Bhatt's model of KM covers the full range of activities with regard to the flow of knowledge in organisations. From an organisational capabilities standpoint, Gold et al. (2001) criticised that the KM process engages with four elements, i.e. knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection. According to Lin (2007b) Gold et al.'s KM model is sufficiently broad to allow complete analysis of KM capabilities in organisations.

A certain number of tools and metrics have been developed to assess the state of KM in organisations. For example, KM assessment tool (KMAT) has been designed by the American Productivity and Quality Center and Arthur Anderson in order to evaluate the operational performance of KM (Lin, 2007b). According to de Jager (1999), the KMAT not only directed organisations toward areas that demand more attention and recognise KM practices in which they excel, but also foster the development of organisational knowledge through KM process. In empirical study by Chawla & Joshi (2010), the KMAT, has been used to study KM implementation in Indian organisations. Their study was based on the five enablers of KMAT, i.e. process, leadership, culture, technology and measurement. The results signified that leadership and measurement are positively significant in KM processes. They argued that although technology is important in KM activities, it is just a facilitator for KM – “it is a means to the end and not an end itself” (p. 722). Chawla & Joshi (2010) concluded that,

“Leadership plays a crucial role in creating, developing, and managing the organizational capabilities by creating effective teams within a diverse workforce; tap talent throughout the organization by recruiting, retaining, and developing people at all levels; build and integrate cultures as mergers and acquisitions become common; use IT to enable and integrate KM processes; develop rewards and recognition systems for employee commitment toward organizational vision” (p.723).

The ultimate goal of KM is to transfer the experience and knowledge of all individuals to organisational assets and resources, to improve overall organisational performance (Lin, 2007b). Lin indicated that KM effectiveness is a two-dimensional construct, involving individual-level KM effectiveness, focusing on the perceptions of individuals engaged in KM activities; and organisational-level KM effectiveness, emphasising on improving organisational innovativeness and performance. As concluded by Chawla and Joshi (2010), “the ability of human resources to manage the KM attributes will differentiate good and great organisations and in turn its long term success and sustainability”, (p. 723). Eventually, it is critical for an organisation to develop and establish its capabilities in terms of strategy, culture, technology and leadership in order to attain competitive advantage in the knowledge economy.

#### **2.4 Overview of knowledge sharing**

Knowledge sharing is a central pillar of KM and is critical to the realisation of its success. Eisenhardt & Martin (2000) indicated that an important agenda of KM initiatives is the systematic promotion of knowledge sharing among organisation members. Undoubtedly, knowledge sharing is spotted as the intractable problem facing KM (Bechina & Bommen, 2006; Chow & Chan, 2008). Support for the innovation strategy and management values are the antecedents of knowledge sharing (Hsu, 2008). The type of knowledge is recognised as a key factor in effective knowledge sharing. Abdullah et al. (2009) argued that it is much easier to share explicit knowledge through various formal methods of training and development compared to tacit knowledge. However, they did not deny the importance of tacit knowledge sharing.

The notion of knowledge sharing is about communicating and transferring knowledge, in explicit and tacit forms, within individuals or groups of people. This process may occur formally among colleagues in a workplace or informally among friends and social networks. Garvin (1993) described that knowledge sharing involves the transmission of knowledge from one person, group or firm to another. More recently, Abdullah et al. (2009) explained knowledge sharing as a process

where the individual exchanges his/her knowledge and ideas through discussions or other forms of social interaction in order to create new knowledge or ideas.

The sharing process, according to Van den Hooff & De Leeuw van Weenen (2004) consists of collecting, organizing, and conversing knowledge from one to another, in which the value of knowledge expanded when it is shared. Hence, if managed properly, knowledge sharing can greatly improve work-quality, decision-making skills, problem-solving efficiency and competency (Alavi & Leidner, 1999; Salisbury, 2003; Syed-Ikhsan & Rowland, 2004b; Yang 2007a;2007b; Widen-Wulff & Suomi, 2007). The term knowledge sharing differs from knowledge transfer (Wang & Noe, 2010), in which knowledge transfer typically refers to the movements of knowledge between different units, divisions, or organisations rather than between individual.

## **2.5 Knowledge sharing behaviour**

Knowledge sharing is a process describing individual behaviour, which is affected by a number of factors. There is a wide range of theories have been adopted to underpin this process, which can be discussed in three ways: (1) knowledge sharing behaviour theories (2) the influence of KS enablers on KS behaviour; and (3) knowledge sharing process model.

### **2.5.1 Knowledge sharing behaviour theories**

Two major theories that have attempted to account for knowledge sharing behaviour of an individual and the actual knowledge sharing behaviour within an organisation include Theory of Reasoned Action (TRA; Fishbein and Ajzen, 1975) and Theory of Planned Behaviour (TPB; Ajzen, 1991). Other theories that have been repeatedly used in extensive research to investigate knowledge sharing behaviour are for example, social capital theory, social network theory, social cognitive theory, social exchange theory, game theory and expectancy theory. According to Fishbein and Ajzen (1975), an individual's decision to engage in a specific behaviour is

determined by their intention to perform the behaviour, which in turn is determined jointly by their attitude toward and subjective norm regarding the behaviour.

The idea of TRA that was developed by Ajzen and Fishbein (1980), evaluate and predict individual behaviour in a social context, following three key components, i.e. attitude, subjective norm, and behavioural intention. TRA has been broadly used for exploring knowledge sharing behaviour (Bock, et al, 2005; Lin, 2007a; Chow and Chan, 2008; Wang and Noe, 2010). Bruce Ho et al. (2009) have studied the differences between TRA and Game Theory in explaining individual knowledge sharing behaviour. According to them, Game Theory assumes each player would analyse the opponents' decisions, whereas the TRA model does not (p. 1211). In their results, Bruce Ho et al. argued that the Game Theory model was a preferred model as compared to TRA, when employees analyse the decisions of other employees in the knowledge sharing decision-making process. In other words, employees make their own decisions whether to participate or avoid sharing knowledge. Teh & Yong (2010), who also applied TRA in their study concerning knowledge sharing in information systems (IS) personnel, suggested that sense of self-worth, in-role behaviour, and organisational citizenship behaviours are antecedents to the attitudinal and behavioural intention constructs (p. 17).

TPB is the extension of TRA by integrating additional construct, i.e. perceived behavioural control (Lin & Lee, 2004). TPB proposes that perceived behavioural control and behavioural intention are determinants for behavioural achievement. According to TPB, the higher people intend to practice behaviour, the higher the possibility that they will engage in that behaviour (Ajzen, 1991). Chatzoglou & Vraimaki (2009) used TPB to examine knowledge sharing behaviour of bank employees in Greece. Their results indicate that the intention to share knowledge is significantly effect by the attitude of employees toward knowledge sharing. However, Chatzoglou & Vraimaki argued that other factors that could inhibit knowledge sharing (e.g. culture and social factors) have not been considered in TPB. In a quantitative study by Tohidinia & Mosakhani (2010) using the TPB model, results show strong connections between the TPB elements and knowledge sharing behaviour. They found that factors like perceived self-efficacy and anticipated

reciprocal relationship, organisational climate, and the level of information and communication technology usage reflected a positive impact on knowledge sharing behaviour.

Both theories, TRA and TPB have received many criticisms in pertain to their applicability and predictive power (Chatzoglou & Vraimaki, 2009). Suggestions were made by a certain number of studies for modification of both models. In a recent study, Reychav & Weisberg (2010) have expanded the TRA analysis into two parallel behaviours, i.e. explicit and tacit knowledge sharing. They found that both explicit and tacit knowledge are interrelated with the intention to share knowledge, which is consistent with TRA theory. They argued that the effectiveness of explicit knowledge sharing behaviour can be enhanced through IT approach, whereas interpersonal interactions among employees can improve the tacit knowledge sharing behaviour. Earlier, Chang (1998) used a modified version of the TPB using a causal path, connecting subjective norm to attitude. Results show a significant improvement on model fit. Chang's findings were confirmed by Ryu et al. (2003). In their modified TPB model, they found that subjective norms have very significant effect on behavioural intentions to share knowledge.

On the other hand, social capital theory that is widely accepted model for validating individual behaviour has been applied extensively in the information systems literature (e.g. Bandura, 1982, 1986, 1997; Hsu, et al., 2007; James Lin, et al., 2009; Tsai & Cheng, 2010). Social capital theory defines human behaviour as a triadic, dynamic, and reciprocal interaction of personal factors, behaviour, and the social network (Chiu et al., 2006, p. 1873). For example, Chen & Hung (2010) have developed a research model using the social capital theory in order to investigate the knowledge sharing behaviour in professional virtual communities (PVCs). They suggested that using the application of social capital theory, the question "Why do individuals choose to give or to receive knowledge from other community members?" need to be addressed from a perspective of both contextual factors and personal cognition. The results show that the reciprocal norms, interpersonal trust, knowledge sharing self-efficacy and perceived relative advantage were significant in affecting knowledge sharing behaviours in PVCs.



In social network theory, ‘who’ you know has a significant impact on ‘what’ you come to know (Cross et al., 2000). Social network theory posits that the formality of network structure may bring impact of knowledge dissemination within an organisation (Dyer & Nobeoka, 2000). According to Cross et al. (2000) the discipline of social network in the area of management has been supported by informal and less hierarchical organisational structure as well as effective intraorganisational relationship among employees. Linking the results to network theory, Siemsen et al. (2009) found that psychological safety increases with the frequency of communication among employees. However, in an empirical study using meta-analysis by Choo et al. (2007) failed to replicate the link between psychological safety and employee knowledge sharing. Edmondson (2003) argued the interrelatedness of trust and psychological safety, where he viewed psychological safety as “individuals’ perceptions about the consequences of interpersonal risks in their work environment” (p. 6).

Both theories, social capital and social network recognises that employees do not work, learn or share knowledge in isolation but are embedded in social networks. When a formal or informal group (or communities of practice) is formed its members bring with not only their knowledge, skills, and abilities but also their social connections (Wang and Noe, 2010), including online social network (Chow and Chan (2008) and social media (Hsu and Lin, 2008; Lin, et al 2009) – e.g. blog, twitter, Professional Virtual Communities (PVC). Using a social network analysis, Janhonen & Johanson (2011) have surveyed 499 employees in private and public sectors. Their results indicated that social networks and the creation of knowledge have significant impact on team performance. This study has validated earlier findings by Cummings & Cross (2003), who examined 182 work groups in a global organisations using social network theory. They found that less hierarchical group structures were positively correlated with group performance.

The social cognitive theory suggested that self-efficacy has strongest effect on individual’s outcome expectations (Bandura, 1982), including extrinsic and intrinsic rewards. Bandura (1997) stressed that self-efficacy is the state of art of social cognitive theory. Following Bandura’s work, Kuo & Young (2008), who examine

knowledge sharing behaviour based on social cognitive theory, found that the impact of perceived self-efficacy of knowledge sharing was statistically significant. Chiu et al. (2006) has linked social capital and social cognitive theories in order to develop a model that explains the willingness of individuals to share knowledge. They proposed that elements like social ties, trust, considerations of reciprocity, identification with the community and its goals, shared mission and vision, and share language are key enablers for knowledge sharing behaviour in virtual community.

The social exchange theory is originated from the economic exchange theory, assuming that people engage in exchange behaviour because they think that the reward will justify their cost – the lesser the reward they gain, the lesser the cost they invest (Liao, 2008). In other words, this theory views that the elements of reciprocal arrangements determine individual's knowledge sharing behaviour. Unlike economic exchange, social exchange requires trust (Luo, 2002). Liao (2008) has integrated social power and social exchange theory to examine the impact of managers' social power and R&D engineers' knowledge sharing behaviour. The results indicated that different social powers have different impact on knowledge sharing behaviour. For example, reward power has direct impact on knowledge sharing behaviour, unlike reference and expert power.

Various disciplines like economics, business, political, science, psychology, and philosophy (Dixit & Skeath, 1999) have applied game theory to examine situations, including knowledge sharing among employees. In game theory, strategic interdependence is considered a central feature, where it analyses multi-person decision problems (Mas-Colell et al., 1995). According to Bandyopadhyay & Pathak (2007), the idea of strategic interdependence is inherited in the concept of knowledge sharing between two or more individuals, where individuals incur certain payoffs (extrinsic and intrinsic) when sharing their knowledge with other person. Following this, Bandyopadhyay & Pathak have placed a study examining the phenomenon of knowledge sharing and analysed it as a game. As a result, they suggested that reciprocity predicts individuals' behaviour in sharing or not sharing knowledge. Their findings replicated Chua's (2003) study, who investigated approximately 100

students in HEIs. Similarly, Chua suggested that the anticipated reciprocal relationship between players is a critical aspect of benefit in knowledge sharing.

Expectancy theory framework has also been used extensively in behaviour research (e.g. Farrell, 2002; Hollenbeck & Klein, 1987; Wright & Kacmar, 1995). Expectancy theory posits that the higher the outcomes of a given action, the more people will perform that action (Vroom, 1964). Nebus (2004), who applied the expectancy theory, stated that perceived expectation of obtaining value enhance individual's knowledge sharing behaviour. Nebus's findings have been confirmed by a more recent study by Cho & Jahng (2009), who have integrated expectancy theory with goal setting theory in order to investigate knowledge sharing behaviour in Korean virtual community. Remarkably, Reychav and Weisberg (2010) claimed that TRA, which explain individual's behaviour, is an expansion of expectancy theory.

### **2.5.2 Knowledge sharing enablers**

Early work on knowledge sharing suggested a focus on technological infrastructure, but later research revealed the importance of an awareness of softer issues, including an organizational culture conducive to KM, and motivation to encourage its uptake. Research into knowledge sharing both qualitative and quantitative studies addressed a number of key issues including organisational context (e.g. culture and climate, management support, reward and incentives, organisational structure, etc.), individual, interpersonal and team characteristics, and motivational factors (Wang and Noe, 2010). Based on the theoretical consideration and KS literature, three enablers are identified to underpin the research design of this study, which discussed below. According to Lin (2007c) an enabler is the mechanism for fostering individual and organisational learning and knowledge sharing within or across teams or work units.

#### ***People as an enabler***

People, which consists of both leaders and employees; are important influential factors affecting the success of KM initiatives (Kulkarni, et al., 2006). The following

two sections review the literature with regard to leaders' support and employees' motivation as influential factors for knowledge sharing.

**a) The influence of leaders' support**

Leader's support and commitment is known as one of the major critical success factors in enhancing knowledge sharing in business organisations (Damodaran & Olphert, 2000; Fliaster, 2004; Akhavan et al., 2006; Lin, 2007b; Gagné, 2009). McDermott (1999) who provided good discussion on management support noted that knowledge sharing involves a person to guide people through their process of sharing. Later in 2001, McDermott & O'Dell, who used both survey and face-to-face interviews to study five large organisations, again found a strong management support for sharing knowledge, in which the support varied across the organisational level, from senior to a much lower level.

According to Jayasingam et al. (2010) leadership can influence and motivate knowledge workers to contribute and participate actively in creating, sharing, and using knowledge effectively. Much earlier, Kluge *et al.*, (2001) indicated that leaders across all levels of organization not only have a unique and important role to play in managing knowledge, but also a particularly important role to get involved in knowledge-sharing processes. Singh (2008, p. 7) sees leadership as "a cardinal thread that runs through whole gamut of the KM initiatives in an organization". However, King & Marks (2008) have found the opposite result to that which has been previously believed. They failed to find a significant impact of organisational support on KM system. Rather, they discovered supervisory control was a significant predictor to enhance knowledge sharing behaviour. King & Marks argued that since the study was conducted in the government sector, i.e. joint civilian military; this setting might have strongly influenced the results.

With respect to employer or leader standpoints, Heisig (2009) stated that in knowledge intensive organisations, leaders who pay attention to people hold the key to the success of knowledge sharing. Leaders can facilitate/build a knowledge sharing culture that motivates staff to understand, value, and participate in

knowledge sharing (Artail, 2006; Abou-Zeid, 2008). The CEOs of Disney, Ryanair and E.ON used ‘management-by-walking-around’ approach and joint-lunches with the employees to promote knowledge sharing at the workplace (Fliaster, 2004). A case study on knowledge sharing in Acquisition Solutions, Inc also established this idea, where the company designed a specific post of ‘Engagement Knowledge Manager’ in order to help motivate employees to share and create knowledge (Kaplan and Reed, 2007).

Liebowitz (1999) argued that the level of support by the top management will determine the organisational success or failure. In a recent empirical case study in Taiwanese shipping industry, Lin et al. (2009) identified four factors affecting knowledge sharing, i.e. corporate culture, employee motivation, leadership, and IT. They recognised that employees with high competence and confidence in their ability to provide valuable knowledge tend to be more likely to engage in knowledge sharing and tend to have stronger motivation to share knowledge with their colleagues. Leaders’ support is strongly correlated with cultivating a knowledge sharing culture (Yang, 2007a), for instance, Sveiby (2007) argued that, unless receiving support from leaders, employees are less inclined to share knowledge. From the empirical study with 92 business units and departments, Sveiby found that managers or senior leaders who do not “walk the talk” as the main behaviour that inhibits knowledge sharing among employees.

Van den Hoof and Huysman (2009) consider knowledge sharing from an emergent perspective and an engineering perspective. The emergent approach focuses on the social dynamics between organisational members and the nature of their daily tasks; the engineering approach focuses on management interventions to facilitate knowledge transfer. The engineering approach assumes that KS can be managed, i.e. management can play a role by stimulating and creating an environment for the process. The researchers particularly raise the question – what managerial contribution is needed to promoting knowledge sharing? and suggested that by providing organisational and infrastructures, management can facilitate, stimulate and influence the emergence of social capital, which in turn influences knowledge sharing.

A certain number of empirical contributions have concluded that leaders play a critical role in the knowledge sharing, creation, and capture (e.g. Bryant, 2003; Lakshman, 2007; Politis, 2001, 2002). Nonaka et al. (2000) observed that the theory of leadership offers significant direction and clarity to the dynamic and emergent process of knowledge sharing, accumulation and creation. Leaders play an important role in adding value to business processes, through knowledge sharing, creation, codification and integration of explicit and tacit knowledge (Nonaka & Takeuchi, 1995). Leaders' role is emphasised on stimulating employees to share and apply their skills and experience willingly in order to create new knowledge, which then leads to competitive advantage of organisations (Yang, 2007a). Several studies suggested that leaders should contribute to drive KM process by encouraging experimentation and facilitating knowledge sharing through empowering leadership, coaching and trust (e.g. Bollinger & Smith, 2001; Roth, 2003; Haas & Hansen, 2005).

Cabrera, et al (2006) examined psychological and organisational variables that determining knowledge sharing, their data support the view that people who perceived their co-workers and supervisors to value knowledge sharing feel more inclined to engage in such behaviour. They suggest that top management can send strong messages to the organisation as to how important sharing knowledge is, through, e.g. rewards and recognition. They cited a KPMG report (2000) about the major barriers facing in implementing KM systems, most answers had to do with people rather than with technology. In a further study by Lee, et al (2010), the relationship between leader's knowledge building role and how it affects knowledge sharing and team performance is examined. It found that leader's knowledge building role significantly predicted team knowledge sharing that is related to team performance. In a comprehensive review of recent knowledge sharing literature, Wang and Noe (2010) reported that management support for knowledge sharing has been shown to be positively associated with employee's performances of knowledge sharing culture. Top management support affected both the level and quality of knowledge sharing through influencing employee's commitment to KM.

## **b) The influence of employees' motivation**

Motivational factors affecting knowledge sharing have been emphasised in most recent studies. Social psychologists (Deci, 1975) consider knowledge sharing motivation has two complementary aspects: egoistic – anticipated extrinsic rewards and anticipated reciprocal relationships; and altruistic – assumes an individual is willing to increase the welfare of others and has no expectation of any personal returns. For instance, Lin (2007a), who applied the theory of reasoned action, has examined the role of both extrinsic and intrinsic motivators of knowledge sharing behaviour. Using a survey in 50 large organisations in Taiwan, she found that factors like reciprocal benefits (i.e. favours given and received), knowledge self-efficacy and enjoyment in helping others are significant influential factors in knowledge sharing behaviour. Lin, et al (2009) cited Davenport and Prusak (1998) by stating that the norm of reciprocity and trust are two of the most significant factors that drive knowledge sharing. They found that self-efficacy, perceive relative advantage, and perceive compatibility positively influence knowledge sharing behaviour in a virtual platform, whereas the norm of reciprocity does not show a positive relationship.

Hsu and Lin (2008) who examined the factors contributing to blogging – “an act of sharing and a new form of socialisation” (p. 66); found that blogging is largely driven by intrinsic motivation (i.e. enjoyment) rather than extrinsic motivation. Similarly, using an Expectancy Theory, Liao et al (2011), who studied motivational predictors for blogging, also revealed that extrinsic rewards are less important for bloggers. Earlier, Bock et al. (2005) synthesised the motivational drivers as: anticipated extrinsic rewards (economic), anticipated reciprocal relationship and sense of self-worth (social-psychological) and fairness, innovativeness and affiliation (sociological). They argued that extrinsic rewards shall not be stressed as a primary motivator within KS initiatives. Efforts shall be on nurturing the targeted social relationships and interpersonal interactions. A quantitative study by Hung et al. (2011) in a university in Taiwan found that intrinsic reward, i.e. reputation feedback, which positively affects an individual's self-esteem, had the strongest significant effect to support knowledge sharing as compared to extrinsic reward like economic incentives.

At the same time, Hall (2001) states that career development is an explicitly effective reward in motivating knowledge sharing among employees. Additionally, Sharrat & Usoro (2003) found that perceived proximity of knowledge sharing to career advancement affect knowledge sharing in online communities of practice. On the other hand, availability of time is another motivator factor spotted in previous studies. For example, Hew & Hara (2007) found that the little amount of time set aside by individuals in their daily schedule hold back individuals from sharing their knowledge with other people. This tie back to the finding reported earlier by Nonnecke & Preece (2001) that one of the most frequently cited reasons for not sharing knowledge is the lack of time due to greater prioritization of other interests. Whitmore (1992) states that, people must be self-motivated in order to perform a particular task. Using the “carrot and stick” analogy, Whitmore explains that people’s motivation can be enticed with “carrot”, whereas with “stick”, people will do as little as they can get away with.

### ***Organisation as an enabler***

Organisational factors, which include elements like process, culture, structure, strategy, reward and incentive systems, etc., affect the degree of knowledge sharing. Van den Hoof & Huysman (2009) suggest that by providing organisational and infrastructures, management can facilitate, stimulate and influence the emergence of social capital, which in turn influences KS. According to Bartlett & Ghoshal (1998), knowledge in hierarchical organisations normally becomes “sticky”, where knowledge resides in one area or silo and not easily moved to other parts of the organisations. Thus, breaking down the hierarchies is one of the key factors for effective knowledge sharing (Fliaster, 2004; Chatzoglou & Vraimaki; 2010). By developing a horizontal structure, an organisation can create openness in communication, which allows people to contribute to practices and share knowledge. Pinchot & Pinchot (1996) suggest that these changes may include a move from individual work to team work, from functional work to project-based work, from single-skilled personnel to multi-skilled employees and from coordination from above to coordination among peers. Reward system is another organisational support that can encourage people to share knowledge (Bartlett & Ghoshal, 1998).



Previous literature also found that vertical organisational structure (i.e. interactions with senior management) as well as horizontal organisational structure (i.e. interactions between employees within the organisations) both formally and informally can enhance knowledge sharing behaviour (e.g. Bartol & Srivastava, 2002; De Long Fahey, 2000; Jones, 2005; Yang & Chen, 2007). Cohen & Levinthal (1990) suggested that interactions between individuals who possess diverse and different knowledge increase the organisational ability to innovate far beyond what any one individual can achieve. Informal interactions include personal relationships and social networks that facilitate learning and the sharing of knowledge (Brown & Duguid, 1991; Nahapiet & Ghoshal, 1998). Tsai (2002) proposed that social interaction has a positive correlation with intra-organizational knowledge sharing (i.e. relationship between employees within the organisation). Chatti et al. (2007) state that today's challenge has shifted from "what you know" to "who you know" (known as connectivism), which presents learning as a connection/network-forming process, where one of its core principles is that knowledge rests in networks. According to Chatti et al., a strong emphasis has been placed on knowledge networking and community building in order to leverage, create, sustain and share knowledge in a collaborative way, through participation, dialogue, discussion, observation and imitation (pg. 412).

On the other hand, organisational culture is another major factor contributing to creating and leveraging knowledge (Politis, 2004). Many studies have examined the consequence of organisational culture on knowledge sharing. A qualitative study conducted by De Long & Fahey (2000) in fifty organisations has discovered direct relationship between supportive organizational culture and successful knowledge sharing. In case study undertaken by Pan & Leidner (2003) in a multinational organisation, similar conclusion was made – organisational culture led to effective knowledge sharing practices. More recently, based on a quantitative study of 301 organisations, Zheng et al., (2010) also found that organisational culture has the strongest effect on the practices of KM (including knowledge generation, knowledge sharing, and knowledge utilisation), which then influence the organisational effectiveness. In other words, a supportive organisational culture is a key prerequisite for knowledge sharing.

Park et al. (2004) define organisational culture as the shared, basic assumptions that an organisation learnt while coping with the environment and solving problems of external adaptation and internal integration that are taught to new employees as the correct way to solve those problems. In other words, organisational culture is basically the way things are done in the organisation and how the organisation organises itself. Organisational culture is not only capable to integrate daily activities of employees to reach the planned goals, but also help organisations adapt well to the external environment for rapid and appropriate responses. Since instilling a culture of standardising and maintaining information is critical to achievement, organisational culture that supports knowledge sharing can lead to more effective achievement (Lai & Lee, 2007; McManus & Loughridge, 2002).

Every organisation has its own culture, which gradually grows overtime to reflect the organisation's identity. Schein (1992; 2004) discloses that organisational culture consists of two separate layers of concepts, i.e. visible and invisible characteristics. The visible layers represents external buildings, clothing, behaviour modes, regulations, stories, myths, languages and rites; whereas the invisible layer means common values, norms, faith, and assumptions of business organisation members. Earlier, Ahmed (1998) also reveals similar components of organisational culture, namely explicit and implicit. According to Ahmed, explicit culture signifies "the typical patterns of behaviour by the people and the distinctive artefacts that they produce and live within", whereas the implicit culture includes component like "values, beliefs, norms and premises", which verify behaviours expressed within the explicit culture (pp. 32). In light of this, it can be assumed that it is much easier and simpler for organisations to change its "visible" or "explicit" culture as it involves explicit aspects of organisational change; as compared to "invisible" or "implicit" culture, which embedded in more subjective aspects. Sackman (1992) refers this subjective aspect of organisational culture as "subculture". He said that the organisational subculture is characterised by common beliefs of different groups and units within an organization, which influence the group members' perceptions, thinking, behaviour and feelings.

Previous literature uncover that trust between co-workers is a tremendously essential attribute in organisational culture, which is proven to have strong influence over knowledge sharing (Al-Alawi et al., 2007; Andrews & Delahay, 2000). Bakker et al. (2006, pp. 598) define trust as “a set of beliefs about the other party (trustee), which leads one (trustor) to believe that the trustee’s actions will have positive consequences for the trustor’s self”. In early years, Blau (1964) has recognised trust as an important element to create and maintain exchange relationships. Blau’s claim was confirmed by Nonaka (1994), where he signified that trust is critical in teams and organisations for creating an atmosphere for knowledge sharing. On top of that, Nichani and Hung (2002) clearly stated that, “trust is the glue that binds the members of a community to act in sharing and adapting manner. Without trust, members would hoard their knowledge and experience and would not go through the trouble of sharing with or learning from others” (p. 51).

Many researchers believe that when trust exists, people are more ready to provide useful knowledge and willing to listen and absorb each other’s knowledge (Andrews & Delahay, 2000; Bakker et al., 2006; Levin, 1999; Levin et al., 2002; Seba et al., 2012; Tsai & Ghoshal, 1998). On the other hand, Connelly & Kelloway (2002) noted that employee would only be interested to share knowledge in situations where they trusted the recipient of this knowledge. Issa & Haddad (2008) revealed in a recent study that mutual trust among employees is needed in order for knowledge to flow freely with a company. They express that since trust is the most important asset that influence knowledge sharing activity, organisations should not forget to cultivate a trustful relationship within the organisation as it then lead to a proper organisational culture.

The literature also demonstrates the important role of leaders in “creating” and “maintaining” particular types of organisational culture (Kavanagh & Ashkanasy, 2006; Schein, 2004). After close investigations on the concepts of organisational culture and leadership, Schein (2004) concludes that organisational culture and leadership are two sides of the same coin – neither can be really understood by itself. Many researchers concludes that leadership at all managerial level is required to develop a desired culture in order to enhance knowledge sharing in organisations

(Kluge et al., 2001; Marsh & Satyadas, 2003; Welch & Welch, 2005). Leaders who take positive initiative in giving proper work environment through ensuring that the necessary support and proper organisational structure are in place; able to facilitate knowledge sharing among different functional groups (Islam et al., 2011). Earlier, Oliver & Kandadi (2006) also confirm that leadership is an influential factor for knowledge culture in organisations. They stated that “senior management should be actively involved in the evangelization process and convey that knowledge creation and knowledge sharing is highly valued in organizations” (pp. 13-14). Their findings highlight the “essential role of middle and front level managers in developing a culture that will facilitate knowledge sharing through the manifestation of various leadership characteristics” (pp. 12). In other words, organisational culture determines a large part of what leaders do to support knowledge sharing within the organisation and how they do it.

### *IT as an enabler*

Technology and infrastructure are emphasised in the early days of KM. It can be crucial for the process of sharing knowledge (Berlanga, et al., 2008), particularly explicit knowledge. It has been widely accepted that IT contributes to the integration of knowledge or even stimulating new knowledge (Davenport & Prusak, 1998). Organisations have made large investments in implementing IT that is specifically designed to support knowledge sharing among team members in the organisation (Bock et al., 2005; Wasko & Faraj, 2005). Tseng (2008) notes that using information technologies, people are able to retrieve and store knowledge in individuals or groups, which allows this knowledge to be shared with other divisions in the same organisation or business partners in the world.

The technology mediated environment can help knowledge accumulation by processing and presenting information in flexible ways (Yu et al., 2009). Earlier, Ruppel & Harrington (2001) found that members in any community become more inclined to use IT if they are encouraged, are able, and have the opportunity to share knowledge with others. Technology like social media – Wiki, Weblogs, Twitter, Intranets, data warehouses, and electronic whiteboards, has been suggested as useful

tools for building communities of practice (Cunningham & Leuf, 2001; Tseng, 2008; Cole, 2009; Hsu & Lin, 2008) and hence, enhance knowledge sharing. Robinson et al. (2010) suggest that IT performs a functional role in knowledge sharing, and also that technology skills and competences may either contribute, or impede knowledge sharing. More recently, Seba et al. (2012., pp. 7) conclude that appropriate, reliable, and easy to use IT resources will facilitate knowledge sharing, whilst a less effective IT infrastructure dominated by functional inadequacies or political agendas may act as a barrier to knowledge sharing.

An empirical study conducted by Golden & Raghuram (2010) who examine knowledge sharing among teleworkers found interlink between IT and the element of trust. They conclude that high technology support implemented in the organisations is less important for employees with low trusting relationship. With the application of Nonaka's (1994) model, whilst adapting a process-oriented perspective, Lee & Choi (2003) also found that the well-developed IT infrastructure in organisation is unsupportive for knowledge sharing if the trust-based culture in organisations is less effective. In other words, IT alone does not lead to the sharing of knowledge among employees in organisations as other 'softer' factors like culture and trust are also critical for the success of knowledge sharing. Seba et al. (2012) suggest that in practice, leaders should play an active role in the selection of user-friendly IT in order to ensure that it builds upon or at least matches the existing knowledge sharing culture in organisations.

### **2.5.3 Knowledge sharing process model**

As discussed earlier, one of the most extensively cited approach to knowledge creation is Nonaka's SECI model (Nonaka, 1994; Nonaka & Takeuchi, 1995) – see Figure 2.1. Professor Ikujiro Nonaka discussed knowledge creation using a spiralling process of interactions, known as SECI model; involving the sharing of tacit and explicit knowledge. According to SECI model, the sharing between these two types of knowledge lead to the creation of new knowledge.

While the SECI model shows several strengths, critics have discussed the shortcomings of the model. Glisby & Holden (2003) argued that the SECI model is only appropriate for the Japanese management cultural practices, and is not necessarily applicable for other environments. They debated that Nonaka's model should only be considered as a "map" rather than a model or a "special kind of mirror", emphasising on KM practices. Another flaw of the SECI has been discovered earlier by Engeström (1999). According to Engeström, the model "does not seem to account effectively for sequences of formulating and debating a problem, in which knowledge is represented as an open, multifaceted *problematic*" (p. 380). Engeström continued arguing that although Nonaka has neglected to address the debate and analysis, even though in case descriptive materials, Nonaka has pointed that such process does take place, specifically in the early phase.

With regard to the sequential nature (i.e. moving the tacit conversions to the beginning and end of the spiral) of the SECI model, Majchrzak et al. (2004) and Thomke (1998) argued that, the conversion of tacit knowledge pass through all knowledge creation stages. Klein (2008) also argued that the development of SECI although valuable, it will not be enough to explain the conversion of knowledge. He suggests that the development of tacit knowledge requires personal facilitation, i.e. by first-hand experience: learning-by-doing. Consequently, Nonaka's SECI model has been criticised for being unable to specify the functional relationship between the tacit and explicit sides to individual and group knowledge (e.g. Thompson & Walsham, 2004).

In a research by Bereiter (2002), four key shortcomings in Nonaka's model have been discovered: (1) the SECI model is incapable of explaining how minds produce ideas or fail to produce ideas; (2) the SECI model has overlooked the fact that in order to learn by doing, an individual has to know what to observe; (3) while the SECI model identifies knowledge abstracted from context, it only discusses little about how knowledge can be managed; (4) since Nonaka views that knowledge derives in minds of individuals, it prevents the conceptualisation of knowledge that arises from collective actions (e.g. a product teamwork). Bereiter debates that Nonaka's theory fails both as a theory and practical tool for organisational business.

Overall, Nonaka's SECI has actually drawn attention to some researchers, but perhaps not forcefully enough and appropriately applicable to all environments.

## **2.6 Roles of leaders in supporting knowledge sharing**

Extensive research has been undertaken to examine characteristics of an effective leader. Researchers show interest in the influence of personality in the work place, which includes organisational behaviour, like leadership as well as the behaviour of employees (e.g. Ehrhart & Klein, 2001; Jong & Hartog, 2007; Oreg & Berson, 2011). Many studies have exhibited that personal attributes of leaders is one of the key influential factors of organisational performances (Waldman et al., 2001); employee welfare (Seltzer et al., 1989); and organisational culture (Schein, 1992; Berson, et al. 2008). For example, trait theories (Yukl, 2010); behaviour theories (Bowers & Seashore, 1966); and the full-range theory of leadership (Bass & Avolio, 1993). In an empirical study by Mayer et al. (2007), it was demonstrated that there is significant relationship between the attributes of leaders and the employees' behaviour. This study replicated Smith & Canger's (2004) findings, who reported that leaders' personality has strong impact on employees' attitude.

In an empirical study, exploring the effect of leadership roles in knowledge sharing and organisational culture, Yang (2007a) identified eight roles of a leader, including monitor, coordinator, director, producer, innovator, broker, facilitator, and mentor. The findings revealed a positively strong connection between 'leaders as facilitator, mentor and innovator' with knowledge sharing effectiveness. However, the study found no relationship between 'leaders as monitor' and knowledge sharing. According to Yang (2007a), leadership styles, which include strict policies and procedures, will be less effective to support knowledge sharing. Rather, leaders who emphasises on human interaction, affiliation, morale, cohesion, and workplace harmony is supportive for knowledge sharing.

Yang's findings were similar to results found by Roth (2003) and Pan & Scarborough (1998, 1999), which revealed an inclusive lists of leadership roles, including role-modelling, facilitating, coaching, and support for organisational

culture and knowledge sharing, creation and application. In the similar vein, Singh (2008), who studied KM processes in a global software company in India, indicated that consulting and delegate modes of leadership, which have lower levels of control and regulation have positive connection with explorative and exploitative KM processes and the sharing of knowledge. At the same time, von Krogh et al. (2011) have also identified that leader who acts as role model or lead by example, are effective to encourage followers to pursue initiatives on particular tasks.

Additionally, Gratton et al. (2007) debated that the improvement of knowledge sharing in team performance requires different styles of leadership, varied accordingly to the issues and problems arise at a particular point of time, when teams meeting the deadline for their work. At the same time, Srivastava et al. (2006) has studied the impact of leaders' empowerment on knowledge sharing behaviour among employees. They found that empowering leadership has significant relationship with knowledge sharing and team efficacy, enhancing job performance. Cabrera & Cabrera (2002) stated that in business organisation, the motivation to share and create knowledge might be less effective since employees tends to protect their knowledge, and thus, the need of leaders' supports is certainly required.

Hermalin (1998) proposed that leading by example is a convincing approach for effective leaders. He stated that through leading by example leaders engaged in a particular action or activity, which thereby persuade employees to follow. Drucker (2004, p. 5) indicated that, "a leader sets an example, especially strong leader. He or she is someone on whom people...in the organisation model themselves". In a review article by Schraeder et al. (2005), they demonstrated that through leading by example, leaders can promote change in organisational culture. In an empirical study by Gächter et al. (2011) in the University of Nottingham, they reported that group performances were found to be at the highest peak when leaders lead by example.

Kirkbride (2006) on the other hand pointed out that a leader who is regarded as role model by followers can enhance organisational competence. He claimed that leader's traits like morality, trust, integrity, honesty and purpose are often seen as key indicators for being viewed as good role model by followers. More recently, in an



exploratory study, Milburn (2010) examined the roles and responsibilities of academic leaders (i.e. programme directors) in HEIs. The study demonstrated that specific role requirements for aspiring programme directors include someone who is respected and is a good role model. Earlier, Wolverson et al. (2005), who placed a study at the University of Nevada, have proposed that good people skills like acting as a role model and performing leadership roles with openness and honesty are amongst the critical success factors to achieve success.

The relationship between leadership and mentoring is closely aligned by many researchers (e.g. Appelbaum, 1994; Moir & Bloom, 2003; Shenkman, 2010; Wright & Wright, 1987; Williams et al., 2009). The concept of mentoring was mainly based on the work of Levinson et al. (1978), who exclusively noted that,

“The mentor is doing something for himself. He is making productive use of his own knowledge and skills in middle age. He is learning in ways not otherwise thought possible. He is maintaining his connection with the forces of youthful energy in the world and in himself. He needs the recipient of mentoring as much as the recipient needs him”. (p. 253).

Brown (1990) used the term ‘experienced veteran’ to describe a mentor, where he stated leaders as mentors assist to shape and guide young employees who are at the beginning of their careers. Mendez-Morse (2004, p. 565) defined a mentor as “someone who actively helps, supports, or teaches someone else how to do a job so that she will succeed”. More recently, Johnson (2011) claimed that leaders who act as mentors are those of effective leaders who are capable to release the creative talents of their mentees. In an exploratory study in the hospitality industry, Ayres (2006) reported that mentoring programmes have increasingly valued and popular as the programmes help employees to cope with the challenge of the tourism careers. In an empirical study in the banking industry, Williams et al. (2009) also found significant correlation between mentoring and individual team-source learning.

Literature shows that research on ‘leaders as mentors’ is popular in academic settings, including, schools and HEIs (e.g. Ambrosetti & Dekkers, 2010; Berk et al., 2005; Carver 2010; Heirdsfield et al., 2008). Previously, Crane (1965) argued that since

published research is one of the main criteria for success in HEIs, research collaboration with established researchers is considered vital to promote young academics to do research. In other words, mentorship is crucial in HEIs, especially in research activities as it is a way to inspire and guide junior academics into research. A review article by Jacobi (1991), emphasising on relationship between mentoring and academics success, has extracted five elements of mentorship in academia: (1) focuses on achievement or acquisition of knowledge; (2) composes of three key components (i.e. emotional and psychological support, direct assistance with career and professional development, and role modelling); (3) focuses on reciprocal relationship between mentor and mentee; (4) is personal in nature, involving personal or direct interaction; and (5) focuses on the mentors' broad experience, influence, and achievement. Using a combination of survey and focus group study, Phillips (2009) has examined the impact of peer mentoring schemes in 94 UK universities, involving first year students attending a UK university. He reported that all students would seek guidance from peer mentor if one was available. It can be argued that young academics working in HEIs would also want to seek advice and supervision from someone with more knowledge, experience, and accomplishment, i.e. a mentor.

Additionally, several studies also focus on leadership and trust in regards to knowledge sharing. Leadership has a direct and positive impact on trust on team knowledge sharing (Renzl, 2008). In a quantitative study, involving the SME Irish software companies, Farrell et al, (2005) have studied the joint effects (i.e. direct and indirect) of transformational leadership and senior managers' team trust on knowledge sharing. They also found connection between leadership, trust and knowledge sharing. Lin (2007a), who investigated organisational employees in Taiwan, also reported that tacit knowledge sharing is affected by trust in co-workers. In a more recent study by Lee et al. (2010), involving 34 engineering project teams, have examined the relationship between the leaders as "knowledge builder", trust among leaders and followers, knowledge sharing and team performance. The results indicated that leaders enhance team members' willingness to share knowledge with one another, which then improve team performance.

On the other hand, previous literature also discovers some appropriate styles of leadership for knowledge sharing. For example, several empirical studies have found that transformational leaders are more supportive in promoting innovative culture and foster knowledge sharing and creation than transactional leaders (e.g. Crawford & Strohkirch, 2002; Crawford et al., 2003; Politis, 2001, 2002). For example, Politis (2001) found that transactional leadership is less effective for knowledge processes. At the same time, Bryant (2003) debated about the strong connection between transformational leaders and KM activities. One of the transformational leadership traits is based on empowerment (Donate & Guadamillas, 2011). Several studies have demonstrated the relationship between empowerment and knowledge sharing. For example, in a quantitative study by Srivastava et al. (2006), involving 102 hotel properties in the US, they illustrated that empowerment is strongly correlated with team efficacy and knowledge sharing. They also indicated that empowerment plays a mediating role in pertain to organisational performance. More recently, Gagné (2009) also showed that empowerment through transformational leadership has positive relationship with employers' need for competency and autonomy, leading to effective knowledge creation and innovation.

Previous work also proves that leader engagement helps to enhance employee engagement (Seijts & Crim, 2006; Kular et al., 2008; Macey et al., 2009). Many studies claimed that employee engagement is a strong predictor to employee outcomes, organisational success, and financial performance (Bates, 2004; Baumruk, 2004; Richman, 2006). Baldoni (2003) stresses in his book, leaders need to stay engaged in the process, so that the opportunity to achieve results is greater. Kahn (1990, p. 694) defined personal engagement as “the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances”, whereas personal disengagement referred to “the uncoupling of selves from work roles; in disengagement, people withdraw and defend themselves physically, cognitively, or emotionally during role performances” (p. 694). Drawn upon Kahn's (1990, 1992) definition of personal engagement, Saks (2006, p. 2) defined employee engagement as being “psychologically present when occupying and performing an organizational role”.

In a quantitative study conducted by Nembhard & Edmondson (2006) in the health care setting, the term ‘engagement’ is linked to quality improvement of work. They viewed engagement as “essential for overcoming powerful barriers to quality improvement” (p. 948). Their study was drawn upon Kahn’s (1990) definition of engagement, as “being physically, cognitively, and/or emotionally connected to the improvement work” (Nembhard & Edmondson, 2006, p. 948). They have concluded that engagement is strongly determined by employees’ psychological safety – ability to speak up freely and not be constrained by any disapproval by others and/or the negative personal consequences. Kerfoot (2005), who also examined the term ‘engagement’ in health care setting, argued that if leaders are disengaged, it is very hard to see an engaged employee. Remarkably, Kerfoot claimed that both engagement and disengagement are “contagious”, which can lead to success or disastrous results in an organisation.

The idea of leader engagement is a style of leadership that is fairly corresponds with the transformational leadership, who determine transformational leaders as someone who stimulate and inspire followers to both achieve extraordinary outcomes (Burns, 1978); and Servant Leadership, who establish servant leaders as people who support others to become better leaders and better people (Greenleaf, 1977). The concept of ‘engagement’ is fast becoming the ‘holy grail’ of organizational success (Alimo-Metcalfe et al., 2008). Few studies examining the nature of leadership in SME and large organisations indicated that engaging leadership has strong effect on organisational performance (Alimo-Metcalfe, 2007; 2008; Alban-Metcalfe & Alimo-Metcalfe, 2007). In an interview with Henry Mintzberg about several issues, including how to be an effective manager, Steve Coomber has reported that Mintzberg supports the idea of engaging leadership. Mintzberg explained,

“Finally we have the style I prefer, which I call engaging. This is where managers and chief executives first go about engaging themselves. They know the industry. They know the people. They are committed to the company. They are not there for a few years just to drive up stock prices and run off with their bonuses. And by engaging themselves, they engage other people” (Coomber 2005).

On the whole, leaders' behaviour, e.g. being a facilitator, coach, role model, leading by example, and supervisor are undoubtedly critical for both organisations and institutions. Leaders is one of the most influential factors not only to support and cultivate knowledge sharing culture in the organisation, but also essential to enhance knowledge sharing behaviour among employees.

## **2.7 Channels of communication for knowledge sharing**

Appropriate mechanisms need to be in place in order to ensure the effectiveness of knowledge sharing processes. The typical medium for sharing knowledge is by personal interactions or face-to-face. Face-to-face is where someone “use spoken language accompanied by expressive sounds and gestures (e.g. laughing, groaning, whistling, smiling, frowning, eyebrow raising, had nodding, hand waving, and pointing)” – Marshall & Novick, 1995, p. 55. Face-to-face interaction is the richest medium for knowledge passing (Koskinen et al., 2003) as “it allows immediate feedback so that understanding can be checked and interpretation corrected” (p. 286). According to Meherabian (1971), unlike other forms of social interaction, face-to-face interaction tend not to result in misinterpretation of meaning as the knowledge shared is conveyed by body language, facial expression and tone of voice, which goes beyond spoken message. It is widely argued that actions or gestures speak louder than words (Jain & Choudhary, 2011; Morgan, 2008; Pennycook, 1985).

Empirical studies have investigated knowledge sharing process within workplaces, emphasising on ‘direct voice’ practices (e.g. Bryson et al. 2006; Machington & Wilkinson, 2000). Rebernik & Širec (2007) argued that face-to-face interaction among employees mainly involve the sharing of tacit knowledge. This replicated argument made by Nonaka & Takeuchi (1995), indicating that personal contact enhances tacit-to-tacit knowledge exchange. The nature of tacit knowledge that is practical (i.e. describing process) and context-specific (i.e. obtained in situations where it is used) – Nonaka, 1991; Sternberg, 1994; makes it shared most effectively through face-to-face interactions like coaching and networking (Rebernik & Širec, 2007). In an empirical study, involving British workplaces, Salis & Williams, (2010) has suggested that personal interactions or face-to-face communication is an

effective way to intensify knowledge sharing, leading to higher employees' productivity of works. Earlier, Voelpel & Han (2005), who examine knowledge sharing network in Siemens, reported that through knowledge sharing employees can enhance the productivity of work, in which it helps employees to solve obstinate problems in their daily business; and also provides solutions based on the experiences of colleagues and experts as well as saving time.

Information richness (also known as media richness) is defined as "the ability of information to change understanding within a time interval", where the longer time taken to enable understanding the lower the richness of communications (Daft & Lengel, 1986, pg 560). Face-to-face is labelled as the richest communication (Daft & Lengel, 1986; Damian et al., 2000; Lengel & Daft, 1988; Wu et al., 2008). Koskinan et al. (2003, p. 286) face-to-face interaction "allows immediate feedback so that understanding can be checked and interpretation corrected". Earlier on, Mehrabian (1971) discovered that through face-to-face interaction misinterpretation of meanings is less because the knowledge is conveyed by body language, facial expression and tone of voice goes beyond the spoken message; comparing with other forms of social relations. However, Dennis & Valacich (1999) argued that it is inappropriate to conclude that face-to-face communication is the richest. According to them, the richest medium is "that which best provides the set of capabilities needed by the situation, including the individuals, task and social context within they interact (p. 3). More recently, van der Kleij et al. (2009) argued that no medium could be marked as the richest medium considering that every medium has its own weaknesses.

In the last decades, the world has witnessed the emergence of computer-mediated-communication (CMC) as a functional alternative to face-to-face interactions. These are the other mechanisms of communication, which are not characterised by employees' physical contact; and are viewed as to enhance the sharing of explicit knowledge (Salis & Williams, 2010). CMC can be synchronous, including chat, messenger, video conferencing, web-mediated manifestation and Skype voice/video call; or asynchronous, for example email-based discussion lists or other structures information systems such as, discussion forum, discussion and bulletin boards, computer Wikis, and Weblog, where the messages are primarily typewritten

(Adrianson, 2001; Marshall & Novick, 1995; Romiszowski & Mason, 1996). Communication facilitated by computer technologies, CMC, is defined as “synchronous or asynchronous electronic mail and computer conferencing, by which senders encode in text messages that are relayed from senders’ computers to receivers” (Walther, 1992, p. 52).

Among the consistently cited advantages of CMC is overcoming the barrier of space and time (Barnes & Greller, 1994; Dimmick et al., 2000; Henri 1992; Rice & Love, 1987). Although CMC offers only limited opportunities for truly ‘social’ communication rich in social cues (Daft & Lengel, 1984; Lengel & Daft, 1986; Kiesler et al., 1984), CMC is the desire that seems to be inherently human but enacted via technology (Walther, 1996). A qualitative study by Vonderwell (2003), exploring students’ experiences in an online course, argued that CMC tools can contribute to a knowledge base for effective planning and implementation of successful learning. However, Chiu & Wang (2008) have criticised the effectiveness of the designed tools or mechanisms for online learning. They argued that such web-based learning system should never delay in response in order to ensure its effectiveness.

The other way to share knowledge is from written documents that may be available in paper or in electronic documents (Hansen & Haas, 2001; Werr & Stjernberg, 2003). Examples of written communication are letters, brochures, and bulletins (Raciti & Dagger, 2010). Winter (1987) claimed that the sharing of written documents is predominantly appropriate for explicit knowledge. The sharing of written documents has been labelled as ‘electronic document usage’ by Haas & Hansen (2007, p. 1136). According to Duncan & Moriarty (1998) written communication (or messages) can facilitate both one-way and two-way interactions, which can improve relationships. Moreover Raciti & Dagger (2010) stated that written communication may also cultivate the dual role of relationship. Following the empirical survey of 422 distance education customers, Raciti & Dagger has found that key components of written communication (i.e. message clarity, aesthetics, accuracy, and physical features) have a significant impact in their relationship with

the service organisations. In other words, unless it is properly decoded, the written message may be less effective as compared to other forms of communication.

The literature reviewed above lays a foundation of understanding KM and KS theories and key issues in practice, however, most of the studies are based on commercial sectors. HE sector has distinctive characteristics when knowledge sharing is concerned. The key issues related to KM and KS in HEIs are reviewed in the next chapter.

## **2.8 Summary**

This chapter has provided a context for the study, including the literature closely related to it: the concept of knowledge and the types of knowledge, the evolution of KM, knowledge sharing in commercial sectors, knowledge sharing behaviours theories, influence of KS enablers on RKS behaviour, (i.e. people, organisation, and IT), knowledge sharing process model and channels of communication for knowledge sharing.

Knowledge has become the key economic resources. The manifold views of knowledge will enable people to understand the knowledge-based of the firm and KM process. Unlike other traditional resources like land, labour, and capital, knowledge has become a public good, once it is shared. Knowledge is seen as an intangible human asset, which then distinguishes it from data and information. The fundamental discussion of knowledge is the distinction between the explicit knowledge (e.g. codified, written) and tacit knowledge (e.g. “know how”). The literature reviewed shows debates about the distinction between tacit and explicit knowledge. In light of this, the SECI model is presented, which explain ways of converting tacit knowledge into explicit and back again in a cycle mode.

Since knowledge is an important asset in an organisation, the idea of KM is crucial. Jarrar (2002) see KM practice as a process, where all knowledge is managed in order to meet the existing and emerging needs, identify and exploit existing and acquired knowledge assets and develop new opportunities. KM not only managing tacit and



explicit knowledge, but also engages individuals and groups intra- and inter-organisation, aiming at improving overall organisational performance. KM is intertwined with knowledge sharing. Knowledge sharing is critical to the realisation of KM success. Knowledge sharing is seen as a process of communicating and passing out both tacit and explicit knowledge either through formal or informal ways. The proper management of knowledge sharing can greatly improve work-quality, decision-making skills, problem-solving efficiency and competency of an organisation.

An individual's decision to engage in a specific behaviour is determined by their intention to perform the behaviour (Fishbein and Ajzen, 1975). Knowledge sharing is affected by a number of factors, including knowledge sharing behaviour theories, the influence of KS enablers, and knowledge sharing process model. There are numbers of theories found in the literature, which attempt to account for knowledge sharing behaviour of an individual. Elements like intrinsic and extrinsic rewards, self-efficacy, trust, reciprocal relationship, and organisational climate reflected a positive impact on knowledge sharing behaviour. There are three key enablers that fostering knowledge sharing activity, i.e. people (e.g. influence of leaders' support and employees' motivation), organisation (e.g. culture, strategy), and IT (i.e. email, Wiki, blog). Early work on knowledge sharing suggested a focus on IT infrastructure. Later research reveals the importance of an awareness of "softer" issues, i.e. people and organisation. IT is undoubtedly enabled knowledge sharing, but the "softer" factors are critical for the success of knowledge sharing.

Many studies have examined the influence of leadership roles in knowledge sharing. Prior works have demonstrated that there is significant relationship between the leaders and the knowledge sharing behaviour among employees. Leaders are seen as facilitator, mentor, or coach so as to support employees' knowledge sharing behaviour. Elements like personal attributes of leaders and leadership styles are key influential factors of knowledge and hence, enhance organisational performances. Literature proves that leaders who emphasise on human interaction and lead by example are supportive for knowledge sharing in a workplace. There are three main mechanisms that need to be in place in order to ensure the effectiveness of

knowledge sharing processes. These include face-to-face interaction, which is the richest medium for passing knowledge; CMC, which can be synchronous (e.g. chat, messenger, Skype) or asynchronous (email, Wikis, Weblog); and written documents, which may be available in paper or in electronic documents.

The literature reviewed in this chapter portrays a foundation of understanding KM and KS theories and key issues in practice. Most of the studies reviewed are based on commercial sectors. The analysis in next chapter will reveal the key issues of knowledge sharing in HEIs.

## **Knowledge sharing in HEIs**

### **Introduction**

As illustrated in Figure 2.1, this chapter discusses the B area by reviewing the literature concerning knowledge sharing in HEIs. It begins with the discussion of different categories of HEIs in the UK. The chapter then stresses the importance of research in the UK HEIs, and follows with the discussion about the Research Assessment Exercise (RAE). Then, it critically reviews the issue of knowledge sharing in HEIs, including the roles of professors in HEIs. The chapter also highlights the research problems and the justification of research gap for this study (i.e. C area – see Figure 2.1); and ends with a summary for the chapter.

### **3.1 The UK HEIs categorisations**

UK HEIs are very much differentiated by origin, status, mission, resources, research activity and income, educational provision and student characteristics (Locke, 2011). A survey of the academic profession has been carried out in England in 1992 as part of the First International Survey of the Academic Profession (Fulton, 1996). The report of the 1992 survey sought to investigate institutional diversity and differentiation on the eve of the abolition of the binary divide in the UK between universities on the one hand and polytechnics and major colleges of higher education on the other (Locke, 2008). According to Locke, UK HEIs are then distinguished into three categories: Pre-1992 universities, Post-1992 universities (i.e. Polytechnics at the time of the 1992 survey), and Post-2004 universities.

The first category is the Pre-1992 universities, which consist of the older universities created in 1960s. The Pre-1992 universities are separated into two different groups, i.e. Russell Group and non-Russell group. The Russell Group universities were established in 1994. It is a collaboration of twenty UK universities that receive two-thirds of research grant and contract funding in the UK. Although the Pre-1992 universities or the traditional universities are recognised as “research-intensive” universities (Locke, 2011) only twenty Pre-1992 universities are Russell Group membership. These universities are Birmingham, Bristol, Cambridge, Cardiff, Edinburgh, Glasgow, Imperial College London, King’s College London, Leeds, Liverpool, London School of Economics, Manchester, Newcastle, Nottingham, Oxford, Queen’s University Belfast, Sheffield, Southampton, University College London, and Warwick. The key objective of the Russell Group universities is to lead the UK’s research effort. In the 2001 national Research Assessment Exercise (RAE), 78% of the staff in Grade 5\* departments were located in Russell Group universities ([www.russellgroup.ac.uk](http://www.russellgroup.ac.uk)).

The second category is the Post-1992 universities. These are the universities created as a result of the abolition of the so-called ‘binary divide’ in the early 1990s. In 1992, under the Further and Higher Education Act, over 40 former polytechnics gaining university status (Greenaway & Haynes, 2003) and given powers to award bachelor’s, master’s, and Ph.D. degrees. Since then, there are no more polytechnics in the UK

(Baimbridge, 1996). Granting university status to the polytechnics afforded the opportunity for the establishment of a centralised funding and control body, by which the external system of quality control were then in place (Evans & Abbott, 1998). The Higher Education Funding Councils established teams of inspectors who would visit institutions, carry inspections on the quality of teaching and award grades, which then linked to future funding arrangements (Evans & Abbott, 1998, pg. 11).

The last category is the Post-2004 universities. The term “Post-2004 universities” refers to those HEIs in England that have gained university status under the revised criteria for university title permitted by the 2004 Higher Education Act, which eliminated the requirement for research degree awarding powers, among other measures designed to relax the definition of a university (Locke, 2008). In short, the Post-2004 universities are those universities that were no longer required to possess the power to award research degree in order to use the title of “university” (Locke, 2011).

Apart from these three well-known categories of HEIs, there are four more universities groups established in the UK. The first group is the “University Alliance” universities, which was formed in 2006. It consists of 23 major, business-engaged universities committed to delivering world-class research and a quality student experience around the UK. With 23 universities formed as current memberships, the University Alliance aims to bring together universities with government and business to create innovative solutions to social and economic challenges ([www.university-alliance.ac.uk](http://www.university-alliance.ac.uk)). The second group is the Million+ universities. Originally known as the Coalition of Modern Universities (CMU), the Million+ represents 31 universities in the UK ([www.internationalstaff.ac.uk](http://www.internationalstaff.ac.uk)). The third group is the GuildHE universities. The GuildHE, which was formerly known as the Standing Conference of Principals (SCOP), is one of the formal representative bodies for HEIs in the UK. It was originally found in the late 1970s as the SCOP and was renamed as GuildHE in 2006 ([www.guildhe.ac.uk](http://www.guildhe.ac.uk)). The last group is the “Unaffiliated” group. It consists of other 25 universities that are not affiliated with

any of the major UK HEIs groupings, such as the Russell Group, University Alliance and GuildHE ([www.ee.ucl.ac.uk](http://www.ee.ucl.ac.uk)).<sup>1</sup>

### **3.2 Research paradigm in the UK HEIs**

In the last 25 years, UK HE has experienced primary change and resulting in several key developments, including the emergence of increasing selectivity and quality-related funding, especially in research, with major consequences for institutional diversity and the interrelationship of teaching and research (Taylor, 2005). Research is becoming an essential function of UK higher education institutions (Schimank & Winnes, 2000), and has been recognised as an engine for economic growth (Bai et al., 2008; Shin, 2009) and a key driver toward innovation. Mamdani (1995, p. 24) clearly described that “without research, education turns into a consumer product, neither original nor creative, nor inspiring independence of thought”. Omari (1991, p. 799) stated that “research is the essence of scholarship and a necessary condition for the existence of the university, since without excellence in scholarship there can be no excellence in teaching, training, social reflection, and service”. More recently, Chong (2010, p. 799) describes research as,

“...an investigative endeavour that aims to arrive at “new” (in a contextual sense) information or understanding, which thereby advances human (or the individual’s) knowledge, involves searching for or gathering of information, followed by interpretation or evaluation followed by interpretation or evaluation”.

The core business of a university is research and teaching activity. According to Schimank & Winnes (2000), there are three principal models or types of relationship between teaching and research. The first model is the pre-Humboldtian model, representing by the French system of higher education, in which research and teaching are separated in different institutions. According to this model, research is carried out separately from teaching and was deemed to be mainly a researcher’s own scientific inquiry (p. 404). The second model concerns the modern idea of an

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<sup>1</sup> See Appendix 1 for lists of universities for each university group.

integration of research and teaching. The combination of teaching and research was declared as an important tenet of scientific education (Henningsen, 2006, p. 98). The third model is the post-Humboldtian pattern characterized by “a differentiation of roles and/or organizations and/or resources for teaching and research”, while both roles are expected of academics at a university (Schimank & Winnes 2000, p. 398). The separation between teaching and research goes further than the Humboldtian type as it is to some extent found in the UK.

One of the key criteria that separate universities is their research quality. The higher research quality produced by one institution, the larger share of public funding and private philanthropy received (Gulbrandsen & Smeby, 2005). Gulbrandsen and Smeby insist that there is a significant connection between the quality of research and the extent of industry funding. Integrating universities’ research performance with the level of funding from the government is not the only motive why higher education institutions value research. Previous studies reported a significant correlation between research productivity and the reputation of HEIs (Hattie et al., 1994; Ho, 1998; Tang & Chamberlain, 1997). Moreover, Liu & Chen (2005) stated that it is an international practice to base ranking of universities on the research outputs. High reputations both domestically and internationally are critical to the endurance and development of a university. The reputation of particular university becomes crucially vital in attracting external research funding and high-quality students (Ho, 1998) when universities are supported to find external funding for their research (MacGregor et al., 2006), and allowed to enrol fee-paying students (Pratt et al., 1999).

Research comes in different forms in UK higher education including pure research or scholarly research (aims to discover new knowledge), pedagogic research, and applied research or practice-based research, for example, consultancy and knowledge transfer projects. Good research track records are essential requirements to recruit academics, promote and secure higher ranking in league tables, thus it constitutes an important part of university’s strategy. In achieving career advancement, academics at universities engaged in research and publication for both extrinsic and intrinsic motives. For example, an empirical work in Nigerian Universities by Aluede (2009,

pg. 23) shows that there is a very strong relationship between publications and career progression of academics. Aluede referred international publication as a “mandatory condition” for an academic to get to professorship promotions.

Many studies shows that factors influenced academics to engage in research are peer pressure, university expectations and social satisfaction and reinforcement derived from publication (Aitkin, 1991; Lawrence & Blackburn, 1988; Mwamwenda, 1994; Noble, 1989). There is development and dissemination of advanced knowledge through research (Levin, 2011). It can be argued that research is the core aspect of academic profession and university reputation.

Newman (1957) who describes the image of Humboldtian universities suggests that the primary function of a university is to disseminate knowledge rather than to generate knowledge. According to Pritchard (2004), the German Humboldtian model of a university appears to have major influence over modern universities worldwide, where the Humboldtian value the universities as having great importance to freedom of the pursuit of knowledge, including knowledge sharing and creation. HEIs are no longer recognised as knowledge provider to students but serve as a knowledge reservoir. In other words, universities nowadays not only oblige to teaching students, but also conducting research and providing services related to their discipline (Kim & Ju, 2008).

Whilst Henkel (1997, pg. 134-138) argues that British academics should experience “security of tenure, relatively generous allocations of time, relatively low levels of administration, a common salary structure, the interdependence of at least teaching and research, an emphasis on equality values in the allocation of work and the idea that academic specialisation is discipline rather than functionally based”; the world has witnessed the increasing responsibilities of faculty members. Recently, academics engage in a multiplicity of activities. Although previously, the core activities of academics are distinguished into teaching in classes and publishing in academic journals (Robertson & Bond, 2001), recently activities like writing proposals, developing contracts, elaborating e-learning programmes, or being engaged in technology transfer are all tasks of academics even though they are not



explicitly rewarded (Musselin, 2007). According to Musselin, these activities are no longer considered as peripheral, un compelling or secondary, but they are important aspects of academic work (pg. 3). Much research has shown how funding policies have impacted on universities, in which research has often been prioritised than teaching (McNay, 1997; McNay, 2003; Lucas, 2006).

In an empirical work involving 40 academic staff from five UK universities, Deem & Lucas (2007) explore academic staff and departmental research and teaching cultures in the Education Departments of five universities in Scotland and England. They found that gender and professional background were the elements that shape academic habitus. The study has noted that like other subjects, Education Department is also part of “UK-wide Research Assessment Game” (pg. 129), where research activity is one of the core activity highly valued by the department. They conclude that the significance and interpretation of teaching/research connection in academic fields is linked with the local cultural context and the broader policy context of a particular country.

Recently, Kloot’s (2009) exploratory study in the South African Institutions, demonstrates a shifting in the value of teaching as a “component of academic capital” to research activity (pg. 478). Many studies has focused on defining approaches to the integration of research, teaching and learning, which mainly drawn from four main approaches, including learning about others’ research, learning to do research (e.g. research method); learning through the research process (e.g. enquiry-based learning);and pedagogic research (e.g. enquiring and reflecting on learning) (Brew, 2006; Healey, 2005; Jenkins et al., 2003). There is some sense within these approaches which requires the need to develop mechanisms for sharing knowledge between academics, specifically research-knowledge. More specifically, it signals the urgency to explore influential factors affecting research-knowledge sharing.

Petrides & Nodine (2003) note that KM in the form of information practices and learning strategies are gaining acceptance in the field of education, where HEIs manage, blend, and share knowledge among the faculty staff themselves. Therefore, knowledge sharing is undoubtedly critical in HEIs and may be regarded as one of the

most important concepts for the success of an institution. This is witnessed by the fact that a number of HEIs have received grants in order to execute KM practices (Sohail & Daud, 2009). Du Toit (2000, p. 187) claims that the prosperity of HEIs is depending on the intellectual capital of academics and their capacity to grow and survive in a dynamic environment. Academics are recognised as developers, users and carriers of high-levels knowledge, and also generators and learners of new knowledge (Biloslavo & Trnavčević, 2007), and hence they need to recognise and respond to their changing and challenging role in society.

### *The roles of professors in HEIs*

Rayner et al. (2010) reveals that the position and role of professors in a UK university is one located at the zenith of an academic hierarchy, and thus, professors are expected to leadership in an academic context. Professors are expected to undertake a range of leadership and professional support not only on research activities but also teaching (Tight, 2002). According to Musselin (2007), in countries like Germany and USA, the ability to raise money and to manage research projects based on external funding is one of the criteria for hiring professors. Previous studies debate that despite of crucial roles played by professors, their responsibilities are often an “unspoken assumption”, in which there is no explicitly clear expectation of what professors should do in relation to university management (e.g. Bolden et al., 2008; Kolsaker, 2008; Whitchurch, 2007). Moreover, some professors are found to provide minimal leadership and offering little time to others, where they are only focusing on sustaining and expanding their own research activity and enhancing their own profile (Evans et al., 2011).

Boyer (1990, pg. 23-24) has identified four “new” principles for academic leadership that may lead to successfully working university. First is the scholarship of discovery, in which academic leaders being the first to find out, to know, or to reveal original or revised theories, principles, knowledge or creations. Second is the scholarship of integration, where they are creating new knowledge by bringing together otherwise isolated knowledge from two or more disciplines/fields, thus creating new insights and understanding. Third is the scholarship of application,

where they are bringing knowledge to bear in addressing significant societal issues, and so using knowledge or creative activities for development and change. The last one is the scholarship of teaching, which emphasising on a “dynamic endeavour”, where academic leaders involves in developing the knowledge, skill, mind, character or ability of other; which means academic leaders are not only transmitting knowledge, but also transforming and extending that knowledge. Arguably, Boyer’s four principles of academic leadership signify the roles of professors in HEIs.

The empirical work by Macfarlane (2011) emphasises to explore the leadership role of professors, mainly in a UK context. In his work, Macfarlane regards professors as “intellectual leaders”, who act as role models, mentors, advocates, guardians, acquirers, and ambassadors. He found that since professors is seen as an intellectual asset to institutions, their roles needs to be recognised explicitly for both moral and functional value. Interestingly in his study, Macfarlane spots a mismatch between what professors see as their role and how they perceive the expectations of their university employers (pg. 72), which means professors feel that their skills and expertise are often overlooked by the university toward its leadership and management. Bright et al. (2012) see role of professors as a facilitator, which they then compare it to a gardener. They states that the way a gardener sets artificial structures that affect plants: soil condition, seed selection, and watering patterns; is similar to a professor’s role that set formal conditions for learning: the arrangement of the physical space, the enactment of class routines, and opportunities for student initiative (pg. 159-160).

In a very recent book, title “Intellectual leadership in higher education: renewing the role of the university professor”, Macfarlane (2012a) argues that is crucial to define and recover intellectual leadership (i.e. professors) as a counter-weight to the prevailing managerial culture of HE. He suggests four orientations to the role of professors, including knowledge producer, community connector, boundary transgressor, and public intellectual. In addition to that, Macfarlane (2012b) argues that becoming a professor is not only about getting a promotion to a higher career grade, but more precisely it is a new role that carries important generalised responsibilities for intellectual leadership. Through the web-based network (i.e.

Profs-Net) that Macfarlane developed at the University of Portsmouth, which allows the trans-disciplinary expertise of professors available to academic faculty; he found that professors' expertise is not only related to research, but also other substantial areas of teaching and learning expertise. He argues that although professors are commonly defined as pure researchers, their roles also have much to offer in terms of teaching and research development (Macfarlane, 2012b).

### **3.2.1 Research performance: Research Assessment Exercise**

One of the main criteria to measure university research performance is the Research Assessment Exercise (RAE). In a review article, examining the university research evaluation schemes practised in 10 European countries, Australia and Hong Kong, Geuna & Martin (2003) explained that the RAE was introduced into the UK HE system in 1986 as a formalised evaluation process of the research quality of individual academics, projects, departments or universities. Consequently, British universities select to submit their research outputs to a subject specialist peer-review panel for a quality rating, approximately every four to six years. The UK higher education funding councils allocate research monies to HEIs based on the ranking results from this assessment (Deem, 2006; Geuna & Martin, 2003; Ito & Brotheridge, 2007).

Subsequently, competition for funding among UK HEIs became more intense when polytechnics were re-designated as universities in 1992. Traditionally, research productivity is considered a critical issue in Pre-1992 universities because research is recognised as an important component of the university's mission and a key indicator of its performance (Bai et al., 2008). The missions of other HEIs like polytechnics were mainly teaching, and their research was not funded by the government. However later on, many universities have changed their brief to include research and the production of knowledge as key to their institutional directions, including polytechnics. After being granted university status and known as Post-1992 universities, they joined the competition for the unregulated research money, which makes research in UK universities more desirable (Deem, 2006). The Post-1992

universities wanting to prove their credentials in research (Blake et al., 1999), and it was then confirmed by the 2003 Government White Paper (Dfes, 2002).

As a result, university research has become highly competitive in a nation's capacity to deliver knowledge in the world market (Bai, et al., 2008, p.1). This can be detected from the readiness of new universities to take part in the RAE 2008. Furthermore the aspirations of the new universities can be noticed from the research enhancement and more research degree program offerings, which have been set as the long and medium term goals of these universities (Deem, 2006).

The RAE has been repeated in 1989, 1992, 1996, 2001 and 2008 since it was first introduced in 1986, with each new implementation becoming more comprehensive and systematic ([www.rae.ac.uk](http://www.rae.ac.uk)). The RAE has had positive effects despite the criticisms about the evaluation scheme. It has encouraged university research efforts and successfully directed resources to areas of research excellence ([www.rae.ac.uk](http://www.rae.ac.uk)). The RAE is a process which examines and judges (using peer panels of academics) the quality of research in academic departments, based on research outputs (including publications), and a range of other factors from research infrastructure to esteem indicators such as journal editorships (Deem, 2006, p.287). However, Gillies (2007, 2009) criticised that the RAE not only damaging the university research output, but also damages the teaching in the UK universities.

The RAE 2008 witnessed the replacement of the single subject/discipline panels with grouped panels of cognate subjects; as well as the modification of the grading system (Deem, 2006). The series of six RAE was completed in 2008, and now been replaced with the Research Excellent Framework (REF). The development of the REF has been led by Higher Education Funding Council for England (HEFCE) and other UK HE funding bodies. The aims of the funding bodies is that the REF should offer a unified UK-wide framework for research quality assessment, recognising that decisions on funding allocations will be taken by each funding body for its own country or territory (HEFCE, 2009, p. 4–5). The Secretary of State emphasised that the REF should take better account of the impact research makes on the economy and society, and gave further guidance on particular activities that the REF should

continue, “...to incentivise research excellence, but also reflect the quality of researchers’ contribution to public policy making and to public engagement, and not create disincentives to researchers moving between academia and the private sector” (HEFCE, 2009, p. 5).

### **3.3 Knowledge sharing in HEIs**

A university is critically linked with knowledge and ideas preservation through key processes, including teaching, research, and publication (Hussein & Nassuora, 2011). Previous work on knowledge sharing is dominated on knowledge sharing within business organisations, where the ultimate goal is obviously profit-oriented. Liebowitz (2001) indicated that by encouraging and promoting knowledge sharing among employees organisations can gained competitive advantages. Hicks (2000, p. 71) argues that intellectual capital and people’s knowledge are the most important assets of an organisation, which constitute the competitive resources in the organisations. Hence, knowledge sharing can be regarded as critical to organisational success. In fact, knowledge sharing is even more important for a knowledge-based institution like a university. It can be argued that the effect of knowledge sharing could be larger than those ingrained in business organisations. Thus, a context-specific knowledge sharing based in HEIs is worth explored.

A university is a platform where academics can communicate their ideas and insights (Martin & Marion, 2005). Moreover, universities add value to the information-processing environment (Mphidi & Synman, 2004). Following the arguments made by Rowley (2000) that HEIs are regarded as knowledge business and progressively exposed to pressures in the market; Steyn (2004) proposed that it is important to consider the importance to manage knowledge in HEIs. Previously, Allee (1997, p. 71) stressed that “knowledge is power, so share it in order for it to multiply”. Steyn (2004) stated that, in order for HEIs exploit the power of knowledge, fair emphasis should be put on people, technology, and structures. This justified the claim made by Hawamdeh (2003) earlier, who stated that the effectiveness of knowledge sharing is depending on the careful transmission and absorption of knowledge by the senders and potential receivers respectively. Swart & Kinnie (2003) summed up, in order for

knowledge-based organisations (e.g. HEIs) to attain the most from their intellectual capital and stay competitive in the global market; they need to promote knowledge sharing among employees.

Literature shows a certain number of research pertaining to knowledge sharing, based in HEIs. For example, Cheng et al. (2009) has examined knowledge sharing behaviour among academics in a private university in Malaysia, which highlighted influential factors impacting academics' behaviour to share knowledge (i.e. organisational, individual, and technology factors). They found that the two key influential factors inhibit academics to share knowledge are incentives systems and personal expectation. At the same time, they reveal that "forced" participation is an ineffective policy to promote knowledge sharing behaviour among academics. Cheng et al., (2009) argue that in academia, knowledge hoarding could be more prevalent than knowledge sharing, due to the non-exclusivity and non-rivalry nature of knowledge as public goods. The issue of knowledge hoarding has also found in Basu & Sengupta's study in a business school in India (2007). They has reported the missing culture of knowledge sharing, where most activities are individualistic, limited to internal peer group, and interactions with external experts are limited to personal acquaintance.

In an empirical study by Abdullah et al. (2008) in seven major public universities in Malaysia, they argue that the availability of appropriate incentives and rewards for contribution in sharing, are modes of motivation of knowledge sharing behaviour. This is akin to an earlier study conducted in a tertiary education institution in Singapore (Wah, et al., 2007), who found that rewards and incentives, open-mindedness of the sharer, and the cost benefits concerns of knowledge hoarding are the greatest predictors of knowledge sharing behaviour. In a cross-sectional survey, examining knowledge sharing behaviour among teaching staff in business and management schools in HEIs in Malaysia, Sohail & Daud (2009), have discovered that the nature of knowledge and working culture are strongest predictors of knowledge sharing behaviour. Moreover, they found that supports from management and opportunities for knowledge sharing are also positively correlated with knowledge sharing behaviour among teaching staff.

A quantitative study by Babalhavaeji & Kermani (2011), who investigated knowledge sharing behaviour among 93 teaching staff in government and private universities in Iran, revealed that the teaching experience was a strongest predictor for knowledge sharing. The results showed that young teaching staff (i.e. less than five years experience) and senior teaching staff (i.e. more than 20 years experience) shares their knowledge more often as compared to those with 5 to 10 years; 11 to 15 years; and 16 to 20 years of experience. Their findings were contradicted with Lou et al.'s (2007) results, who studied the knowledge sharing behaviour of instructors from Information Management department at public and private colleges and universities in Taiwan. They have discovered that the first group decline in knowledge sharing was senior instructors with 5 to 10 years experience, followed with young instructors with less than 5 years of experience. Instructors with more than 10 years of teaching experience were those who less share their knowledge.

Apart from that, an empirical study was conducted by Kim & Ju (2008), involving faculty members in a research university in South Korea. They examined several factors (i.e. perception, trust, openness in communication, collaboration, reward systems, and communication channels) influencing knowledge sharing behaviour among faculty members. Perception and reward system was found as the strongest factors affecting knowledge sharing behaviour. In the same vein, van Westrienen & Lynch (2005) has examined the academic institutional repositories (IR) in 13 countries, including the UK. They have discovered that the feeling of uncertainty and fear about the intellectual property (IP) issues as well as the impact factors with regard to scholarly credit are the inhibitors in institutional repositories. One of way to promote scholarly activities, for instance teaching, research, and knowledge sharing is through publicly accessible repositories on campus (Cronin, 2001; Kidwell et al., 2000). Metcalfe (2006) who suggest the application of KM in HEIs points out that an increase in IT management positions and investments in technological infrastructure necessary to accommodate KM strategies are not without cost, both organisationally and financially.

On the other hand, a number of researchers show interests in exploring the sharing of knowledge via CMC tools (also known as Web 2.0 tools), like blog/photoblog,



Wikis, podcast, and vodcast. Chua (2003) in an empirical study, involving 100 students in HEIs in Singapore has examined students' willingness to post asynchronous entries (i.e. ideas, suggestions, questions) to an electronic discussion forum in order to enhance the learning process, where students' willingness was positively correlated with their perceived payoffs of such behaviour. Williams & Jacobs (2004) argued tools like blog as potential to be a transformational technology for teaching and learning. More recently, in a case study by Ravid et al., (2008), the application of wiki technology as introductory academics textbook on information systems (i.e. wikitextbook) was examined. Wikibook was found to be an effective learning vehicle, provided that it is augmented by a careful study of cultural, societal, behavioural and pedagogic variables. Garcia-Perez & Ayres (2010), in their qualitative study concerning the use of Web 2.0 (i.e. wiki) in supporting a group of researchers, however, found contrary results. They reported that after one year of implementing wiki, the usage has declined although attempts were made to stimulate users' interest through incentives for contribution. One of the reasons for such failure was time required to access or contribute to the body of information and knowledge embedded in the technology (p. 50).

In an early explorative study, Kidwell, et al (2000) suggest to applying KM concepts to colleges and universities to three processes, i.e. research process, curriculum development process, student and alumni service services and propose a repository of research interests, results and a portal for research administration procedure and policies. They argue that education institutions need to develop initiatives to share knowledge to achieve business objectives. However, the approaches proposed by the researchers is mainly addressing explicit knowledge sharing using Internet Portal technology that has become common in many UK universities. Wang & Noe (2010) suggested that research is needed to investigate whether the frequency and type of knowledge shared differs based on a team's stage of development, especially when teams are managing multiple tasks.

The evidences in the above discussion show that several research have explored factors affecting knowledge sharing behaviour among academics. These studies are conducted in countries like Malaysia, Taiwan, India, Singapore, Iran, and South

Korea. There are a few studies being carried out in the UK HEIs concerning knowledge sharing practices, however, this research only focus on generic knowledge sharing practice. The evidences show that no research has so far explored the specific context of knowledge sharing, i.e. research-knowledge. Most importantly, no research has yet explored possible commonalities and differences in different types of universities in the UK with regard to this context-specific knowledge sharing, i.e. RKS. On top of that, no research has examined the influence of research-leaders on RKS behaviour among academics. This study aims to bridge this gap by exploring the nature of RKS within the boundary of six desired key determinants in two different types of UK HEIs. Arguably, the best practice of RKS lead to better university research performance and hence, an in depth and breadth research is critical so as to explore influential factors affecting RKS behaviour among research-academics.

### **3.4 Research problems and the gap**

From the review of literature concerning knowledge sharing in HEIs, three problems have been identified. They are:

- ***Lacking of knowledge sharing research in higher education (HE) settings***

The study of knowledge sharing is dominated by those focusing on knowledge sharing activity within the commercial sectors, which is disproportionate with HE settings. The issue of knowledge sharing is equally important for a knowledge-based institution like the HEIs. The impact of knowledge sharing in HE could be larger than those created by the business organisations. This is because HE is a knowledge intensive sector, where knowledge production, distribution and application are ingrained in HEIs. Therefore, it is interesting to explore knowledge sharing practice in HE settings.

- ***Lacking of research on context-specific knowledge sharing***

The fundamental idea of tacit and explicit knowledge sharing is not only determined by the individual behaviour, but the context-specific-behaviour (Augier et al., 2001; Ford and Staples, 2010; Nonaka et al., 2000a; Jeon, et al., 2011). In other words, the

practices of knowledge sharing vary across contexts. Since research is now becoming the core activity in most British universities in the UK (Bai, et al., 2008) and has been recognised as a key driver toward innovation (Schimank & Winnes, 2000), a specific context of knowledge, i.e. research-knowledge is arguably critical in HEIs. Research-knowledge can be useful to support research activity and research output of a particular university, which then lead to better research performance. Therefore, an in depth research is important to explore this context-specific knowledge sharing in HEIs, which never been studied so far.

▪ ***The different types of university in the UK***

The UK HEIs are varied based on their origin, status, mission, resources, research activity and income, educational provision and student characteristics (Locke, 2011). This includes Pre-1992 universities, Post-1992 universities, Russell group, and few others. Nevertheless research is now an essential function of UK HEIs (Schimank & Winnes, 2000) regardless of types of universities. Considering these differences, the nature of RKS might be complex given the different types of universities. Therefore, it is interesting to examine how research-knowledge is shared in different types of universities – whether it is common or different; and how it is related to university research performance; which is currently unknown.

This study is designed to fill the gap in the literature and to address some of the unknown issues concerning RKS in HEIs. Following the critical aspects of research in UK HEIs, this study carries out a complete review of the key determinants of knowledge sharing with regard to research-knowledge. The key determinants include: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. In short, this study examines the practice of RKS by examining commonalities and differences between Pre-1992 and Post-1992 universities. The best practice of RKS will lead to better university research performance. At the same time, this study examines the relationship between research-leaders and research-academics concerning the issue RKS.

### **3.5 Research model**

The review of previous studies concerning KS in other sectors flags up the urgency to investigate critical issues relating to RKS in HEIs. Although many studies have explored knowledge sharing in HE settings, key determinants relating to a context-specific KS, i.e. RKS is yet unknown. Figure 3.1 visualises the research model designed for this study. This study examines RKS practice in UK HEIs on the basis of three knowledge sharing enablers (people, organisation, and IT) found in commercial sectors. In this respect, six key determinants on RKS have been developed, i.e. (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS.

This study examines two different types of universities in the UK that have different research performance achievement. The RAE Power Ranking 2008, emphasising on the Unit of Assessment 36 (i.e. Business and Management Studies) is used to measure the university research performance. The first type of university chose for this study is Pre-1992 universities, which appears at the higher rank of the RAE Power Ranking and the second one is Post-1992 universities, which appears at the lower rank. This study further examined the commonalities and differences of RKS practices in both types of universities, which ultimately lead to better university research performance. The result of this study not only contributes to the body of knowledge, advance the knowledge sharing theory, but also brings implications to the practitioners.

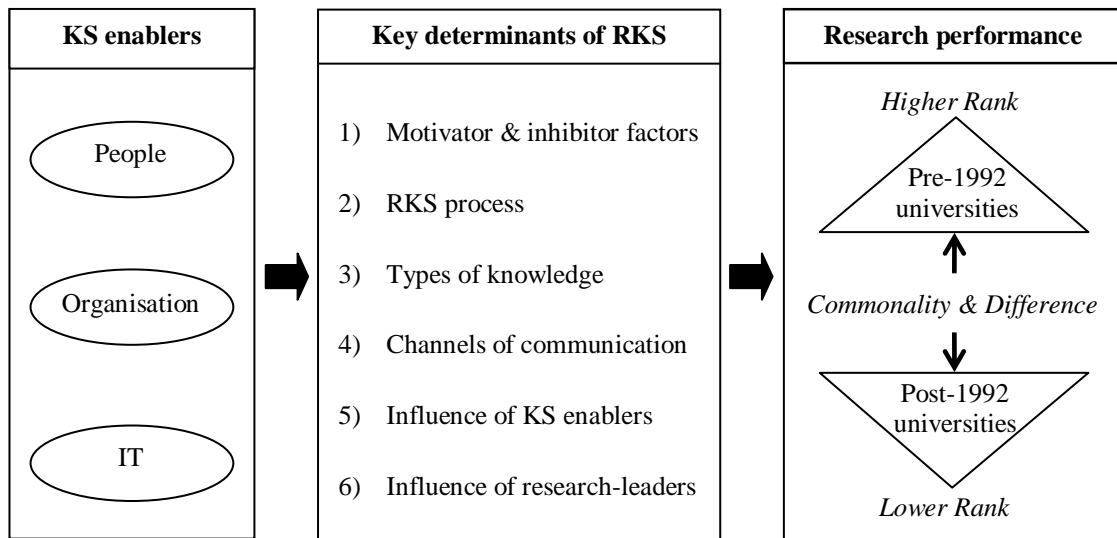


Figure 3.1 Research model

### 3.6 Summary

This chapter emphasises on the key issues of knowledge in UK HEIs by reviewing the literature that discusses the categorisation of HEIs in the UK, the importance of research in the UK HEIs, the Research Assessment Exercise, and the empirical works of knowledge sharing in HEIs.

There are three main groups of universities in the UK: 1) the Pre-1992 universities; 2) the Post-1992 universities; and 3) the Post-2004 universities. There are also four other categories of HEIs in the UK which are less well-known, including University Alliance, Million+, GuildHE, and Unaffiliated universities. The core business of a university is research and teaching activity. Research is not only recognised as an engine for economic growth, but also a key driver toward innovation. Previous studies have demonstrated that research quality and productivity is one of the key criteria that affecting the university's reputation. There are several forms of research in UK HEIs, which includes pure research or scholarly research, pedagogic research, and applied research or practice-based research. Peer pressure, university expectations, social satisfaction, funding or grant pressure, and reinforcement derived from publication are among the elements reported in prior studies, which influence academics to engage in research.

The RAE is known as the main criteria to measure university research performance in the UK HE system. Previous studies show that the UK HE funding councils allocate research monies to HEIs based on the RAE's ranking results. Therefore, research has been included in the university's mission not only in Pre-1992 universities, but other universities as well. The Post-1992 universities for instance, wanting to prove their credentials in research (Blake et al., 1999). As a result, university research has become highly competitive, especially in the UK HEIs. Academics are recognised as developers, users and carriers of high-levels knowledge, and also generators and learners of new knowledge (Biloslavo & Trnavčević, 2007). Hence their involvement in knowledge sharing is crucial.

Several studies have explored the practice of knowledge sharing in HEIs by examining the influential factors affecting knowledge sharing behaviours. Elements like trust, incentives systems, open-minded of the sharer, working culture, and personal expectation are recognised as factors that impacting knowledge sharing behaviours among academics. Another strongest predictor of knowledge sharing behaviour is academics' teaching experience, which is separated into three different groups, i.e. working less than five years, between 16 to 20 years, and more than 20 years. Studies in knowledge sharing within the HE setting are disproportionate with those in commercial sectors. This shows the urgency to carry out a study that focuses on the context-specific knowledge sharing, i.e. RKS in UK HEIs. On top of that, due the different categories of universities in the UK, it is interesting to study RKS in different types of universities in the UK. This study can bridge the gap in the body of literature.

A specific research model is designed for this study, which lays the three enablers of knowledge sharing (i.e. people, organisation, IT) and the six key determinants that affect knowledge identified from the literature (i.e. motivator and inhibitor factors, the process of RKS, types of knowledge shared, channels of communication, influence of knowledge sharing enablers, and influence of research-leaders). These key determinants act as a foundation to explore a context-specific knowledge (i.e. RKS) in both Pre-1992 and Post-1992 universities.

## **Research methodology**

### **Introduction**

This chapter presents the methodology of this study in six different sections. The first section describes the nature of this study, research philosophies and justifies the choice of mixed method approach. The second section explains the research process of this study, followed with the descriptions of qualitative and quantitative approaches applied in this study. The spectrum of research is illustrated in this section. The third section explains the sampling method for this study. This includes the sampling procedure in both pilot study and the main phase, where the selection of participants is presented. The ethics issue is also described in this section. The fourth section indicates the data collection procedure for this study, which include the explanation of interviews and transcribing processes are included. The fifth section notifies the data analysis process in this study. It presents the usage of CAQDAS for qualitative data analysis, emphasising on NVivo application. This chapter also discusses the validity and reliability for rigorous purpose of this study, and ends with a summary for the chapter.

## **4.1 Nature of study**

This section is devoted to the nature of this study. First, it addresses the philosophical orientation that underlies this research. Subsequently, it is argued why a mixed method has been chosen.

### **4.1.1 Philosophical orientation**

All research methods, whether quantitative or qualitative are based on some underlying or hidden assumptions that constitute the validity and reliability of research (Myers, 1997). Philosophically, Creswell (2003, pg. 6) suggested that ontology involves people making claims about what is knowledge; epistemology is how people know it; axiology is what values go into it; rhetoric is how people write about it; and methodology is the process for studying it. Therefore, terminologies like “paradigm”, “method”, “strategy”, “mode of enquiry”, “technique” and “approach” are often used interchangeably in multidisciplinary research depending on researcher’s philosophical views of the world (Tan, 2010) and different methods of inquiry. Pickard (2007) clarified the relationships between these terms by illustrating a research hierarchy, which incorporates research paradigm (positivist, interpretivist), research methodologies (qualitative, quantitative), research methods (case study, survey, experimental research, ethnography, Delphi study, action research, historical research, grounded theory), research techniques (questionnaire, experiment, interview), and research instrument (human, pencil and paper, Brass, etc).

#### ***Determining an appropriate research philosophy for this study***

In general, philosophical assumptions create a basis for any research enquiry, which influence the nature of the research and decide how a research model is adopted to answer the research questions. With respect to methodology, the most pertinent philosophical assumptions of this study are guided by those that relate to the epistemology basis. Critical, positivist, and interpretive stands are the different classifications of epistemological assumptions (Myers, 1997; Orlikowski & Baroudi, 1991).



Critical researchers focus on the oppositions, conflicts and contradictions in contemporary society (Myers, 1997). Critical researchers recognise that their ability to consciously act to change their social and economic circumstance is constrained by various forms of social, cultural and political domination. The main task of critical research is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light (Klein & Myers, 1999). Critical theorists also assume that social reality is historically constituted and that it is produced and reproduced by people (Myers, 1997).

According to Myers (1997) positivist studies generally aim to test theory, attempting to increase the predictive understanding of phenomena. Positivists generally assume that reality is objectively given and can be described by measurable properties independent of the observer and one's instruments. According to the French philosopher August Comte (cited in Dash, 2005), who emphasised observation and reason as means of understanding human behaviour, true knowledge is based on experience of sense and can be obtained by observation and experiment. Positivists adopt the thinking of scientific method as a means of knowledge generation. However, this thinking has been criticised for its lack of regard for the subjective states of individuals (Dash, 2005).

Interpretivists conversely believe that the understanding of phenomena should be obtained through the human and social interaction (Chen & Hirschheim, 2004). The nature of interpretivist paradigms are: "qualitative" (although not necessary), "soft", "non-traditional", "holistic", "descriptive", "phenomenological", "anthropological", "naturalistic" and "illuminative" (Denzin & Lincoln 1994). According to Walsham (1995) the epistemological stance on interpretive approaches is that knowledge of reality is gained only through social construction such as language, shared meanings, tools, documents, etc. The philosophical base of the interpretive perspective is hermeneutics and phenomenology (see Table 4.1), in which it generally attempts to understand phenomena through the meanings that people assign to them (Myers, 1997). There are no predefined dependent and independent variables in an interpretive research project but as the situation emerges, there is a focus on the complexity of human sense-making (Kaplan & Maxwell, 1994). The interpretive

approach is inductive and concerned with discovering and interpreting social patterns (Orlikowski & Baroudi, 1991).

Qualitative research may or may not be interpretive, depending upon the underlying philosophical assumptions of the researcher (Myers, 1997). In other word, qualitative research can be positivist, interpretive or critical. It can identify strategic patterns that hold across different venues and with different actors (positivist); and it can also seek to understand what general concepts mean in their specific operation, to uncover the conscious and unconscious explanations people have for what they do or believe (interpretive) (Lin, 1998). Nevertheless, qualitative research is ostensibly referred as qualitative in nature and the positivist paradigm is quantitative (Gable, 1994).

Table 4.1 Differences between positivist and interpretive perspective

	<b>Positivist Perspective</b>	<b>Interpretive Perspective</b>
<b>Basic belief:</b>	<ul style="list-style-type: none"> <li>▪ The world is external and objective</li> <li>▪ Observer is independent</li> <li>▪ Objective and value-free interpretation by researchers</li> </ul>	<ul style="list-style-type: none"> <li>▪ The world is socially constructed and subjective</li> <li>▪ Observer is part of what is observed</li> <li>▪ An analysis based on participants' viewpoints and is driven by human interests</li> </ul>
<b>Researcher should:</b>	<ul style="list-style-type: none"> <li>▪ Focus on facts</li> <li>▪ Look for causality and fundamental laws</li> <li>▪ Reduce phenomena to simplest elements</li> <li>▪ Formulate hypothesis, propositions, quantifiable measures, of variables, models or casuals relationships among variables and test them</li> </ul>	<ul style="list-style-type: none"> <li>▪ Focus on meaning</li> <li>▪ Try to understand what is happening</li> <li>▪ Look at the totality of each situation</li> <li>▪ The phenomena are examined with respect to cultural or contextual setting</li> <li>▪ Develop ideas through induction from data and no deterministic perspective imposed by the researcher</li> </ul>
<b>Preferred methods include:</b>	<ul style="list-style-type: none"> <li>▪ Operationalising concepts so that they can be measured</li> <li>▪ Use of quantitative methods to test theories or hypotheses (although not always necessary)</li> <li>▪ Taking large samples</li> </ul>	<ul style="list-style-type: none"> <li>▪ Using multiple methods to establish different views of phenomena</li> <li>▪ Small samples investigated in depth</li> </ul>

*(Adapted from Chen and Hirschheim, 2004; Easterby-Smith et al., 1991)*

This study intends to emphasise the socially-constructed nature of reality in relation to the desired phenomenon. This study mainly follows interpretive perspectives, in

which it has taken the desire for full richness of the data by asking open-ended questions in getting the respondents' genuine views. Apart from that, this study also follows positivist perspectives by taken into account the need for rigour and triangulation.

#### **4.1.2 Mixed method approach**

According to a definition suggested by Johnson & Onwuegbuzie (2004), mixed method is “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study”. Mixed method approach is recognised as “new and still developing in form and substance” compared to quantitative and qualitative approaches (Creswell, 2003, pg. 3). The triangulation of the two methods is often used as it offers a useful research avenue both methodologically and philosophically: (1) offers a practical and outcome-oriented method of inquiry that is based on action and leads, iteratively, to further action and elimination of doubt, (2) offers further check on the accuracy of the data gathered by each method that helpful for answering a broader and more complete range of research questions, (3) represents an expansive and creative form of research, (4) lessens weaknesses in a study through the use of eclectic approach to method selection that may offer the best chance to obtain useful answers (Denscombe, 2007; Johnson & Onwuegbuzie, 2004; Mason, 2002; McNeill & Chapman, 2005). These rationales have been clearly evidenced in Gorman & Clayton's (2005, pg. 12-13) work, which stated:

“First, when two or more methods are employed, the researcher is able to address different aspects of the same research question, thereby extending the breadth of the project. Second, by employing methods from different research paradigms (positivist and interpretivist), the researcher is able to compensate for inherent weaknesses in each approach.”

The juxtaposition of mixed methods research in regards to quantitative and qualitative approaches can be seen in three issues, which are fundamental to social research methodology: (1) the underlying logic that guides a research design in relation to how theory is connected to data, (2) the relationship between the

researcher and the research process, and (3) the inferences made from research results, that is whether results are context-dependent or generalisable (Patton, 1990). With respect to these issues, Morgan (2007) has built on an organising framework that demonstrates how the pragmatic approach translated into mixed methods research can contribute to social science methodology – see Table 4.2.

Table 4.2 Quantitative, qualitative and mixed research methodology

	<b>Quantitative Methodology</b>	<b>Qualitative Methodology</b>	<b>Mixed Methodology</b>
<i>Connection of theory and data</i>	Deduction	Induction	Abduction
<i>Relationship to research process</i>	Objectivity	Subjectivity	Intersubjectivity
<i>Inference from data</i>	Generality	Context	Transferability

(Adapted from Morgan, 2007, pg. 71)

The objective of abduction is to study the constructive connecting points between inductive and deductive reasoning (Morgan, 2007), which can uncover the best set of explanations for understanding results (Johnson & Onwuegbuzie, 2004, pg. 17) or what known as “holistic triangulation” (Jick, 1979, pg. 603-604). Morgan (2007, pg. 72) signifies the idea of intersubjectivity as a pragmatic response to issues of “incommensurability”, which describes as follow:

“Rather than treating incommensurability as an all-or-nothing barrier between mutual understanding, pragmatists treat issues of intersubjectivity as a key element of social life. In particular, the pragmatist emphasis on creating knowledge through lines of action points to the kinds of “joint actions” or “projects” that different people or groups can accomplish together.”

In relation to transferability, Morgan (2007, pg. 72) argued that transferability arises from a solidly pragmatic focus on what people can do with knowledge they produce and not on abstract arguments about the possibility or impossibility of generalisability.

A study conducted by Bryman (2006) that involved a sample of 232 articles, published between 1994 and 2003; in five fields of the social sciences, including management and organisational behaviour (23%), has examined the ways by which

quantitative and qualitative methods are combined in research. The results show that 57% of the sample was based on a combination of a survey instrument and qualitative interviewing. With respect to research methods and research designs together, nearly 42% of all articles included both a survey instrument and personal qualitative interviewing within a cross-sectional design for the collection of both sets of data. Bryman found that almost 27% of the articles, quantitative and qualitative data collection were not based on the administration of separate instruments.

Since this study aims to explore a context-specific knowledge sharing, i.e. RKS in HEIs, it is generally exploratory in nature. An inductive approach is used to explore the topic in further depth, leading to context-dependent results. The inductive approach may be conducted in an “inductive” way, where theory would follow the data (Saunders et al., 2003). This is useful for this study as the review of literature proves that more evidence needed before variables are constructed and tested in the study. The use of mixed methods in this study also leads to methodological triangulation, seeking convergence across qualitative and quantitative data of the methods employed throughout the research process.

The triangulation of data, which can come from four different sources: theories, methods, sources and investigators; is purposeful to establish consistency among the data, that is, to establish credibility (Lincoln & Guba, 1985). The triangulation in this study is achieved by the application of mixed method, which combines both qualitative and quantitative studies together. Table 4.3 represents the relative distinction between the two main research paradigms and the combination of qualitative and quantitative methods.

Table 4.3 The strategies of qualitative, quantitative and mixed methods

Criteria	Qualitative Approaches	Quantitative Approaches	Mixed Method Approaches
Philosophical assumptions	<ul style="list-style-type: none"> <li>Constructivist/ Advocacy/ Participatory knowledge claims</li> </ul>	<ul style="list-style-type: none"> <li>Post-positivist knowledge claims</li> </ul>	<ul style="list-style-type: none"> <li>Pragmatic knowledge claim</li> </ul>
Strategies	<ul style="list-style-type: none"> <li>Phenomenology, grounded theory, ethnography, case study and narrative</li> </ul>	<ul style="list-style-type: none"> <li>Survey and experiments</li> </ul>	<ul style="list-style-type: none"> <li>Sequential, concurrent and transformative</li> </ul>
Methods	<ul style="list-style-type: none"> <li>Open-ended questions, emerging approaches, text or image data</li> </ul>	<ul style="list-style-type: none"> <li>Close-ended questions, predetermined approaches, numeric data</li> </ul>	<ul style="list-style-type: none"> <li>Both open and close-ended questions</li> <li>Both emerging and predetermined approaches</li> <li>Both quantitative and qualitative data analysis</li> </ul>
Practices of researchers	<ul style="list-style-type: none"> <li>Self-position</li> <li>Collect participant meanings</li> <li>Focus on a single concepts of phenomenon</li> <li>Bring personal values into the study</li> <li>Study the context or setting of participants</li> <li>Validate the accuracy of findings</li> <li>Make interpretations of the data</li> <li>Create an agenda for change or reform</li> <li>Collaborate with the participants</li> </ul>	<ul style="list-style-type: none"> <li>Test of verify theories or explanations</li> <li>Identify variables to study</li> <li>Relate variables in questions or hypotheses</li> <li>Use standards of validity and reliability</li> <li>Observe and measure information numerically</li> <li>Use unbiased approaches</li> <li>Employ statistical procedures</li> </ul>	<ul style="list-style-type: none"> <li>Collect both quantitative and qualitative data</li> <li>Develop a rationale for mixing</li> <li>Integrate the data at different stages of inquiry</li> <li>Presents visual pictures of the procedures in the study</li> <li>Employ the practices of both qualitative and quantitative research</li> </ul>
Research Problems	<ul style="list-style-type: none"> <li>Understand a concept or phenomenon</li> <li>Exploring unknown variables</li> <li>Research topic is new</li> <li>An existing theory does not apply within a particular group</li> </ul>	<ul style="list-style-type: none"> <li>Identifying factors</li> <li>Utility of an invention</li> <li>Understanding the best predictors of outcomes</li> <li>Test a theory of explanation</li> </ul>	<ul style="list-style-type: none"> <li>Capture the best of both quantitative and qualitative approaches</li> </ul>
Researcher's personal experiences	<ul style="list-style-type: none"> <li>Incorporate literary form of writing, computer text analysis programs</li> <li>Experiences in conducting open-ended interviews and observations</li> </ul>	<ul style="list-style-type: none"> <li>Trained in technical, scientific writing, statistics and computer programs</li> </ul>	<ul style="list-style-type: none"> <li>Understanding of rationale of combining both forms of data</li> <li>Require knowledge about mixed method designs</li> </ul>

(Adapted from Creswell, 2003)

## **4.2 Research process**

This study starts with an existing theory of knowledge sharing in commercial sectors. As discussed in Chapter 3, although enormous studies have examined knowledge sharing both in commercial as well as HE settings, no study has yet explored a context-specific knowledge sharing, i.e. RKS in HEIs. This study is therefore aims to bridge this gap, by exploring the six key determinants of RKS: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. The entire key determinants were employed by the review of previous literature. Research questions were developed based on these determinants. The pilot study was carried out in order to evaluate the feasibility of the study prior to a larger study. Then, the main study begins, where both qualitative and quantitative data is analysed, the findings are discussed, both theoretical and practical are explained, and the research objectives are achieved. Figure 4.1 describes the overall research process for this study.

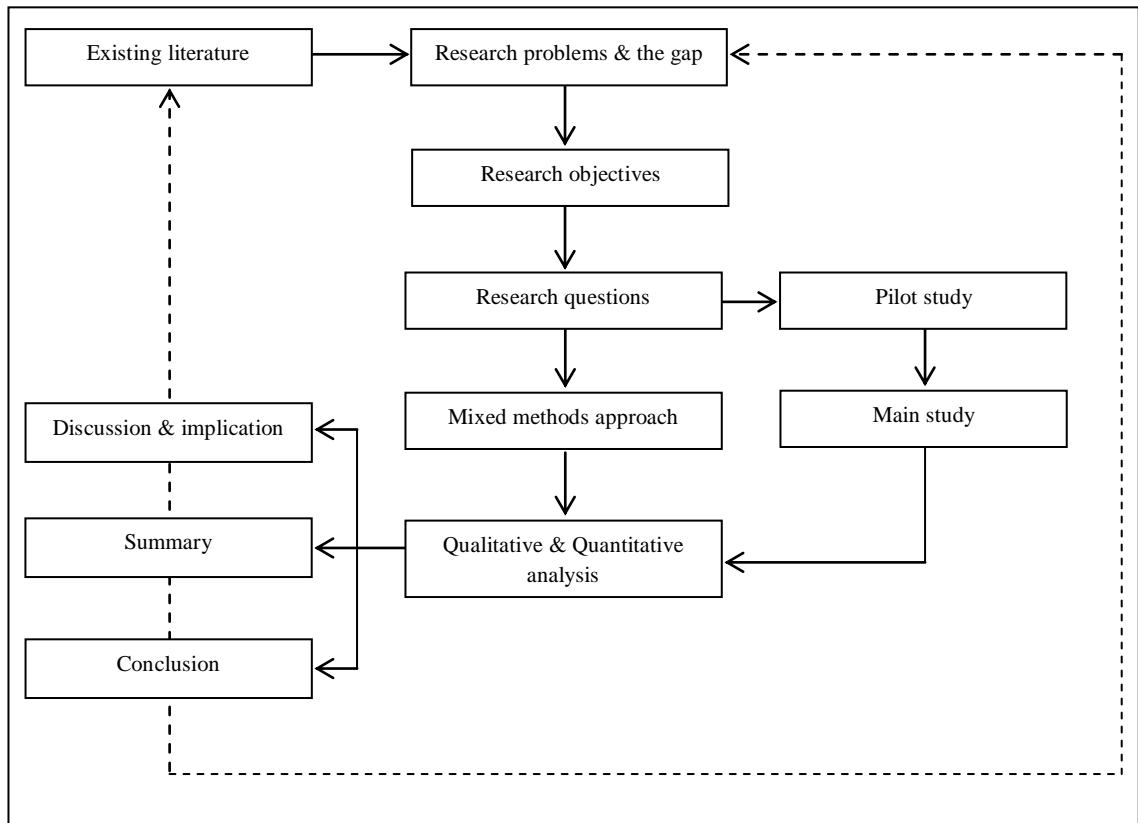


Figure 4.1 Research process

#### 4.2.1 Qualitative approach

The qualitative research is a field that is quite diverse. In qualitative research, Patton (1990), for example used the interpretive approach, which emphasises on the role of patterns, categories, and basic descriptive units; Bliss and her colleagues (1983) used the network approach, which focuses on categorisation; Miles & Huberman (1994) used the quasi-statistical approach, which emphasises on a procedure called “pattern coding”; Strauss & Corbin (1990) used the “grounded theory” approach, which centres on a variety of different strategies for “coding” data; and Boyatzis (1998) used the thematic analysis, which emphasised on the categorisation of data. Auerbach & Silverstein (2003), defines qualitative research as,

“...a research that involves analysing and interpreting texts and interviews in order to discover meaningful patterns of a particular phenomenon.”



Merriam (1998) discussed several approaches to data analysis, including ethnographic analysis, narrative analysis, phenomenological analysis, and constant comparative method. Bernard (2000) also suggests several approaches to data analysis, including hermeneutics or interpretive analysis, narrative and performance analysis, discourse analysis, grounded theory analysis, content analysis, and cross-cultural analysis. Bernard states that in interpretive analysis, the researcher “continually interpret(s) the words of those texts to understand their meaning and their directives” (pg. 439).

As stated earlier, this study follows an interpretive approach, which is aimed to explore and uncover meaning toward a better understanding of the desired issues. The semi-structured interviews were carried out with 60 participants selected from Pre-1992 and Post-1992 universities. The multiple coding procedures were adopted in order to analyse the qualitative data. Coding is heuristic devices for discovery (Seidel & Kelle, 1995, pg. 58) or in other word it enables the researcher to discover or learn something. It is the process of examining the raw qualitative data which will in the form of words, phrases, sentences or paragraphs) and assigning “codes” or labels. Miles & Huberman (1994) suggest that qualitative data can be coded descriptively or interpretively. Bogdan & Biklen (1992) recommend reading data over several times so as to begin developing a coding scheme. They describe that the coding of data follows a number of guideline, which includes several categories and details of settings; types of situation observed; perspectives and views of subjects of all manner of phenomena and objects; processes, activities, events, strategies, and methods observed; and social relationships.

In this study, the coding process of semantic data (or interview data) is borrowed from Strauss and Corbin (1990) due to the systematic method of analysis, which includes the multiple coding process, i.e. open coding, axial coding and selective coding; and constant comparative method. The open coding is a process where the researcher “runs the data open” (Glaser, 1978). The researcher first runs the data open in NVivo 8, the data are broken down into discrete parts (i.e. open coding). They are closely examined so as to look for similarities and differences. Eventually, the researcher had a large number of codes and it is necessary to sort them into some

sort of order or into groups (i.e. axial coding). Constant comparison is made during the process of analysing semantic data, in an indicator (e.g. word(s), phrase(s), or sentence(s)); is compared with previous indicators that have been coded in the same way. The same indicators are then grouped together. Once no more indicators found, the researcher then chose specific categories to be the core ones, where all other relevant categories are linked to that core category (i.e. selective coding).

This study has both deductive (based on theory) and inductive (based on data) reasoning. It is deductive, in which KM and knowledge sharing literature were reviewed so as to identify the key determinants and the enablers of knowledge sharing mostly in commercial sector. It is also inductive so as to determine and establish the nature and the process of context specific knowledge sharing (i.e. RKS) in UK HEIs.

#### **4.2.2 Quantitative approach**

Quantitative approach employed on this study is aimed to triangulate qualitative data analysis. Quantification of the data is one of the first techniques employed in quantitative data analysis, where all data were converted into a numerical format. This is for the readability of the quantitative analysis software. This research has employed the Statistical Package for the Social Sciences (SPSS) version 18 to analyse the data. Data entry of each question was then undertaken. This was double checked in order to avoid clerical errors. All responses then had numerical value and were then ready for data entering into SPSS data files. According to Coolican (1996), the main purpose of the quantitative data analysis was to construct statistical models that assist the test for significance and correlations or tease out possible relationships. The first statistical test employed in this study was Fisher Exact Test in Chi-square, a non-parametric test (Siegel, 1956). Fisher Exact test used to analyse the contingency tables, which gives accurate statistical tests for small samples (Fisher, 1954; Alan, 1992). Due to the relatively sample size (i.e. 27 respondents), this study has employed Fisher Exact Test to test the significant differences in both Pre-1992 and Post-1992 universities, with 95% confidence interval, where  $p$  value is 0.005.

At the same time, the Analysis of Variance (ANOVA) was used as the statistical method to compare the means of key variables (Pallant, 2007) across the two types of universities in order to assess whether there were statistically significant differences between them. ANOVA is essentially “a set of analytic procedures based on a comparison of two estimates of variance” (Tabachnick & Fidell, 2007, pp. 38). One way ANOVA was used to analyse data collected from the close-ended interview questions, i.e. five point Likert-type scales: 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree.

### 4.2.3 Research spectrum

As described earlier, although this study is primarily follows interpretive perspective, it also looks at the positivist perspectives. Figure 4.4 illustrates a spectrum of research approaches for this study. The research spectrum of this study falls in between interpretive and positivist paradigms, employing both qualitative (i.e. interpretive) and quantitative (i.e. five point Likert Scale questions) approaches.

Table 4.4 Spectrum of research approaches on the basis of different philosophical perspectives and empirical research method

		Philosophical Orientation			
		Positivist	Interpretive	Critical	
Empirical Research Method	Quantitative	Survey (Likert-scale)	✓		Mixed Method
		Experiment (lab)			
		Formal method			
		Numerical method			
	Qualitative	Biography			
		Ethnography			
		Case study			
		Action research			
		Interpretive		✓	

### 4.3 Sampling

A sample is a collection of observations from a population (Nelson, 2007, pg 293), referring to a small number of cases, units or sites. Sampling allows researcher to estimate the representativeness of the cases studied and thus let the researcher to estimate the degree of confidence in any inferences drawn from the cases (Silverman, 2006). There is hardly any doubt that, sample selection has a critical consequence on

the final quality of any research. Amongst the popular terms of sampling procedures in qualitative research are, “theoretical” “selective” and “purposive” sampling. Theoretical sampling as suggested by Strauss & Corbin (1990, pg. 176) is “sampling on the basis of concepts that have proven theoretical relevance to the evolving theory”.

Unlike theoretical sampling, selective sampling is, “shaped by the time the researcher has available to him, by his framework, by his starting and developing interests, and by any restrictions placed upon his observations by his hosts” (Schatzman & Strauss, 1973, pg 39). Put simply, selective sampling describes a process where a researcher pre-designed the sampling frame at the beginning of the study, which permits the development of conceptual lines. The latter term, purposive sampling (also known as “purposeful” or “judgmental sampling”), according to Patton (1990, pg. 169) “...lies in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research...”. Purposive sampling is the most common technique, where a researcher may select the most productive sample to answer the research questions. In light of this, the purposive sampling is employed in this study both at the pilot study and the main phase.

#### **4.3.1 Sampling procedure**

Eight universities in the UK were examined in this study. These universities consist of four Pre-1992 and Post-1992 universities respectively. These universities were selected based on the RAE 2008 Power Ranking. The RAE 2008 Power Ranking is used to measure university research performance. The RAE is a bench-marking exercise to measure the quality of research being conducted by universities across the UK. It is also an internationally recognised quality barometer. The RAE measures the research performance of a particular university by looking at the quality score of a research submitted times the number of full-time equivalent staff submitted. The RAE measures research volume and ranks the relative contribution based on the Unit of Assessment (UoA) and institutions. The results for each submission are presented

as a quality profile, which present the proportions of research activity in each submission ([www.rae.ac.uk](http://www.rae.ac.uk)).

The RAE quality profiles present in block of 5% the proportion of each submission and are judged by the panels following several quality levels: (1) quality that is world leading in terms of originality, significance and rigour – classifies under 4\*; (2) quality that is internationally excellent in terms of originality, significance and rigour but which nonetheless falls short of the highest standards of excellence – classifies under 3\*; (3) quality that is recognised internationally in terms of originality, significance and rigour – classifies under 2\*; and (4) quality that is recognised nationally in terms of originality, significance and rigour – classifies under 1\*. All the work that fell below national quality or was not recognised as research was labelled as “unclassified” in the RAE 2008 ([www.rae.ac.uk](http://www.rae.ac.uk)). The RAE 2008 Power Ranking is considered appropriate because of the emphasis it places on the output of academic research, which is a core function of research universities besides teaching.

Following the RAE 2008 Power Ranking, higher and lower rank universities in terms of research performance have been identified. This study emphasises on the UoA 36 specifically, i.e. Business and Management Studies (BMS). The UoA 36 was chosen because the BMS faces acute pressures to achieve high performance in publication rankings, both for reputational purposes and because of the financial incentives associated with the research assessment procedures of the HEFCE (Rafols et al., 2011, pp. 2). UK BMS also subject to a predominantly strictly-conceived formal ranking scheme for disciplinary journals, provided by the British Association of Business Schools (ABS) (ABS, 2010). Although journal rankings (like those of the ABS) are not formally included in the RAE evaluation, a number of studies portrayed that the journals ranks’ of a departments’ publications are undoubtedly the strongest predictor of the results obtained in the RAE 2008 (e.g. Kelly et al., 2009; Taylor, 2011). Consequently, the UK universities are making increasingly explicit use of such rankings to prepare future assessments (Rafols et al., 2011). Thus, the UoA 36 is considerably a critical unit to be studied, specifically in the pertinent of RKS. Among the 90 UK universities submitted to the UoA 36, the Pre-1992 universities samples were ranked at the top 30, whereas the Post-1992 universities

samples were ranked in between 45 to 65. This indicates clear differences in terms of university research performance. Therefore, these samples could be best compared to examine any differences concerning the best practice of RKS.

### *Participants*

The participants for this study were distinguished into two different groups, i.e. research-academics and research-leaders. Altogether, there were 38 research-academics and 22 research-leaders participated in this study. Purposive samplings was used in selecting participants. A total of 60 semi-structured interviews were conducted in this study, including the pilot study and the main phase. For the pilot study, 11 research-academics and 7 research-leaders were participated. For the main phase, 16 research-academics and 10 research-leaders were participated from Pre-1992 universities, whereas 11 research-academics and 5 research-leaders were participated from Post-1992 universities. The following sections discuss the sampling method employed in this study for each phase, including the criteria for selecting participants. Figure 4.2 illustrates the distributions of participants during the main study for both types of universities.

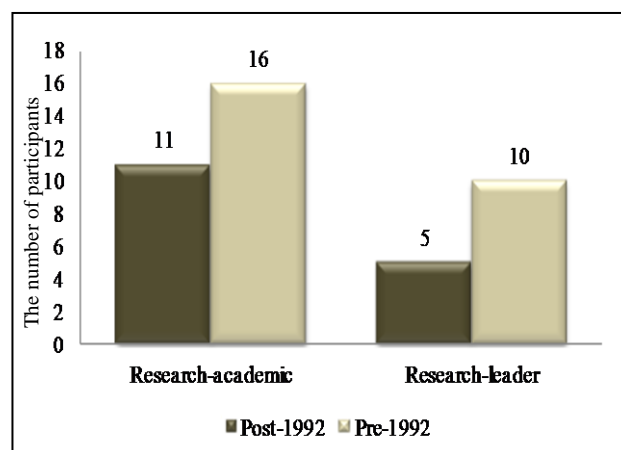


Figure 4.2 Number of participants in Pre-1992 and Post-1992 universities

### *Sampling in the pilot study*

Recruitment for the pilot study was made between May and June 2010. It was decided to conduct a preliminary study within the researcher's own University environment due to familiarity with structures and processes and expectation of support from colleagues within the work environment. A recruitment email (see

Appendix 2) was sent out to 20 research-academics and 10 research-leaders, which include both formal and informal research-leaders across university levels. 11 research-academics and 7 research-leaders responded to the recruitment email and were interviewed in person. At this stage, the response rate achieved for research-academics was lower (i.e. 55 percent) than research-leaders (i.e. 70 percent). The participants were chosen to help in providing information in the relevance of desired issue, examine research questions, scrutinise interviewing techniques, and most importantly help searching valuable data to develop concepts as well as recognise connections between those concepts and develop a theoretical hypotheses from the data (Glaser & Strauss, 1967).

The recruitment of samples at this phase was made following the lists of academics in the Portsmouth Business School webpage, which is accessible to public. The researcher determined which of the research-academics were most suited to the research by examining their research profiles. The researcher then decided which participant is to be invited for an interview. The recruitment for research-leaders was more straightforward, in which all formal and informal research-leaders across university fit for this study. In order to fulfil conditional anonymity of participants all the original names of participants were replaced with pseudonym (Creswell, 2003). The usage of pseudonym in this study does not represent the gender of the participants as all their personal details remain confidential. Table 4.5 shows the information of research-academics participated in the pilot study.

Table 4.5 Participations of research-academics in pilot study

No	Alias	Research experience (years)
1	Ali	<10
2	Naomi	2
3	Jordan	<10
4	Lisa	1
5	Reena	<10
6	Alexandre	3
7	Pierre	7
8	Lucy	7
9	Tina	1
10	Cathy	5
11	Ahmed	5

### *Sampling in the main phase*

The recruitment of the main phase was launched in September 2010. Email recruitment was sent to 40 research-academics and 20 research-leaders in each university, which makes a total of 280 recruitment emails for research-academics and 140 recruitment emails for research-leaders for all the universities. Due to a quite slow response rate, telephone recruitment was used as a supporting technique to email recruitment. Telephone recruitments were made to the same potential participants. Eventually 42 participants from both Pre-1992 and Post-1992 universities were interviewed, consisting of 27 research-academics and 15 research-leaders.

In this study, the demographic characteristic of the participants refers to the years of research experiences of an individual research-academic after the PhD study. This represents the “career phase” of that participant. Cheol (2011) grouped faculty members following by their age, i.e. early career (aged 39 or younger), mid career (aged 40–55) and late career (aged 56 or older). Instead of using age, this study chose to group academics using a specific career phase. Bazeley (2003) defines an early career researcher as one who is currently within their 5 years of academic or other research-related employment allowing uninterrupted, stable research development following completion of their postgraduate research training. Following the scale of five years on each career phase, the phase ranges for this study were set as: early career researcher (within 5 years of academic employment); mid researcher (within 10 years of academic employment); and senior career researcher (beyond 10 years of academic employment).

During the main phase, the response rate achieved for research-academics was nearly 10 percent, whereas approximately 11 percent were accomplished for research-leaders. The sample profiles for research-academics and research-leaders participated in the main phase were summarised in Table 4.6 and 4.7 respectively. As stated earlier, in order to fulfil conditional anonymity of participants all the original names of participants were replaced with pseudonym. The use of pseudonym in this study does not represent the gender of the participants, in which all their personal details remain confidential.



Table 4.6 Sample profiles of research-academics

Types of university	Alias	Research experience after PhD study (years)
Pre-1992 universities	Alexandra	2
	Brittany	19
	Chua	17
	Doherty	5
	Ellicia	20
	Francis	7
	Garry	6
	Holly	12
	Iola	4
	Jamie	5
	Katoya	6
	Linda	15
	Moss	5
	Nathan	8
	Ogawa	8
Prue	14	
Post-1992 universities	Amy	4
	Billy	14
	Catherine	6 months
	Danni	10
	Emelda	15
	Fredrick	12
	George	7
	Helen	14
	Isaac	1 month
	Jacky	10
	Kirk	8

Table 4.7 Sample profiles of research-leaders

Types of university	Alias	Position
Pre-1992 universities	Prof Woody	Professor
	Prof Lee	Director of Research
	Prof Augustus	Associate Dean of Research
	Prof Isabell	Professor
	Prof Rama	Associate Dean of Research
	Prof Samuel	Professor
	Prof Jekaterina	Professor
	Prof Tracy	Professor
	Prof Martin	Professor
	Prof Heather	Professor
Post-1992 universities	Prof Gerald	Associate Dean of Research
	Prof Cameron	Associate Dean of Research
	Prof Edmund	Professor
	Prof Wither	Professor
	Dr Stacy	Professor

### ***Ethics***

This study undertook in depth research with humans, where information were based on their perceptions, feelings and opinions. Therefore, the ethics issues are crucial. Leedy & Ormrod (2005) strictly emphasised on the ‘voluntary’ issue in respondent’s participation in a study. There are eight rules summarised by Wellington (2000, pg. 57) with respect to the ethics issue as follows: (1) no parties should be involved without prior knowledge or permission and informed consent; (2) no attempt should be made to force people to do anything unsafe, or do something unwillingly (e.g. have their voice tape-recorded); (3) relevant information about the nature and purpose of the research should always be given; (4) no attempt should be made to deceive the participants; (5) avoid invading participants’ privacy or taking too much of their time; (6) benefits should not be withheld from participants or disadvantages imposed upon others; (7) all participants should be treated fairly, with consideration, with respect and with honesty; (8) confidentiality and anonymity should be maintained at every stage, especially in publication.

This study followed the entire checklists suggested by Wellington for ethical purposes. On 08<sup>th</sup> March 2010, the researcher obtained the ethics approval from Portsmouth Business School Research Committee and started data collection. A specific Participant Consent Form was used in this study (see Appendix 3).

### **4.4 Data collection**

A qualitative approach employed in research allows the researcher to provide a descriptive account for the desired phenomenon using in depth interviews that delve into the individual and subjective experiences of the participants (Charmaz, 2006). This study has employed a qualitative data collection, i.e. semi-structured interviews, involving both open-ended and close-ended questions. The following subsections present the data collection procedure for this research, which includes both interviews and transcribing processes.

#### 4.4.1 Interviews

According to Hoepfl (1997), it is helpful for the researcher to utilise semi-structured, open-ended questions that allow individual variations; in order to gain richer data as well as forming and refining theoretical categories and to generate a theory. Agreeing with Seidman (1998, pg. 2) that “interviewing is a basic mode of inquiry” and (Law et al., 1998, pg. 5) that interviews “...are useful when a particular issue needs to be explored in depth”; semi-structured, in depth interview method were employed in this research in order to collect data and develop a series of questions to address the research problems.

Since this study employed a mixed method approaches, both open-ended and close-ended questions were adopted in the interview. Foddy (1993, pg. 127) explained that close-ended questions limit the respondent to the set of alternatives being offered, while open-ended questions allow the respondent to express an opinion without being influenced by the researcher. In other words, open-ended questions require the participants to provide depth and breadth of information. For the qualitative perspective, several semi-structured interview questions have been designed – see Appendix 4. The interview questions designed for this study act more like probing questions to elicit more in-depth and breadth information from the participants. On the other hand, for the quantitative perspective, four close-ended questions using the five point Likert-type scales have been included: 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree – see Appendix 5. The following statement was quoted from Albaum’s (1997, pg. 332) work describing about Likert scale measurement.

“When a Likert scale is used to measure attitude, its usual or standard format consists of a series of statement to which a respondent is to indicate a degree of agreement or disagreement using the following options: strongly agree, agree, neither agree nor disagree, disagree, strongly disagree. As such, the scale purports to measure *direction* (by ‘agree/disagree’) and *intensity* (by ‘strongly’ or not) of attitude.”

These Likert scale questions have intentionally adopted in the interview questions in order to seek information relating to the research-leadership issue, which include four key areas: 1) the degree of the influence of research-leaders on RKS; 2) the

effectiveness of support gained from research-leaders on RKS; 3) the effectiveness of university research policy to support RKS; and 4) the degree of relationship between research-leaders and RKS behaviour.

In this study, the interviews ranged in duration from one hour to one hour and half. All the interviews were recorded using tape recorder with permission from each participant in order to enable the researcher to transcribe and analyse the data. The tape recorded interviews were transferred into the computer and transcribed in full and the analysis was based on the typed transcripts, which were labelled using serial number, date and time.

### ***Transcribing***

The data collection process in the main phase was spread from November 2010 to March 2011. The raw data was then transcribed. Raw data means the original cassette interview recordings, whereas transcription is the textual interviews transcribed by the researcher. The term 'data' is used synonymously with 'transcription' in this study.

The transcription process was carried out in three separate levels. First the researcher listened to each recorded interviews in full concentration in order to familiarise each words or phrases in detail. Then for the second round, the researcher then thoroughly transcribed the interviews word by word. And for the third round, the researcher listened to interviews again and matches it with the transcriptions made earlier in order to avoid any mistake. Once completed, the transcripts have been sent back to the participants via email as to validate the transcribing process. The validated transcripts were then used as empirical actual data.

## **4.5 Data analysis**

The results for this study were presented in three separate chapters. Chapter 5 and 6 represents the qualitative findings, whereas Chapter 7 indicates the quantitative results. Specifically, Chapter 5 highlights the findings for Pre-1992 universities, whereas Chapter 6 highlights the findings for Post-1992 universities. On the other

hand, Chapter 6 reports the quantitative results, signifying commonalities and differences between Pre-1992 and Post-1992 universities. The qualitative data analysis involves the basic processes of multiple coding (i.e. open coding and axial coding).

#### **4.5.1 The use of CAQDAS for qualitative data analysis**

Traditionally, qualitative researchers used index cards or shuffling cards, scissors, photocopies, coloured pencils or pens to analyse their qualitative data. Today, computers have a key role in assisting research projects with regard to data analysis. Many qualitative researchers are unsure the significant role of CAQDAS or also known as qualitative data analysis (QDA) software; in supporting the analysis of qualitative data. Recently, Lewins & Silver (2009, pg. 3) have described six key roles of CAQDAS, which derived from various tools in CAQDAS, including, content searching tools, linking tools, coding tools, query tools, writing and annotation tools, and mapping or networking tools.

Using CAQDAS, large volumes of unstructured evidence can be systematically organized or managed, as Wickham & Woods (2005, pg. 688) said, “an efficient and well-structured data management system is critical to tracking, accessing, and documenting the data available and the analyses applied to it”. CAQDAS or QDA are employed for efficient handling, managing, searching and displaying data and related items like codes (Weitzman 2000; Seale 2000). It is sometimes argued that CAQDAS do not save time due to the time spent on learning the usage of the software, but as described Weitzman & Miles (1995) it is particularly worthwhile for more complex tasks and large amount of data.

Using CAQDAS, coding and editing of data, writing up and storing memos as well as searching text, themes, or models take just a few moves and clicks of a mouse (Séror, 2005, pg. 323). Some CAQDAS also supports work with non-textual data such as pictures, video and audio. Also, it can provide a more complex way of looking at the relationships in the data (Barry, 1998). It increases the quality of qualitative research because it offers consistency and provides more rapid and

rigorous qualitative data analysis (Rambaree, 2007). The key advantage is that data management becomes easier and faster with CAQDAS. The following statement is quoted from Fielding & Lee (1998, pg. 10) with regard to the efficiency of using CAQDAS:

“Of course, one can build theory with paper and pencil, or while in the bath or walking down the street. What the software does is to facilitate and enhance theoretical development, usually by treating codes applied to text segments as building blocks for the production of a set of interrelated conceptual categories...Use of the appropriate software tools allows the analyst to go beyond using codes simply to label or point to relevant themes in the data. Instead, codes become theoretical categories, emerging out of the data, but linked in possibly complex, but theoretically relevant ways.”

The number of CAQDAS packages available continues to grow, ranging from general-purpose approaches, i.e. word processors, text retrieval programs, textbase managers, to special-purpose approaches, i.e. code-and-retrieve programs, code-based theory-builders and conceptual networking-builders (Weitzman & Miles 1995; Weitzman 2000; Seale 2000). There are numbers of CAQDAS tools grown since its first emergence over 20 years ago (Séror, 2005), such as NVivo, N6, HyperResearch, Atlas.ti, MAXqda and Qualrus. QSR software is generally regarded as being one of the more sophisticated qualitative analysis packages (Weitzman & Miles 1995) and its usage is well-verse. According to Barry (1998), the QSR software like N6, NVivo and Atlas.ti are considered the main qualitative analysis software packages.

Recently, there are two distinct QSR software packages, i.e. NUD\*IST and NVivo, in which they were both developed from one root using the same underlying concepts, that is, ‘code-based theory building’ concept (Lewins & Silver, 2009). Basically, QSR software packages have evolved from NUD\*IST 2 (N2) and N3 through N6 to NVivo. As Richards (2002) explained, both NUD\*IST and NVivo create an environment in which researchers can create, manage and explore ideas and categories through coding. The codes are kept in the ‘nodes’, the place where the researcher stores ideas and categories. Nodes can represent any categories, including

concepts, people, abstract ideas and places. Nodes can be managed in two ways, i.e. free nodes (unorganised coding) or tree nodes (hierarchically organised coding – tree-like structure). In general, NVivo comes with more specific tools. The following is the original statement by Richards (2002, pg. 208-209) concerning the usage of NVivo:

“...in NVivo, QSR has invented a method of storing coding at the character level which is impervious to the adding and deleting of text. Such a full edit-while-you-code capability encourages writing up documents inside the project and coding them as you write. Full edit-while-you-code also means that the project can contain a lot more than just, for example, the interview data. It can, importantly, contain your research notes and memos that can also be coded, even though you are going to expand and modify those notes as time goes on...one can freely create sets of documents or nodes, the sets can overlap as good sets should, and their membership can change very freely as the project advances”.

### ***NVivo application***

Following various advantages of CAQDAS, QSR software, i.e. NVivo (version 8) has been employed to aid the qualitative data analysis in this study. The raw data that were transcribed earlier in the MS Word format (.doc) were first exported to NVivo. The transcripts were then accessed and managed. Appendix 6 shows a transcription files that were stored in NVivo. Each document (transcript) was browsed and analysed, where relevant quotes were coded to the predefined code scheme, known as ‘nodes’ in NVivo. The process of disaggregating data into units (or nodes) involves three main stages. Firstly, the data is coded in “free nodes”. Secondly, the free nodes are then grouped accordingly and organised into a hierarchical structure, i.e. “tree nodes” (tree-like structure of coding). Appendix 7 captures the tree nodes for this study. Finally, specific models can be developed in order to indicate the relationship between the tree nodes. Models in NVivo provide visual representation of patterns and discoveries with much clearer view, in which they have different icons for documents, nodes and attributes and their values. In this study, the presentation of these models are can be evidenced in Chapter 5 and 6.

#### **4.6 Validity and reliability**

In qualitative research there are different ways to approach rigour. Many studies have demonstrated the credibility in qualitative research (Creswell, 2003; Creswell & Miller, 2000; Lincoln & Guba, 1985; Patton, 2002). This study follows suggestions by Lincoln & Guba (1985) on the alternatives to the “reliability” and “validity” tests appropriate to qualitative research. These are “trustworthiness” and “authenticity”. Trustworthiness is further divided into four categories: credibility (which parallels internal validity); transferability (which parallels external validity); dependability (which parallels reliability); and confirmability (which parallels objectivity).

“Credibility” can be established by showing that the researcher conducted their work according to recognised principles for good practice. In this study, credibility is reached through triangulation. On top of that, further step is taken to improve the credibility of the study by discussing the work with an expert qualitative researcher available within the department. On the other hand, “dependability” can be demonstrated, for instance by an auditing approach by peers. Bernard (1995) suggests the use of intercoder reliability in order to avoid errors when applying codes to data. Kurasaki (2000) defines intercoder as a measure of agreement between multiple coders about how to apply codes to the data (pg. 179). According to Saldana (2009), this process is called “member checking”. It is a way to validate the qualitative findings, in which solo coder can consult with other colleagues about coding and analysis, even though they are working on different research projects. Sharing coded field or the quotes/excerpts help solo coder find better connections between categories in progress and such process can increase the credibility of qualitative analysis (Saldana, 2009).

The “intercoder analysis” or “member checking” has been adopted in this study, in which the researcher discussed with her colleagues about the categorisation of data. These colleagues have also undertaken that qualitative data analysis approach in their fields of work. The researcher initially predetermined the codes. Before further categorised the data, the initial codes were then discussed with the other coders so as to find the possibly better connections between categories in progress; before the agreement is reached. According to Ryan (1999) such agreement is useful so as to



measure the reliability of the coders or as a proxy for the validity of the constructs that emerge from the data. This process is crucial to articulate researcher's internal thinking processes, especially in the latter capacity that the themes are shared constructs and not simply a figment of the researcher's imagination or interpretation.

In terms of "confirmability", it requires acceptance that subjectivity is inevitable in the approach used. This study has followed this by recognising principles drawn in qualitative research, including, multiple coding procedures and constant comparative method. Apart from that, opinions from peer auditors (i.e. the intercoder analysis or member checking) were sought from time to time as the work progressed. "Authenticity" criteria on the other hand, raise a wider set of issues concerning the context of the work. There are five criteria suggested by Lincoln and Guba (1985), including fairness, ontological authenticity, educative authenticity, catalytic authenticity, and tactical authenticity. This study has demonstrated one of the authenticity criteria as suggested by Lincoln and Guba (1985), i.e. "fairness". In this study, fairness is reached through its sampling strategy that the views expressed are a fair representation of the group.

#### **4.7 Summary**

This chapter presents the methodology chosen for this study. The qualitative research methodology is very essential to examine the context-specific knowledge sharing in HEIs in two different types of UK HEIs, which has not been explored before. This study is mainly interpretive in nature by looking at the desire for full richness of the data by asking open-ended questions in getting the respondents' genuine views. It also follows the positivist perspective by looking at the need for rigour and triangulation. This study is both inductive, in which knowledge management and knowledge sharing literature were reviewed so as to identify the key determinants and the enablers of knowledge sharing that mostly found in commercial sector; and deductive so as to determine and establish the nature and the process of RKS in UK HEIs. The use of quantitative analysis in this study is not for testing hypothesis. Rather it is used to reinforce views developed from qualitative evidences.

This chapter also presents the research process in this study, including the sampling method, sampling procedure, and also the participants' profiles. Since this study undertook in depth research with humans, where information were based on their perceptions, feelings and opinions; the ethics issues are crucial. This chapter highlights eight rules suggested by Wellington (2000) in relation to ethics issues. The data collection procedures and data analysis are then described in this chapter, followed by the detail explanation of NVivo application so as to assist the management of qualitative data analysis. This chapter ends by explaining the validity and reliability of this study by explaining the credibility of qualitative research followed in this study.

## **Qualitative findings: Pre-1992 universities**

### **Introduction**

This chapter reports results generated from Pre-1992 universities within the boundary of six key determinants of RKS: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. This chapter is divided into six sections, where each key determinant is reported separately by showing evidences gained from research-academics and research-leaders. As mentioned in Chapter 4, the pseudonym technique is used to fulfil conditional anonymity of participants. In addition, the usage of NVivo is also evidence. Figure 5.1 summarises the key determinants of RKS in HEIs examined in this study. This chapter ends with a summary for the chapter.

**Key determinants of RKS in HEIs**

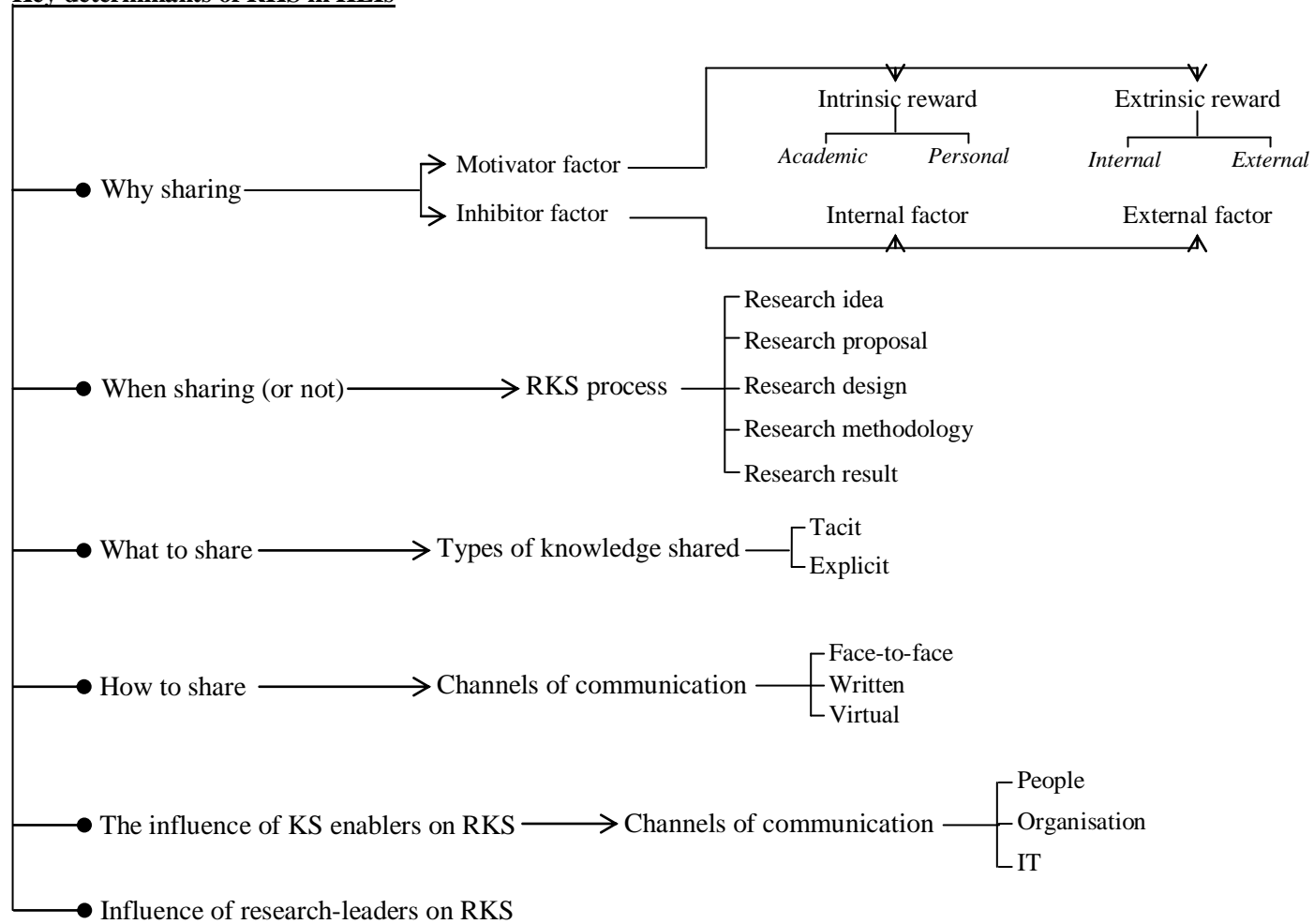


Figure 5.1 Key determinants of RKS in UK HEIs

## **5.1 Why sharing**

The “why sharing” issue refers to first key determinant, i.e. motivator and inhibitor factors for or against sharing research-knowledge. It presents the reasons for research-academics sharing as well as stop sharing research-knowledge. This section is divided into two subsections, representing the findings for motivator factor and inhibitor factor respectively. These emerged largely from the participants’ answers to the two questions: 1) what motivate you to share research-knowledge and why? and 2) what inhibit you from sharing research-knowledge and why?.

### **5.1.1 Motivator factor**

The findings indicate that RKS behaviour is largely influenced by intrinsic rewards. This finding is common in both Pre-1992 and Post-1992 universities. The intrinsic reward involves the situation where research-academics engage in RKS voluntarily due to individual preferences, and hence sharing the research-knowledge deliberately. From the findings, the intrinsic reward can be separated into different aspects, i.e. academic and personal. Academic aspect refers to the situation where research-academics intrinsically engage in RKS for improving their academic performance, whereas personal aspect refers to the situation where research-academics engage in RKS due to individual self-awareness and for self-growth. This finding is akin to earlier studies that motivation to share knowledge is largely driven by intrinsic motivation (Hsu & Lin, 2008; Hung et al., 2011; Liao et al., 2011).

On the other hand, the findings also indicate that extrinsic reward has also influenced RKS behaviour among research-academics. However, the influence of extrinsic rewards is lesser than intrinsic rewards. This finding substantiates Bock et al.’s (2005) argument that extrinsic rewards are not a primary motivator within knowledge sharing initiatives. Extrinsic reward involves the situation where research-academics have no personal interest in RKS, but wanted to achieve some extrinsic rewards. It has been found that the extrinsic rewards in this study are: (1) the university expectation; and (2) the REF target. In this case, research-academics engage in RKS for the purpose of achieving the university target towards research performance as well as being included in the REF. In return, if they get a paper published through

RKS and being included in the REF, they will be valued by the university and hence, their reputation as research-academics will also be enhanced. In this study, the first extrinsic reward (i.e. the university expectation) is classified as “internal factor”, whereas the second extrinsic reward (i.e. the REF expectation) is classified as “external factor”. Figure 5.2 illustrates the motivator factors found in this study for both types of universities, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

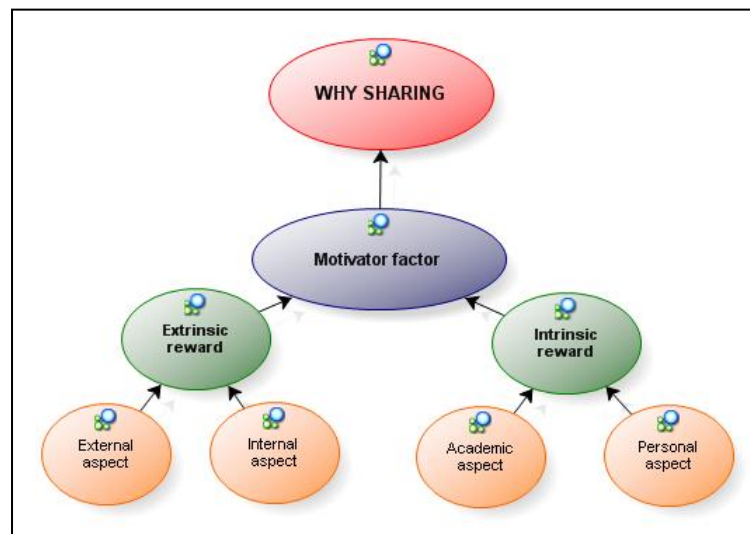


Figure 5.2 Motivator factors

Table 5.1 below summarises the emergent factors for the “motivator factors” in Pre-1992 universities after open coding and axial coding. The subcategories are ranked from the most coded to the least coded.

Table 5.1 Motivator factors in Pre-1992 universities

Motivator factors in Pre-1992 universities			No. of time sources coded	Percentage % (N=16)
Level	Categories	Subcategories		
Intrinsic reward	Academic	Motivated by the REF	8	50
		Growing body of knowledge	6	38
		Enhancing teaching quality	5	31
		Enhancing research productivity	4	25
		Contribution to the university	3	19
		Job role	3	19
	Personal	Awareness of the importance of RKS engagement	12	75
		Career development	6	38
Personal interest		5	31	
Extrinsic reward	Internal	University expectation	8	50
	External	The REF target	9	56

The following details are the findings reported in Pre-1992 universities concerning intrinsic and extrinsic rewards. The first part reports results of the intrinsic reward with regard to academic aspects, followed with personal aspects. The second part reports result of the extrinsic reward with regard to internal and external aspects.

#### D) Intrinsic reward

##### Academic

There are six factors grouped in academic aspects. These factors are recognised as intrinsic rewards that drive research-academics to engage in RKS. Figure 5.3 illustrates the academic aspect model in Pre-1992 universities and factors related to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

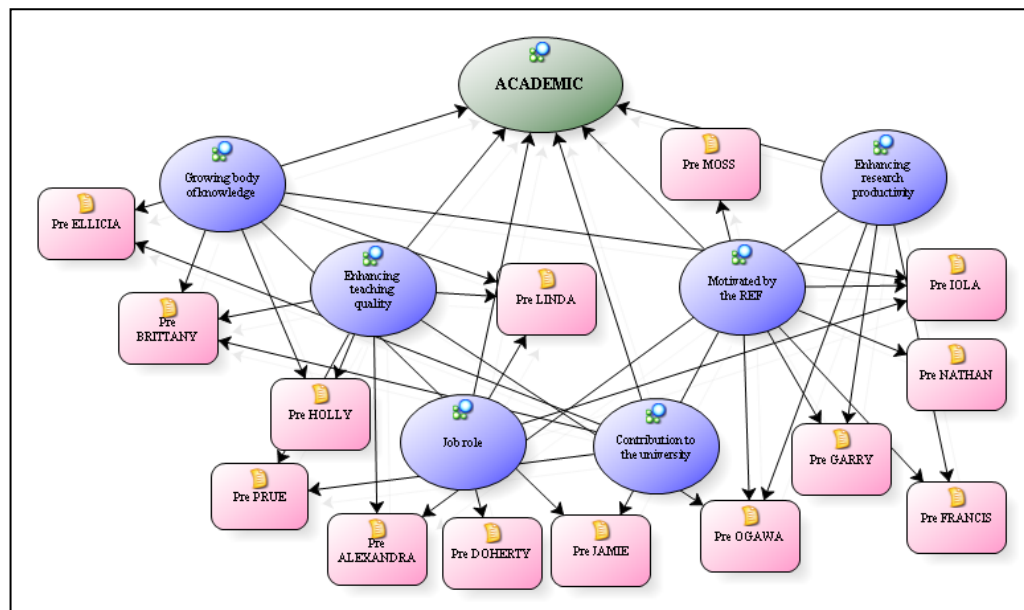


Figure 5.3 Academic aspect in Pre-1992 universities and number of sources coded

##### ▪ **Motivated by the REF**

The results show that half of research-academics in Pre-1992 universities described that the REF is one of the key factors that motivate their RKS behaviours. This implies that large numbers of research-academics in Pre-1992 universities are aware

of the importance of the REF, as one of the research performance indicators. Hence, they view the REF as one of the drivers that induce their RKS behaviour. Nathan, for example described the reasons he thinks that the REF policy enhance RKS behaviours.

“I have to say I quite like the current policy, the REF. I quite like the fact that there is urgency to collaborate with people, share your work, disseminate them. I am able to work with people not only within my university but also across the world. The more I involved in knowledge sharing, my knowledge grow a step further. And the REF make this happens. I like to see more of that.” Nathan

Nathan’s statement is in line with Leng’s (2009) claim that knowledge sharing is the kind of property that does not have a detrimental effect, in which when a person shares the knowledge with another person there will be no reduction in the contributor’s own knowledge.

#### ▪ **Growing body of knowledge**

The finding indicates that in Pre-1992 universities, research-academics’ RKS behaviour is also driven by their own intention to grow body of knowledge. According to Linda, the RKS engagement is not only for personal gratification, but to let everyone know what have been discovered and from that, it can add value to that particular area of interest and hence grow body of knowledge.

“It (*RKS*) depends on what the objectives you have, “Do I want to do research and share the knowledge only for my personal gain or do I want to do it in order to add value and advance body of knowledge? The latter for me and I think most people are the same.” Linda

Prof Lee, a Director of Research in Pre-1992 universities has also discussed about this value-added issue.

“They (*research-academics*) truly want to expand the knowledge. Some people truly want to expand what they’re doing to the rest of the world. They add value to it. Some researchers feel that research will help change the societies or economics condition or change the world outside and they want to share knowledge that way.”



On the other hand, a suggestion provided by Prof Isabell, a professor in Pre-1992 universities describes the “growing body of knowledge” issue in a slightly different way. She commented that in order to make contribution to grow body of knowledge, it is important for individual research-academics not to work in silo because they will be seen as no value.

“...we know that in many areas of lives, advance happened when people working together at the frontiers and they exchange information on the study they do. Now if you (*research-academics*) want to take part in that, if you want to benefit from that kind of network, and if you want to grow body of knowledge, you obviously have to make your own contribution to it. You can’t just sit there silent while everyone else talks, you’ll be seen as no value.” Prof Isabel, Professor

#### ▪ **Enhancing teaching quality**

A number of research-academics in Pre-1992 universities agreed that through RKS engagement, they are able to enhance their teaching quality. This is akin to Leng’s (2009) finding, where knowledge sharing has a direct impact on the quality and effectiveness of teaching. The following excerpts are the two comments in regards to this factor.

“RKS is good for improving teaching...if you are involved in it that will make you better teacher because your knowledge is being updated through sharing.” Linda

“Part of the idea of knowledge sharing is that, it is useful for students and also everyone else.” Prue

The results indicate that some research-academics in Pre-1992 universities believe that their teaching is informed by their research. This is in line with Griffiths’ (2004) model of research-teaching nexus, where teaching activities could be described as “research-led”, “research-oriented”, “research-based”, and “research-informed”.

#### ▪ **Enhancing research productivity**

The results also uncover that some research-academics in Pre-1992 universities recognised that through RKS engagement, they can enhance their research productivity. Ogawa precisely highlights his belief towards the interplay between his

RKS and research productivity. He said, “I strongly believe it (*RKS*) does enrich my own research”. Alexandra, on the other hand, explained the usefulness of RKS in relation to specialisation of work and how it can save time.

“...yes, it (*RKS*) is a very important part of our research...allow people to become specialised in a particular area and if they can share that specialisation with people in other areas, this will enable other people to learn more quickly without having some necessarily devote the same amount of time to an area of research...time-saving issue.” Alexandra

Prof Tracy, a professor in Pre-1992 universities confirms that productivity of research can be enhanced through RKS.

“Sharing knowledge also means that you (*research-academics*) gained insight into different research topics, different methodologies which often informs your own research. So your own research is improved or becomes better because of what you have learned from other people. Obviously, it enhances your research output. It might give you insight on how to tackle particular research problem or even generate new idea for a new research problem that have not been investigated before.” Prof Tracy, Professor

This is akin to the findings reported by Voelpel & Han (2005) that employees participate in knowledge sharing network in Siemens in order to enhance the productivity of work, in which it helps employees to solve obstinate problems in their daily business; and also provides solutions based on the experiences of colleagues and experts as well as saving time.

#### ▪ **Contribution to the university**

From the results, it has been identified that a small number of research-academics engage in RKS as part of their contributions to the university. Brittany, for example stated that, “...it’s my contribution to improve research profile in the university”. This finding communicates that some research-academics believed that through RKS engagement they can help improving university research performance.

## ▪ Job role

The finding also indicates that research-academics' job role is another intrinsic reward that enhance their motivation to engage in RKS. The following excerpts evidenced this fact.

“I do research in my job because I want to do... Obviously that is part of my job.” Doherty

“I do research and share it with people because partly I have to do, it's part of my job and partly I want to do.” Linda

The results show that research-academics in Pre-1992 universities aware that RKS is part of their responsibilities as academics apart from teaching. As stated by Musselin (2007), activities like writing proposals, developing contracts, elaborating e-learning programmes, or being engaged in technology transfer are no longer considered as peripheral, un compelling or secondary, but they are important aspects of academic work (pg. 3). Thus, such awareness has intrinsically-driven research-academics in Pre-1992 universities to engage in RKS.

It interesting to note that a comment by Prof Tracy, a professor in Pre-1992 universities has concluded all the mentioned intrinsic rewards, i.e. growing body of knowledge, enhance teaching quality, enhance research productivity and job role.

“...really being an academic or professor or even a lecturer in the university without doing research and share it with the world is just inconceivable. I mean you (*research-academics*) have to add to the body of knowledge and drive it forward, increase your research output. You can't simply let the world pass you by. The world is rapidly changing. We have to understand what is happening in the world so that we can teach it more effectively.” Prof Tracy, Professor

## **Personal**

There are three intrinsic rewards relating to personal aspects found in Pre-1992 universities, which motivate research-academics to engage in RKS. Figure 5.4 illustrates the personal aspect model in Pre-1992 universities and factors relating to

it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

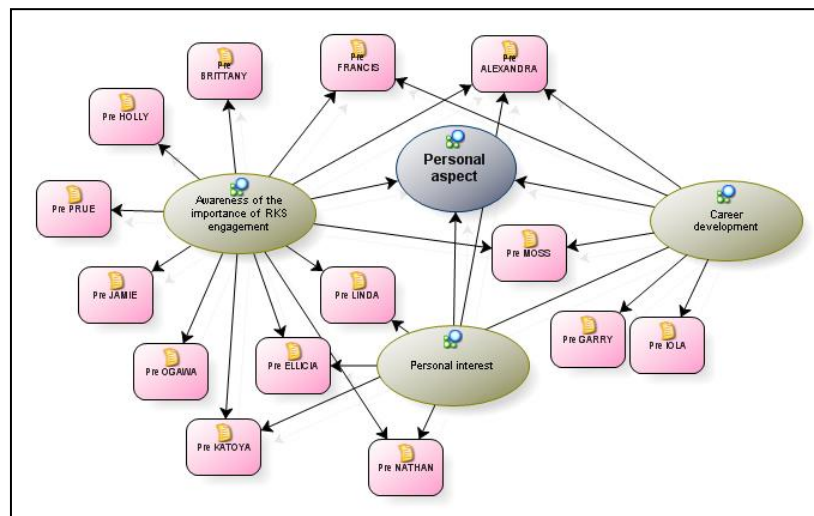


Figure 5.4 Personal aspect in Pre-1992 universities and number of sources coded

- **Awareness of the importance of RKS engagement**

As shown in Table 5.1, majority of research-academics in Pre-1992 universities identified that their awareness towards the importance of RKS engagement has influenced their RKS behaviour. The following two statements present the evidence for this element.

“It’s (*RKS*) essential, isn’t? You can’t just create knowledge for your own entertainment. You can’t not share your knowledge. You can’t not share your ideas. Commission of knowledge is not an individual activity. It’s a combined social activity.” Ellicia

“It (*RKS*) certainly is, especially in academic research as you also know, you go to conference, to disseminate your research, you discuss not only your research but also do a little bit of executive education, you talk to business leaders and also find any different issues in that area of research. I believe it’s got important issues and it’s good for us to learn from those issues and this can modify our own understanding.” Ogawa

The finding signifies that in Pre-1992 universities, RKS is being regarded as an important activity for research-academics at large. This implies that they are aware

that as academics, they engage in multiplicity of activities. Again, this is akin to Musselin's (2007) statement earlier.

At the same time, few research-leaders in Pre-1992 universities have also discussed this issue. The following excerpts illustrate how such awareness can induce RKS behaviour among research-academics.

“There's no point in doing it (*RKS*) if you're doing it on your own because the whole point about doing research is to share your knowledge and you therefore need to share knowledge both about your finding and about how to do a better research. It is important to instil such awareness on researchers.” Prof Woody, Professor

“If we don't share knowledge then why create it? Bold intention and the belief behind creation of knowledge is we share it...if you don't share, if you don't disseminate it properly then the whole purpose of doing research is lost. People have to be aware that it is very crucial to share knowledge.” Prof Augustus, Associate Dean of Research

#### ▪ **Career development**

Career development or career progression has been recognised as another intrinsic reward that enhances RKS behaviour among research-academics in Pre-1992 universities. As mentioned by Hall (2001) that career development is an explicitly effective reward in motivating knowledge sharing among employees. This confirms Sharrat & Usoro' (2003) findings that the perceived proximity of knowledge sharing to career advancement affect knowledge sharing behaviour.

Moss states that the possibility of promotion is the key aspect for him and that one of the ways to achieve it is through publication. A statement from Katoya has strengthened this standpoint.

“...you can't get away without sharing knowledge because you're not going to get anywhere. And one way of sharing knowledge is through publications.” Katoya

As stated in Chapter 1, RKS is defines as “individual research-academics pass out and/or seek tacit or explicit knowledge; to or from other people either through

publications, collaborations, books or formal and informal conversations”. Therefore, one of the aims for RKS engagement is publication. A comment by Prue has also confirmed this notion.

“Research is about publications. It’s very much to do with doing research and find something that’s worth publishing, worth disseminating. The whole idea of publishing is knowledge sharing... The concept of knowledge sharing is telling people about it, so it's done through publication. It's interlinked! You can’t just choose to do one and forget the other you see.” Prue

Iola, on the other hand, has associated “career development” with “self-recognition”. She expressed,

“...to some extent for career development because obviously it impacts upon my reputation as a researcher...” Iola

A statement by Prof Tracy clearly substantiates that RKS can lead to professional development of research-academics.

“... there is an individual personal reason which is to do with professional development. If you (*research-academics*) share knowledge then you learn and you become a better researcher because you don’t simply share facts, you share issues to do with epistemology, anthology, methodology and so forth. So researchers share their knowledge because its aid their own professional development.” Prof Tracy, Professor

#### ▪ **Personal interest**

The finding has portrayed that a small number of research-academics in Pre-1992 universities expresses that their involvement in RKS is also induced by their own personal interests. The following excerpts are comments by few research-academics about this issue.

“I do that (*RKS*) because that’s something that I enjoy doing...I don’t really need anybody telling me that I have to publish because I wouldn’t have become an academic if I didn’t want to publish.”  
Alexandra

“It’s partly because I’m interested in looking at fields where I don’t have answers and partly to do with finding answers and to keep my brain active.” Linda

“...that’s what I want to do... That’s what interests me.” Nathan

The finding suggests that with personal interest, some research-academics feel the enjoyment to keep engaging in RKS. Alexandra again said,

“...the incentive for performing or publishing good research or even sharing is not really extrinsic for me. It’s more intrinsic because I do like the idea of doing good research and share it. I just enjoy doing it.” Alexandra

And this was supported by Linda, who states that the RKS behaviour is largely influenced by intrinsic reward rather than extrinsic.

“I think most of it is intrinsic rather than extrinsic. We don’t get anything out of it, financially. To be written in the Research Excellent Framework (*REF*) would be very good for most the people because that would be an acknowledgement that we are doing our work...and that is the main one.” Linda

Prof Jekaterina, a professor in Pre-1992 universities has linked research-academics’ personal interest with “intellectual curiosity”. Her comment suggests that research-academics continue engaging in RKS due to their own desire to know more about a specific knowledge.

“I believe they (*research-academics*) must have their passion in it (*RKS*), which I prefer to call it, intellectual curiosity.” Prof Jekaterina, Professor

## **II) Extrinsic reward**

The finding shows that there are two extrinsic rewards that influenced RKS behaviour among research-academics, i.e. the university expectation (internal factor) and the REF target (external factor). Figure 5.5 illustrates the model of extrinsic reward in Pre-1992 universities and factors related to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

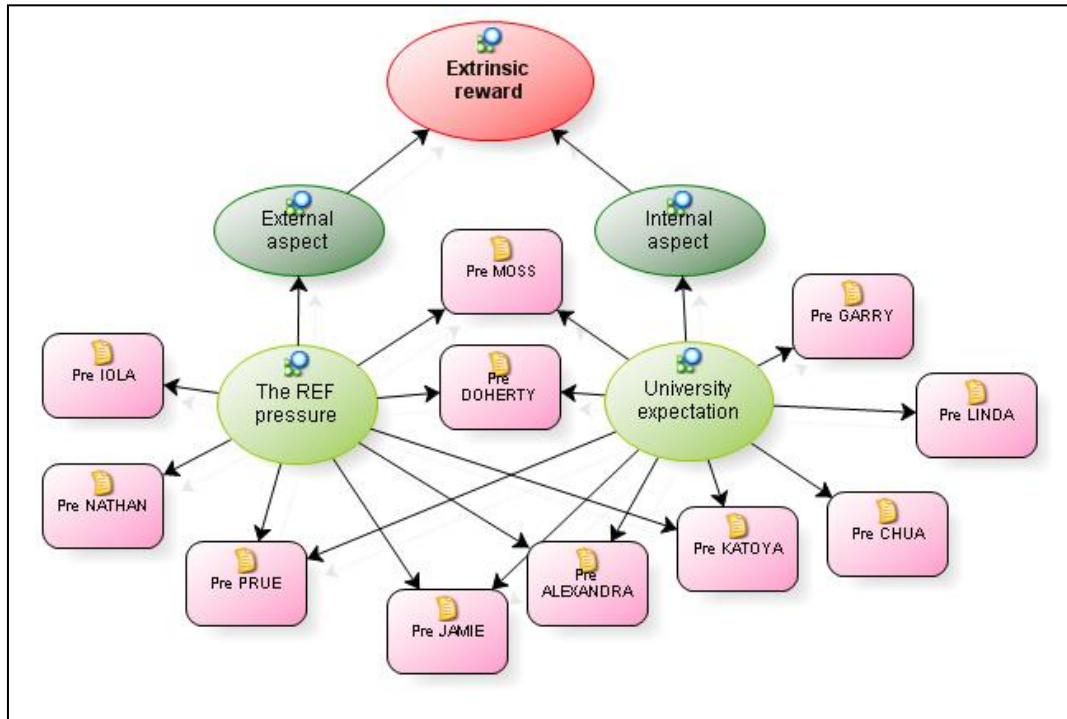


Figure 5.5 Extrinsic reward in Pre-1992 universities and number of sources coded

**Internal aspect**

▪ **The university expectation**

Results indicate that the university expectation is an extrinsic reward that controlled and coerced research-academics to engage in RKS. Doherty, for instance describes that the demands from the university has driven her to involve in RKS, which often not because of her own choice.

“From my own institution here, I mean internally within here, we have system setup that kind of demands that we do research and share our knowledge...The university has the mechanism that demand that we do this, that we do share information. Very often it’s not a personal choice to do it. I mean I do it for a few reasons, but most of the time is because of the mechanism which demands that I do it.” Doherty

A statement from Alexandra also supports this issue. According to Alexandra, the university expectation is giving pressure to research-academics to produce more publications.



“There’s certainly pressure to publish. Conference papers, journal articles, books, guest lectures, keynote address at conferences...any of these sorts of activities would be viewed as very important by the university. There’s undoubtedly pressure to be trying to achieve these sorts of outputs”. Alexandra

At the same time, Moss expressed that the pressure to publish has negative impact on research-academics as they always fear that their job is at risk without yearly publication track record.

“I think there is lot of pressure to do the research and of course publish it. If you (*research-academics*) don’t do it, I think people would fear for their job, so. There is negative incentive as well if you like. The atmosphere is obviously competitive. Definitely a lot of pressure! If you don’t do it, someone will and of course you put your job at risk.” Moss

Moss’s comment is supported by Chua. He said that pressure to publish is not supportive for research-academics to naturally continue engaging in RKS.

“We’re always under pressure to publish whether for the REF or not. I don’t see any differences. We’re always under pressure to publish and I don’t think that the pressure is supportive for researchers to involve more in research.” Chua

Catherine clearly points out that publication is very critical for research-academics’ career development.

“...if you want to get to higher level, certainly higher than a senior lecturer level in any university now you’ve got to publish. It’s a pressure that I think all of us aware of all the time. And certainly if you want to get to a lecturer level at old university or the Pre-1992 universities if you like, then you’ve got to publish.” Catherine

Catherine’s comment is in line with Aluede’s (2009, pg. 23) finding in Nigerian Universities that there is a very strong relationship between publications and career progression of academics. Aluede regards international publication as a “mandatory condition” for an academic to get to professorship promotions. Likewise, this study also reveals that in Pre-1992 universities, research-academics consider publication as a critical element for their job security.

Prue also supports Catherine's comment. Prue highlighted that research-academics are being evaluated every year in their annual appraisal, where one the key performances is measured by a good publication track record.

“There's the expectation that you have to publish and produce certain amount of publications, go to conferences, and you will be evaluated in an Annual Appraisal, where at least you have published one paper every year.” Prue

A statement from Nathan also highlights the same thing. He said, “...another reason for sharing knowledge is simply that we are evaluated, our performances are evaluated for the amount of research we do and how many publication we've got every year”. Interestingly, Katoya states that research publication is the main target of every UK HEIs nowadays and for that reason, research-academics are now facing a great pressure to publish. She said,

“Every university in the country is trying to be in the top ten in the lists of 100 in the country. For that, publications are very important, citations are very important and then ascetic practices are very important. You (*research-academics*) are expected to do everything and be good at everything! That's a great pressure placed on us.”  
Katoya

Remarkably, Catherine explains that through RKS, particularly publications, research-academics can generate income to the university, and hence research-academics can secure their job as academic.

“I think personally everybody wants to do their own academic research because that's what makes you may evolve... That's what the university demands us to do...to get a good list of publications, where that's worth so much the RAE money. If you're an income generator to the university then your job is secured!” Catherine

Few research-leaders have discussed the issue concerning the university expectation, emphasising on the pressure to publish faced by research-academics. It is interesting to note that they address this issue in a more positive view. A comment made by a professor, Prof Woody, indicates this standpoint. On one hand Prof Woody admit the fact that there is a pressure to publish faced by research-academics, but on the other hand, he argues that such pressure is not a new phenomenon in academia, where

everyone is well aware about it since years ago. Prof Woody has not suggested any solution in order for research-academics to cope with such pressure.

“That is a very strong pressure on all staff. Most universities would say that if you don’t actually share what you’re doing then it doesn’t count at all. So everything is the first in terms of publication. However, that is not a new phenomenon in academia. That has been true for very many years now. I think that probably came in during the 1980’s. There is a great pressure on most staff to do research and publish, but everyone aware about it long time ago.” Prof Woody, Professor

Similarly, a Director of Research, Prof Lee also discusses this issue from a similar perspective. He said, “...there’s requirement for that (*publication*) but I don’t think that is a pressure as it is very prominent. People are doing it in their daily job, we (*the university*) don’t have to force them.” In a sense, Prof Lee suggests that the university pressure should not be an excuse of being burdened or forced to share research-knowledge because it has been developed in UK HEIs for long, and it is now part of research-academics’ job routine.

Another professor, Prof Samuel also addresses this issue with a tactful manner.

“There’s no pressure. As long as you get publication in top ranked journals, as long as you get funding, there’s no pressure at all... As long as you get the output, they (*the university*) don’t mind. The university is encouraging people, not pressure... the university is encouraging people to share knowledge through publications...” Prof Samuel, Professor

Although Prof Woody states that there is no pressure to publish in the university, the words “as long as” contains an unspoken meaning. From his comment, it seems that the university does not pressure research-academics to publish provided that they produce the research output and attain the funding for the university.

### External aspect

- **The REF pressure**

Results indicate that the REF target is another extrinsic reward that pushed more than half research-academics in Pre-1992 universities to engage in RKS. This implies that in Pre-1992 universities, research-academics at large are striving to meet the REF target. Doherty has expressed how the REF has affected research-academics' behaviour in terms of RKS.

“I think the REF put pressure on all of us (*research-academics*) because it has very specific criteria which it measures people (*research-academics*) in the university, and so of course your behaviour to share knowledge is affected because you got to do things that are what the REF theme is being important and valuable.” Doherty

A statement from Prue also confirmed the influence by the REF pressure in terms of publication.

“The REF is the major factor for all of these! If it wasn't for the REF, it will be less, less pressure. But with the REF, we (*research-academics*) have to meet the deadlines. So in a sense dissemination and knowledge sharing are the major impact.” Prue

On the other hand, Moss claimed that although the pressure from the REF made research-academics share research-knowledge through publication, it is not practical for research-academics' job performances.

“...on the negative side, you (*research-academics*) sometimes feel pushed to share or to publish something that is not yet ready or you're not ready to publish it yet, that you would like to work on a bit longer, but you have to publish it and I suppose this is not good for our performance.” Moss

It is interesting to note that the REF is a “double-edge sword” for research-academics in Pre-1992 universities, which has both intrinsic and extrinsic values. As stated earlier, some research-academics in Pre-1992 universities are intrinsically-driven by the REF when engaging in RKS. But at the same time, some of them feel that they

are extrinsically pushed by the REF in RKS. This is in line with the “carrot and stick” analogy used by Whitmore (1992) that some people are induced by “carrot” and some are pushed by “stick” in order to perform as specific task. Likewise, on one hand, the REF is seen as a “carrot” that induces research-academics to engage in RKS, and on the other hand, it is also a “stick” that has forced research-academics to stay motivated and put forth the effort to engage in RKS.

Katoya, on the other hand views the REF pressure as a threat to the job security of research-academics. She explains that the university will withdraw the research support on individual research-academics who do not meet the REF target and add more teaching and administrative tasks into their jobs.

“There’s a lot going on at the moment where, people basically are told to produce, 3 or 4 star publications for the REF... And if they’re not submitted to the REF then actions are taken in terms of giving them more teaching or admin, taking away their research support. What we’ve been told is that people who are not submitted to the REF in the next cycle will be given more teaching or more admin. This is a threat to us.” Katoya

An excerpt from Prof Jekaterina, a professor, confirms that research-academics’ job might be at risks if their work is not included in the REF.

“...the REF is having a negative effect. It forces people to publish and it forces people to aim very high and especially with younger researchers. It forces them to aim perhaps too high because they have to in order to keep their job. And if they’re not careful, their job will be at risk”. Prof Jekaterina, Professor

Remarkably, Nathan has stated that with support by research-leaders, particularly professor, the pressure faced by research-academics concerning the publication issue could be eased. This implies that research-leader is an influential factor for RKS engagement among research-academics.

“...we (*research-academics*) are struggling as the REF deadline approaches. As that deadline (*the REF*) gets closer there will be scrutiny of how individual lecturers are doing. I think at the moment it is fear. We're struggling for papers which are three stars quality rather than two stars quality where possible. So of course

we would expect a lot of support from someone who has good track record in high ranked publications, like professors. For example, "what we can do to help you? who can we put you in touch with, to collaborate on research with?" It will be stuff like that that we're looking for." Nathan

### 5.1.2 Inhibitor factor

This study found that there several factors that inhibit research-academics from engaging in RKS. These factors are: 1) fear of losing power; 2) lack of trust; 3) fear of stealing of ideas; 4) unavailability of Intellectual Property (IP) protection; and 5) lack of confidence. This implies that factors that inhibit research-academics from engaging in RKS are more personal and interconnected with the individual's own attitudes. This is akin to the findings reported by Syed-Ikhsan & Rowland (2004a) that individuals' attitudes is one of the crucial elements that influence knowledge sharing behaviour in an organisation. Figure 5.6 illustrates the inhibitor factors found in this study, applied from NVivo.

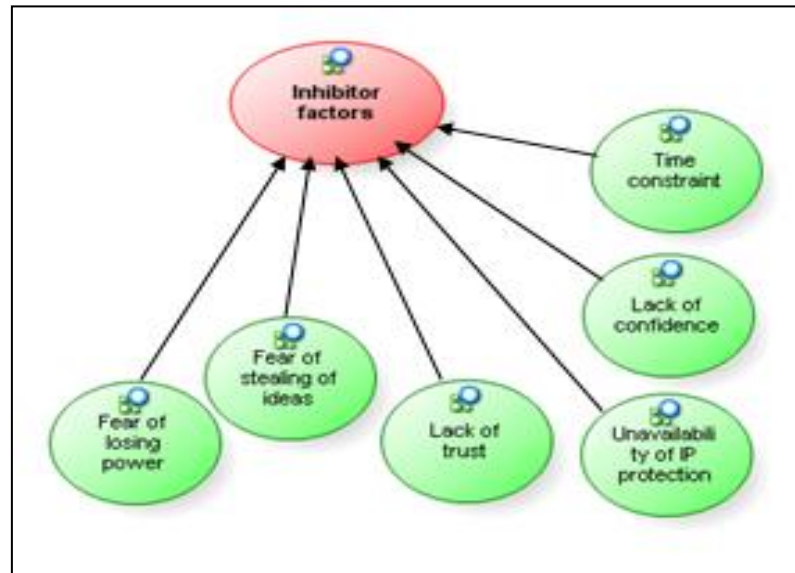


Figure 5.6 Inhibitor factors

Table 5.2 below summarises the emergent factors for the “inhibitor factors” after open coding and axial coding. The subcategories are ranked from the most coded to the least coded.

Table 5.2 Inhibitor factors in Pre-1992 universities

Resistance to share	No. of time sources coded	Percentage % (N=16)
Fear of losing power	4	25
Lack of trust	4	25
Fear of stealing ideas	3	19
Unavailability of IP protection	3	19
Lack of confidence	1	6

Figure 5.7 portrays the model for inhibitor factors in Pre-1992 universities, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

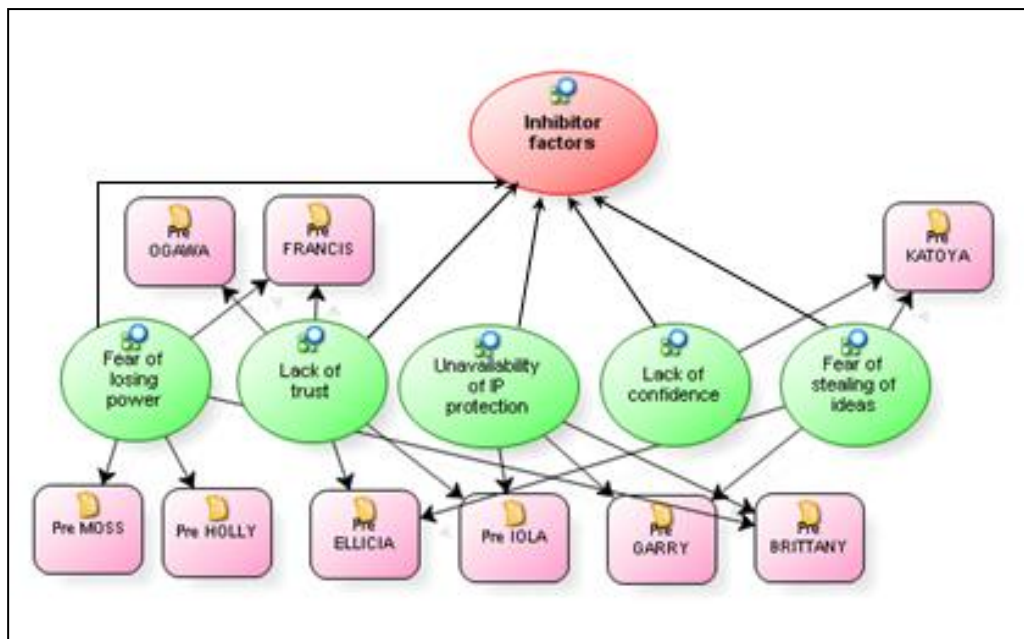


Figure 5.7 Inhibitor factors in Pre-1992 universities and number of sources coded

▪ **Fear of losing power**

The results indicate that a number of research-academics decline to engage in RKS due to fear of losing power. This implies that research culture in Pre-1992 universities is possibly more competitive and for that reason, as research-academics are competing with one another, they tend not to share their research-knowledge.

Francis, for example reveals that when he first involved in research, he did not think about the fear of losing power when sharing his knowledge. However, as he moved forward in his career, the fear of losing power has become his barrier when sharing research-knowledge.

“Honestly, I never thought this kind of situation before... But I took it onboard and now, I know about that experience... Knowledge is acquired over years and years... this is a competitive advantage for particular us (*research-academics*)... We don't want to lose the competitive advantage. As simple as that! ...like it or not, I start to think about it now”. Francis

In a sense, this implies that research-academics who are at the early career phase face less fear of losing power than those at mid and senior career phase. This may be due to lesser experience and expertise in terms of RKS. Some evidences concerning this issue are shown below.

“There is an element of personal competitiveness within academics. Obviously you don't want to share knowledge more than you should as you don't want to lose your expertise. So it's a question of managing that correctly.” Brittany

“If you're putting together of what you think as an innovative idea in order to secure research funding then, you're not going to give the game away to people you regard as rivals, in case they get in there before you.” Holly

“I know my main competitors... I know the main people who work in the same field as me and I trust them... without trust I might have fear of becoming less competitive within my own department...” Moss

Two professors in Pre-1992 universities, Prof Martin and Prof Heather both support this issue. They agree that fear of losing power is critical and that has caused research-academics not sharing their research-knowledge.

“I could understand the researcher being unwilling to share knowledge... They don't want to lose their competitive advantage on that research.” Prof Martin, Professor

“...it's a hugely competitive environment that we are in. In my own field, I know there is a large reluctance for people to share



research... many are fear of losing their power... that's human nature!" Prof Heather, Professor

- **Lack of trust**

The results also show that lacking of trust is another inhibitor factor for RKS behaviour. As suggested by Nichani & Hung (2002) that, "trust is the glue that binds the members of a community to act in sharing and adapting manner - without trust, members would hoard their knowledge and experience and would not go through the trouble of sharing with or learning from others" (p. 51). Clearly, trust is a critical factor that makes research-academics feels free to engage in RKS. The following excerpts show evidences pertaining to the issue of lack of trust.

"...you have to work with people you trust. That's the big procedure!" Iola

"You have to be careful about who you discuss your ideas with. When I first started I also be careful about who I share my knowledge and insight with, and that's until now. You can't just simply share with people whom you can't trust." Ellicia

"I don't simply share it with people without trust except with one or two of my closest colleagues." Ogawa

"I am more comfortable talking about certain ideas with people whom I trust... I mean, I choose who I want to speak to or share my ideas." Francis

A professor in Pre-1992 universities, Prof Samuel has strongly supported the issue of trust in RKS activity. He explains the importance of trust in RKS by sharing his own experience, working with someone who broke the interpersonal trust.

"...it deals with great deal of trust. You have to be able to trust the person that you collaborate with... I did try to collaborate with a colleague at another university... I share a great deal of my draft work with him... But he used all the information he got from me in order to write papers on his own account and that broke the trust and so I would not work with the person I can't trust. They must honour the partnership and publish in both names... you have to trust that they will honour the working relationship and give the other partner the credit for contribution as they're going to publish." Prof Samuel, Professor

▪ **Fear of stealing ideas**

The finding also notifies that some research-academics in Pre-1992 universities decline to engage in RKS due to fear of stealing ideas. Ellicia and Katoya both used the term ‘always’ when talking about the issue of fear of stealing ideas. This implies that fear of ideas being stolen is among the key factor that inhibit RKS engagement.

“...yeah, your colleagues **always** pinch your best ideas”. Ellicia

“I **always** feel afraid that somebody else is going to steal my ideas”. Katoya

On the other hand, Garry said that he refuses to share rough ideas with people as they are easily stolen. He said,

“I don’t prefer to share it (*research-knowledge*) if they are still rough ideas. I don’t want another person to start working on it before I finished with it and publish it.” Garry

This issue has gained attentions from many research-leaders in Pre-1992 universities. Table 5.3 represents the evidences quoted from research-leaders in regards to fear of stealing ideas issues.

Table 5.3 Research-leaders’ comments on the fear of stealing ideas issue in Pre-1992 universities

Alias	Position	Excerpts
Prof Lee	Director of Research	“A good idea is not easy to come by, so <b>people don’t want to lose</b> that, they don't share it until it is publish, as simple as that.”
Prof Woody	Professor	“I think the biggest worry is that other people will <b>pinch your ideas.</b> ”
Prof Isabell	Professor	“There is a danger that you give someone an idea and that they <b>run and use your ideas.</b> If one has something really, very special, you might be a bit guarded about sharing it.”
Prof Jekaterina	Professor	“...if they have a very good idea they <b>don’t want somebody else to steal it.</b> That’s how it is... There's always a danger in academia and I think the same applies to other organisations as well, that there're people who will lose out because they won't have the joy of seeing other people developed”.
Prof Tracy	Professor	“There’re always pearls somewhere in one’s ideas... this is where they hesitate to share. They <b>have fear that someone might grab their ideas</b> and publish it before them. Unless your work is already out there published!”
Prof Heather	Professor	“...people are protective about their own research, where they might have an idea which they feel they haven’t sort of made it properly thought through yet and they don’t want to sort of risk exposing it and then somebody else...might get all the glory and benefits from it where <b>the original person didn’t get any credit...</b> ”

According to Prof Heather, the Performance Management System of a particular university is one of the contributing factors that lead to fear of stealing of ideas.

“...something like Performance Management System tends to make it quite difficult to escape from, because each individual person’s performance is measured in terms of their output (*publication*) and so they’re reluctant, understandably reluctant to kind of not to exploit their own ideas as much as possible and choose not to share them because they don’t want other people to take it away!” Prof Heather, Professor

▪ **Unavailability of IP protection**

The finding also signifies that in Pre-1992 universities, some research-academics have considered the unavailability of IP is also an inhibitor factor for RKS. The result supports the finding reported by Riege (2005) who found that the amount of knowledge shared depends upon the availability and extent of IP protection for knowledge sharing activities.

Britanny stresses that, “I wouldn’t share information before I probably get it published or protect it in a particular IP or through some legal protection...”. At the same time, Garry also explains how RKS would fail without the IP protection.

“The management of IP becomes important... If it hasn’t been thought of properly then you (*research-academics*) could easily see... how people fall out at any stage and simply stop collaborating.” Garry

An Associate Dean of Research, Prof Rama has discussed about the IP protection for a particular research project. He confirms that the IP protection is essential, particularly for commercial research projects.

“...the other extreme it may be tied up with people’s concern of Intellectual Property... Working with anyone other than very small circle of collaborators potentially risk diluting their IP... if it a big commercial research projects that could be quite important to that respect.” Prof Rama, Associate Dean of Research

Prof Rama also talks about the university's concern in managing IP protection. He indicates an example of action taken by the university he works with in order to manage the IP issue.

“...many universities are taking very serious now in their hands how do they actually manage IP and how do you do that in a knowledge sharing environment... that would be an interesting challenge for the university in research where people has starts working in more diverse team in areas where the IP actually has value. We have a Central Research Support organisation that is responsible for the bid Construction Management and preparation and that has its own legal department, which normally will look at IP issues and what's attached to that.”

At the same time, Prof Rama clarifies that it is important for the university to educate all research-academics concerning the IP protection for risk avoidance purposes.

“...certainly one other things we're doing is making researchers much more conscious of what the IP issues actually are in a project that they put on forward, so they do need to write specific section on that setting out what these are and how these need to be managed so that there sort of risk management element there.”

However, the unavailability of IP protection has not been mentioned by research-academics in Post-1992 universities. This communicates that in Pre-1992 universities, research-academics have greatly involved in RKS as compared to those in Post-1992 universities. For that reason they are more concerned about the IP protection of their research work. Without IP protection they are more likely resist engaging in RKS.

- **Lack of confidence**

The results also indicate that lacking of confidence is another inhibitor factor for RKS. As found by Lin et al. (2009) that employees with high competence and confidence in their ability to provide valuable knowledge are more likely to engage in knowledge sharing and tend to have stronger motivation to share knowledge with their colleagues. However, only a very small number of research-academics in Pre-1992 universities talks about this issue. Katoya for example, said that she feels lack of confidence about her research work, which then made her resist engaging in RKS.

“I sometimes feel worried that my idea will be destroyed by criticisms. I lose my confidence. And sometimes I am afraid that my study is not going to look favourably by my superiors.” Katoya

An Associate Dean of Research in Pre-1992 universities, Prof Rama, shares his idea concerning this issue. Interestingly, Prof Rama explains that lack confidence occurs due to lack of social skills among research-academics. Prof Rama uses the word ‘personality defect’ to describe this situation.

“One extreme you could say maybe because of **personality defect**. This is simply people who don’t like working with other people or simply lack of social skills to enable them to actually do that. Again it isn’t uncommon in academia still there are those people around.”  
Prof Rama, Associate Dean of Research

Prof Rama’s explanation is in line with Riege’s (2005) claim that at an individual or employee level, a factor like poor communication skills is one of the barriers of knowledge sharing. Riege argues that “the ability of employees to share knowledge depends first and foremost on their communication skills” (pg. 24).

The very low response gained in Pre-1992 universities with regard to this one inhibitor factor implies that majority research-academics in Pre-1992 universities are more research savvy, in which they are more capable and skilful in terms of research. Therefore, the lacking of confidence issue is not a major factor that inhibits them from engaging in RKS.

## **5.2 When sharing (or not)**

The “when sharing (or not)” issue refers to the research timeline that individual research-academics share or not share their research-knowledge. These emerged largely from the participants’ answers to the question: “Referring to a basic research timeline, when you do share and not share your research-knowledge?” For the purpose of this question, all participants were given a printed copy containing a timeline series of a research project – see Appendix 8. This timeline includes five main phases: (1) research ideas, (2) research proposal, (3) research design, (4) research methodology, and (5) research results. Table 5.4 below summarises the

emergent categories for the “when sharing (or not)” issue after open coding and axial coding. The subcategories are ranked from the most coded to the least coded.

Table 5.4 When sharing (or not) issue in Pre-1992 universities

When sharing (or not) <i>RKS process</i>	No. of time sources coded	Percentage % (N=16)
Not sharing research idea	6	38
Only sharing research results	6	38
Sharing across all research phases	4	25
Not sharing research proposal	3	19
Not sharing research design	1	6
Not sharing research methodology	1	6

Figure 5.8 below indicates the “when sharing (or not)” issue in Pre-1992 developed in NVivo, where the number of time sources coded by each participant is evidenced. This model only emphasise the results for the “not sharing” issue for four different phases (i.e. research idea, research proposal, research design, research methodology), and therefore the research result phase is not included in this figure.

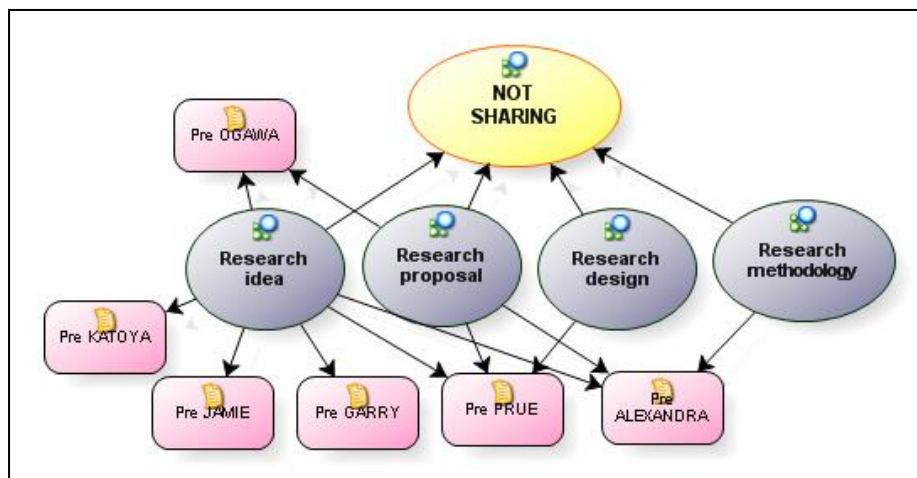


Figure 5.8 When sharing (or not) in Pre-1992 universities and number of sources coded

▪ **Not sharing research idea & research proposal**

The result shows that a number of research-academics in Pre-1992 universities do not share research-knowledge during research idea and proposal. The finding communicates that more than half of research-academic consider that during research idea and proposal phase, their knowledge is not yet developed and still uncertain.

Prue for example, indicates that she does not share knowledge at the very basic point, where, “my ideas are still immature or not so strong and well-developed”. Jamie, at the same time declares that,

“...if I don't have strong concrete basis for that idea, then I won't be sharing it yet you know because I feel as a junior researcher, I should be very careful when sharing things with people... not when my ideas are still undeveloped.” Jamie

Garry also says,

“In these early phases (*research idea and research proposal*) I don't prefer to share it because these are still rough ideas.”Garry

In a sense this implies that, research-academics fear that it is possible that they are sharing something valuable with other people and that idea might get stolen. As stated by Huber (2001) employees “who had valuable knowledge were reluctant, or at least hesitant, to share it, and sometimes successfully avoided sharing it” (pg. 76).

#### ▪ **Not sharing research design and research methodology**

The result shows a small number of research-academics in Pre-1992 universities do not share their research-knowledge during research design and research methodology phases. It is interesting to note that at these two phases, research-academics chose to seek knowledge from other colleagues but at the same time hoard their own research projects concerning research design and research methodology. Alexandra expresses,

“...I think it's the other way around, I think it's more that I go out and seek for knowledge just to make sure that I use the right method for the right research.” Alexandra

Alexandra's comment notifies that instead of sharing knowledge, at these two phases, research-academics decide to seek knowledge from other colleagues who they believe has the knowledge in order to assist their works. In other words, knowledge seeking is directed at those who are expected to provide the information.

### ▪ Sharing only research results

The findings indicate that 38 percent of research-academics in Pre-1992 universities do not share at any other phase, except research results. Research results for this study refer to any publication or book. Figure 5.9 illustrates the “sharing only research result” model in Pre-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

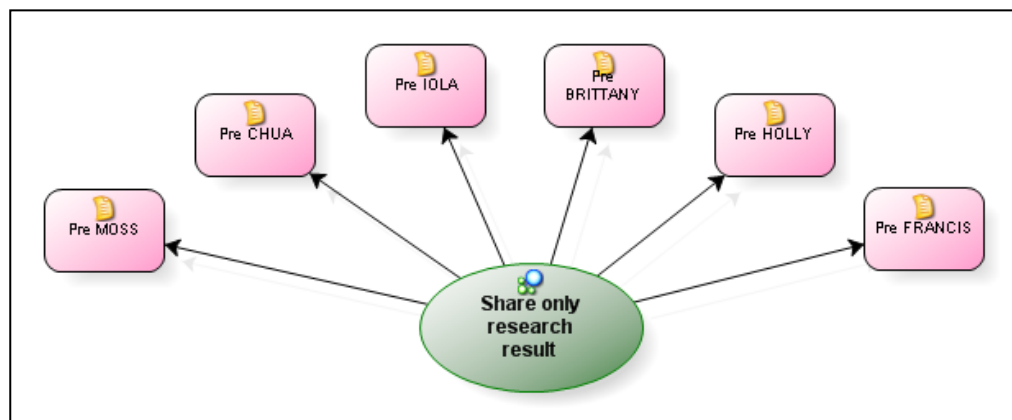


Figure 5.9 Sharing only research result in Pre-1992 universities and the number of sources coded

Brittany for example, clearly mentions that she would not share knowledge before any publication is made. This was also supported by Chua, when he says, “I don’t see myself sharing at other stages than results”. Interestingly, Holly explains that the reasons why research-academics should not be sharing other things before getting the results, because they are considered as ‘individual knowledge entrepreneurs’.

“I don’t share knowledge at any other point than results. For me, academics are kind of **individual knowledge entrepreneurs**. So if you have something that you think an innovative idea then, don’t give the game away to other people, especially those you regard as rivals in case they get in there before you.” Holly

Knowledge assets are recognised as “entrepreneur” (Thorpe et al., 2006). Earlier on, Balázs (1996) described the behaviour of “academic entrepreneurship” as an “income generating” behaviour. Drawing upon this respect, “knowledge entrepreneur” is someone who can generate income for the workplace. In this study,



some research-academics in Pre-1992 can be seen as “knowledge entrepreneur” or “income generator” to the university and for that reason they resist sharing the unpublished research as they are targeting to get the ideas published in order to stay competitive.

- **Sharing across all research phases**

Interestingly, the results also indicate a number of research-academics in Pre-1992 universities sharing research-knowledge at all research phases. Figure 5.10 illustrates the “sharing across all research phases” in Pre-1992 universities developed in NVivo, where the number of time sources coded by each participant is evidenced.

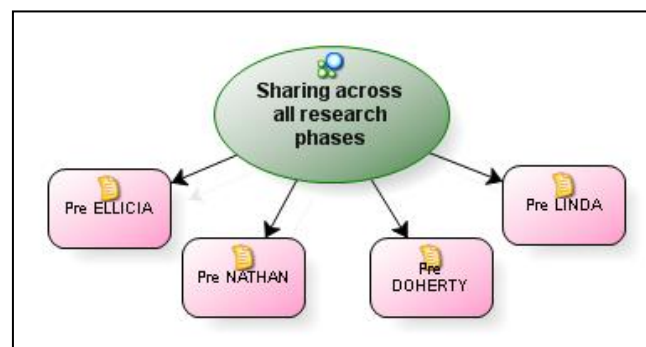


Figure 5.10 Sharing across all research phases in Pre-1992 universities and the number of sources coded

It interesting to note that there is one condition for sharing across all research phases, and that is, trust. Doherty for example, explains that,

“I actively share information with anyone at any phase. Sometimes I supposed at various stages you got more knowledge and more information if you share... But I don’t share it outside of that sort of my trusted team of people at that stage.” Doherty

Nathan also notifies the same thing. He said, “I must have been sharing knowledge at the very beginning phase, but only to the person I trust not to tell everyone else”. Ellicia at the same time, points out that she has to be very careful when sharing research-knowledge.

“I share it with people throughout but always be very, very careful when sharing because you’ll never know. So it tends to fall between me and people I trust.” Ellicia

This implies that without trust, research-academics are most likely not freely sharing their research-knowledge across all research phases. As suggested by Levin et al. (2002) trust is the “magic ingredient” that links strong ties and knowledge. The results confirms the findings reported by Chen & Hung (2010), who concludes that interpersonal trust is significantly and positively associated with knowledge sharing behaviour.

#### ▪ **Sharing at research result**

The results show that all participants in Pre-1992 universities unanimously sharing research-knowledge at the last research phase, i.e. research result. Iola for example, explains that,

“Obviously you want to have a degree of certainty that you’re speaking till your data set and you’re not kind of going beyond what you can support. I guess when we’re still not analysing the data we will be a bit more careful because you don’t want to go beyond what your data actually says.” Iola

This implies that research-academics in Pre-1992 universities are completely feel free sharing research their results because they are established and protected, and hence reduce the risks of ideas being stolen or plagiarised.

Remarkably, this study has discovered a distinctive finding concerning the RKS process in both types of universities. The results indicate that more than half research-leaders in Pre-1992 universities state that RKS need to be managed carefully. It has been revealed not all research-knowledge can be shared freely in public at all times. Research-leaders suggest that some research-knowledge needs to be hoarded at certain points within the research timeline. The following excerpts contain evidences from professors in Pre-1992 universities concerning this issue.

“If you’ve got a good idea, you don’t have to give away more than you have too... Share it but control the sharing. So don’t think of sharing as being sharing with everybody except when you’re actually published a paper or a report. Think of sharing as being ‘controlled sharing’... not ‘uncontrolled sharing’... Think of it as controlled sharing and take control of the sharing... You share as

much as you want to share, as much as you need to share but not more than that.” Prof Woody, Professor

“If you want to be part of the game, then you have to make wise decision about to share or not to share. If you want to share, then you have to think what to share with people and what to keep for yourself. And also you must know when to share. It must be properly managed.” Prof Isabell, Professor

“I believe you want to make sure you fully exploit all the benefits of your research so you may want to hold back on disseminating that work, until you’re in a position to fully exploit it.” Prof Martin, Professor

“Sharing is not as easy as how you see it! You must be thinking very wisely before sharing your work with people. The sharing of knowledge needs to be managed properly.” Prof Tracy, Professor

Interestingly, the finding contradicts to Konstantinou’s (2010) argument that knowledge hoarding leads to inefficiency, fragmentation or breakdown in an organisation (pp. 826). In this study, the result suggests that knowledge hoarding is critically important in academia, so that research-academics will not lose the benefits of research they work on. As suggested by Cheng et al. (2009) earlier that knowledge hoarding could be prevalent in academic institutions due to the non-exclusivity and non-rivalry of public goods. They claimed that once shared and distributed, knowledge become public good.

### **5.3 What to share**

The “what to share” issue refers to the type of knowledge that individual research-academics choose to share. These emerged largely from the participants’ answers to two questions: 1) do you normally share both tacit and explicit knowledge together or separately and why?; and 2) what types of knowledge you normally share with regard to research? This study discusses both tacit and explicit knowledge. The results show that in Pre-1992 universities, the types of knowledge shared by research-academics can be broken down into three patterns: (1) sharing both tacit and explicit knowledge; (2) sharing mainly explicit knowledge; and (3) sharing only explicit knowledge. The results show that no one sharing only tacit knowledge.

Table 5.5 below summarises the emergent categories for the “what to share” issue after open coding and axial coding. The subcategories are ranked from the most coded to the least coded.

Table 5.5 Types of knowledge shared in Pre-1992 universities

What to share	No. of time sources coded	Percentage % (N=16)
Sharing both tacit and explicit knowledge	9	56
Sharing mainly explicit knowledge	4	25
Sharing only explicit knowledge	3	19

Figure 5.10 below illustrates the model for “types of knowledge shared” in Pre-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

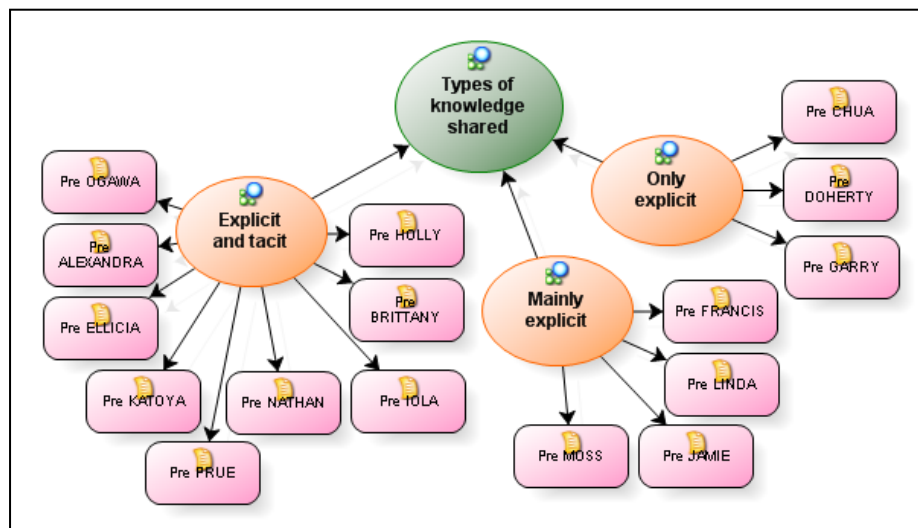


Figure 5.11 Types of knowledge shared in Pre-1992 universities and number of sources coded

▪ **Sharing both tacit and explicit knowledge**

The results indicate that majority research-academics prefer to share both tacit and explicit knowledge. They argue that tacit and explicit knowledge are inseparable. This is akin to Polanyi’s (1966) original idea, who argued that the concept of tacit knowledge was not a separate category of knowledge; and opposes Nonaka &

Takeuchi's (1995) arguments, that tacit and explicit knowledge are two separate types of knowledge. The following excerpts evidenced this issue.

"In sharing knowledge, I can't see the dichotomy between tacit and explicit. For me it happens naturally that we don't realise we share knowledge". Ellicia

"...it sounds a bit odd because I can't think of any knowledge that I would have that I can't put into some sorts of documented form. Well, I don't simply share documents and hard copy materials with people. I have discussions with them as well." Alexandra

Holly who believes that knowledge is tacit and explicit in nature at the same time, explains that she unavoidably share her tacit knowledge while sharing the explicit knowledge, albeit unconsciously.

"...you (*research-academics*) are probably doing both without realising it. That's the nature of tacit knowledge. If that's tacit, you don't know when you're sharing it. So do I consciously share tacit knowledge? Well, I don't know. I think the factual answer would be, that you do both because knowledge is necessarily tacit and explicit at the same time. So I think, inevitably you will do both. I don't really make a conscious distinction between the two. I wouldn't say that in my research exchange I really make that kind of distinction but I imagine that both things happen simultaneously." Holly

Interestingly, Prue conveys that the sharing of her tacit knowledge supports her explicit knowledge sharing.

"...when you go out and presents your paper, present your idea, so people might ask questions and that's where you share your tacit knowledge, it supports your explicit knowledge. It may not be there written in your paper explicitly. Pretty much on your methodology, people will ask how you do your research. The questions might be more tacit or implicit within the research that needs further explanation." Prue

Prue's comment supports the claim made by Jasimuddin et al. (2005) that explicit knowledge is supported by tacit knowledge. As suggested by Bollinger & Smith (2001) people who have the "know how" (or tacit) knowledge are considered

unconsciously skilled. For that reason, they tend to share their tacit knowledge unconsciously.

Iola, on the other hand indicates that the sharing of tacit and explicit knowledge depends on the person she talks to. She explains that her tacit knowledge is often shared with people working on the same area with her, whereas explicit knowledge is used when she talks to people with less knowledge about her area.

“...it depends on whom you have the conversations with. If it is kind of with colleagues or people with similar level to myself or more senior colleagues that would be more tacit as we understand each other’s area very well. If it’s about my work in general then it would be much more explicit and codified.” Iola

Ogawa also supports Iola’s comment. He uses tacit knowledge when talking with people who work in the same area or have more experienced, whereas explicit knowledge is used when he communicates with wider group of people.

“It always depends to person you talk to. If someone who is already experienced, very senior researcher or within the same area of interest, we don’t have to talk about all the tacit knowledge that much because this person most likely know a lot about it already. But wider audience, it is quite different approach... I have to really explain more about what’s actually going on in my head and how this can then be transferred into a theoretical model.” Ogawa

#### ▪ **Sharing mainly explicit knowledge**

The finding shows that some research-academics in Pre-1992 universities choose to share more explicit knowledge than tacit. In a sense, this communicates that this group of people are those who believe that tacit and explicit knowledge are separable things. Linda for example, says that explicit knowledge outweighs the sharing of her tacit knowledge.

“It’s going to be mainly explicit rather than tacit because tacit tend to be things that we just know, that we haven’t necessary discovered through research. We may have some tacit knowledge confirmed by research but not necessarily deliberately. It’s just the way things are happened. I tend to share things which are explicit that I have found, rather than things I just know.” Linda

Interestingly, Jamie has come up with a different view. He explains that he shares different types of knowledge at particular phases of a research project.

“I would mainly share explicit. It really depends on which stage of the research I am in. Say if I’m at the beginning... some tacit knowledge that I can express, some ideas, or hints, or speculations, which as I said, I don't share much during this point of time. But the farther the research phases is, it's more completed and knowledge has been consolidating, over few months... that is more of sharing the explicit knowledge... talking to people about what I've working on in the formal explicit, definite, consolidated way. So this is where I share most, explicit knowledge.” Jamie

Similarly, Francis and Moss both state that their preferences to share mainly explicit knowledge are also influenced by the research timeline of their research project. Both of them avoid sharing at the very early phases, i.e. research idea and research proposal.

“I believe this (*sharing mainly explicit knowledge*) is due to my preferences to share ideas when they are stronger, well-developed and not when they are still uncertain.” Francis

The findings reveal a distinctive characteristic of RKS in HEIs as compared to knowledge sharing in other sectors. For RKS, the type of knowledge shared is influenced by the research timeline of a particular research project.

#### ▪ **Sharing only explicit knowledge**

It is found that a small number of research-academics in Pre-1992 universities choose to share only explicit knowledge. The result implies that this group of research-academics are those who believe that there is a clear dichotomy between tacit and explicit knowledge. As suggested by Nonaka & Takeuchi (1995) and Mooradian (2005) that tacit knowledge is intrinsically different from explicit knowledge and in making tacit knowledge explicit is to change it following the process of converting tacit into explicit knowledge. The same finding has not been discovered in Post-1992 universities. The following three excerpts show the evidences gained from research-academics in Pre-1992 universities.

“Obviously explicit. As I said earlier, I only share my results. The only way you can share tacit knowledge is to work together probably through a project or chat with colleagues at the corridor... that is beyond the scope of the presentation. As far as presentations or chatting with colleagues are concerned, no transfer of the tacit knowledge for me personally. I often talk about the paper that has been published. However, I might be sharing tacit knowledge without I realise it.” Chua

“I supposed the vast majority of communication in terms of research is probably communicating the research that you’ve done, i.e. a paper or funding bid or some sort of a report on a project that you’ve done... I suppose that would be classed as explicit. And that is the part where I share with people because it is out there in the public domain and people can see it and they can understand it. Whether I chance for any of my ‘know-how’ and any of my knowledge that is unwritten, I don’t know.” Doherty

“I think I only share the explicit knowledge because tacit knowledge is still rough and at first I need to make myself comfortably get that knowledge. I need to think more and more and get my idea more structured for delivering steps. But maybe, while sharing explicit knowledge, I might be sharing tacit knowledge as well.” Garry

However, it is interesting to note that, while this group of research-academics claim that they only share explicit knowledge, they admit that they might be sharing tacit knowledge unconsciously while sharing the explicit knowledge. Again, as stated by Bollinger & Smith (2001) people tend to share their tacit knowledge unconsciously. Gertler’s (2003) statement also provided similar idea, in which tacit knowledge is “an essential complement to explicit knowledge in the sense that it supports the acquisition and transmission of explicit knowledge through tacitly held constructs such as the rules enabling speech, reading, and writing” (pg. 78). This confirms Nonaka et al.’s (2000b) argument that “knowledge is created through interactions between tacit and explicit knowledge, rather than from tacit or explicit knowledge alone” (pg. 8). In this study, although research-academics claim that they share only explicit knowledge, they may possibly share their “know-how” skills or tacit knowledge unconsciously. As noted by Nonaka et al. (1996, 2000a), tacit knowledge is rooted in action, procedures, routines, commitment, ideals, values, and emotions of an individual.



## 5.4 How to share

The “how to share” issue refers to the most preferred channels of communication used for sharing research-knowledge. These emerged largely from the participants’ answers to the question, “what is the most preferred channel of communication you use when sharing research-knowledge and why?” This study discusses three channels of communication: (1) face-to-face, (2) written, and (3) virtual. Table 4.6 below summarises the emergent categories for the “how to share” issue after open coding and axial coding. The subcategories are ranked from the most coded to the least coded.

Table 5.6 Communication channels in Pre-1992 universities

<b>How to share</b> <i>Communication channels</i>	<b>No. of time</b> <b>sources coded</b>	<b>Percentage %</b> <b>(N=16)</b>
Face-to-face	5	31
All three channels	4	25
Written	3	19
Virtual	2	13
Face-to-face and virtual	2	13

Figure 5.12 illustrates the model for communication channels in Pre-1992 universities and factors relating to, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

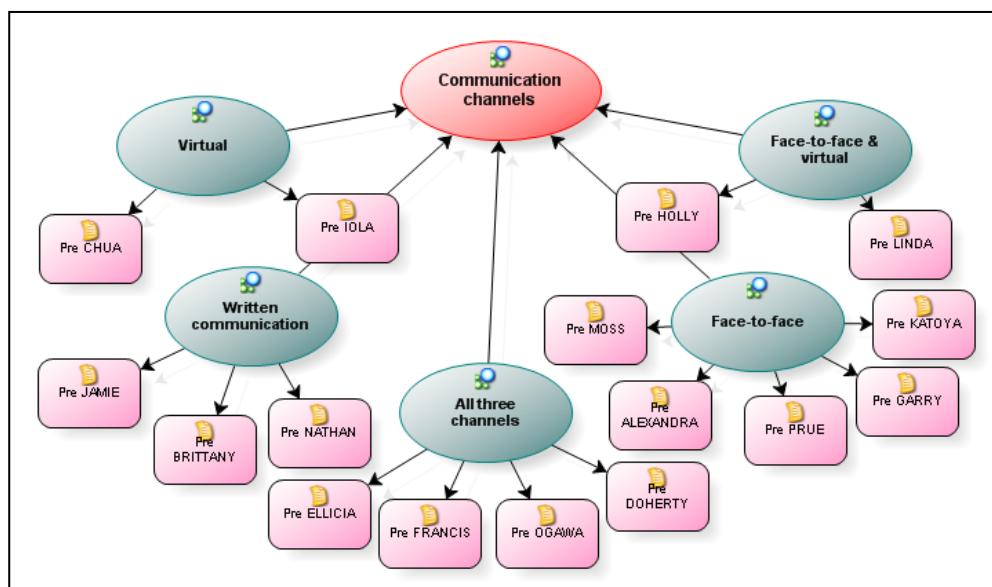


Figure 5.12 Communication channels in Pre-1992 universities and number of sources coded

### ▪ **Face-to-face communication**

The finding indicates that majority of research-academics prefer to share research-knowledge through face-to-face interaction. They generally convey that face-to-face is the best way for sharing research-knowledge. Moss for instance, expresses that through face-to-face communication, "...people understand your message a lot better and they hear it from you directly". Garry on the other hand, compared the effectiveness of face-to-face with email (i.e. virtual communication). He argues that email works slower and more time consuming as compared to face-to-face.

"I prefer face-to-face communication. It will be easier and more effective to work face-to-face and to understand at the counterparty's decision on that problem on the thing. I think email is much slower in that sense because in face-to-face you can easily get back to each other and the email will take more time to work."

Garry

Interestingly, Alexandra claims that the choices of communication channels varied across a research timeline. She says that face-to-face is the best channel for research ideas and research proposal. Once the ideas are generalised at the research design, research methodology, and research result; virtual or written communication is the best choice.

"Well, obviously I prefer to share things in person with people. But I suppose it depends on which stage you are with your research. Like for example, face-to-face is best used during the generation of ideas, you know earlier stage. Then as we move further, we might just use email or printed documents. But again, for me the best channel is face-to-face." Alexandra

### ▪ **All three communication channels**

At the same time, the results indicate that some research-academics in Pre-1992 universities use all three communication channels when sharing research-knowledge. Doherty expresses that all three channels are useful in its own way depending on a research time frame. For research results, she chose virtual or written communication, whereas for research ideas she chooses face-to-face interaction.

“...depends on what it is that you’re sharing... electronic communication if you’re communicating a new publication... it’s much easier to send it around, you know send the citation for it and brief kind of abstract so a lot of people can see it electronically. At the same time might be useful if you send written papers for someone to read it. If you’re sharing ideas and try to generate new ideas then you’re meeting up with people and talking to people about things face-to-face... all three are useful in different ways.”  
Doherty

At the same time, Ellicia also says that all three communication channels play different roles across a research timeline. She uses the idioms “horses for courses” to explain this situation.

“...they’ve (*all three communication channels*) all got their different roles to play. I don’t think there’s a preferred way. It depends on where you are with your piece of work (*i.e. research time frame*). Sometimes you might want to go for a chat about your research and sometimes you want something a bit more formal. It is ‘**horses for courses**’ really.” Ellicia

Ogawa has also supported the comments made by Doherty and Ellicia. During research ideas and research proposals, Ogawa states that face-to-face communication works well in order to get ideas across effectively. Then at the later phases, virtual and written communication is fine.

“It depends on the stage of the paper. If it is early on, of course face-to-face is absolutely essential, because otherwise you wouldn’t actually get across your point... Once it’s more progressed, of course you would then move more into sending a paper by e-mail, receiving comments, which could be done electronically which is absolutely fine, or may be receiving written papers. But this would be kind of the final stage.” Ogawa

The finding again, notifies another distinctive characteristic of RKS in HEIs as compared to knowledge sharing in other sectors. For RKS, the choice of communication channel is influenced by the research timeline of a particular research project.

### ▪ **Written communication**

The finding indicates that there are a number of research-academics who prefer to use written channels as compared to face-to-face or virtual. Brittany and Jamie both express that they prefer written communication when sharing their research-knowledge. Interestingly however, they explain that written communication is only used when they seek knowledge from other people and not use it when sharing their own research-knowledge. Other than that, they state that face-to-face communication is the best choice.

“For me, most importantly is written documentation like research papers. However, I would argue that I might prefer written papers when I seek for knowledge or ideas, but when it comes to my own sharing then personal contact is more effective.” Brittany

“I would say my preference is for written documents or printed because then I have time to read it. I think when I want to obtain or seek some knowledge from other researchers I prefer to have written papers or articles. But when I want to share my ideas I think it’s easier to do it orally.” Jamie

On the other hand, Nathan believes that the general idea of written and virtual communications like email is overlapping. He says, “Email is written communication... it’s just happened to be done on screen not on paper... the way that make it written is I print it!”. Nathan’s comment is line with the explanation made by Haas & Hansen (2007) that written communication is also part of electronic-based communication and has labelled it as ‘electronic document usage’, where “employees record what they know in writing and upload those documents into databases that can be accessed by other employees...” (pp. 1136).

### ▪ **Virtual communication**

The findings also indicate that there are a small number of research-academics in Pre-1992 universities who prefer virtual communication. Chua for example says, “Obviously I would prefer electronic communication because almost everything can be done electronically these days”. Iola, on the other hand, state that she prefers

virtual channels as her research projects involve external institutions and hence, other channel is less effective.

“...because I work for a large institutional project so a lot of that is done electronically by exchanging draft via email and also with Skype calls or whatever.” Iola

Iola’s comment supports previous studies that virtual communication is useful to overcome barrier of space and time (Barnes & Greller, 1994; Dimmick et al., 2000; Henri 1992; Rice & Love, 1987).

#### ▪ **Face-to-face and virtual channel of communication**

The results show that another group of research-academics in Pre-1992 universities prefer to use both face-to-face and virtual channels. This group of research-academics claim that virtual channel functions like face-to-face. Linda indicates that through virtual channel, “...you are not face-to-face geographically but you have the advantage of being able to pick non-verbal communications”. Holly adds up that through Skype voice/video call as well as video conferencing via the Internet, “...people can see each other's body language and facial expression”. As suggested by Isaacs & Tang (1993) that although the function of virtual channel is not as effective as face-to-face demonstration, “video channel adds or improves the ability to show understanding, forecast responses, give non-verbal information, enhance verbal descriptions, manage pauses and express attitudes” (pg. 63).

### **5.5 The influence of KS enablers on RKS behaviour**

The fifth key determinant in this study refers to the KS enablers, i.e. people, organisation, IT. These emerged largely from the participants’ answers to three questions: 1) how research-leaders influence your RKS behaviour? 2) how your interaction with research-leaders and other colleagues influence your RKS behaviour? and 3) what are the IT infrastructures available in the university and how it influence RKS activity? The following subsections report results for each enabler separately.

### 5.5.1 People as an enabler

People consist of both leaders and employees, which is one of the critical determinants affecting the success of knowledge sharing. In this study, it refers to formal and informal interactions between individual research-academics with research-leaders, specifically professors; or with their colleagues. Table 5.7 summarises the findings for this category after open coding and axial coding. The results are ranked from the most coded to the least coded.

Table 5.7 People enabler in Pre-1992 universities

People enabler	No. of time sources coded	Percentage (N=16)
Research-leader as inspirer	9	56
Formal & informal interaction with other colleagues	6	38
Research-leader as mentor	6	38
Research-leader as role model	5	31

Figure 5.13 illustrates the model for “people enabler” in Pre-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

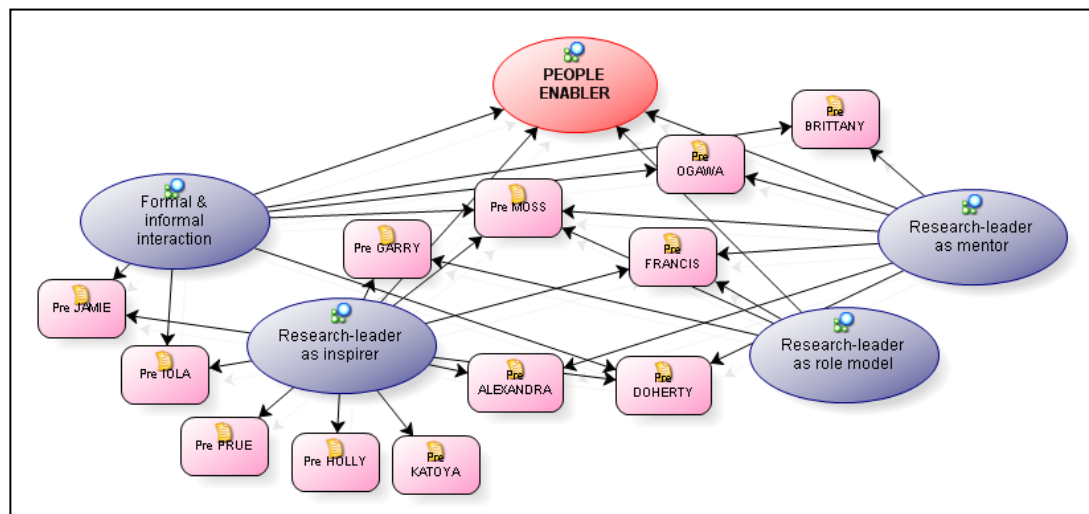


Figure 5.13 People enabler in Pre-1992 universities and number of sources coded

### ▪ **Research-leader as inspirer**

Results show that in Pre-1992 universities, more than half research-academics perceived that the inspiration gained from research-leaders has positively influenced their RKS behaviour. This is akin to the finding reported by Artail (2006) and Abou-Zeid (2008) that leaders can facilitate/build a knowledge sharing culture that motivates staff to understand, value, and participate in knowledge sharing. The following excerpts contain evidences for this issue.

“I’m quite lucky that the school that I’m in has quite a large number of well-known respected research-leaders and in my experience they are always available if I want to go and have a chat with them. I can just need to book the meeting with them or I can catch them in the restaurants at lunch time. I can always approach these people. And they’re generally very nice and it can be quite motivational and I would classed that as inspirational.” Alexandra

“I have support from the Associate Dean of Research who is very supportive and he is quite, kind of having laid back attitudes towards producing the output and everything that is nevertheless very inspiring. And he is willing to sort of offer additional support.” Katoya

Few research-leaders in Pre-1992 universities have described that their key role is to support research-academics in terms of RKS engagement. Table 5.8 below shows their comments about being an inspirer for research-academics concerning RKS engagement.

Table 5.8 Research-leaders' comments about being an inspirer for RKS

Alias	Position	Excerpts
Prof Lee	Director of Research	"I do work with junior staff all the time... I do have to keep an eye on the researcher and the research output. I do try to inspire them to go out work. I don't link in to their ideas, but if they need ideas or work with leaders so I'm never away from working with them..."
Prof Augustus	Associate Dean of Research	"I regularly visit all academic groups and I make presentation and I listen to them and I invite suggestions... You'll be surprised ever since I've taken this position I have not denied any colleague with any genuine request if they want to buy machines, software, computers, printers and if they want to go to conferences, want to organise seminars, want to organise workshops, special methodology-related kind of activities and so on. So we ( <i>research-leaders</i> ) keep asking, we keep checking, what different kind of places avenues or any other support is needed."
Prof Isabell	Professor	"I used to make sure we had seminars... I've manage to keep the group together geographically in the same corridors so people can always have their door opens so a lot of informal exchange goes on. I encourage that atmosphere where people talk to each other quite a lot... I think it's kind of inspiring for them ( <i>research-academics</i> )."
Prof Rama	Associate Dean of Research	"...part of what the ADR job involve facilitating the people to work together in order to get some sort of project up and running. We try our best to give inspiration to people."

▪ **Formal and informal interaction with other colleagues**

The finding also notifies that a number of research-academics in Pre-1992 universities claim that their formal and informal interactions with other colleagues also have significant impact on their RKS behaviour. Iola describes that informal meeting is useful for getting feedback and advice about particular research projects. Similarly, Jamie and Ogawa both explain the importance of personal interactions on their RKS behaviour. Both their comments support the findings reported by Tsai (2002) that social interaction between employees is correlated positively with intra-organizational knowledge sharing.

"There are very often, I think every day we have informal occasions in which we meet at coffee break... we end up talking about someone's research." Jamie

"The most important platform is simply you just go for a coffee, you have certain circle of friends, of good colleagues. You just send papers and draft and you just get comments back." Ogawa



#### ▪ **Research-leader as mentor**

The finding also indicates that a number of research-academics in Pre-1992 universities comment that by having research-leaders as their mentor enhance their RKS behaviour. For example, Moss confirms that as an academic who just recently involved in research, supports received from a research-leader who act as his mentor have assisted him in many tasks, most importantly RKS engagement.

“I just recently started, I have a mentor. He is a professor, who has been at the university for a while. He helps me find my feet here, especially in terms of research. Honestly, without this kind of support I would be quite lost finding my way out!” Moss

This is akin to the finding reported by Yang (2007a) that mentoring is among the eight key leader’s roles that influence knowledge sharing in organisation. Likewise, mentoring is also crucial to enhance RKS behaviour among research-academics in HEIs.

#### ▪ **Research-leader as role model**

At the same time, the results present that research-academics in Pre-1992 universities also express that research-leaders who act as role models have positively enhanced their RKS behaviour. However, this is not found in Post-1992 universities. The following two statements evidenced from research-academics in Pre-1992 universities.

“There are numbers of research-leaders in our group. In general, this group of people are role models to us.” Francis

“There’re few professors in our department who always try to support research activity... They are responsible for preparing that type of research stage, research activities or presentation conferences. I see them as role models. In a sense they actually lead you by showing good examples.” Garry

This result confirms the findings reported by von Krogh et al. (2011) that leaders who act as role models or lead by example, are effective in encouraging followers to pursue initiatives on particular tasks. In this study, the role modelling traits played by research-leaders, particularly professors has positively influenced RKS behaviour

among research-academics. As suggested by Macfarlane (2011) that as “intellectual leaders”, professors should act as role models, mentors, advocates, guardians, acquirers, and ambassadors.

### 5.5.2 Organisation as an enabler

Organisation enabler refers to elements like organisation culture, structure, and policy that affect the degree of RKS engagement. From the result, organisation enabler in this study can be broken down into two categories, i.e. research strategy and research events. Table 5.9 summarises the findings for organisation enabler concerning research strategy and research events in Pre-1992 universities after open coding and axial coding. The categories are ranked from the most coded to the least coded.

Table 5.9 Organisation enabler in Pre-1992 universities

Organisation enabler		No. of time sources coded	Percentage (N=16)
Categories	Subcategories		
Research strategy	Mentoring system	7	44
	Workload system	6	38
	Working paper series	5	31
	Research budget	4	25
	Newsletter	3	19
	Annual review	2	13
	Intellectual Property support	2	13
	Research incentives	2	13
	Sabbatical policy	2	13
	Research Academy	1	6
	Research centre	1	6
	Special interest group	1	6
	University research publication	1	6
Research events	Research seminar	13	81
	Research conference	3	19
	Away day	2	13
	Lunch time meeting	2	13
	Research meeting	2	13
	Inaugural lecture	1	6
	Research forum	1	6

## D) Research strategy

From the results, 14 elements have been grouped under “research strategy” category in Pre-1992 universities. Figure 5.14 illustrates the model for research strategy in Pre-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

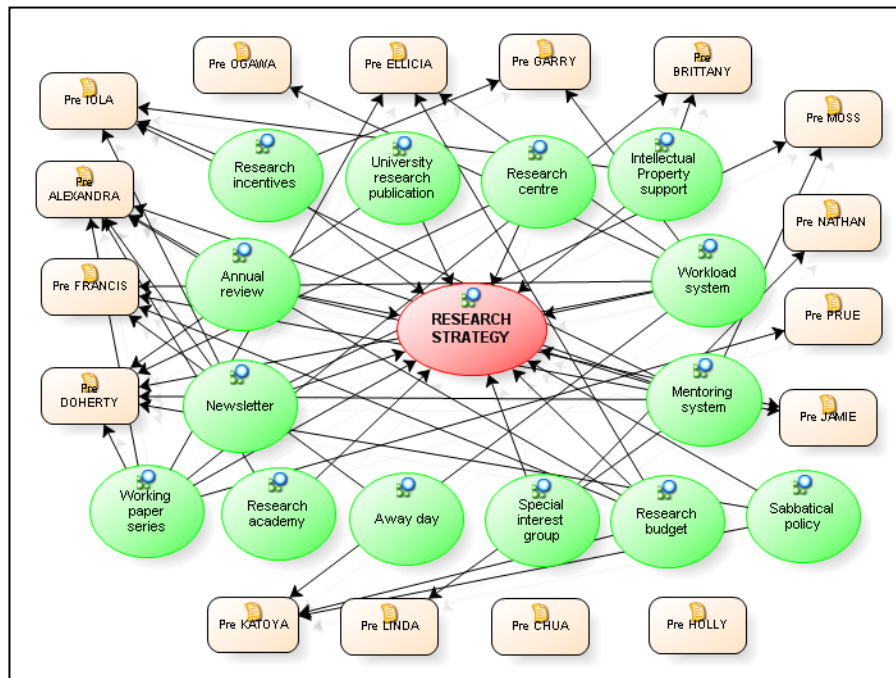


Figure 5.14 Research strategies in Pre-1992 universities and the number of sources coded

From Table 5.9 above, it can be seen that mentoring system is the most frequent factor mentioned by research-academics in Pre-1992 universities. This implies that a mentoring system is an effective strategy to promote RKS behaviour among research-academics. The following excerpts contain evidences for this point.

“There is very much a mentoring system in place here as well, where as soon as I started I was assigned a senior academic to act as my mentor, a professor in my subject group. And they’re in charge of giving me guidance in career development, developmental of research ideas... if people aren’t performing somebody within the department or subject group might need to step in and perhaps offers some mentoring or some guidance on how to bring their research up to a level that is more appropriate for the school.” Alexandra

“Usually when you start off as a new lecturer, you are given a mentor. Somebody who looks after you and speaks with you, who has been in the department longer. So that’s the policy that they have.” Francis

The second highest factor is the workload system. A number of research-academics confirmed that a systematic allocation of work allows them to engage more effectively in RKS. For example, Doherty and Ogawa both state that the university’s workload system helps them to balance up between research, teaching and administrative activities. This implies that with a proper workload balance, research-academics are more likely to have more time to engage in RKS.

“...their (*the university*) approach is to supporting research, trying to gain the balance in terms of workload so that people have time to do research and share knowledge.” Doherty

“The workload model kind of defines how much teaching you have to do, which is also depend on the level, whether you’re on probation or not, so it’s changing. Initially, if you’re starting as a lecturer, you have three years probation. In this period the workload would slowly go up. At the beginning there is hardly any teaching, and overtime you will get more and more teaching, plus more and more admin. It is modified. Good balance of workloads enables us to work active in research and publish more papers.” Ogawa

From the findings it can be seen that research-academics also considered working paper series as an effective research strategy to support RKS behaviour. Doherty for example mentions that working paper series help research-academics gaining confidence with their research works, especially those who are at early career stage. Doherty considers working paper series as ‘halfway post’ of journal publications. She explains that each paper is reviewed in working paper series and it is published in the university with particular ISBN number. After that, they will then receive feedback from other colleagues on their papers.

“We also have a series of working papers. So if you have some researches that you want to write up and especially the newer researchers they may not have the confidence to submit to a journal so it is sort of a halfway post and and it will be reviewed and when it’s published it has an ISBN number and then it’s published on the website so people can come and see it. But it's like getting the

friendly reviewer who gives you few pointers and then at that point they might also say, "have you thought of targeting this particular journal or have you thought of there's a conference coming up, maybe you should go for that". Doherty

Prof Martin, a professor in Pre-1992 universities confirms that working paper series is really an important medium supportive for RKS activity.

“We have what we call a discussion paper or working paper series. So even if it's not being accepted by journals as soon as the paper is drafted, we will put it in our working paper series and then it will be available online to everyone inside the university as well as everyone externally. It is a very good way for sharing knowledge.”  
Prof Martin, Professor

The results also reveal that the university research budget is another supportive factor for RKS. For example, Francis explains that the university has allocated some budget for research-academics to attend useful research conferences, seminars and workshops organised locally and internationally and that is helpful to support RKS engagement among research-academics.

“They give us budget to go to conferences or seminars... That means you can go to the international conferences. And it can be one in a year, two, three, the more the better from the university's perspectives. So, they really fund you to go to these conferences, present your work, which enhances the chances of publishing. And on the other hand, you have the chance to meet the performers around the world at these big international conferences. And there is no real limit to draw on this funding.” Francis

Prof Augustus, an Associate Dean of Research in Pre-1992 universities substantiates the funds available for research-academics are not only to attend research conferences for sharing their research-knowledge, but also to go to any research workshops, which is useful to seek out knowledge to support their research work – for example, a workshop on research methodology.

“We also encourage and support colleagues to go to leading conferences anywhere in the world... We also provide funds for colleagues to go to any workshop on methodology and so on. We also provide support for colleagues to go to conferences, there they

go and share their knowledge and findings.” Prof Augustus,  
Associate Dean of Research

Apart from that, research-academics also talks about newsletters, which for them is supportive for RKS. Iola says that, “newsletter approach is probably the key thing for sharing of information...”. Alexandra adds up, “...newsletters sent to us with news of any significant publications that people have had or again conference presentations that they’re making, research projects for the research been completed”. This implies that research-academics wanted to keep themselves updated with current news concerning RKS activity that goes around the university. This is helpful for them as to know the area of research that other people are interested in and thus, they could easily identify any potential colleagues to collaborate with. Through newsletter, they may also look for people with certain research expertise who could assist or advice them with their research projects.

Other factors like research incentive, annual review, IP protection, sabbatical policy, research academy, research centre, as well as special interest group; have also been recognised as influential factors RKS. The following excerpts show evidences with regard to these factors.

“There’s a **research incentive** scheme for publishing in very good quality journals which helps you towards conference attendance.”  
Iola

“I do have performance development review or **annual review**, where I meet with my Head of Group and we review my current research activities and it might be suggested in that meeting that instead of targeting that journal I could’ve targeted at a slightly higher journal, this sort of thing... At the school level, we also got a **Research Academy** where we can apply for internal funding grant from them as well, so that can be used to set up seminars, or attend conferences and workshops or it can be useful for data collection if I need to collect data for a paper, or I want to employ Research Assistant for a few months, or...so I can put a proposal for that. So that I suppose is assistant into ways for knowledge sharing.”  
Alexandra

“We have the department in the university that look after all that IP thing. So we might consult them and they do the appropriate thing. And they’re not necessarily research-leaders. They are Business

Partnership Unit and we have legal people in there who specialised in Intellectual Property Law.” Brittany

“The university announced that there’s **sabbatical policy** to help us with our research, that we can take some research leaves if we want to turn some of our research ideas into publication.” Katoya

The above results support van den Hoof & Huysman’s (2009) suggestion that by providing organisational and infrastructures, management can facilitate, stimulate and influence the emergence of social capital, which in turn influences knowledge sharing.

## II) Research event

From the results, 7 elements have been grouped under “research event” category in Pre-1992 universities. Figure 5.15 illustrates the model for research event in Pre-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

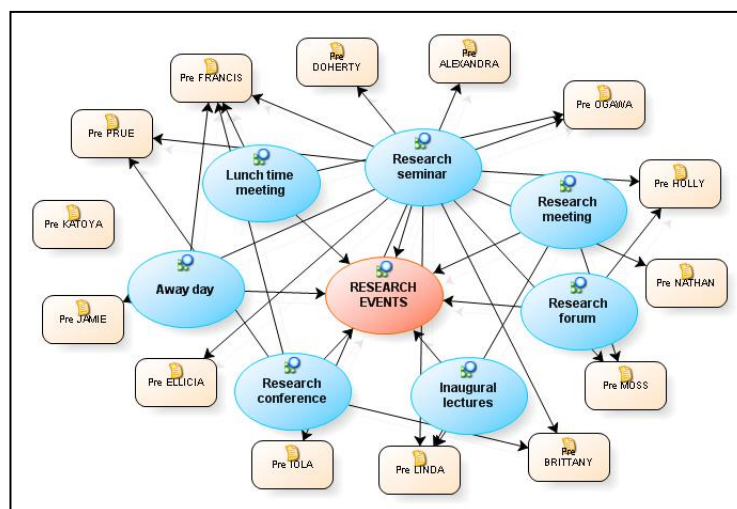


Figure 5.15 Research events in Pre-1992 universities and the number of sources coded

Table 5.9 above clearly shows that majority of research-academics in Pre-1992 universities remark that research seminar is the most effective way to support RKS behaviour. The following excerpts contain evidences for this point.

“We have things like internal research seminars... which is setup and people are invited regularly to contribute to...” Doherty

“There’re seminars that are run within faculties and also seminars to people from different faculties if there are cross-collaborative ideas that is worth presenting.” Alexandra

“We also have regular lunch time seminar... And I’ve come across numbers of speakers where I’ve never met them before and what research they were doing... and sparks off that certain interest and I thought, I learn from them.” Francis

“...within the department there are regular occasions like seminars, in which researchers or the members of the departments present their work, even if it is still the work in progress or not yet completed... so I would say one of the main instruments is the department seminars and this is more official one.” Jamie

At the same time, research conferences have also been considered supportive to enhance RKS behaviour. Isaac, for example said that research conference is the place that research-academics seek and share knowledge.

“...we facilitate conferences within the school so obviously we have the opportunity to be part of those conferences and to look for information and provide information as well as share information from our research.” Isaac

Isaac’s comment has been supported by Prof Rama, an Associate Dean of Research in Pre-1992 universities.

“We’ve also had sort of many research conferences across the university, where people (*research-academics*) can promote ideas, people can see what other people are doing in other areas.” Prof Rama, Associate Dean of Research

Other than that, inaugural lectures, research forums, research meetings, Away Days and lunch time meetings have also been regarded as supportive events for RKS. For example, Francis has explained how events like Away Day and lunch time meeting support RKS behaviour among research-academics.

“We bounce of ideas especially in **Away Days**. We have an Away Day every year, where we present our research and one of the motivations and reasons of Away Day is to spark off ideas and to



collaborate with people that you might not have work within the past... We also have regular **lunch time meeting** and we invite people from outside, to present their works for an hour, during lunch time. I've come across numbers of speakers where I've never met them before and what research they were doing but during that hour I go to know at least which field they were working and sparks off that certain interest and I thought, I learn from them." Francis

### 5.5.3 IT as an enabler

IT enabler refers to technological infrastructures provided in the university in order to support RKS activity. There are six IT infrastructure stated by research-academics in Pre-1992 universities as fundamentally supportive for RKS. Table 5.10 summarises the IT in Pre-1992 universities after open coding and axial coding. The categories are ranked from the most coded to the least coded.

Table 5.10 IT enabler in Pre-1992 universities

Technology factor	No. of time sources coded	Percentage (N=16)
University website	5	31
Email	3	19
Research database	3	19
Data analysis software	2	13
Digital media	1	6
Online research repository	1	6

Figure 5.16 illustrates the "IT enabler" model in Pre-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

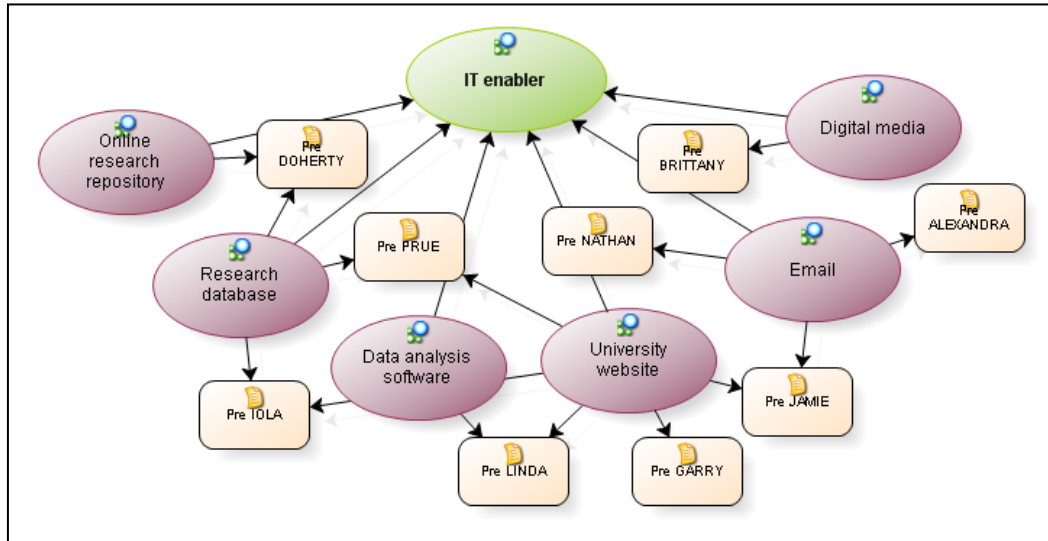


Figure 5.16 IT enabler in Pre-1992 universities and the number of sources coded

The results show that in Pre-1992 universities, the university website is the most supportive infrastructure for RKS activity. Linda, for example, says that the university website contains “the details of every member of staff, what their research interest are, and probably a list of their publications and that is accessible to everyone within and outside the university”. Similarly, Jamie states that from the university website, people’s research is spread across the university and hence, is helpful for research-academics to get to know area of interests of other colleagues. At the same time Iola also comments that through university website people can easily get to know other people’s research interest as well as publications.

“The university website helps to spread information about other people’s research, from different departments within the Business School.” Jamie

“We have standard kind of website with news updates about the things that people are working on... We have our own individual biographical pages and data, with updated research interests, publications, etc.” Iola

Other IT enabler like email, research database, data analysis software, digital media, and online research repository have also been recognised as supportive for RKS activity. For example, Brittany explains that the university has implemented several digital media infrastructure to assist RKS, including Webinars (i.e. virtual

workshops), Podcasts (i.e. a series of audio or video digital-media files that are distributed over the Internet) and Vodcasts (i.e. video podcasts) on the websites. At the same time, Doherty talks about the online research repository.

“We have an online repository for research. We are regularly asked by the member of the organisation to provide information on new publication, on new conference, those that we delivered or new kind of research funding opportunity that we might have got. So there is a central repository for this kind of things, which is accessible throughout the university by other people.” Doherty

Prof Heather, a professor in Pre-1992 universities confirms the usefulness of online research repository in assisting RKS.

“This is sort of electronic access to publications that we called ‘E-print’, which is developed here in our Computer Science Department... So it is basically serve as an electronic repository for documents and so people are encouraged to put everything up there like, papers and working papers, etc. It’s a good way of knowledge sharing.” Prof Heather, Professor

These findings confirm Tseng’s (2008) statement that using IT, people are able to retrieve and store knowledge in individuals or groups, which allows this knowledge to be shared with other divisions in the same organisation or business partners in the world.

## **5.6 The influence of research-leaders**

The “the influence of research-leaders” is the last determinant for RKS in HEIs discussed in this study. It refers to the role of research-leaders in supporting research-academics to engage in RKS. This emerged largely from the participants’ answers two questions: 1) do you personally think there is a relationship between your RKS behaviour and research-leaders? and 2) what kind of support you expect to gain from research-leaders in terms of RKS?

The result shows that majority research-academics in Pre-1992 universities state that there is a relationship between their RKS behaviour and research-leaders. For example, Garry comments,

“...the culture is generated from the leaders to lower level lecturers or research staff and this is certainly important. If the leader doesn't encourage other people then the lower level staff cannot get the culture and cannot be part of the organisations... There is a correlation! Research-leaders' encouragement put a pressure on the researches to have good work, to work more and so we feel the leaders really want to encourage us and we're working hard to have good outcomes... because the leaders is working hard and so we want to work harder to increase our research output.” Garry

However, Linda expresses her disagreement about this relationship. She says,

“No! People would do research and share knowledge regardless of what leaders are like because they are an individual thing. People would not necessarily do research or share knowledge because you (*research-leaders*) tell them to. Even if you say, “right, you have to share this”, the chances are only “I share what I want to share and I will hold some stuff back”. And how do research-leaders know what I know to tell me what I should do and what to share?” Linda

As stated in Chapter 4, Linda is one of the senior career research-academics with 15 years of experience in research. Her comment may be exceptional because as a senior career research-academics, her motivation to engage in RKS most possibly intrinsically-driven and for that reason, research-leaders' support is not important for her.

It is interesting to note that, some research-academics have shared their opinions about this issue, i.e. no relationship between RKS behaviour and research-leaders. Based on this comments, there are two main reasons that make some research-academics oppose this relationship: 1) unfavourable experience with research-leaders; and 2) research-academics' career phase. The following comments contain evidence for this issue.

“I would say maybe they've **experienced something bad or destructive** if you like, with their research-leaders, so that they

make such claim... they're on their own with their research. No one to support or to get support from." Katoya

"...for example **senior researcher**. They don't need research-leaders to support or inspire them to go to conference. They don't need that to write something. It's their currency, it's what they do. It's in their DNA." Ellicia

"If you're **further in your career** so you don't need the support anymore, but for early researchers, the support and inspiration is very, very important!" Moss

The findings indicate that more than half research-academics in Pre-1992 universities express the kind of supports they expect to gain from research-leaders. Helen, for example claims that research-leaders should be responsible to facilitate better RKS culture within the university. Isaac supports Helen's comment. He says research-leaders need to generate situations, allowing research-academics to share knowledge. According to Isaac, individual research-academics tend to work in silo when it comes to research, and therefore, research-leaders are crucial to gather people together by organising events like research conferences in order to support RKS activity within the university. Isaac believes that it is a waste having skilful research-academics with good research when no one knows about it. Thus, he believes that research-leaders' role is vital in supporting the RKS activity within the university.

"They (*research-leaders*) have to continue in generating situations where people can share information because as an academic... it can be quite a lonely career because when you're doing research generally people are locked away in their room, focusing... so it can become quite an isolated thing to do... research-leaders need to actively encourage people to get together more, to be able to research and to do that it means they have to provide the resources to setup this kind of conferences, research days, etc. Otherwise you can have somebody who is brilliant at research and nobody actually really finds out what they're doing because they are hidden away in their own office, doing their own thing. And it's not until you get people together then you're start talking and you're actually realised the skills different people have and you can then actually start to drawn the different skills to generate new research and I think that's very important for research-leaders to be able to facilitate that process." Isaac

At the same time, Alexandra explains that research-leaders should not be seen as isolated in order to encourage young research-academics to discuss and talk about their research works. Rather, they should use more informal ways like “open-door policy”, “informal policy” and “approachability”. Interestingly, she comments that research-leaders must not forget their roots that they were once a lecturer before. With that, they will be able to understand the feeling of young research-academics who are lacking of knowledge in terms of research.

“...you (*research-leaders*) don’t want to be seen as isolated. You should run for the ‘open-door’ policy or the ‘informal’ policy... and that, “yes, you can come and talk to me anytime you like”... it’s nice to get that sense that they are perfectly happy talking to you... they should try to create this ‘inclusive system’, trying to encourage research and knowledge sharing, they’ve got to maintain this. Perhaps, ‘informality’ is the wrong word, but certainly things like ‘approachability’, ‘open-door’ policies... And the other thing is don’t forget where you came from. Well, even you’re a Research Director in the university previously you were probably just a lecturer like us as well. Just don’t forget that thing. Don’t forget that sort of thing!” Alexandra

Additionally, Doherty considers research-leaders’ role as to take the lead in research, by providing clear vision, implement and influence effective research culture. She stresses that professors are leaders in research and as research-leaders they should be a trendsetters for the school and department.

“...their (*research-leaders*) role would be to take a lead in research... providing a vision for it... trying to implement the culture... influence the culture of the organisation. Certainly professors would be leaders in research and therefore they should be setting some degree or kind of trend for the school and department. They should take the lead on all those things.” Doherty

Similarly, Francis claims that research-leaders are role models for research-academics, and thus the way they interact with early career research-academics is important in order to influence and inspire them. Francis also states that research-leaders need to stay active in research and work closely to the group, using more face-to-face interaction. He argues that although some research-leaders have a very good research track record, if they are less seen in the department, they are less

inspiring. Francis hopes that research-leaders can lead by example and walk around the department more often in order to support and inspire research-academics.

“...they are role models for the researchers... the way they interact with young researchers is important... they (*research-academics*) need these support and need to be inspired... that influences the group, at least early researchers in a major way. I think leaders need to be active in research and be close to the group... the ones (*research-leaders*) that are more inspiring to me rather than some others are the ones that come more into the department, into the university. There are more face-to-face interactions. There are some professors who do a lot of very, very good researches, but you rarely see them... it is less inspiring... The ones who do work more from the office and you can see them, and you can learn more from them by just being around them... if it can be done is having inspiring leaders around more and you see them more rather than via email or something... lead by example, walk around!” Francis

At the same time, Garry supports Francis’s comment that research-leaders must lead by showing example.

“The research-leaders can make presentation about how to do good research and how to present them as papers as good conference presentation and talk about their experiences and so that their valuable experiences can be learnt by inexperience staff. Lower level lecturers can present their papers and take comments from research-leaders. That can be valuable for both the university and the lecturers.” Garry

Additionally, Jamie expects that research-leaders should have widely established networks with other institutions, so that they can spread and improve university research through confrontation and presentations.

“One of the pressures that senior researchers should have is the network... better established network of other researchers with other institutions... If they have good relationships with other institutions they can also manage to spread research and improve it through confrontations, through presentations to other institutions...” Jamie

On the other hand, Katoya suggests that research-leaders should not only stress on publication and university ranking. She disagrees that micromanaging people will produce best research output. Rather, she says research-leaders should encourage and support, inspire, lead by example, and able to confront the challenge of research faced by higher education. She expresses that the university nowadays has becoming much more autocratic, and operated like an army, forcing people to do things, which is very unusual for academia.

“...throw journal ranking and the university ranking in the bin and to remember why we’re all here. We’re here to do meaningful research, meaningful teaching. And if we could remember the value of the university and stop micromanaging people and to inspire people instead, by example, by being able to stand up to the challenge that is currently facing by higher education... what they need really is encouragement and support rather than micromanagement... as if we’re in an army... We are here because we want to think for ourselves, not because we want to be told what to do. It's becoming a lot autocratic than I believe what academia should be about.” Katoya

At the same time, Moss comments that he is well-aware of the university research objectives, but he is much keen to know how to achieve it. He says research-leaders should not simply talk about what they expect research-academics to achieve in terms of research. From Moss’ comments, it implies that he expects that the professors could be more supportive and inspiring, whereas research-leaders at the top and middle levels should avoid using “scare tactics. Rather, Moss expects to see more friendly or supportive approach by research-leaders, which could lead to better outcome.

“...it would be better for the university (*research-leaders*) to get those research policies passed on to everyone because I think what they're doing now is communicated the end-results and what they want. We (*research-academics*) know what they want, but we don't know how! Research-leaders within department should be supportive and inspiring... they all play a big role. They get their target from the university level and they are responsible to implement or provide practical support... for the university level, the scare tactics are not always necessary. Sometimes it's a bit bullish, a bit aggressive! Sometimes it creates sort of animosity between the researcher who feel that they're working hard already and the leaders still feels that we're not doing enough! The slightly



friendly or more supportive approach might actually get more results, because people are quite frustrated with being constantly told that we don't do it! Moss

Likewise, Prue also claims that she wanted to know more about the university research strategy on how to achieve the research targets. According to Prue, in order to show support in terms of RKS, research-leaders should present their research works at least twice a year at the department or faculty level. Prue also hopes that research-leaders can work with research-academics in joint-research in order to avoid silo atmosphere at work, where RKS engagement can be distorted.

“The research strategy, I would like to read it! If my research-leader asks me, “How you are doing, how's your research going?” that's enough! He's communicating, he's telling me how things on, how to keep it up, how to deal with pressure, in a very informal way. I think in many ways there's a lot of implicit way of telling people, very informally. I'm not saying it's good, but at least, better than nothing!... provide the maximum support for the sharing of knowledge. One example to encourage knowledge sharing is presenting your (*research-leaders*) research work at the department or faculty level, say twice a year... encouraging not a silo thinking but rather the opposite side... work with people on the joint-research and that can only happen when people are sharing knowledge among themselves, among different departments... because if not people only think about their own thing, their own department, their own faculty, where knowledge sharing is clearly distorted!” Prue

Similarly, Nathan also hopes to gain more “genuine support” from research-leaders. He says,

“research-leaders should ask, “what we can do to help you? who can we put you in touch with, to collaborate on research with?” It will be stuff like that that we're (*research-academics*) looking for”.  
Nathan

On the other hand, Linda expresses that,

“...what they (*research-leaders*) have to do is to get people to do research rather than hit them with the ‘stick’ or entice them with a ‘carrot’. You've actually got to show an interest in what they're doing and give encouragement all the time just by showing

interest... If you (*research-leaders*) concentrate just on getting research done and telling people they got to do research, it won't happen! If you get involved with people doing research... then it would happen. But that requires time and effort and often they don't have the time to put their additional effort in. So it's easier to tell people they must do research and share it with people... People need to be put up by kind of pedestal and flag up as people who are doing good research. That is a simple motivational technique, it is recognition for achievement." Linda

Linda then continues that all research-leaders across university levels need to have openness in communicating to research-academics. As suggested by Fliaster (2004) and Chatzoglou & Vraimaki (2010) earlier, by breaking down the hierarchies, organisations can create openness in communication, which then allows people to practice and share knowledge. Linda says it is important for research-leaders to value all researches even if they are not the core research areas. According to Linda, research-leaders' role is to "re-motivate" research-academics when they are less motivated to engage in RKS. She continues that rather than managing, leading is the best way to support RKS behaviour among research-academics.

"Regardless of levels in the hierarchy, research-leadership is where you talk to those engage in research... Talk to them and ask them what they're doing and why they're doing it. Be prepared to accept research which is not necessarily core to school activities... leaders need to be aware of what is going on and to acknowledge the efforts that people (*research-academics*) are making and not only to encourage them through recognition, but also making them believe that they can do better, inspire them. Rather than tell people that their research is not good enough, leaders should tell them what they need to do to make it better. The problem is when you tell someone that their research is not good enough, that will demotivate them and leaders have to re-motivate them. Leading is the best way in this context of supporting research and knowledge sharing, not managing!" Linda

At the same time, one question was raised up to research-leaders in Pre-1992 and Post-1992 universities with regard to this issue, i.e. "how research-leaders influence RKS behaviour among research-academics?" Table 5.11 contains evidences from research-leaders in Pre-1992 universities.

Table 5.11 Research-leaders' comments in Pre-1992 universities on the influence of research-leaders in RKS

Alias	Position	Excerpts
Prof Augustus	Associate Dean of Research	"It is many at times research is a silo activity because colleagues, they have their own research ideas, they have their own research kind of objectives... But obviously that is not going to work smoothly without any kind of support from research-leaders, especially at the university level. We communicate clearly the message, the expectation, and the aspiration. People might not realise that this is kind of support they get... Supports and inspirations by research-leaders are very crucial! Otherwise it will be not solid. It will not be so focus... Support from research-leader is very, very important!"
Prof Heather	Professor	"What defines you ( <i>research-leaders</i> ) is what and how you communicate your excitement for your own research to sort of creating the culture and the atmosphere, in which other people can do excellent research and then share that knowledge with people."
Prof Isabell	Professor	"Research-leaders can do a lot to create an effective atmosphere for RKS or they could do the opposite, where everyone not going to like it!"
Prof Woody	Research professor	"There isn't really much managing to do in research. It is much more on the question of inspiring and leading people and therefore it's generally a case of leading by example. If the leaders have a culture of, "You will share your knowledge and that's what we're doing and that's important to make that work and let us know what you need to help you do it", then that would transmit through. It's not something that you can manage or tell people to do! It is really mainly about leading by example... So the leader literally sets the culture for everyone else."
Prof Rama	Associate Dean of Research	"It is necessary to have research-leadership but not necessarily guarantee a success. However, you won't get total success without it!"
Prof Martin	Professor	"...even if you're ( <i>research-leaders</i> ) not always directly working with all of them ( <i>research-academics</i> ), but when you talk to people, you advise them, having a chat with them about what they are doing, getting feedback on what they're are doing, it ( <i>research-leaders' supports</i> ) definitely is an influential factor."

Based on the above evidences, it communicates that research-leaders mainly see their roles as setting the right research culture and environment for RKS in the university. Although some of research-leaders admit that such culture might not guarantee full success, they argue that without support from research-leaders at all levels the whole activity of RKS activity would fail. This is akin to Yang's (2007a) finding, who reports that leaders' support is significantly important for cultivating knowledge sharing culture within organisations.

The results also notify that research-leaders at large state that "leading by example" is among the most effective way to enhance RKS behaviour among research-

academics. This substantiates a suggestion made earlier by Bandura (1997) that “leading by example” exhibits a leader’s commitment to his/her works and offers guidance to subordinates on how to attain effective performance, and thus enhance subordinates’ efficacy through observational learning. As what argued by Lee et al. (2010) earlier, that as “knowledge builder”, leaders are responsible for setting the example and communicating that the idea of knowledge sharing is important and valuable for the team, and hence the sort of role modelling approach drives team members to reciprocate and share their expertise and knowledge with the team.

## **5.7 Summary**

This chapter reports results generated from Pre-1992 universities in relation to the six key determinants of RKS. First is the “why sharing” issue, which presents the motivator and inhibitor factors for or against RKS. The motivator factor for this study is distinguished into extrinsic and intrinsic rewards. It is found that in Pre-1992 universities, RKS behaviour is largely influenced by intrinsic rewards as compared to extrinsic rewards. There are nine elements of intrinsic rewards found in Pre-1992 universities. Six elements were grouped in academic category (i.e. motivated by the REF, growing body of knowledge, enhancing teaching quality, enhancing research productivity, contribution to the university, and job role); and the other three elements were grouped in personal category (i.e. awareness of the importance of RKS engagement, career development). There are two extrinsic rewards that influenced RKS behaviour among research-academics in Pre-1992 universities, i.e. the university expectation (internal factor) and the REF target (external factor). On the other hand, five elements were recognised as inhibitor factors in Pre-1992 universities, i.e. fear of losing power, lack of trust, fear of stealing of ideas, unavailability of IP protection, and lack of confidence).

Second is the “when sharing (or not)” issue, which refers to the research timeline (i.e. research ideas, research proposal, research methodology, research results) that individual research-academics share or not share their research-knowledge. The results show that most of research-academics in Pre-1992 universities less sharing their research ideas and only sharing research results. During the research design and

research methodology stages, they choose to seek out knowledge than passing out their research-knowledge. There are a number of research-academic who also share their research-knowledge at all times. However, this is also happen with group of people whom their trusted.

Third is the “what to share” issue, which refers to the type of knowledge that individual research-academics choose to share. The results show that in Pre-1992 universities, the types of knowledge shared by research-academics is broken down into three patterns: 1) sharing both tacit and explicit knowledge; 2) sharing mainly explicit knowledge; and 3) sharing only explicit knowledge. No one is found sharing only tacit knowledge. Some research-academics believe that tacit knowledge is separated from explicit knowledge, whereas some others believe that tacit and explicit are inseparable. Interestingly, the analysis reveals that the research timeline influences the types of knowledge shared by research-academics, in which at the research ideas and research proposals, tacit knowledge is mainly shared, and at later stages, explicit knowledge is shared.

Fourth is the “how to share” issue, which refers to the most preferred channels of communication used for sharing research-knowledge. It is found that some research-academics in Pre-1992 universities prefer face-to-face interaction when sharing research-knowledge as compared to other channels. Interestingly, some of them argue that face-to-face and virtual channels are typical as some virtual channels like Skype video call allow them to see body language and facial expression, which has no difference with face-to-face. Again, it is revealed that the research timeline also has an impact on the choices of channels of communication chose by individual research-academic. It is found that face-to-face communication works well in order to get ideas across effectively, whereas at the later phases, virtual and written channels are used.

Fifth is the influence of KS enablers on RKS, which refers to the KS enablers, i.e. people, organisation, IT. For people enabler, which consists of both leaders and employees, the results suggest that most research-academics in Pre-1992 universities see research-leaders as inspirer who interactively supports them to pursue RKS

engagement. Some of them also see the importance of formal and informal interaction with other colleagues in supporting their RKS behaviour. A number of research-academics in Pre-1992 see research-leaders as their mentor and role models that significantly influence their RKS engagement. On the other hand, organisation enabler refers to elements like organisation culture, structure, and policy that affect the degree of RKS engagement. There are various organisational elements revealed from this study, which are separated into research strategy (e.g. mentoring system, research centre, workload system) and research event (e.g. research seminar, Away Day, lunch time meeting). The last enabler, i.e. IT enabler refers to technological infrastructures (e.g. university website, email, online research repository) provided in the university in order to support RKS activity. Interestingly, this study reveals that the “softer” aspect of knowledge sharing enabler, i.e. people and organisation, have more impact on RKS behaviour among research-academics in Pre-1992 universities than the “hard” aspect, i.e. IT infrastructure.

Lastly is the influence of research-leaders on RKS behaviour, which refers to the role of research-leaders in supporting research-academics to engage in RKS. The result suggests that majority research-academics in Pre-1992 universities claim that there is a relationship between their RKS behaviour and research-leaders. They also provide suggestions of the kind of support that should be provided by research-leaders in supporting RKS among research-academics, including practicing open-door policy, being approachable and friendly and having established networks. The evidence gained from research-leaders with regard to this issue shows that they mainly see their roles as research-leaders as setting the right research culture and environment for RKS in the university.

## **Qualitative findings: Post-1992 universities**

### **Introduction**

This is a sequent chapter from Chapter 5. This chapter reports results generated from Post-1992 universities within the boundary of six key determinants of RKS: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. Following the structure in Chapter 5, this chapter is also divided into six sections, where each key determinant is reported separately by showing evidences gained from research-academics and research-leaders. As mentioned in Chapter 4, the pseudonym technique is used to fulfil conditional anonymity of participants. In addition, the usage of NVivo is also evidenced. This chapter ends with a summary for the chapter.

## 6.1 Why sharing

As presented in Chapter 5, the “why sharing” issue refers to first key determinant, i.e. motivator and inhibitor factors for or against research-knowledge. It presents the reasons for research-academics sharing as well as stop sharing research-knowledge. This section is divided into two subsections, representing the findings for motivator factor and inhibitor factor respectively.

### 6.1.1 Motivator factor

The results show slight differences between responses gained in Pre-1992 and Post-1992 universities concerning the motivator factor. Five factors marked with star (\*), in Table 6.1 illustrate major differences concerning the motivator factors in Post-1992 universities as compared to Pre-1992 universities.

Table 6.1 Motivator factors in Post-1992 universities

Motivator factors in Post-1992 universities			No. of time sources coded	Percentage % (N=11)
Level	Categories	Subcategories		
Intrinsic reward	Academic	Growing body of knowledge	5	45
		Enhancing research productivity	4	36
		Enhancing teaching quality	2	18
		Job role	2	18
		Looking for co-authorship*	2	18
		Contribution to the university	1	9
		Motivated by the REF*	0	0
	Personal	Awareness of the importance of RKS engagement	10	91
		Career development	5	45
		Personal interest	2	18
Building up networking*		1	9	
Extrinsic reward	Internal	University expectation*	10	91
	External	The REF target*	3	27

From the above table, it is evidenced that “looking for co-authorship” and “building up networking” is additional motivator factors (i.e. intrinsic reward) discovered only in Post-1992 universities. On the other hand, there is no response in Post-1992 universities with regard to “motivated by the REF” issue. On top of that, it can be seen that most research-academics in Post-1992 university states that the “university expectation” is the key motivator factor (i.e. extrinsic reward) that drive them forward to stay engage in RKS. Apart from that, unlike Pre-1992 universities, only a small number of research-academics indicate that the REF target is extrinsically



motivated them to engage in RKS. All these five drivers are discussed in detail in the following sections.

## D) Intrinsic reward

### Academic

The same results have been discovered in Post-1992 universities, where intrinsic reward is a motivator factor that enhance RKS behaviour as compared to extrinsic reward. Figure 6.1 illustrates the academic aspect model in Post-1992 universities and factors related to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

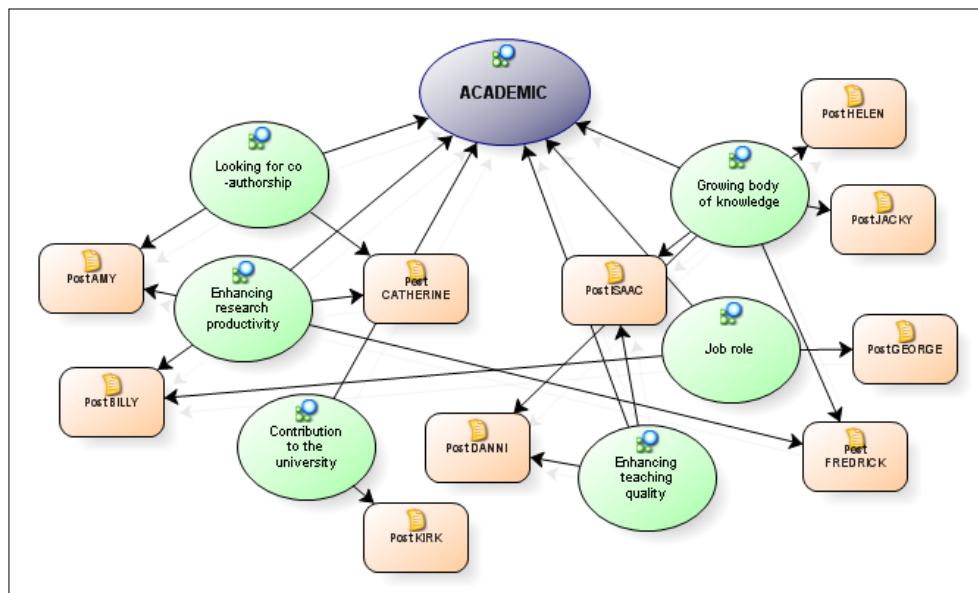


Figure 6.1 Academic category in Post-1992 universities and number of sources coded

#### ▪ Growing body of knowledge

The “growing body of knowledge” is mostly mentioned by research-academics in Post-1992 universities. It has been identified as the key intrinsic reward that enhances RKS behaviour among research-academics. The following excerpts show some comments by research-academics in Post-1992 universities concerning this issue.

“The reason for sharing knowledge is hopefully furthering the field... And I would hope that I would contribute somewhere in that development of the field.” Danni

“From the purely academic point of view, by engaging and sharing your research-knowledge, we can develop new theory and grow body of knowledge.” Isaac

Similar to a statement given by Prof Lee, a Director of Research in Pre-1992 universities, Prof Wither a professor in Post-1992 universities also comments about the “value-adding” issue when discusses about how the body of knowledge can be grown through RKS.

“Through knowledge sharing, they (*research-academic*) will strive to improve their own research, they’re also strived to improve the others and most importantly they’ll strive to add value to particular area of interest and by doing so there will be a chance to have knowledge across today’s sections, across today’s discipline.” Prof Wither, Professor

#### ▪ **Enhancing research productivity**

Similar results have been identified in Post-1992 universities concerning the “enhancing research productivity” issue. Billy, in his comment below, describes how young researchers can gain help from someone with more experience and expertise through RKS.

“One of the reasons is for public good and to gain more knowledge, because say, young researchers, if they keep knowledge to themselves, they will never know what goes wrong or how to improve the ideas so that it is publishable. If you share knowledge with someone more senior than you in terms of research, people can say to you where you’re wrong and can actually add something to it...like when you present a paper at a conference or talk to colleagues.” Billy

This is agreed by Amy, who says,

“...in a way it’s (*RKS*) for getting the feedback. You know, have I made any stupid assumption? Have I use the wrong hypotheses tests? Am I doing something that I think it’s brand new but actually it was published two years ago and I never find it? So it’s sort of

validation going on when you share knowledge isn't? Especially with someone more senior than you." Amy

The findings suggest that research productivity is one of the key motivator factors that drive research-academics in both types of university to get involve in RKS.

- **Enhancing teaching quality**

Again, similar result has been found in Post-1992 universities with regard to "enhancing teaching quality" issue. However, the percentage is slightly lower than Pre-1992 universities. The following excerpt shows the two comments by research-academics in Post-1992 universities with regard to this issue.

"...it's fundamentally that as a lecturer, you need to have a research background as well, because otherwise, it's quite easy to lose touch with industry what's actually going on in the real life. You can't just teach out of the textbook...by getting involved in disseminating knowledge, you not actually gain knowledge but also generate some new information, very contemporary information that you can actually transfer through into your teaching." Isaac

"One of the main reasons I share knowledge is for teaching purpose." Danni

Prof Gerald, an Associate Dean of Research in Post-1992 universities, who shares his own experience, explains how research enhances his teaching.

"When I go into a classroom, I can't talk about the example you know, when I did my PhD research all those years ago. It has to be up-to-date, it has to be relevant. So I have to keep updating, and so you can do it through research and on top of that through knowledge sharing because sometimes you don't know about this particular area, but you got to know from other colleagues when sharing knowledge. It's the important part of the job, it can't be neglected." Prof Gerald, Associate Dean of Research

The finding implies that, unlike Pre-1992 universities, teaching in Post-1992 universities is less informed by their research activity.

- **Job role**

The result for this factor is similar both types of universities. The two statements below are evidences for this factor.

“...it’s my job no matter what the pressure is, this is my job to produce papers and to share my knowledge because if not my job will be at risk.” Billy

“Research and sharing what I've found is part of my job. I’m in that job because I want the job and that’s the job I want to do. I want to be researcher so I’m in a job that says you do research and of course sharing knowledge.” George

A statement by Prof Gerald, an Associate Dean of Research in the Post-1992 universities confirms the fact that academics’ job role enhances their RKS behaviour.

“...what brought me into academia and maybe stay here is doing research, sharing it with people, going out there and talking to companies, talking to practitioners and studying around the different sort of theoretical models and then trying to make sense of the world based on the theory and the practice... for me it is a part of our (*research-academics*) job.” Prof Gerald, Associate Dean of Research

The results suggest that as part of their roles as academics, research-academics in both Pre-1992 and Post-1992 universities feel motivated to engage in RKS.

- **Looking for co-authorship**

This particular intrinsic reward is only found in Post-1992 universities and not been identified in Pre-1992 universities. Some research-academics in Post-1992 universities indicate that the potential to seek for co-authors has enhanced their RKS behaviour. The following excerpts are the evidences for this issue.

“...the facts that other colleagues usually have a lot to offer and so I kind of work close enough with other people, that what they’re doing is relevant... We share knowledge. This enables me to look for co-authors, you know, someone to work with, with regard to research.” Catherine

“I can meet people who talk the same “language” as I do, you know, who has the same area of interest... They could be my potential co-authors.” Amy

Although this issue has not been discussed among research-academics in Pre-1992 universities, it has gained attention from a research-leader in Pre-1992 universities, i.e. Prof Lee, a Director of Research. He states that research-academics engage in RKS in order to seek for someone to work along with, divide the work, which is helpful for research, especially for bigger research projects.

“They (*research-academics*) want to divide work, division of labour. Especially when the projects are big, then they need more help to do the project and then need to share knowledge because of that. They truly want to expand the knowledge... Most of researchers in my opinion do it (*share research-knowledge*) because they want to look for co-author.”

#### ▪ **Contribution to the university**

As what found in Pre-1992 universities, the results also show that “contribution to the university” is another intrinsic reward that motivates research-academics in Post-1992 universities to engage in RKS. Kirk, for example states that, “...I could contribute to improve the school’s research performances.”

A statement made by Prof Cameron, an Associate Dean of Research in Post-1992 universities supports Kirk’s comment. He says that through RKS, individual research-academics can publicise the university. In other words, when engaging in RKS with other people outside the university, research-academics act like an ambassador to the university, promoting the university, and hence enhance university research performance.

“I think researchers want to make contribution to the research and I feel as a researcher, if you (*research-academics*) have an idea, if that idea is good and that idea is useful, you should want people to read your work. It’s important from your personal perspective, it’s important for your university. It’s your contribution to the university, you’re advertising the university. It’s what research is about, giving back to the community.” Prof Cameron, Associate Dean of Research

The findings suggest that a number of research-academics in both types of universities believe that that the university research performance can be enhanced through research performance.

### Personal

There are four intrinsic rewards relating to personal aspect found in Post-1992 universities, which motivate research-academics to engage in RKS. Figure 6.2 illustrates the personal aspect model in Post-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

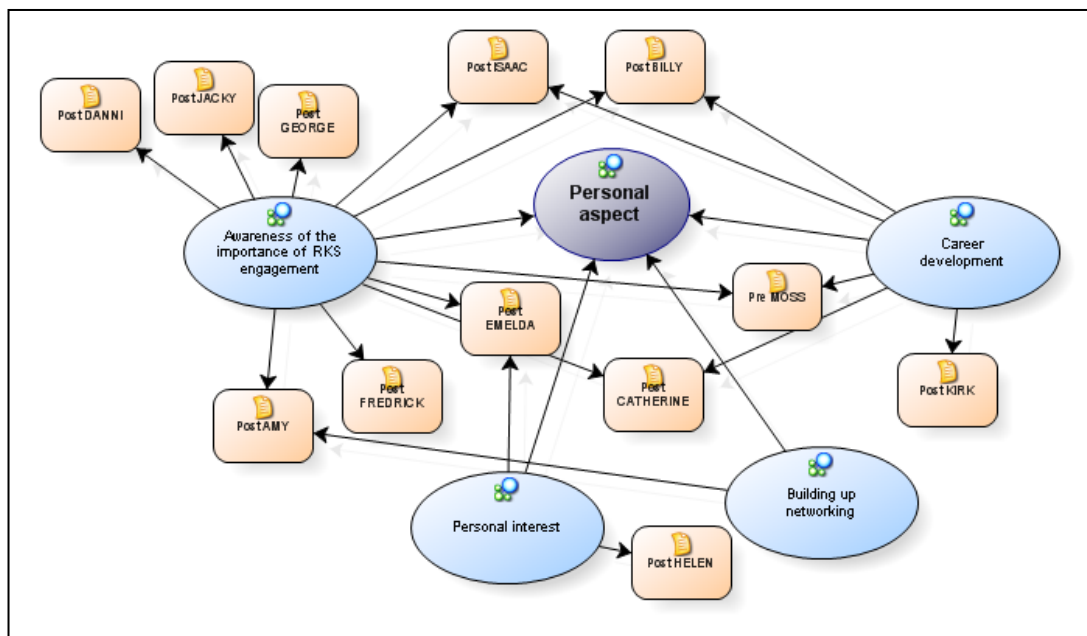


Figure 6.2 Personal aspect in Post-1992 universities and number of sources coded

- **Awareness to the importance of knowledge sharing**

As what found in Pre-1992 universities, research-academics in Post-1992 universities at large stated that their awareness towards the importance of RKS engagement has influenced their RKS behaviour. While laughing, George interestingly expresses his feeling about this issue.

“Well I don’t understand why it wouldn’t be? I would think it would have been a core feature. So if we don’t share knowledge, if we don’t share our research what are we doing with it?” George

Prof Cameron, an Associate Dean of Research in Post-1992 universities also discusses the same thing.

“I think it (*RKS*) is vital. Research is all about knowledge sharing. It’s all about people reading your work and you influence young people in all ways, from students to government policy, to fellow academics. So I feel dissemination of knowledge sharing is vital in research and every academic need to be aware of this fact.” Prof Cameron, Associate Dean of Research

This implies that regardless of types of university, research-academic at large are well-aware that *RKS* is very essential for their career as academics.

#### ▪ **Career development**

Similar to Pre-1992 universities, the results show that career development has been recognised as another intrinsic reward that enhances *RKS* behaviour among research-academics in Post-1992 universities. Billy supports a comment made by Iola a research-academic in Pre-1992 universities. He comments on the interaction between career development and self-recognition.

“When you always share knowledge, it is good for your own career development because people will recognise you in certain expertise”.

Likewise, Isaac says,

“...from career point of view it is very important as well. I think everybody knows now you cannot be an academic without doing research these days. It is absolutely essential!”

The findings suggest that career development is one of the intrinsic rewards that influence *RKS* behaviour in both Pre-1992 and Post-1992 universities.

#### ▪ **Personal interest**

As what revealed in Pre-1992 universities, research-academics in Post-1992 universities also express that their involvement in *RKS* is driven by their own personal interests. However, responses gained in Post-1992 universities are much lower than Pre-1992 universities. The following statements show the evidences.

“Personally because of my passion. And so of course, I do research and share the knowledge with people. What’s the point of doing, if I want to keep it to myself? But what really matters here is personal interest!” Emelda

“It’s my personal desire that push me to keep sharing knowledge. I think without it won’t work this way. I mean not so effective.”  
Helen

This implies the characteristics differences between research-academics in Pre-1992 universities and Post-1992 universities. Research-academics in Post-1992 universities are more intrinsically-driven to engage in RKS as compared to those in Pre-1992 universities. Only a small number of research-academics in Post-1992 are naturally motivated to engage in RKS, while the rests are much driven by other factors. This may be due to a less effective research culture in Post-1992 universities as compared to the Pre-1992 universities.

#### ▪ **Building up networking**

As stated earlier, the intrinsic reward relating to “building up networking” factor is only found in Post-1992 universities. A number of research-academics are motivated to engage in RKS as to build up their social network, which in return is useful for their RKS activity. A statement below contains evidence in pertain to this factor.

“...a more obscured thing from knowledge sharing is networking. Through conferences you meet people, you sort of expand your social networking, increase your stock of contacts. So you ring them or email them a month later say, “we met at conference so and so, we have common interest, would you be interested to become an external examiner for my PhD student?” Or you might also say, “I saw you talking at the conferences, can I buy you coffee and have chat afterwards because I find it really exciting”. So maybe after that you can have a joint-writing with the person. So that network is useful for our job as academics.” Amy

As claimed by Chatti et al. (2007) that today’s challenge has shifted from “what you know” to “who you know” (known as connectivism), which presents learning as a connection/network-forming process, where one of its core principles is that knowledge rests in networks. According to Chatti et al., a strong emphasis has been



placed on knowledge networking and community building in order to leverage, create, sustain and share knowledge in a collaborative way, through participation, dialogue, discussion, observation and imitation (pg. 412). In this study, social network enables people to exchange experiences, expertise or ideas. In Pre-1992 universities, social network may be seen as a “too-common” factor, which embedded in the university research culture, which is strongly established. Therefore, research-academics tend not to regard this as an important intrinsic reward that drives them forward to engage in RKS.

## II) Extrinsic reward

The findings shown in Post-1992 universities concerning the extrinsic reward are the same with the Pre-1992 universities. Equally, there are two extrinsic rewards that influenced RKS behaviour among research-academics in Post-1992 universities, i.e. the university expectation (internal aspect) and the REF target (external aspect). Figure 6.3 illustrates the model of extrinsic reward in Post-1992 universities and factors related to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

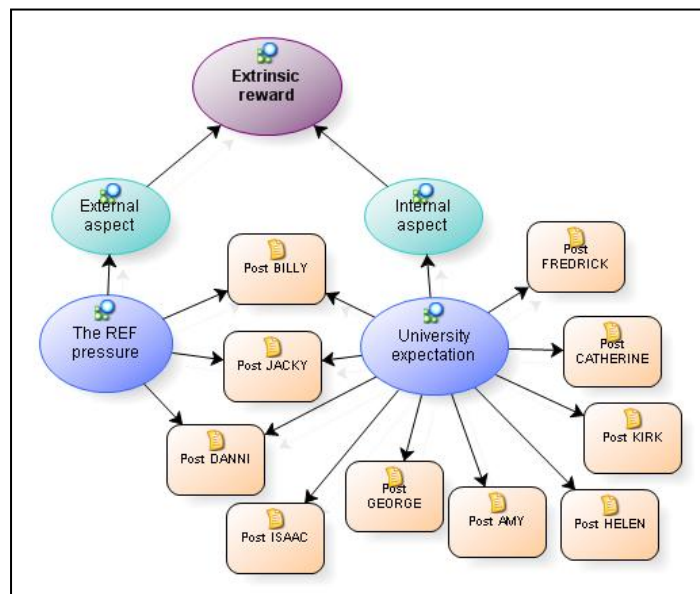


Figure 6.3 Extrinsic rewards in Post-1992 universities and number of sources coded

### Internal aspect

#### ▪ **The university expectation**

As shown in Figure 6.3, there is a high response in Post-1992 universities as compared to Pre-1992 universities concerning the “university expectation” issue. Billy, for example expresses,

“There’s a tremendous pressure from the university, for us to research and share our knowledge.” Billy

This implies that in a way to catch up with the current demand for research performance, the Post-1992 universities may have overlooked that the expectation they place on research-academics are causing great pressure to them. Although, this is identified as extrinsic reward, research-academics are not naturally motivated to engage in RKS. Rather, their motivation is controlled and pushed by the pressure placed on them by the university. Some research-academics in Post-1992 universities are worried about the risk that they need to bear if they do not engage in RKS. Amy has highlighted this issue by saying,

“Within the Business School, they have expectations on the researchers, well, it's a pressure for us obviously...You'll (*research-academics*) produce a paper like once a year, and you will attend and listen and give feedback to other colleagues who are giving papers...There is an expectation that if you want to stay in school, you at least have to produce one peer review journal each year.”  
Amy

Amy’s comment is supported by Billy.

“It is my job to produce papers and that is sharing my knowledge with people, because if not my job will be at risk”. Billy

In addition to her statement earlier, Amy also explains how many of her colleagues left the university due to the high pressure in terms of publications.

“...a quarter of the school just ran away. They took VSS. Those who stay were research-active and they are all very busy, running like mad. Staff at large have their PhDs but haven’t produce any output. So they’re now running around try to produce papers...For

example myself, if I am 65 with outputs they will keep me and if I am 65 without any output, they will say, go away!” Amy

Frederick on the other hand, explains an interesting reason behind the university’s high expectation towards RKS.

“...a huge pressure of knowledge sharing now is to bring sort of consultancy to the university and of course publication at the RAE level, where you can generate money to the university. And that’s why the university keep pushing people around...because we can make money!” Frederick

The findings suggest that although research-academics in both types of universities talks about the university expectation as one of the extrinsic reward that keep them stay engage in RKS, the gap between these two types of universities is quite big. It is clear that in Post-1992 universities, the expectation made on research-academics towards enhancing university research performance is possibly too far to be reached by most of the research-academics.

### **External aspect**

#### **▪ The REF pressure**

Unlike Pre-1992 universities, the findings indicate that the “REF pressure” is less regarded as extrinsic reward for research-academics in Post-1992 universities. This communicates that in Post-1992 universities, the pressure to meet up to the REF is less aggressive as compared to Pre-1992 universities. Those who point out this factor may be a very small number of research-academics in Post-1992 universities who are active in research or those of senior research-academics. Therefore, as most of research-academics in Pre-1992 universities, they also feel the pressure by the REF concerning RKS, while the rests are just not bothered. The following excerpts show some comments from research-academics in Post-1992 universities with regard to this issue.

“...the REF is certainly starting to influence my knowledge sharing, where I publish my research.” Jacky

“It’s mostly driven by the REF that you must publish in a 3 4 star journals. So for us for the next REF in 2014, we’re explicitly required to have four papers, two of which will be in three star and the other two can be in two star. So there’s explicitly some pressure for you to sort of engage in research.” Billy

“Well the pressure is linked to the RAE and REF... We are under pressure, especially those at senior level to publish and in relevant journals... There is pressure from the RAE, REF perspective... I think that is something maybe requirement if I want to progress in career wise.” Danni

In another comment made by Danni, she expresses that, “...that is (*the REF*) a key requirement if I want to progress in career wise”. Her statement supports Katoya’s comment, a research-academic in Pre-1992 universities.

Interestingly, Dr Stacy, a professor in Post-1992 universities used an analogy of “factory and production” to describe the university environment due to the REF pressure. She clearly expresses her disappointment that the REF has negatively impacted the spontaneity and creativity of research and publication.

“...with the REF, it means that the university has become more like a **factory and production**. I know people who really, really love research in early days and they have become grimed because it’s almost like a publishing factory. We’ve lost spontaneity, the creativity in research and publications.” Dr Stacy, Professor

The findings indirectly suggest that research-academics in Post-1992 universities are still lacking of competitive advantage in terms of research skills, capability, and exposure as compared to research-academics in Pre-1992 universities. For that reason, only a small number of them sees the REF pressure as an extrinsic reward that drive them forward to engage in RKS and ultimately be included in the REF.

### **6.1.2 Inhibitor factor**

The results also show some differences between responses gained in Pre-1992 and Post-1992 universities concerning the inhibitor factor. Two factors marked with star

(\*), in Table 6.2 illustrate major differences concerning the inhibitor factor in Post-1992 universities as compared to Pre-1992 universities.

Table 6.2 Inhibitor factors in Post-1992 universities

Resistance to share	No. of time sources coded	Percentage % (N=16)
Fear of stealing ideas	5	45
Lack of confidence	4	36
Fear of losing power	2	18
Lack of trust	2	18
Time constraint*	2	18
Unavailability of IP protection *	0	0

From the above table, it is can be seen that the “time constraint” is an additional inhibitor factor discovered in Post-1992 universities only. On the other hand, there is no response in Post-1992 universities with regard to “unavailability of IP protection” issue. Figure 6.4 portrays the model for inhibitor factors in Post-1992 universities, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

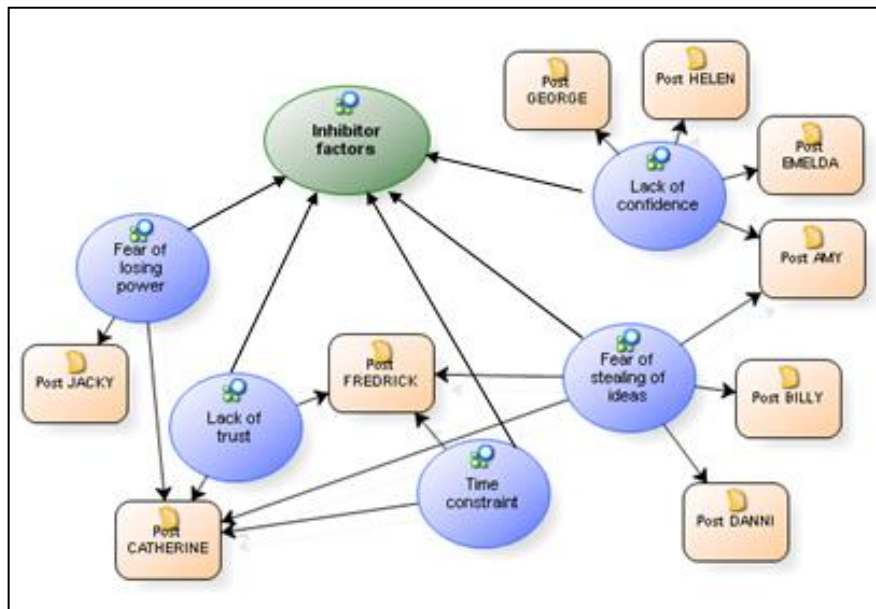


Figure 6.4 Inhibitor factors in Post-1992 universities and number of sources coded

### ▪ Fear of stealing ideas

Unlike Pre-1992 universities, the results in Post-1992 universities show a high responses concerning fear of stealing of ideas. This implies that in Post-1992 universities, the university research culture is less supporting research-academics to engage in RKS. Most of research-academics have less skill and are less capable in RKS. Therefore, once they have research ideas to work on, they tend to resist sharing them with other colleagues as they are fear that their ideas might get stolen. This feeling may possibly arise due to less supportive research culture within the university.

Amy and Catherine both express their views about this issue.

“...there’s always a danger in sharing that someone might steal your ideas... You (*research-academics*) might be saying some ideas which are great and you just shouldn’t talk about it yet with other people until to the stage where you’re sure about it.” Amy

“If it’s (*RKS*) in a public form like the conference where it’s already published in your name then that’s fine but if it’s around sort of developing research stage, then not really! I worry that somebody would nick my stuff, nick my ideas... anyone could quite easily somebody will nab it from you (*research-academics*) ...somebody with more time, somebody with more resources to do it , somebody who can do more quickly then you.” Catherine

Similar to Garry’s comment, a research-academic in Pre-1992 universities, Frederick also claims that it is easy for other people to steal rough ideas.

“...within the research ideas, when the ideas are still rough, it’s very difficult to proof that that ideas are yours. Unless you have that on paper or you record it and then it’s very risky. So I don’t share my ideas, not until I publish it”. Frederick

From Frederick’s comment, it communicates that that unless the ideas are established, he tends not to share his research-knowledge. Billy’s statement clearly supports Frederick’s comment. Billy says that people tend to steal immature ideas and for that reason, he claims that he tends not to simply share the undeveloped ideas with other people.

“If you (*research-academics*) share your idea before it’s mature enough, then someone might take it and publish it before you... If I go to conference with a basic idea, which is not well-developed, somebody might actually see the idea and see the potential in it then they will take it and develop a paper and send for publication quicker than you... That’s reason why I don’t simply share all because the goal here is to publish.” Billy

This issue has also attracted a number of research-leaders in Post-1992 universities. This implies that research-leaders are aware that the fear of stealing of ideas is one of the main inhibitor factors that hold back people from sharing their research-knowledge. Table 6.3 presents the supporting evidences quoted from research-leaders in Post-1992 universities.

Table 6.3 Research-leaders’ comments on the fear of stealing ideas issue in Post-1992 universities

Alias	Position	Excerpts
Prof Gerald	Associate Dean of Research	“Obviously there is always a danger in sharing knowledge. People unwilling to share because there is fear other people might <b>steal their idea</b> ...”
Prof Cameron	Associate Dean of Research	“Now a lot of people are unwilling to share because they feel that if the paper is not yet publish, and they give away their ideas, <b>other people can do the same work</b> and publish it first.”
Dr Stacy	Professor	“...sadly, there’s a big difference with the way staff talks about their research and ideas nowadays. In the early days you could tell almost everybody about your research. I don’t think that’s so much now, not in this department. ... <b>they’re so careful now when sharing ideas</b> or disseminating with people, even the students.”

The findings suggest that although “fear of stealing of ideas” is among the inhibitor factor for RKS in both types of universities, research-academics in Post-1992 universities tend to face with larger challenge in coping with this one factor. This is because the university research culture in Post-1992 universities is less supportive for RKS and therefore, research-academics are less readily engaging in RKS and share their research-knowledge with other colleagues. Rather, they are more intimidated that when sharing their research-knowledge, their ideas will get plagiarised.

▪ **Lack of confidence**

Figure 5.8 indicate a big gap between Pre-1992 and Post-1992 universities concerning “lack of confidence” as another inhibitor factor. Emelda who faced this problem says,

“I don’t think the unwillingness to share as a feeling that other people wouldn’t necessarily be that interested. I think it's more sort of lack of confidence. You’re (*research-academics*) doing your own project and feel hesitate to show it to people. You maybe just undervalue yourself. This is especially for new researchers.”  
Emelda

Amy also supports Emelda’s comment. She expresses,

“When I first went to the conference and presented my paper, I received harsh feedback and said to myself, let’s hide for few weeks! When you first started your career, you just have no confidence really”. Amy

From Emelda’s comment, it suggests that research-academics who still in the early career phase not only have less confident in their research works, but also in themselves. According to Emelda, professor is the right person to enhance confidence in research-academics, especially young research-academics. She claims that mentoring is one of the most effective methods to increase the level of confidence among research-academics.

“...they (*early career research-academics*) might want to be motivated or encouraged by someone in order for them to have the confidence to share their knowledge with people... that's the job of professors I believe. Mentoring is always one of the best ways to inspire people!” Emelda

This finding is akin to the earlier studies by Ayres (2006) and Williams et al. (2009), which both report that mentoring programmes help employees to cope with the challenge of their career and can assist individual learning.

Similar to Prof Rama’s view, an Associate Dean of Research in Pre-1992 universities; Prof Lee, a Director of Research in Post-1992 universities at the same



time stated that the motivation to share research-knowledge depends on the personality of individual research-academics. He uses the term “not a team game player” to describe research-academics who choose not to get involve in RKS.

“Also some of the researchers, in their opinion feel they can do the paper by themselves... why should they share it with anybody else... Also researchers are **not a team game player**. They stay in the office and do their researches... (*RKS*) depends upon the personality of the researcher.” Prof Lee, Director of Research

A response gained from one research-academic in Post-1992 universities, i.e. Helen; has substantiated Prof. Lee’s claim. Helen states that her lack of communication skills has made her feel reluctant to share research-knowledge. She says, “...I cannot communicate effectively what I want to say to people, I don't have confidence and I think that’s why I don’t share.” This communicates that an individual’s social skill is an important influential factor that inhibit research-academics from engaging in RKS.

The findings suggest that since teaching is the core activity in Post-1992 universities, a number of research-academics are less exposed to research, and hence, they have less confidence in themselves as well as their research work. This scenario has made them feel uncomfortable and resist sharing their research-knowledge with other people.

- **Fear of losing power**

Although “fear of losing power” is also recognised as an inhibitor factor in Post-1992 universities, the response is lower than Pre-1992 universities. The following are two statements commenting on this issue.

“...research has become critical to promotion... it’s where do you publish, how often do you publish, how many journal articles do you have... obviously researchers won’t share some of the tacit knowledge associated with publishing because they know that in a year, two years time they’re going to be competing for promotion against with some other people or some other colleagues in an office next to them. So they’re fear of losing their power on a

particular area of expertise... they feel threatened. Whether I feel that way or not? Very rare!” Jacky

“...if I’m being honest, I do sometimes feel unwilling and kind of worry that particularly somebody who’s in my own area within my youth and we’re sharing knowledge and that one of us might lose our expertise or power...” Catherine

Clearly, “fear of losing power” is not an important inhibitor factor for most research-academics in Post-1992 universities. This implies that with regard to RKS, the atmosphere in Post-1992 universities is less competitive as compared to Pre-1992 universities. It communicates that in a university with less competitive environment, research-academics are less competing with each other. Thus, majority research-academics in Post-1992 universities do not fear that their power is in jeopardy when sharing their research-knowledge with other people.

#### ▪ **Lack of trust**

Another inhibitor factor is lacking of trust. Similar to Pre-1992 universities, research-academics in Post-1992 universities also regard trust as an important element that influences their RKS behaviour. Frederick, for example expresses that he feels hesitate to share research-knowledge with people whom he does not trust. He said, “I would be unwilling to share with a stranger, someone I don’t know very well... I would be reluctant, how much I can share.”

Catherine shares her experience sharing research-knowledge with someone she barely knew, and as a result her ideas have been stolen.

“I wouldn’t do it (*sharing research-knowledge*) with everyone... I have an incident. It was where I talk to somebody I don’t really know about something and then six months later it comes out as a paper with their names on it... I do worry... I’m guarded with certain people I trust.” Catherine

The finding suggests that trust is a key influential element for RKS regardless of types of universities. Without it, research-academics at large often feel unsafe to engage in RKS.

### ▪ **Time constraint**

As shown in Figure 6.8, “time constraint” is another inhibitor factor discovered in Post-1992 universities. The issue of time constraint is linked to the teaching loads. Catherine and Frederick both claim that the heavy teaching loads limit their involvement in RKS.

“I have a quite heavy timetable, teaching timetable. So this is kind of depressing me sometimes to keep doing research or even share my knowledge.” Catherine

“I remember when I started five years ago... or six years ago we had more time to do the research compared to now... People are keen to share their knowledge and do joint-project, but now it’s about finding the time...” Frederick

This is akin to the findings reported by Nonnecke & Preece (2001) that one of the most frequently cited reasons for not sharing knowledge is the lack of time due to greater prioritization of other interests.

Although this issue has only been discovered in Post-1992 universities, it has gained attentions from many research-leaders in both types of universities. Associate Director of Research in Post-1992 universities, Prof Gerald, shares his experience in regards to teaching loads.

“...they (*research-academics*) still had to do a lot of teaching and the research was suffering in my own experience... certainly been suffering as a result of trying to deliver teaching to large student course. So, that part has been very challenging.” Prof Gerald, Associate Director of Research

At the same time, Prof Rama, an Associate Dean of Research in Pre-1992 universities also shares the same view.

“Normally the limitation is... as the time scale involved and people commitment into other areas, so it is more pragmatic concern in that respect”. Prof Rama, Associate Dean of Research, Pre-1992 universities

Also, Prof Augustus, an Associate Dean of Research in Pre-1992 universities stresses that the balance between teaching and research is very critical for every research-academics regardless of types of universities. This implies that the time spent by individual research-academics on teaching could strongly influence their commitment on research, and hence affecting their RKS behaviour. This finding has confirmed findings by Hew & Hara (2007) that the little amount of time set aside by individuals in their daily schedule hold back individuals from sharing their knowledge with other people.

Similarly, a professor, Dr Stacy in Post-1992 universities, explains that research-academics in Post-1992 universities need to be capable of doing both teaching and research. She claims that at certain point of time in a year, due to teaching loads and other administrative tasks, the commitment in research is paused.

“In a teaching-intensive university you (*research-academics*) do have kind of commitment to show you can teach as well. ...it’s been a lack of respect to people who just do research and don’t teach. There is a slightly pressure on you, in order to be able to satisfy all those different needs of the university...

The university do have pressures on them, in terms of admin commitments... teaching commitments... And so it’s not always possible to do that (*RKS*) ...the idea is to back off at certain time and accept that you’re not gonna get the output, you’re not gonna get the enthusiasm at certain period of the year...” Dr Stacy, Professor

However, Prof Samuel, a professor in Pre-1992 universities disagrees with the claim made by Dr Stacy. He argues that there is no difference between Pre-1992 and Post-1992 universities with respect to teaching loads. He claims that it all depends on the behaviour of individual research-academics.

If they’re (*research-academics in the UK Post-1992 universities*) comparing our teaching loads with them, well, that’s just an excuse!... For some people if you give them all the time for research, they won’t be publishing in the top ranked journals, they will just do less work. Some of them get only one module to teach a year but they still don’t publish in four star publication. Some people manage to get four star publications with the same amount

of teaching... So you can't make that argument. It's about how productive you are." Prof Samuel, Professor, Pre-1992 universities

Ogawa from Pre-1992 universities, who has previously experienced working in one of the Post-1992 universities, shares his experience about teaching and research. While agreeing that the amount of time spent on teaching in his previous workplace (i.e. Post-1992 universities) was higher as compared to his current workplace (i.e. Pre-1992 universities), Ogawa stresses that the quality of students play an important role. He says,

"You teach more hours at the new university (*Post-1992 universities*) compare to an old university (*Pre-1992 universities*). That is first of all true! However...the students are very different and the level of teaching is very different... I certainly have less hours to teach but I have to prepare much, much more because the students are much more demanding here (*Pre-1992 universities*) ...they challenge you much more, which also mean then you have to work harder to make sure that actually the lecture is on the right level. In terms of teaching level at (*Post-1992 universities*)... If you simplify, you take any time to prepare... So of course you have more hours there to teach, but you are not really challenged in class. No one asked any questions, people don't send you email, people don't come to your office and you just left alone to a large extent... I would never say that now my teaching life is easier compare to before because now the level is very different...of course the hours are different but it's just one part of the story."  
Ogawa

Ogawa's comment communicates that since the quality of students in Pre-1992 universities are generally higher than those at Post-1992 universities, research-academics are most possibly facing bigger challenge in preparing teaching materials. Therefore, according to Ogawa, time constraint is not an issue, as in Pre-1992 universities despite the lesser teaching loads, the time spent to prepare for teaching is longer.

It interesting to note that a number of research-leaders discusses about the current conditions experienced by most of the UK HEIs when commenting about the time constraint issue, and that is, the increment of international students' recruitment and the increment of tuition fees. A professor in Pre-1992 universities, Prof Isabell says,

“...the university has the incentives to build its avenue by recruiting more international students... obviously they’re going to pay a lot of money! And the teachers on particular fields are going to be under very heavy teaching loads... there is an indirect effect cause by the financial crisis that is, increasing international students’ number.”  
Prof Isabell, Professor, Pre-1992 universities

The comment made by Prof Isabell suggests that research-academics in Pre-1992 universities are most likely getting higher teaching loads due to the economic unrest. This scenario may affect their RKS engagement. At the same time, Prof Heather, a professor in Pre-1992 universities claims that due to economic instability, most UK HEIs tend to emphasise on teaching activities as it is now one of the important income generators for the university.

“Everybody complaint about the amount of teaching they have to do... we’ve had to sort of shift our focus, particularly with the increase fees coming along... certainly there is an increasing pressure on people (*research-academics*) because income from teaching is so significant for all of us now.” Prof Heather,  
Professor, Pre-1992 universities

Prof Augustus, an Associate Dean of Research in Pre-1992 universities comments that there is an urgency in upgrading the delivery of teaching and learning in HEIs, which obviously challenge the Pre-1992 universities to balance up the hours between research and teaching activity.

“...perhaps everyone is not required to do active research anymore because as soon as the tuition fees comes in we are looking for more and more emphasis on how we are going to improve our quality of learning and teaching... the challenge for the university is to find this balance between research and teaching... what we are realising is we need to perhaps focus in the new kind of rapidly changing education academic and related environment in this country. We need to ask ourselves do we really want every colleague to be research-active? And the answer is perhaps, no! ...because we really need to now ensure that the delivery of learning and teaching need to be really, really excellent if we are going to charge huge amount of tuition fees.” Prof Augustus, Associate Dean of Research, Pre-1992 universities

In order to deal with such change, Prof Augustus reveals that some Pre-1992 universities have introduced the “teaching-only” post. He explains,

“...what we are pursuing in fact now, is the recruitment of teaching-only fellows. So these colleagues are not expected to do research. They solely focus on teaching... we feel it is a sensible way for work where we further enhanced quality of our learning and teaching but simultaneously we don’t want to lose or we don’t want to stop attracting leading research scholars to our place.” Prof Augustus, Associate Dean of Research, Pre-1992 universities

Although research-academics in Pre-1992 universities have not viewed “time constraint” as an inhibitor factor affecting their RKS behaviour, this issue seems to be a critically important issue discussed by research-leaders in both types of universities.

## 6.2 When sharing (or not)

Table 6.4 below summarises the emergent categories for the “when sharing (or not)” issue in Post-1992 universities after open coding and axial coding. The subcategories are ranked from the most coded to the least coded. The one factor marked with star (\*) in this table indicates the difference between Pre-1992 and Post-1992 universities, concerning this issue. It can be seen that there is no response in Post-1992 universities with regard to “only sharing research results” issue.

Table 6.4 When sharing (or not) issue in Post-1992 universities

<b>When not sharing <i>Research time frame</i></b>	<b>No. of time sources coded</b>	<b>Percentage % (N=11)</b>
Not sharing research idea	9	82
Not sharing research proposal	6	55
Not sharing research design	5	45
Not sharing research methodology	3	27
Sharing across all research phases	2	18
Only sharing research results	0	0

Figure 6.5 below indicates the “when sharing (or not)” issue in Post-1992 developed in NVivo, where the number of time sources coded by each participant is evidenced. This model only emphasise the results for the “not sharing” issue for four different

phases (i.e. research idea, research proposal, research design, research methodology), and therefore the research result phase is not included in this figure. Similar to the findings in Pre-1992 universities, results show that all research-academics in Post-1992 universities also share their research-knowledge during research result phase.

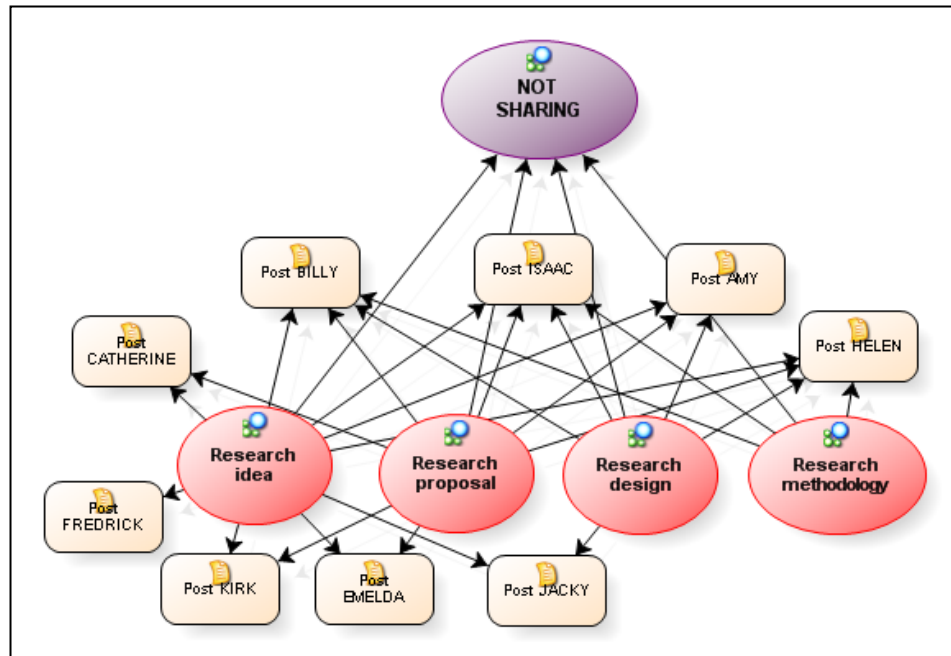


Figure 6.5 When sharing (or not) issue in Post-1992 universities and number of sources coded

- **Not sharing research idea and research proposal**

The result shows that most of research-academics in Post-1992 universities do not share their research-knowledge during research idea and research proposal phases. As what found in Pre-1992 universities, research-academics in Post-1992 universities also regard knowledge during research idea and proposal as undeveloped, and for that reason they less sharing it with other people. This finding ties back with the earlier findings, i.e. fear of stealing of ideas. Most of them do not share their research ideas and research proposal as they are fear that their ideas might get stolen or plagiarised.

Helen for example, explains that research ideas and research proposal phases are the ‘embryonic stages’. She says, “...there’s a fear that people will steal your ideas”. This is supported by Jacky. She expresses,



“...at research idea, I don't like working with other people. I tend keep it with me. Well, the idea is still uncertain. Some are not so strong. I may discuss general ideas with some colleagues but not revealing specific ideas that I have.” Helen

Amy also points out similar opinion.

“Research proposal and research idea, I don't think I share those very much. Quite often not... I don't want to share them because you might have an interesting idea so you might as well go away think about it and try out rather than sharing it... No! I don't share here (*pointing at the research idea and research proposal phases*).” Amy

This implies that unless the ideas are well-developed and strongly established, research-academics in both types of universities tend to hoard their ideas from other colleagues, as they believe it is too risky to share the undeveloped or raw ideas with other people.

▪ **Not sharing research design and research methodology**

Similar finding also has also been found in Post-1992 universities, in which research-academics in Post-1992 universities also do not share research-knowledge during research design and method phase. Rather, they are seeking knowledge from other people and at the same time hoard their own research-knowledge. Billy explains this situation by saying,

“At these two stages (*pointing at research design and research methodology*), I go and ask people, for example, “If I want to find this, what sort of research design can I follow?” So it is not really sharing... I actually ask people rather than me giving the idea.”

Similarly, Amy also says that at the research design and research methodology phases, she seeks for external knowledge in order to support her works.

“...I might go to a colleague and ask, “How do you this? I've tried myself but it didn't work out” or somebody might come and seek knowledge from me... here (*research design and method*) I rather seek for external knowledge but not sharing mine.”

- **Sharing across all research phases**

This study also indicates there is a small number of research-academics in Post-1992 universities who share their research-knowledge across all research phases. Similar to what found in Pre-1992 universities, the element of “trust” plays a key role here. Without trust, the whole RKS activity is distorted. George for example, explains that although he shares research-knowledge across research phases, this is done within certain groups of people that he trusts only.

“Well, I share at all stages really. I use the research ideas to share because I go to people I trust or people I’ve worked with before... I suppose it can happen anywhere within the time frame... It depends if you got people you trust then you may well be sharing it. It depends with whom.” George

- **Sharing at research result**

As what shows in Pre-1992 universities, the results also show that all participants in Post-1992 universities unanimously confirm that they are sharing research-knowledge at the research result phase. Catherine said,

“When it comes to sharing, the key idea is really sharing the result. When you’ve got something to publish and again when you’ve got the result”. Catherine

Frederick similarly expresses,

“The highest risk is here (*pointing at research idea*), the lowest risk will be at the end of the project and I obviously share most here (*pointing at research result*).” Frederick

Kirk also points out the same thing about this issue.

“I would normally start to share it with public when my ideas are fairly strong, to be specific at the research results stage not at the very beginning stage definitely.” Kirk

This finding suggests that regardless of types of universities, research-academics at large feel secure sharing research results as compared to other research phases.

As stated in Chapter 5, this study has discovered a distinctive finding concerning the RKS process in both types of universities. The results notify a number of research-leaders in Post-1992 universities also claim that that RKS need to be managed carefully. In other words, research-leaders in both Pre-1992 and Post-1992 universities argue that research-knowledge cannot be simply shared at all times across the research timeline. At certain point of time, research-knowledge needs to be hoarded. The following are the excerpts from research-leaders in Post-1992 universities with regard to this issue.

“Not all knowledge can be shared with people. There’s something you must hold on to. Wait until the right moment of time then you open it to public.” Prof Gerald, Associate Dean of Research

“There’re always risks when sharing your knowledge with people. You’ve got to be careful what and when to share. Never share everything all the time to everyone. That’s the skills people (*research-academics*) have to have.” Prof Edmund, Professor

“Clearly one has got to be clever enough what knowledge they’re sharing with people and when they should start sharing it. Well, obviously not everything you can disclose to public... if you have a rough idea that you’re not sure about, keep it to yourself until the point when you feel the idea is strong and you know what you’re going to do with it. That’s how things work.” Prof Wither, Professor

### **6.3 What to share**

The findings indicate the type of knowledge shared by research-academics in Post-1992 universities varies in two patterns, i.e. sharing both tacit and explicit knowledge and sharing mainly explicit knowledge. Table 6.5 below represents the emergent categories for the “what to share” issue in Post-1992 universities after open coding and axial coding. The subcategories are ranked from the most coded to the least coded. The factor marked with star (\*) illustrates the difference between Pre-1992 and Post-1992 universities.

Table 6.5 Types of knowledge shared in Post-1992 universities

What to share	No. of time sources coded	Percentage % (N=11)
<i>Types of knowledge shared</i>		
Sharing both tacit and explicit knowledge	8	73
Sharing mainly explicit knowledge	3	27
Sharing only explicit knowledge*	0	0

From the above table, no one in Post-1992 universities shares only explicit knowledge. Figure 6.6 illustrates the model for “types of knowledge shared” in Post-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

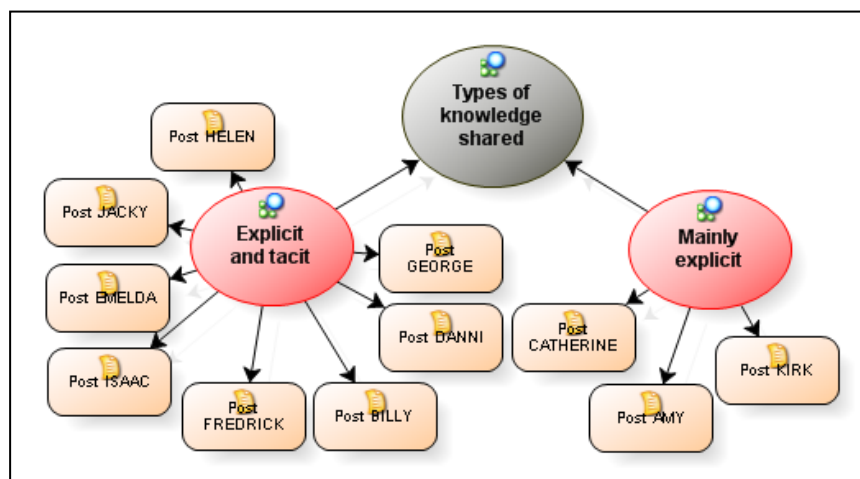


Figure 6.6 Types of knowledge shared in Post-1992 universities and number of sources coded

- **Sharing both tacit and explicit knowledge**

As what found in Pre-1992 universities, results show that in Post-1992 universities majority research-academics also prefer sharing both tacit and explicit knowledge when sharing research-knowledge. Likewise, most of them state that tacit and explicit knowledge are inseparable. Emelda for example, says that she cannot separate between tacit and explicit knowledge, where most of the time she shares both types of knowledge even without realising it.

“I don’t think I can separate between the two. Well, you know, especially when you’re sharing it with anyone interested, so kind of share both knowledge without you realise it.” Emelda

In line with Iola' and Ogawa's comments in Pre-1992 universities, George and Isaac also indicate that the sharing of tacit and explicit knowledge mostly depend on the person that they talk to. Both of them claims that tacit knowledge is often shared with people working on the same area, whereas explicit knowledge is shared with people who have less knowledge about their area of research.

“Depends with whom I'm talking to. If I'm talking to people who understand what I'm talking about then it will be tacit knowledge and if its people who are a little bit more distance to my area then it will be explicit knowledge. So it's mainly mixed of both. If I think about having a conversation with someone in my field then it's gonna be tacit...” George

“But the tacit knowledge what embedded in the mind of individual... for example if I'm having a glass of wine with another lecturer and I'm trying to work through part of my research, I will make the effort to try and get the information across but you need somebody that is quite like-minded because otherwise it is very difficult to try and price out the detail of what you're trying to explain... which is why explicit knowledge is generally use for wider audience...” Isaac

In contrast, Helen explains that she uses tacit knowledge when dealing with people who have less knowledge about her research area as she needs to use her experiences (i.e. tacit knowledge) to explain about her area in depth. In terms of explicit knowledge, she shares it when talking to colleagues in the same area.

“Maybe when I'm talking with a colleague, somebody who is at the same area as me, then it is enough with just explicit knowledge. Sometimes when you also deal with people who are completely vague in what you are doing, need some explanation at some level I think tacit helps where you talk about your own experiences. You try to facilitate people to get work through things with issues related to research and I think tacit is quite important.” Helen

The results suggest that research-academics' belief toward the nature of tacit and explicit knowledge most likely determine the types of knowledge shared with other people.

Interestingly, Frederick expresses that although he shares both types of knowledge, the sharing of tacit knowledge is more risky. According to Frederick, the tacit ideas might easily get stolen, whereas the sharing of explicit knowledge is much safer.

“...explicit knowledge if you (*research-academics*) publish it, it’s formally available... it’s more straight forward... and I think with the risk this (*explicit knowledge*) this is quite safe because if it is publicly available... there is always a way sort of to prove that the work is yours. With tacit one of the problem is there is sometimes no way to prove that you’ve contributed. So you know if we just have a chat and we exchange the ideas and someone pick it up and start building on it, I don’t have a formal proof to say that this is my ideas.” Frederick

In a sense, this implies that some research-academics are fear that their tacit knowledge might get stolen easily if they are not careful when sharing them with other people. Thus, it may jeopardise their research work as they are competing for sustainable research track records.

#### ▪ **Sharing mainly explicit knowledge**

The findings indicate that a number of research-academics in Post-1992 universities also prefer sharing more explicit knowledge than tacit. Catherine personally describes that explicit knowledge is easy to quantify because it appears in written form, as compared to tacit knowledge which embedded in mind.

“Well I think explicit simply because it’s more easy to quantify, whereas the tacit knowledge is more sort of what’s in your mind. So because of that, the explicit knowledge is always something you share more because generally when you give a paper, you normally have something that’s almost written, rather than something that’s in your mind... my research funding applications are on tacit knowledge, and my research papers that I present are my explicit knowledge and I applied them both... the explicit is mostly dominated because I have more papers on research funding applications.” Catherine

Catherine also explains that the sharing of explicit knowledge is where an individual research-academics present research papers in conferences. She says this in events like research conferences; the sharing of tacit knowledge is not included. A statement from Amy also supports Catherine’s comment. She states,

“I share mostly explicit knowledge when I present my papers at the conferences and I will share some tacit knowledge if the conversation is going further after the presentation. For instance, someone said after my presentation, “I’m interested with your area, can we have lunch together so we could further about what you’re doing”. But overall, I believe I share explicit more often.” Amy

Catherine’ and Amy’s ideas correspond to Haldin-Herrgard’s (2000) statement, who indicates that tacit knowledge can neither given in lectures nor found in databases, textbooks, manuals or internal newsletters for diffusion.

On the other hand, Kirk states that he prefers sharing more explicit knowledge as compared to tacit because he shares only mature ideas with people. Kirk said that he tends not to share research-knowledge with people at the research idea and proposal phases.

“I might be sharing more explicit than tacit because as I said, I would normally share my ideas when it is more mature in a sense and that would be something written rather than rough ideas.” Kirk

As reported in Chapter 5, the sharing of tacit and explicit knowledge is much determined by the research timeline of a particular research project. The sharing of explicit knowledge is found to be much freely shared as compared to tacit knowledge.

#### **6.4 How to share**

As explained in Chapter 5, the “how to share” factor represents the most preferred channels of communication used for sharing research-knowledge. Table 6.6 below represents the emergent categories for the “how to share” issue in Post-1992 universities after open coding and axial coding. The subcategories are ranked from the most coded to the least coded. The factors marked with star (\*) illustrate the differences between Pre-1992 and Post-1992 universities concerning this issue.

Table 6.6 Communication channels in Post-1992 universities

How to share <i>Communication channels</i>	No. of time sources coded	Percentage % (N=16)
Face-to-face	7	64
Face-to-face & virtual	3	27
All three channels	1	9
Written*	0	0
Virtual*	0	0

As shown in above, when sharing research-knowledge, research-academics in Post-1992 universities do not prefer using written and virtual channels independently. Figure 6.7 illustrates the model for communication channels in Post-1992 universities and factors relating to, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

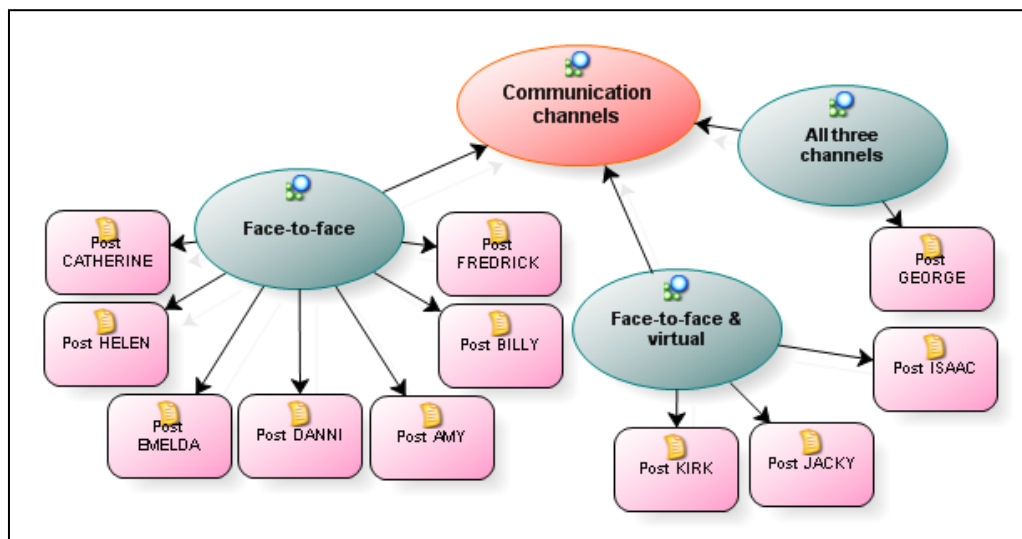


Figure 6.7 Channel of communications in Post-1992 universities and number of sources coded

▪ **Face-to-face channel of communication**

Similar evidences were found in Post-1992 universities; in which research-academics in Post-1992 universities at large indicate that face-to-face is the best way for sharing research-knowledge. Emelda uses the word “effective” to describe the usefulness of face-to-face communication.



“Obviously face-to-face because I can read their mind by looking at their face and their eyes. So it is kind of more effective for me”.  
Emelda

Helen also agrees that face-to-face is the most effective channel for sharing research-knowledge. She explains that face-to-face communication is useful because people can, “...read somebody’s facial expressions”. On the other hand, Billy claims that virtual communication is the best substitution for face-to-face communication for people with geographical constraint.

“I read something about ‘information richness theory’, where they think that face-to-face is the richest way of communication. So there’s no doubt that face-to-face is the best way or effective because you can almost clarify all issues that you don’t understand... but I can understand geographical constraint would mean that virtual communication is better.”

Billy has mentioned the term “information richness” in his comment. According to Daft & Lengel’s (1986) information richness (also known as media richness) is defines as “the ability of information to change understanding within a time interval” (pg 560). In other words, the longer the time taken to understand a particular message, the lower the richness of that communication.

As what found in Pre-1992 universities, it has been discovered that in Post-1992 universities, the usage of communication channels also varies across research time frame. Danni, for example, states that during research ideas and research proposal phases, face-to-face communication is necessary as human or personal interaction is important. Then as the research moves on to further phases, it could be substituted with virtual communication.

“I would say that research idea bit has to be face-to-face. Even research proposal bit has to be face-to-face that I would say at the beginning is a face-to-face. It’s a human thing. It’s the interaction thing and you can’t take away the value of that. And then later on as you designing it further, as you developing it, as you structuring it better then yes, the sort of email, video conferencing or telephone conferencing (*virtual communication*). So idea generation bits are

very much a face-to-face and later on as you develop that collaboration then you can build on using electronic.” Danni

Frederick also agrees that during the first two research phases, face-to-face communication is the best channel because at these early phases, people need to brainstorm ideas so they can have direct interaction. Then at the research design and research methodology, written or virtual communication is acceptable.

“I prefer face-to-face because I’m visual and I also react to people’s voices. I’m sensitive to sound and also I want to read the body language. For me I believe it depends at what stage. I think the first two stages (*research ideas and research proposal*) I think it’s better if you can share the knowledge face-to-face because it is sort of brainstorming environment, so it’s ineffective if you don’t have immediate interaction. With research design and research method you can sort of share knowledge more over the Internet, emailing or sending your stuff and definitely research results can be done this way.” Frederick

#### ▪ **Face-to-face & virtual communication**

As what found in Pre-1992 universities, some research-academics in Post-1992 universities also prefer using both face-to-face and virtual communications. Likewise, research-academics in Post-1992 universities claim that virtual communication operates like face-to-face communication. Jacky for example, states that virtual communication “...in some way is also face-to-face, like Skype or any type of video conferencing via the Internet”. According to Isaac,

“...although it’s (*virtual communication*) not quite the same as being in the room with somebody all the way, I suppose it’s the second best that you can get”.

Interestingly, Kirk says that face-to-face as ‘classic’ face-to-face communication, while virtual is ‘modern’ face-to-face communication.

“...the way I see it (*virtual communication*) is, it’s kind of overlapping with ‘classic’ face-to-face. I would say virtual communication is a ‘modern’ face-to-face communication, for example Skype.” Kirk

- **All three communication channels**

Similar to the results shown in Pre-1992 universities, a small number of research-academics in Post-1992 universities also use all three channels when sharing research-knowledge. George says when seeking knowledge, he prefers doing it face-to-face or reading written papers, whereas when sharing his own research-knowledge with other people, he rather shares it through virtual or face-to-face communication.

“Depends entirely on what the information I’m looking for... I prefer to listen to someone present the paper... I might read it as well but I might read it afterwards or just a minute before hearing them present. If I was going to share my knowledge, I guess I do it through email or personal meeting.” George

The findings suggest that research-academics in both Pre-1992 and Post-1992 universities consider the function of virtual channel (e.g. Skype video/voice call or other video conferencing) is just like face-to-face, in which virtual channel also enables them evidence other people’s body language and facial expression.

## **6.5 The influence of KS enablers on RKS behaviour**

As stated in Chapter 5, the KS enablers refer to people, organisation, IT. The following subsections report results for each enabler separately.

### **6.5.1 People as an enabler**

The findings show a slight different pattern in Post-1992 universities with regard to people enabler. Table 6.7 below represents the emergent categories for people enabler in Post-1992 universities after open coding and axial coding. The subcategories are ranked from the most coded to the least coded. The factors marked with star (\*) illustrate the differences between Pre-1992 and Post-1992 universities.

Table 6.7 People enabler in Post-1992 universities

People enabler	No. of time sources coded	Percentage % (N=11)
Research-leader as inspirer	8	73
Formal & informal interaction with other colleagues	5	45
Research-leader as mentor	1	9
Research-leader as role model*	0	0

As shown in the above table, unlike Pre-1992 universities, no one in Post-1992 universities see their research-leaders as role model. Figure 6.8 illustrates the model for “people as enabler” in Post-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

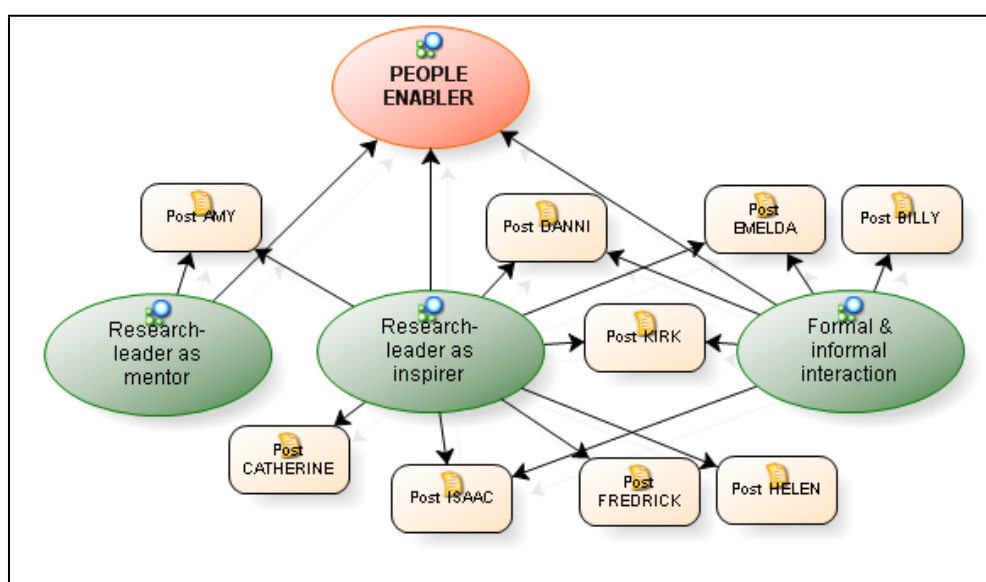


Figure 6.8 People enabler in Post-1992 universities and number of sources coded

- **Research-leader as inspirer**

The findings show that majority of research-academics in Post-1992 universities view their research-leaders as inspirers who have positively influenced their RKS behaviour. Amy and Helen both confirm that they are inspired by their research-leaders, especially in terms of publications.

“The Deputy Dean of the Business School, he is 33 years old but has 40 outputs. That is inspirational! I mean, how do you do that?”  
Amy

“...I send him (*research-leader*) email saying that, “I try to bid for this thing but I wasn’t really sure I can register for it”. And she went back to me and she said, “I myself have done it”. And I think I remember that when he said, “I myself have done it” and that inspired me. So for me I remember of her support. Having her said “I myself have done it”, I did it! I think that I would seriously consider that as an inspirational leader.” Helen

As what reported in Pre-1992 universities, majority research-leaders in Post-1992 universities also see that their key role is to support research-academics in terms of RKS engagement. Table 6.8 below shows their comments.

Table 6.8 Comments from research-leaders about being an inspirer for RKS

Alias	Position	Excerpts
Prof Cameron	Associate Dean of Research	“I very much encourage people to disseminate their knowledge even after they’ve published their papers because the lack in publication is huge... I also encourage people to circulate a working paper series... I’ve spoken to people and I’ve gone through some of their ideas... I’ve investigating Research Centres of Excellent, which are very, very important. I’ve also, along with other professors developed the research seminar series... people are encouraged to give their papers.”
Prof Edmund	Professor	“...I act as mentors to emergent researchers at the Business School. We ( <i>research-leaders</i> ) do spend time with them, we try to see them regularly anyway and give them advice with regards how to complete their research, give them feedback on papers and writing, give them advice on research grant bidding. But equally what we’re trying to do is involved them or sub them into existed research team if they’re interested and if possible.”
Prof Wither	Professor	“...we ( <i>research-leaders</i> ) identify, we disseminate opportunities, we train people to bid, we mentor them, we partner people with experience bidders, we run events to show what a good bid is and what a poor bid is... I’ve been along all the people that I have within my centre to talk about what they’re doing and to share with each other and to identify how they will leverage that knowledge together.”
Dr Stacy	Professor	“My job is to go to research meetings... to encourage people here to do research and papers, just to keep the culture alive as much as possible. We ( <i>research-leaders</i> ) help them to complete research grants... I’m a supervisor for a couple of the staff as well that do PhD. I also do mentoring.”

### ▪ **Formal and informal interaction with other colleagues**

The findings also show that almost half of research-academics in Post-1992 universities indicate that both formal and informal interactions they have with other colleagues is supportive for their RKS behaviour.

“On individual basis, we just email each other, go for coffee or lunch and discuss about papers. It’s more informal, but it is supportive.” Billy

“We have regular informal meetings. We all are in the same corridor mostly. So there is an informal as well... you might have meeting informally next to the photocopier or waiting the kettle to boil and sometimes things like that comes up informally...” Emelda

“...we’re all interested in research, we support each other and we seek for opportunities to share knowledge informally.” Danni

On the other hand, Kirk explains about team writing when discuss about this issue. According to Kirk, team writing is some kind of informal meeting held within the department, which gathers research-academics and research-leaders together.

“The idea of team-writing is about encouraging groups of academics to work together on joint research and writing for publication to help raise their research profile and that of the school. It is usually initiated by the academic or suggested by a senior researcher and helps bring on new researchers who have limited experience of getting published. I think that’s something we want to really embed within the school to help to develop research culture.” Kirk

### ▪ **Research-leader as mentor**

At the same time, the finding indicates that a number of research-academics also claim that by having research-leaders’ roles as their mentors, their RKS behaviour is enhanced. A statement from Amy explains this situation.

“They’ve (*research-leaders*) been supportive, they’re suggesting things, they’re suggesting in joint-papers...” Amy

Few research-leaders in Post-1992 explain about their roles as mentors to a number of early career research-academics.

“I mentor some of young researchers with their research and then they're trying to get out there but the world of research is so wide and so complex and they don't even know where to start, and so with senior researcher to work with them, to help them, to guide them and then develop their area a bit better until they become developing researcher. So this is some of what I do.” Prof Gerald, Associate Dean of Research

“I mentor different people so that they come with research ideas and I talked through how they possibly could do or approach the research and also how to put a bid. I help them with the application and things like that. So it's that kind of input that I give wherever possible and really the main task is to try and keep the enthusiasm and see that it's very, very important to do research and keep sharing your knowledge with them.” Dr Stacy, Professor

### **6.5.3 Organisation as an enabler**

With regard to organisation enabler, similar results are found in Post-1992 universities. Table 6.9 presents the emergent categories for organisation factor in Post-1992 universities after open coding and axial coding. The subcategories are ranked from the most coded to the least coded. The three factors marked with star (\*) illustrate the differences between Pre-1992 and Post-1992 universities concerning organisation enabler.

Table 6.9 Organisation enabler in Post-1992 universities

Organisation enabler		No. of time sources coded	Percentage (N=11)
Categories	Subcategories		
Research strategy	Research budget	6	55
	Research centre	5	45
	Workload system	4	36
	Mentoring system	3	27
	Newsletter	2	18
	University research publication	2	18
	Working paper series	1	9
	Annual review	1	9
	Intellectual Property support	1	9
	Research incentives	1	9
	<b>Research academy*</b>	<b>0</b>	<b>0</b>
	<b>Sabbatical policy*</b>	<b>0</b>	<b>0</b>
	<b>Special interest group*</b>	<b>0</b>	<b>0</b>
Research events	Research seminar	7	64
	Research conference	2	18
	Research meeting	2	18
	Research workshop	2	18
	Away day	1	9
	Inaugural lecture	1	9
	Research forum	1	9
	<b>Lunch time meeting*</b>	<b>0</b>	<b>0</b>

#### D) Research strategy

It has been noted from Table 6.9 that in Post-1992 universities, no one has mentioned about sabbatical policy, research academy, and special interest group when discuss about organisation enabler. This might be the case in which research-academics in Post-1992 universities feel that these three elements are less effective in supporting their RKS activity. Figure 6.9 illustrates the model for research strategy in Post-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.



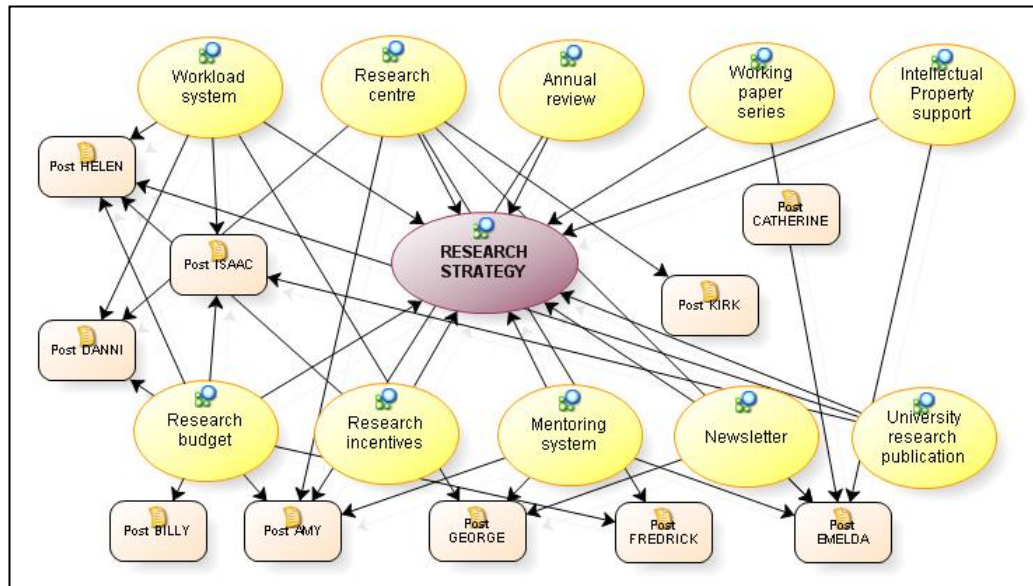


Figure 6.9 Research strategies in Post-1992 universities and the number of sources coded

Results show 11 elements have been grouped under “research strategy” category in Post-1992 universities. Table 6.9 above indicates that more than half research-academics in Post-1992 remark that the university research budget is supportive for their RKS activity. Helen and Isaac both explains that the university has allocated some budget for research-academics to attend some useful research events organised locally and internationally, which is supportive for their RKS activity.

“...officially they (*the university*) will provide you on financial support for this conferences and seminars and workshop too.”  
Helen

“They (*the university*) provide the resources for us to be able to go and attend different conferences and workshops across the world so that we can actually provide our own platform to get our information out there and to provide feedback for us, which is very important.” Isaac

The findings indicate a big gap between Pre-1992 and Post-1992 universities with regard to research centre. Almost half of research-academics in Post-1992 universities repeat the same thing, i.e. the university research centre is a very supportive for their RKS engagement. A statement from Emelda clearly evidence this issue.

“...their (*research centre*) agenda is to support research and that involve people who are likeminded people and they have particular knowledge in particular area. I see this as a useful platform for us to share knowledge.” Emelda

On the other hand, similar result is found in both Pre-1992 and Post-1992 universities, concerning the workload system. Like Doherty and Ogawa, research-academics in Pre-1992 universities, Danni also states that the university workload system helps research-academics to balance up between research, teaching and administrative tasks.

“They (*the university*) try to balance up the allocation of time for teaching and research for everyone. We do have a process in place, which is called RC1, where we fill in the application form for research credits.” Danni

An Associate Dean of Research in the Post-1992 universities, Prof Cameron, says that the allocation of workloads of individual research-academics is depending on their research publications. He explains that the amount of research publication will offset the teaching hours of a research-academic. He also describes how research-leaders try to systematically allocating the teaching hours in order to afford research-academics more time to be involved in RKS.

“There’s less teaching, less administration as the results of publications because essentially what happens is its part of the allocation of workloads and they get an exemption for that... also we try to essentially allocate their teaching within two or three consecutive days in one semester, and that to give time to do research and produce more papers. That’s not always guaranteed, but we’re trying.” Prof Cameron, Associate Dean of Research

The results show a slight difference with respect to the mentoring systems in Pre-1992 and Post-1992 universities as another way to support RKS among research-academics. Unlike Pre-1992 universities, only a small number of research-academics in Post-1992 universities claim that mentoring system is not widely practiced within the university as to support RKS behaviour among research-academics. Below are evidences from Emelda and George who explains about the practice of mentoring system in Post-1992 universities.

“When new colleagues join the university mostly on the teaching side of things, obviously their research interests are taken into account. And when they’re actually arrived the research professors will go and ask them “What are you interested in? Ohh, I can think of something you might be interested in”. So they do try and draw people in...” Emelda

“There are mentoring systems as to help and guide new staff. We are just part of BAA Mentoring Scheme so we got some professors from other university coming to support the early career researchers.” George

However, a professor in Post-1992 universities, Prof Wither, comments that the mentoring system help to enhance research profiles, research plan and most importantly to support RKS.

“We have, system of mentorship, where we help develop research profiles, research plans and again that of course knowledge sharing, we are talking about how we can make the most of the knowledge which is there...” Prof Wither, Professor

Other research strategies like newsletter, university research publication, working paper series, annual review, Intellectual Property support, and research incentives have also been identified in Post-1992 universities. As what found in Pre-1992 universities, research-academics in Post-1992 universities also view that these elements are supportive to enhance their RKS behaviour. The following excerpts contain evidences for some of these points.

“There’s a **newsletter**. I don’t know how often that comes out. Maybe once a term. It contains things like sort of high level projects that people have won. It’s useful way of sharing knowledge.” George

“There are also **university-based research publications**. They tend to be within specific areas... They act like a journal within the university. So that’s the platform been able if you like to present your research and share your research...” Isaac

“...there’s a **working paper series** that the university will actually put something in prints for you, so that you can start circulating that as an official working papers of the university and then it can be hosted online. People can have a correct citation for that work and that sort of thing.” Amy

## II) Research events

With regard to research events, the finding in Post-1992 universities is slightly different from Pre-1992 universities. As shown in Table 6.9 no one in Post-1992 universities talks the lunch time meeting as an element supportive for RKS. Most importantly, there is an additional element mentioned by research-academics in Post-1992 universities, and that is research workshop. Figure 6.10 illustrates the model for research event in Post-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

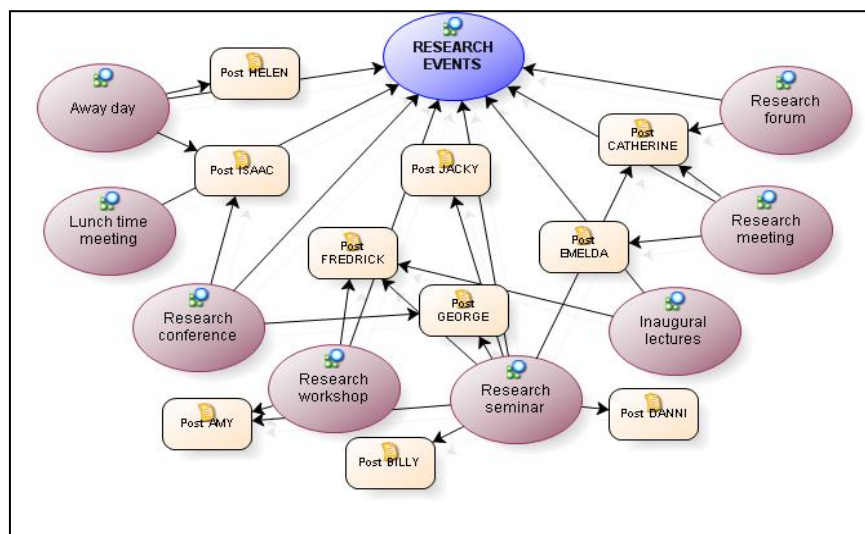


Figure 6.10 Research events in Post-1992 universities and the number of sources coded

Similar to the findings in Pre-1992 universities, majority of research-academics in Post-1992 universities also claim that research seminar is the most effective way to support their RKS behaviour. The following excerpt is quoted from George concerning this issue.

“There are seminars that people run on their projects, on their work in progress, they can present their work to people.” George

Prof Gerald, an Associate Dean of Research explains the importance of research seminar in supporting RKS.

“...research seminar series where people go and talk about their research, how they’re developing, what are published or if they’re

about to publish you know, what sort of research findings, what possibilities are the challenges and then they (*research-academics*) get an area.” Prof Gerald, Associate Dean of Research

Apart from that, research conference, research meeting, research workshop, Away Day, inaugural lecture and research forum have also been identified as supportive elements to enhance RKS behaviour among research-academics. The following excerpts contain evidences for some of these points.

“Within the university we’re running tonnes of **research conferences**, so you would expect most the internal people to go to, apart from external as well and people are sharing knowledge with each other.” George

“...this **research meeting** that we have are purely for people to talk about the research they’re doing and anybody can add to the agenda and we usually try if it all possible to come up with one person who can then maybe give a part of presentation about the ongoing research, usually to get feedback from other people.” Emelda

“We also have **Away Day**. We had a research trip to Belgium, where the whole department went away so we had no distractions in relation to teaching and administration and we talked purely about different people’s research and how we could help each other and how we could cooperate together to try and build some of our research as well.” Isaac

### 6.5.2 IT as an enabler

With regard to IT enabler, only a small difference has been spotted in Post-1992 universities as compared to Pre-1992 universities. Table 6.10 below presents the emergent categories for IT enabler in Post-1992 universities after open coding and axial coding. The subcategories are ranked from the most coded to the least coded. The two factors marked with star (\*) illustrate major differences in between Pre-1992 and Post-1992 universities, concerning IT enabler.

Table 6.10 IT enabler for RKS in Post-1992 universities

Technology factor	No. of time sources coded	Percentage (N=11)
Research database	5	45
Email	2	18
Data analysis software	1	9
University website	1	9
Digital media*	0	0
Online research repository*	0	0

Figure 6.11 illustrates the “IT enabler” model in Post-1992 universities and factors relating to it, where the number of time sources coded by each participant is evidenced. This model is developed in NVivo.

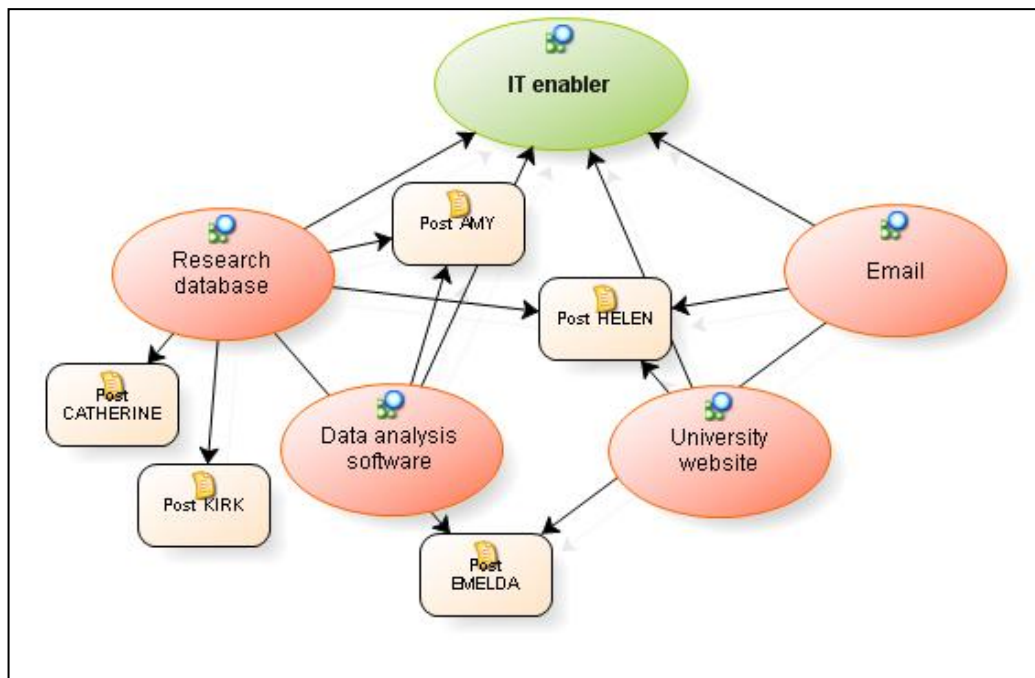


Figure 6.11 IT enabler in Post-1992 universities and the number of sources coded

The finding indicates a big gap between results in Pre-1992 and Post-1992 universities with regard to research database. It has been evidenced that in Post-1992 almost half of research-academics repetitively mention that research database is an effective IT infrastructure supportive for RKS. Helen, for instance explains that research database enables other research-academics getting access to other people’s research projects.

“...they (*the university*) developed research database, where everybody has to upload on this database. You (*research-academics*) have to give information about what you’ve done and what report what you’ve retained and this database is available so we all have to put our information on... if you are also looking for somebody who you can share with or talk to or communicate to and find out what they are doing then that database is available... that is useful and helps people to share knowledge.”

This implies that in a way to enhance research culture within the university, the research database is used as a platform to spread out information about research activities or research projects undertaken by research-academics in Post-1992 universities. Hence, it is most possibly helpful to motivate other colleagues to engage in RKS.

Other than that, factors like email, data analysis software, and university website have also been discovered in Post-1992 universities. However unlike Pre-1992 universities, research-academics in Post-1992 universities have not mentioned about digital media and online research repository as another supportive elements for RKS. In a sense, this communicates that Pre-1992 universities is a step ahead as compared to Post-1992 universities, in which some Pre-1992 universities have practiced more advance IT infrastructures to support RKS.

Nevertheless, when comparing all the three KS enablers (i.e. people, organisation and IT), it has been noted that the IT enabler has gained the least attention from research-academics in both types of universities. This implies that regardless of types of universities, research-academics at large consider that “softer” issues like interaction with other colleagues, guidance from research-leaders, research strategy as well as research events are more supportive than the “hard” element like technological infrastructures. This supports the findings reported by Lee & Choi (2003) that high technological support implemented in the organisations is less important for employees with low trusting relationship.

## 6.6 The influence of research-leaders

A similar result is reported in Post-1992 universities concerning the influence of research-leaders issue. This refers to the role of research-leaders in supporting research-academics to engage in RKS. The result shows that all research-academics in Post-1992 universities state that there is a relationship between their RKS behaviour and research-leaders. Garry, for example comments that,

“...the culture is generated from the leaders to lower level lecturers or research staff and this is certainly important. If the leader doesn't encourage other people then the lower level staff cannot get the culture and cannot be part of the organisations... There is a correlation! Research-leaders' encouragement put a pressure on the researches to have good work, to work more and so we feel the leaders really want to encourage us and we're working hard to have good outcomes... because the leaders is working hard and so we want to work harder to increase our research output.” Garry

It interesting to note that, although research-academics in Post-1992 universities agrees that RKS behaviour and research-leaders are interrelated, they claim that at current state, there is lacking of research-leaders' support in the university. The following statements are the example of comments gained by some research-academics in Post-1992 universities.

“The two must be closely connected...but most of the time we don't see much of this in practice, which is a shame!” Danni

“There is a strong relationship there, but unfortunately in reality they're not related in terms of support or inspiration. They're supposedly related!” Emelda

As explained in Pre-1992 universities, some research-academics in Post-1992 universities have shared their opinions about why some research-academics deny the relationship between RKS behaviour and research-leaders. The same two reasons that are highlighted: 1) unfavourable experience with research-leaders; and 2) research-academics' career phase. The following comments contain evidence for this issue.



“It might come from those people who **never experience any kind of support** from research-leader. They might be disappointed with less supportive culture within the university.” Billy

“these people might not denying the fact that with support from research-leaders it’ll be very helpful for them, but they might **just don’t get the support from them**, so therefore they’re making such claim.” Danni

“Quite often **they’re just lack of support!** They don’t know who to go to. They need a research-leader to mentor them and perhaps there are not enough people to go round... If you don’t know where to go and if you’re not encouraged so a lot of people can’t say that they’re connected with those research-leaders.” Kirk

“Maybe this statement comes from those **researchers with strong track record in research** so the existence of research-leader has no use to them or whatsoever.” Amy

“...they’re already **advance in research** and don’t need a leader to support.” Frederick

“...unless we’re talking about **people who have strong base on research**. They’ve done research for many years, and so whether research-leaders are inspirational, that just not bother them. They just don’t need that sort of guidance.” George

Like research-academics in Pre-1992 universities, all research-academics in Post-1992 universities also express the kind of supports they expect to gain from research-leaders. For example, Amy states that research-leaders should monitor the RKS activities, specifically research output. She says,

“...just because people know what the message (*university research target*) is, doesn’t mean they’re going to do it”. Amy

This is supported by Billy, when he states, “research-leaders should actually listen and ask, “What can I do to help your research? Not just expecting things to happen just like that!” Billy on the other hand, describes that the best way is research-leaders should start listening to the problem faced by research-academics concerning research and assist them to solve it. When asked whom he refers to when saying the word ‘the university’, Billy answers that he refers to research-leaders at the top and middle levels.

“One most important thing is they need to start listening to the problem and solve it and not only giving excuse like ‘constraint’ this and that, because I believe all universities have constraints but we’re moving to the same goal, i.e. research! So the university need to be more research-friendly, not to chase people away.” Billy

At the same time, Catherine states that she hopes to get constructive feedback from research-leaders with regard to her research works, especially about possibilities to publish papers. She also says that a clear university research policy like sabbatical policy for instance, is essential for the effective research culture. According to Catherine, instead of forcing people, a supportive culture is critical to enhance RKS behaviour among research-academics. She believes that the openness in communication across department or faculty and the availability of reward are important elements for effective research culture within the university.

“...as an early career researcher to have your work looked at by somebody more experience like professors... just gives you a comment, gives you constructive feedback so you can improve your work... They need a policy that’s transparent and straightforward so that everybody will have the same policy with regard to research, say sabbatical policy. They should create an environment, a culture, which will be easier for current and future researchers... You can’t force people to do research but can encourage by a culture of research... Policies on sabbatical here are not good at all... They should have a clearer policy for sabbatical as in the old universities... They also should encourage lots more communication across department or faculty and also rewarding people for publishing...” Catherine

Danni on the other hand, claims that he feels lack of support from research-leaders and expects to gain some facilitations from them, for example personal interaction with professors and other research-leaders. Danni’s comments communicates that the some Post-1992 universities is currently practicing a quite rigid “top-down” management approach, in which there is lacking of openness in communication between research-academics and research-leaders.

“I do feel lack of support actually for research... It seems to be a tick-box exercise. You get a form saying, “We are looking at the REF contribution this year, can you write down your top 3 publications based on star journals and other contributing factors?”

and that's it! That's all we hear from the research-leaders here... There's better way to go about it. More interactions between researchers with not just professors, but those in senior levels as well." Danni

Frederick, who see research-leaders as mentor or coach claims that he has no idea about the university research policy. He also states that there is lacking of understanding about placing a research bid. Frederick says as a foreigner, he is not aware of the some research practices like research bids and hence, he expects to gain supports from research-leaders to aid the learning process concerning this matter.

"...to be honest, I don't have a clue about it (*research policy*). I think the message is that you should publish more and you should do more research but how to do it, I don't know! No one assist us here... in the department we don't even know enough how to bid for things... most of us are foreigners. So we don't know about the culture how to bid for things, how to apply for things, so a lot of us are still in the learning process... It would be better if we have someone who could write the bids well and tell us, this is how you do this, this is how you do that, and this is the person responsible for it, if you have any question." Frederick

At the same time, George comments that it is good to have research-leaders attending university research conferences and providing supportive feedback or comments on research projects presented by research-academics. Clearly, George expects that research-leaders can share their research-knowledge as well as experiences with other research-academics at such research events.

"...they (*research-leaders*) should attend conferences and giving feedback on the presenters... commenting on people's presentations. That's good, that's very good! You're having an opportunity to talk to them... learning what they did, what they've done." George

Interestingly, Jacky see research-leaders as a "sounding board" for early and mid career research-academics, in which they can assist them in terms research publications, pass on information on research grants and also research opportunities as well as congratulate and celebrate research achievements of individual research-academics. She also states that an effective research-leader is someone who has the

ability of motivating, inspiring, setting standards, providing resources to research-academics and most importantly leading by example.

“I would say to be a ‘sounding board’ for younger and even mid range academics as to how they should publish, where they should publish, what the systems are... congratulate and celebrate research achievements, be that by email, by display cabinet with publications in it or through developing some level of a reward system. I would see the role of passing on information on research grant, research opportunities... effective research-leaders certainly need to be able to motivate, inspire, set standard and provide resources, and most important of all, they must be leading by example!” Jacky

Last but not least, Kirk expresses that he expects to see research-leaders encouraging communicating and mentoring early career research-academics. He describes that when sharing their experiences or research outputs, research-academics can spark new research ideas to research-academics. Interestingly, Kirk points out that, research-leaders at the top university level should be proud of the level of research output produced by the university. Kirk sums up that, research-leaders at the top university level need to communicate to all research-academics about the university research policy as they like to be updated with recent news concerning research. With that, he says, research-academics would more engage in RKS. In other words, Kirk expects to see research-leaders at different levels within the university to promote and inspire research-academics with regard to RKS.

“...encourage, talk, mentor new researchers. That’s where we all get inspiration from. Then listening to their experiences, listen to their research outputs and that gives you something to start to think about and something to work with. They should be proud of our research output in school... The top research-leaders at the university coming out and talking about the research policy and the strategy because I think that encourages people... research-leaders need to be public and visible... regularly update everyone as we’re very interested to know really. That’s our job. We need to know what happen and what has been put in place to face all these. So then people will say, “How can I be part of that?”... That’s really roles of research-leaders.” Kirk

As mentioned in Chapter 5, one question was raised up to research-leaders in Pre-1992 and Post-1992 universities with regard to the “the influence of research-leaders” issue. Table 6.11 contains evidences gained from research-leaders in Post-1992 universities.

Table 6.11 Research-leaders’ comments in Post-1992 universities on the influence of research-leaders in RKS

Alias	Position	Excerpts
Prof Gerald	Associate Dean of Research	“We ( <i>the university</i> ) have to have a research culture certainly to help in terms of development, encouragement, reward mechanisms and in terms of making sure that we ( <i>research-leaders</i> ) provide them ( <i>research-academics</i> ) with enough space although they will say, there is an autonomy in research... Yes, there is an autonomy in research, but there's always room for support that is needed out there. People make their own choice, yes! But honestly, I believe without such culture to support research and knowledge sharing, it's going to be hard for them because sometimes it's in the culture, so they don't realise that that is some kind of support that they receive!”
Prof Cameron	Associate Dean of Research	“Well, it's related very much! You need research-leaders and you need people driving forward, you also need people to support you and give you time for the research and share that knowledge. And that's all true! If the research culture is not there, it's much more difficult to publish. It can be still been done but it's more difficult... Research-leaders can take the university to the next level.”  “If you're a young researcher you need to be in the right research environment to do research. Research-leaders are there to mentor you ( <i>research-academics</i> ), they help you, they introduce you to their network, they read your papers, they give you ideas and make possible collaborations. The experience that you gain is absolutely huge and I feel that that is one of the ways, in which you can really, really explore yourself because if you really think about it, a lot of young lecturers coming to the game, want to do research and of course share their knowledge through publications.” In terms of research-leadership, we are making huge differences to people!”
Prof Wither	Professor	“The research-leaders is a focal point or a conjure or a facilitator for the knowledge exchange... A research-leader cannot be a research-leader unless he or she is leading in research, influencing people and that activity ( <i>RKS</i> ).”

As what reported in Pre-1992 universities, research-leaders in Post-1992 universities mainly also see their roles as setting the right research culture and environment for RKS in the university. The results also signify that research-leaders in both types of universities agrees that their roles as research-leaders is among the key influential factor that can enhance RKS behaviour among research-academics.

## 6.7 Summary

This chapter is a sequent of Chapter 5. It reports the results generated from the Post-1992 universities in relation to the six key determinants. Firstly, for the “why sharing” issue, the results indicate that there are ten motivator factors found in Post-1992 universities, which is slightly differ than those at Pre-1992 universities. No one in Post-1992 is intrinsically motivated by the REF when engaging in RKS. Also, there is an additional intrinsic reward found in Post-1992 universities, i.e. building up networking. Interestingly, majority research-academics in Post-1992 are extrinsically-driven by the university expectation in relation to RKS engagement. This shows that their interest to engage in RKS is not naturally motivated by their own interest, but largely pushed/guided by other extrinsic reward. On the other hand, for the inhibitor factors, the results indicate that most research-academics in Post-1992 universities is fear of stealing of ideas. They are also lacking of confidence to pursue RKS engagement. No one in Post-1992 universities mentioned about the unavailability of IP protection that inhibit their RKS behaviour. However, there is an additional inhibitor factor found in Post-1992 universities, i.e. time constraint. The results indicate that in Post-1992 universities, research-academics face with heavy teaching loads, which limit their time to engage in RKS. This issue has gained attention from several research-leaders from both types of universities, which mainly that there is an urgency to balance between teaching and research activity in Post-1992 universities. However, some research-leaders argue that time constraint is simply an excuse for not engaging in RKS as it is all up to the behaviour of individual research-academics.

Secondly, for the “when sharing (or not)” issue, the results reveals in Post-1992 universities are very similar with those at Pre-1992 universities. Similarly, majority research-academics in Post-1992 are refuse to share research ideas since at this time the ideas are still undeveloped and immature. They also less sharing research proposal. During research design and research methodology, they tend to seek out knowledge than sharing their own knowledge. A small number of them also share research-knowledge throughout research timeline but only with those whom they trust.

Thirdly, for the “what to share” issue, the findings again show very similar results with those at Pre-1992 universities. Similarly, some research-academics in Post-1992 universities also believe that tacit knowledge is separated from explicit knowledge, whereas some others believe that tacit and explicit are inseparable. The analysis also reveals that the research timeline influences the types of knowledge shared by research-academics in Post-1992 universities, in which at the research ideas and research proposals, tacit knowledge is mainly shared, and at later stages, explicit knowledge is shared.

Fourthly, for the “how to share” issue, the findings in Post-1992 are again similar with Pre-1992 universities. The results show that majority research-academics in Post-1992 universities prefer face-to-face interaction when sharing research-knowledge as compared to other channels. Similarly, some of them also argue that face-to-face and virtual channels are typical as some virtual channels like Skype video call. Likewise, it is suggested that the research timeline also has an impact on the choices of channels of communication chose by individual research-academic in Post-1992 universities. It is found that face-to-face communication works well in order to get ideas across effectively, whereas at the later phases, virtual and written channels are used.

Fifthly, for the influence of KS enablers on RKS behaviour, the findings show some differences with the results reported in Pre-1992 universities. For people enabler, no one in Post-1992 universities see their research-leaders as role models who support their RKS behaviour. Only one research-academic regards the research-leaders as mentor, while the rest did not. As what found in Pre-1992 universities, some of them also see the importance of formal and informal interaction with other colleagues in supporting their RKS behaviour. For organisation enabler, there is slight different in terms of research strategy in Post-1992 universities as compared to Pre-1992 universities. It is found that research-academics in Post-1992 universities are more attached to research-centres. For IT enabler, although IT infrastructure in Pre-1992 universities is more advanced than Post-1992 universities, the results indicate similar findings, in which IT enabler as less important than people and organisation enablers.

Lastly, for the influence of research-leaders on RKS behaviour, the findings indicate that all research-academics claim that research-leaders' support and RKS behaviour among research-academics are significantly related. However, they argue that at current state, there is lacking of research-leaders' support in the university. This shows that research-leaders in Post-1992 universities are less supportive as compared to those at Pre-1992 universities in encouraging and motivating research-academics to engage in RKS. Research-academics in Post-1992 universities express their expectations that they like to receive supports from research-leaders in terms of RKS engagement. Overall, they argue that research-leaders in Post-1992 universities should not only tell them "what to do" but also show "how to do" so that they will be aware how to achieve the research targets set by the universities. Interestingly, the responses gained from research-leaders in Post-1992 indicate that they are not aware of the problems faced by the research-academics in pursuing RKS engagement.



## **Quantitative analysis: Pre-1992 vs. Post-1992 universities**

### **Introduction**

This chapter presents a quantitative examination for Pre-1992 and Post-1992 universities, the results reinforce the qualitative analysis (i.e. Chapter 5 and 6). The SPSS statistical package for Windows version 18 was employed in order to analyse all the six key determinants. Following the structure designed in Chapter 5 and 6, each key determinant is represented by: (1) why sharing; (2) when sharing (or not); (3) what to share; (4) how to share; (5) the influence of KS enablers on RKS behaviour; and (6) the influence of research-leaders. The Fisher Exact Test in Chi-square was used to test the  $p$  value for the first five key determinants, whereas the Analysis of Variance (ANOVA) was employed to test differences concerning the last key determinant, i.e. the influence of research-leaders on RKS behaviour in Pre-1992 and Post-1992 universities. This chapter is divided into three main sections. First section highlights three key determinants (i.e. why sharing; when sharing (or not); and the KS enablers); where key differences ( $p < 0.05$ ) were found. Then, the second section indicates the rest of the key determinants, where no significant difference was found between the two types of universities. Lastly, the third section illustrates One-way ANOVA test, discussing the significant differences concerning the influence of research-leaders on RKS behaviour between Pre-1992 and Post-1992 universities. This chapter ends with a summary for the overall quantitative analysis for both Pre-1992 and Post-1992 universities.

## 7.1 Key differences

The test results indicate that the key differences ( $p < 0.05$ ) were found in three key determinants. The following subsections discussed each issue in detail.

### 7.1.1 Why sharing

As stated in Chapter 5, the “why sharing” issue refers to first key determinant, i.e. motivator and inhibitor factors for or against RKS. It presents the reasons for research-academics sharing as well as stop sharing research-knowledge. The key differences were found in motivator factors, whereas there is no difference found in the inhibitor factors. The test results marked with star (\*) in Table 7.1 indicates the key differences ( $p < 0.05$ ) between Pre-1992 and Post-1992 universities.

Table 7.1 Key differences in motivator factors in Pre-1992 and Post-1992 universities

Determinant	Categories	Responses in Pre-1992	Responses in Post-1992	Proportional differences (%)	Level of significance ( $p$ value)
		N=16 (%)	N=11 (%)		
Motivator factors	Motivated by the REF*	50	0	50	0.008
	University expectation*	50	91	41	0.042
	Looking for co-authorship	0	18	18	0.157
	The REF pressure	56	27	29	0.239
	Building up networking	0	9	9	0.407
	Awareness of the importance of RKS engagement	75	91	16	0.624
	Contribution to the university	19	9	10	0.624
	Enhancing teaching quality	31	18	13	0.662
	Personal interest	31	18	13	0.662
	Enhancing research productivity	25	36	11	0.675
	Career development	38	45	7	0.710
	Growing body of knowledge	38	45	7	0.710
	Job role	19	18	1	1.000
Inhibitor factors	Lack of confidence	6	36	30	0.125
	Time constraint	0	18	18	0.157
	Fear of stealing of ideas	19	45	26	0.206
	Unavailability of IP protection	19	0	19	0.248
	Fear of losing power	25	18	7	1.000
	Lack of trust	25	18	7	1.000

Note:  $p$  values are derived by the Fisher exact test using SPSS

As discussed in Chapter 5 and 6, there is a significant difference for the “**motivated by the REF**” as a motivator factor ( $p = 0.008$ ), where higher result is indicated in

Pre-1992 universities as compared to Post-1992 universities. Half of research-academics in Pre-1992 universities see the REF as a motivator factor that drives them towards RKS engagement. As explained in Chapter 5, it is interesting to note that the impact of the REF is like a “double-edge sword” for research-academics in Pre-1992 universities, in which it has both intrinsic and extrinsic values. The REF works like a “carrot and stick” motivation. While some of them see the REF as a “carrot” that entice them to engage in RKS (i.e. intrinsic reward), the rests see it as a “stick” that pushes them to stay active in RKS (i.e. extrinsic reward). This is not the case in Post-1992 universities, in which all research-academics only see the REF as an extrinsic reward that forced towards RKS engagement. Overall, the REF is recognised as the most critical factor that enhances RKS behaviour among research-academics in Pre-1992 universities. This implies that the research culture in Pre-1992 universities is strongly established and the atmosphere is quite demanding in terms of RKS.

As shown in Table 7.1, the second key difference is the **university expectation** ( $p = 0.042$ ). It is clear that the result is higher in Post-1992 universities as compared to Pre-1992 universities. This test has substantiated the qualitative results presented in Chapter 6. In a way to meet up the current demand for research performance, the Post-1992 universities may have missed to see that the high expectation placed on research-academics has adverse impact on research-academics. Research-academics in Post-1992 universities at large are facing with pressure to meet up with the university research target. Although, the university expectation is referred as a motivator factor, research-academics are not intrinsically-driven to engage in RKS. Rather, their motivation is controlled and pushed by the pressure placed on them by the university. In some extent, the Post-1992 universities may have achieved the research target, but they are not improving the university research culture as a whole. This is because most of the research-academics are not naturally engaging in RKS, but they are pushed by other external factor. This evidences that the research culture in Post-1992 universities is not yet improved and stable as compared to Pre-1992 universities.

Consequently, with such pressures research-academics will do as little RKS activity as they can get away with and hence affecting the university research performance in

the long run. As discussed in Chapter 6, research-academics in Post-1992 universities express that they are fully engaged with heavy teaching loads as well as other administrative roles. For that reason, reaching the research target as expected by the university is a huge pressure for them. Besides, since they are aware that their job as academics would be jeopardised without having good research profile adds more pressure on them.

In contrast, the research culture in Pre-1992 universities is much stronger and established. Although, some research-academics in Pre-1992 universities also feel the pressure from the university, this may be the case of research-academics who are at the early career. Thus, this can be considered a scenario where early career research-academics are trying to adapt into the university research culture. So the pressure is more towards learning and polishing their skills in terms of RKS in order to fit into the university culture. Figure 7.1 and 7.2 illustrate the comparative results in both types of universities, emphasising on the two motivator factors, i.e. motivated by the REF and the university pressure.



Figure 7.1 Comparative results between Pre-1992 and Post-1992 universities for motivated by the REF

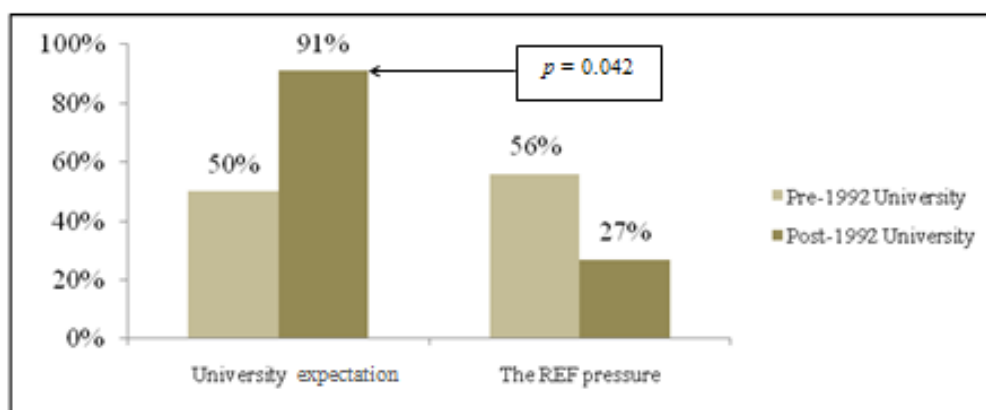


Figure 7.2 Comparative results between Pre-1992 and Post-1992 universities for university expectation issue

### 7.1.2 When sharing (or not)

As stated in Chapter 5, the “when sharing (or not)” refers to the research timeline that individual research-academics share or not share their research-knowledge. The test results shown in Table 7.2 indicate two significant differences, which are marked with star (\*). First is the “not sharing research design” issue. The findings show higher result in Post-1992 universities as compared to Pre-1992 universities ( $p = 0.027$ ). Second is the “not sharing research idea” issue. Higher results is found in Post-1992 universities in comparison with Pre-1992 universities ( $p = 0.047$ ). These results are consistent with the discussions stated earlier in Chapter 5 and 6.

Table 7.2 Key differences in Pre-1992 and Post-1992 universities for when sharing (or not)

Determinant	Categories	Responses in Pre-1992	Responses in Post-1992	Proportional differences (%)	Level of significance (p value)
		N=16 (%)	N=11 (%)		
When sharing (or not)	<b>Not sharing research design*</b>	6	45	39	<b>0.027</b>
	<b>Not sharing research idea*</b>	38	82	44	<b>0.047</b>
	Only sharing research results	38	0	38	0.054
	Not sharing research proposal	19	55	36	0.097
	Not sharing research methodology	6	27	21	0.273

Note: p values are derived by the Fisher exact test using SPSS

Again, this result reflects on the university research culture between the two types of universities. Most of research-academics in Pre-1992 universities are less fear of stealing of ideas and therefore they are not decline to share their research idea or research design. In Pre-1992 universities everyone is a capable researcher and they are doing research as their main activity. Besides, teaching in Pre-1992 universities is informed by research. Such culture has been established in Pre-1992 universities. Therefore, sharing research idea or research design is not a major problem here. In Post-1992 universities however, research-academics are more decline to share research idea and research design. This is because research is not the main activity in Post-1992 universities. Therefore, not everyone is a capable researcher and most of them have less exposure in terms of RKS. For that reason, those with research ideas or specific research designs developed for their research tend to feel insecure that someone else might copy their ideas.

It is interesting to note that a number of research-academics in Pre-1992 universities only sharing research results (38% responses). This implies that the atmosphere in Pre-1992 universities may be quite demanding in terms of research, in which research-academics might be competing with each other to enhance their research track record. Such competitive scenario has created a more individualistic approach in Pre-1992 universities, where some research-academics choose to work in silos and not sharing their research-knowledge until the result is achieved. Figure 7.3 illustrates the comparative results in both types of universities, emphasising on the “when sharing (or not) issue.

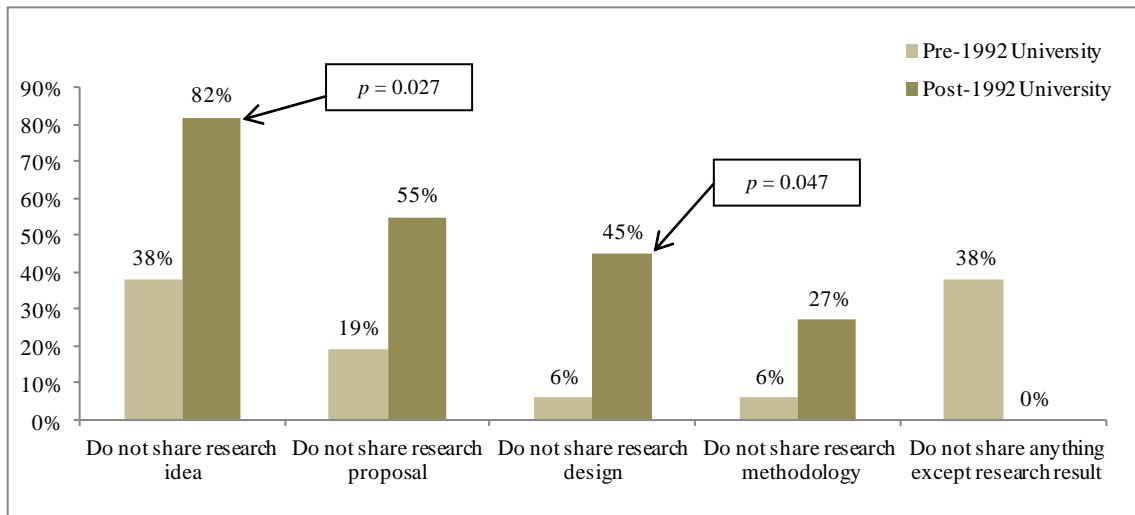


Figure 7.3 Comparative results between Pre-1992 and Post-1992 universities for when sharing (or not)

### 7.1.3 The influence of KS enablers on RKS behaviour

As explained in Chapter 5 and 6, the KS enablers refer to people, organisation, and IT. The test results in Table 7.3 highlights that a significant result only found in the organisation enabler, i.e. research centre ( $p = 0.027$ ) – marked with star (\*). Higher result is found in Post-1992 universities as compared to Pre-1992 universities.

Table 7.3 Key differences in Pre-1992 and Post-1992 universities concerning KS enablers

KS enablers	Categories	Responses in Pre-1992	Responses in Post-1992	Proportional differences (%)	Level of significance ( <i>p</i> value)
		N=16 (%)	N=11 (%)		
Organisation	<b>Research centre*</b>	<b>6</b>	<b>45</b>	<b>39</b>	<b>0.027</b>
	Research workshop	0	18	18	0.157
	Special interest group	6	0	6	0.224
	Research budget	25	55	30	0.224
	Working paper series	31	9	22	0.350
	Research seminar	81	64	17	0.391
	Lunch time meeting	13	0	13	0.391
	Mentoring system	44	27	17	0.448
	Sabbatical policy	13	0	13	0.499
	University research publication	6	18	12	0.549
	Annual review	13	9	4	1.000
	Away day	13	9	4	1.000
	Inaugural lecture	6	9	3	1.000
	Intellectual Property support	13	9	4	1.000
	Newsletter	19	18	1	1.000
	Research Academy	6	0	6	1.000
	Research conference	19	18	1	1.000
	Research forum	6	9	3	1.000
	Research incentives	13	9	4	1.000
	Research meeting	13	18	5	1.000
Workload system	38	36	2	1.000	
People	Research-leader as role model	31	0	31	0.060
	Research-leader as mentor	38	9	29	0.183
	Research-leader as inspirer	56	73	17	0.448
	Formal & informal interaction with other colleagues	38	45	7	0.710
IT	University website	31	9	22	0.350
	Email	19	18	1	1.000
	Research database	19	45	26	0.206
	Data analysis software	13	9	4	1.000
	Digital media	6	0	6	1.000
Online research repository	6	0	6	1.000	

Note: *p* values are derived by the Fisher exact test using SPSS

As discussed above, not everyone in Post-1992 universities is a capable researcher. Therefore, the university research centre plays important roles. Most of resources for research as well as research expertise in the Post-1992 universities may be consolidated in the research centre. Therefore, research-academics tend to attach more to research centre as compared to those in Pre-1992 universities, as most of them are capable researchers and have more exposure in terms of RKS. Apart from that, Table 7.3 indicates that research-academics in Pre-1992 universities see the function of research workshop is less important as compared to a slightly higher response in Post-1992 universities. Again, this implies that research-academics in Pre-1992 universities are less relying upon research workshop as to provide them with research training as they are more capable in terms of research. Rather,



research-academics in Pre-1992 universities at large see research seminar as the most important platform that can enhance their RKS behaviour. In contrast, research workshop is an important platform to enhance RKS behaviour among research-academics. This is because as some of them are less capable in terms of research, they require some research trainings as to aid their research activity and that can be obtained through research workshops.

## **7.2 What to share and how to share**

As explained in Chapter 5, the “what to share” issue refers to the type of knowledge that individual research-academics choose to share, whereas the “how to share” refers the most preferred channels of communication used for sharing research-knowledge. The test results show in Table 7.4 illustrates that there is no difference found in Pre-1992 and Post-1992 universities with regard to these issues. This suggests that the types of knowledge shared and the channel of communication used for sharing research-knowledge is common in both types of universities. Rather, as reported in Chapter 5 and 6, the “what to share” and “how to share” issues are much determined by the research timeline of a particular research project. The belief that research-academics have towards tacit and explicit knowledge also plays an important in determining the types of knowledge shared. Some of research-academics who believe that tacit and explicit are inseparable and that tacit knowledge support explicit knowledge; believes they share both tacit and explicit knowledge simultaneously. However, those who believe that tacit knowledge is hard to explain and cannot be made explicit believe that they only share explicit knowledge alone.

Table 7.4 What to share and how to share issues in Pre-1992 and Post-1992 universities

Determinants	Categories	Responses in Pre-1992	Responses in Post-1992	Proportional differences (%)	Level of significance ( <i>p</i> value)
		N=16 (%)	N=11 (%)		
What to share	Sharing only explicit knowledge	19	0	19	0.248
	Sharing both tacit and explicit knowledge	56	73	17	0.448
	Sharing mainly explicit knowledge	25	27	2	1.000
How to share	Face-to-face	31	64	33	0.130
	Written	19	0	19	0.248
	Face-to-face and virtual	13	27	14	0.370
	Virtual	13	0	13	0.499
	All three channels	25	9	16	0.618

Note: *p* values are derived by the Fisher exact test using SPSS

### 7.3 ANOVA Test

Analysis of Variance (ANOVA) was used to compare the means of both types of universities with regard to four issues: 1) the degree of the influence of research-leaders on RKS (i.e. DOI); 2) the effectiveness of support gained from research-leaders on RKS (i.e. EOS); 3) the effectiveness of university research policy to support RKS (i.e. ERP); and 4) the degree of relationship between research-leaders and RKS behaviour (i.e. DOR). For the purpose of this, all participants were given close-ended interview questions, emphasising on five point Likert-type scales: 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree. This section is divided into two subsections. The first one discusses the responses gained from research-academics, whereas the second one highlights the responses gained from research-leaders.

#### 7.3.1 Responses from research-academics

The first element is the degree of the influence of research-leaders in RKS. These resulted from a statement: “I personally believe that research-leaders have influenced my RKS behaviour”. Table 7.5 indicates that unlike in Pre-1992 universities, research-academics in Post-1992 universities mostly disagree that their current involvement in RKS is influenced by research-leaders within the university (*p* =

0.000). The second element is the effectiveness of support gained from research-leaders on RKS, resulted from a statement: “I personally believe that the support gained by research-leaders is effective”. It is found that research-academics in Post-1992 universities also claim that research-leaders’ support is less effective, which is contradicting with the results in Pre-1992 universities results ( $p = 0.001$ ). The first and second elements are interrelated, in which it communicates that in Post-1992 universities research-academics feel that research-leaders do not enhance their RKS behaviour. Rather they are motivated by other intrinsic and extrinsic factors. In other words, research-leaders’ roles in Post-1992 universities as one of the key influential factors to enhance RKS behaviour is less effective as compared to research-leaders’ roles in Pre-1992 universities.

Table 7.5 Descriptive analysis for Pre-1992 and Post-1992 universities in ANOVA gained from research-academics

	N	Mean	95% Confidence Interval for Mean		Min.	Max.	P value	
			Lower Bound	Upper Bound				
<b>DOI</b>	Pre-1992 Uni.	16	3.88	3.23	4.52	1	5	.000
	Post-1992 Uni.	11	2.00	1.26	2.74	1	4	
	Total	27	3.11	2.53	3.70	1	5	
<b>EOS</b>	Pre-1992 Uni.	16	4.06	3.30	4.83	1	5	.001
	Post-1992 Uni.	11	2.18	1.59	2.77	1	4	
	Total	27	3.30	2.69	3.91	1	5	
<b>ERP</b>	Pre-1992 Uni.	16	3.50	2.83	4.17	1	5	.000
	Post-1992 Uni.	11	1.73	1.29	2.16	1	3	
	Total	27	2.78	2.24	3.32	1	5	
<b>DOR</b>	Pre-1992 Uni.	16	4.25	3.75	4.75	2	5	.033
	Post-1992 Uni.	11	4.91	4.71	5.11	4	5	
	Total	27	4.52	4.20	4.84	2	5	

The findings reported in Chapter 6 indicate that research-academics in Post-1992 universities do not see their research-leaders as role models. They are seen as inspirers. According to Vora (2002) as an inspirer leaders motivate followers to contribute, develop and learn, be innovative, and be creative, whereas as a role model, leaders show examples to followers through their ethical behaviour and personal involvement in planning, communication, and coaching. This is in line with the findings discovered in this study, in which research-leaders in Post-1992 universities by far tend to set the research target and leaves it on the hands of an individual research-academics itself to learn, contribute, and achieve the target (i.e. inspirer). They are less likely showing the research-academics how to achieve the

target, through mentoring or personal interaction (i.e. role model). For that reason, research-academics in Post-1992 universities comment that the degree of the influence of research-leaders on RKS behaviour is less significant as compared to those in Pre-1992 universities.

This indirectly reflects on the research culture in Post-1992 universities. Research-leaders, particularly professors in Post-1992 universities tend to busy working on their own research and may have neglected their roles as research-leaders in enhancing RKS behaviour among research-academics. At the top and middle level, research-leaders tend to emphasise more on setting up research policies to improve research performance, but at the same time may have overlooked the importance of staff development. They may have missed to see the importance of developing the staff in terms of research; for the purpose of enhancing university research performance. In Pre-1992 universities however, it is evidenced that research-academics are not only act as inspirers but also role models and thus, the degree of the influence of research-leaders in enhancing RKS behaviour among research-academics is more significant.

The third element is the effectiveness of university research policy to support RKS. These resulted from a statement: "I personally believe that the university research policy is effective to support my RKS behaviour". Research-academics in Post-1992 universities mostly claim that the university research policy implemented is less effective in supporting RKS behaviour as compared to Pre-1992 universities ( $p = 0.000$ ). As reported in Chapter 6, majority research-academics in Post-1992 universities state that the university expectation towards research is leaving great pressure on them. This may have contributed to the claim of the ineffectiveness of university research policy in Post-1992 universities. In other words, since the university research policy is seen as something that pushes and forces them to engage in RKS, research-academics in Post-1992 universities do not perceive those policies as effective. In contrast, research-academics agree that university research policy is effectively supportive for their RKS behaviour. This may be due to the stronger research culture in Pre-1992 universities, which then make research-academics see the university research policies as something common that they should be able to

adapt to. The research policies in Pre-1992 universities may have already embedded in the university research culture and thus, research-academics believe that such policies are effective to support the RKS behaviour.

The fourth element is the degree of relationship between research-leaders' supports and RKS. These resulted from a statement: "I personally believe that there should be a strong relationship between research-leaders and RKS behaviour among research-academics". Table 7.5 indicates interesting results with regard to this issue. Higher results found in Post-1992 universities (mean=4.91) as compared to Pre-1992 universities (mean=4.25); with  $p$  value of 0.033. It is found that although research-academics in Post-1992 universities mostly disagree that their current involvement in RKS is influenced by research-leaders within the university, they believe that there should be a strong relationship between research-leaders and RKS behaviour among research-academics. This result confirms the qualitative results reported in Chapter 6. Research-academics in Post-1992 universities at large are expecting to gain supports from research-leaders within the university. Such support is critical to enhance RKS behaviour among research-academics. This suggests that it is crucial for research-leaders, especially professors to closely interact with research-academics as to encourage and facilitate RKS behaviour among research-academics through activities like supervising, mentoring, or coaching. This in long run would improve research culture within the university and thus, lead to better university research performance.

### **7.3.2 Responses from research-leaders**

Following the same four elements, results shown in Table 7.6 below indicate that research-leaders in both types of universities believe that their roles as research-leaders have influenced RKS behaviour among research-academics ( $p = 0.500$ ). At the same time, they also believe that their supports are strongly effective to enhance RKS behaviour among research-academics ( $p = 0.622$ ). For Pre-1992 universities, results gained from research-leaders are consistent with the responses gained from research-academics. However, for Post-1992 universities, the results gained from research-leaders are contradicting with the results obtained from research-academics.

This implies that research-leaders in Post-1992 universities are less aware of the pressure faced by research-academics in order to achieve the university research target. Besides, they are also less conscious about the urgency to support research-academics in terms of RKS. The results presented above evidenced that research-academics in Post-1992 universities expect to gain more supports from research-leaders. They hope to have closer interactions with research-leaders, not only to inspire them but to mentor them and assist their RKS activity. In other words, they need research-leaders who not only tell them “what to do” and “what to achieve” but also research-leaders who can show them “how to do” and “how to achieve” specific tasks concerning RKS.

Table 7.6 Descriptive analysis for Pre-1992 and Post-1992 universities in ANOVA gained from research-leaders

	N	Mean	95% Confidence Interval for Mean		Min.	Max.	P value
			Lower Bound	Upper Bound			
<b>DOI</b> Pre-1992 Uni.	10	4.10	3.87	4.33	4	5	.500
Post-1992 Uni.	5	4.00	4.00	4.00	4	4	
Total	15	4.07	3.92	4.21	4	5	
<b>EOS</b> Pre-1992 Uni.	10	4.10	3.87	4.33	4	5	.622
Post-1992 Uni.	5	4.20	3.64	4.76	4	5	
Total	15	4.13	3.94	4.33	4	5	
<b>ERP</b> Pre-1992 Uni.	10	4.10	3.87	4.33	4	5	.000
Post-1992 Uni.	5	5.00	5.00	5.00	5	5	
Total	15	4.40	4.12	4.68	4	5	
<b>DOR</b> Pre-1992 Uni.	10	4.90	4.67	5.13	4	5	.500
Post-1992 Uni.	5	5.00	5.00	5.00	5	5	
Total	15	4.93	4.79	5.08	4	5	

With regard to the third element, i.e. the effectiveness of university research policy in supporting RKS; the result shows a significant different ( $p = 0.000$ ) between the two types of universities. Interestingly, research-leaders in Post-1992 universities believe that the university research policy is effective to support RKS behaviour among research-academics. Clearly, this result is contradicting to the result gained from the research-academics. As discussed in Chapter 6, in a way to catch up with the current demand for research performance, the Post-1992 universities may have overlooked that the expectation they place on research-academics through the university research policy; are causing great pressure to them. They may not aware that the university research policy may be too ambitious for the university environment and thus, leave pressure on research-academics. They do not realise that such policies are seen as

ineffective by research-academics, in which they only view them as a burden that forces them to engage in RKS. The clash of beliefs between research-leaders and research-academics has contributed to this contradictory result. On the other hand, in Pre-1992 universities results gained from research-leaders and research-academics are consistent.

In terms of the last element, i.e. the degree of relationship between research-leaders and RKS behaviour; the results indicated in Table 7.6 show that all research-leaders in both types of universities agree that there should be a strong relationship between research-leaders and RKS behaviour among research-academics ( $p = 0.500$ ). This result is common with the results gained from research-academics both in Pre-1992 and Post-1992 universities. This study suggests that research-leaders' support is a significant influential factor for RKS behaviour among research-academics regardless of types of universities. This finding ties back to the earlier studies that leadership plays a crucial role in supporting knowledge sharing among employees (Chawla & Joshi, 2010; Oliver & Kandadi, 2006; Singh, 2008; Yang, 2007a).

#### **7.4 Summary**

This chapter presents the comparative analysis between Pre-1992 and Post-1992 universities treated by quantitative method. Firstly, qualitative data, for example similar comments on specific issues provided by different participants were counted, and thus become categorical data, which can be analysed quantitatively. The Fisher Exact Test was used to analyse this categorical data, which involves five key determinants: 1) why sharing; 2) when sharing (or not); 3) what to share; 4) how to share; and 5) the influence of KS enablers on RKS behaviour. Another set of quantitative data is generated from the five point Likert-scale questions, and thus become sequential data. This sequential data is analysed using ANOVA in order to examine variance between the two types of universities in relation to the last key determinant, i.e. the influence of research-leaders on RKS behaviour. As stated in previous Chapter 4, the quantitative data analysis in this study is not to test the research hypothesis, but to reinforce views developed from qualitative evidences.

This study found that there are three key differences that widen the gap between Pre-1992 and Post-1992 universities resulted from the Fisher Exact Test. The first key difference is the “motivated by the REF” as a motivator factor ( $p = 0.008$ ), where higher result is indicated in Pre-1992 universities as compared to Post-1992 universities. This suggests that half of research-academics in Pre-1992 universities see the REF as a motivator factor that drives them towards RKS engagement. The second key difference is the “university expectation” as a motivator factor ( $p = 0.042$ ), where higher results is found in Post-1992 universities as compared to Pre-1992 universities. The last key differences is the “research centre ( $p = 0.027$ ), in which higher result is found in Post-1992 universities as compared to Pre-1992 universities. This reinforces that research-academics in Post-1992 universities are more attached to research centres. This communicates that most of resources for research as well as research expertise in the Post-1992 universities may be consolidated in the research centre. Research-academics in Pre-1992 are more capable researchers and have more exposure in terms of RKS, and hence they are less attached to the university research centres. The rests of key determinants tested in Fisher Exact Test are mostly common in both types of universities.

The last key determinant that is tested by ANOVA shows results for four issues. The findings report results from both research-academics’ and research-leaders’ responses. From the responses gained by research-academics, it is found that for the first issue (i.e. the degree of the influence of research-leaders on RKS), unlike in Pre-1992 universities, research-academics in Post-1992 universities mostly disagree that their current involvement in RKS is influenced by research-leaders within the university ( $p = 0.000$ ). For the second issue (i.e. the effectiveness of support gained from research-leaders on RKS), it is found that research-academics in Post-1992 universities also claim that research-leaders’ support is less effective, which is contradicting with the results in Pre-1992 universities results ( $p = 0.001$ ). For the third issue (i.e. the effectiveness of university research policy to support RKS), research-academics in Post-1992 universities mostly claim that the university research policy implemented is less effective in supporting RKS behaviour as compared to Pre-1992 universities ( $p = 0.000$ ). And for the last issue (i.e. the degree of relationship between research-leaders and RKS behaviour), it is found that



although research-academics in Post-1992 universities mostly disagree that their current involvement in RKS is influenced by research-leaders within the university, they believe that there should be a strong relationship between research-leaders and RKS behaviour among research-academics. Higher results found in Post-1992 universities as compared to Pre-1992 universities ( $p = 0.033$ ).

Based on the responses gained from research-leaders from both types of universities believe that their roles as research-leaders have influenced RKS behaviour among research-academics ( $p = 0.500$ ). At the same time, they also believe that their supports are strongly effective to enhance RKS behaviour among research-academics ( $p = 0.622$ ). For Pre-1992 universities, results gained from research-leaders are consistent with the responses gained from research-academics. However, for Post-1992 universities, the results gained from research-leaders are contradicting with the results obtained from research-academics. With regard to the third element, the results show a significant difference between the two types of universities ( $p = 0.000$ ), in which that research-leaders in Post-1992 universities believe that the university research policy is effective to support RKS behaviour among research-academics between the two types of universities. Obviously, this result is contradicting to the result gained from the research-academics. For the last element, the results indicate that all research-leaders from both types of universities agree that there should be a strong relationship between research-leaders and RKS behaviour among research-academics ( $p = 0.500$ ). This result is common with the results gained from research-academics both in Pre-1992 and Post-1992 universities. Both qualitative and quantitative analysis reported in this study suggests that research-leaders' support is a significant influential factor for RKS behaviour among research-academics regardless of types of universities.

## **Discussions & implications**

### **Introduction**

This chapter synthesises the main findings generated from this study. Some discussions in this chapter were presented earlier in Chapter 5, 6 and 7. This is important so as to draw out the contributions of this study both theoretically and in practice. This chapter is divided into two main sections. The first section discusses the six key determinants of RKS: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. Both differences and similarities between Pre-1992 and Post-1992 universities are particularly discussed. The second section presents the three associated issues emerged from the findings. This includes the impact of the REF, the impact of the university workload system, and the impact of research academic's career phase; on RKS involvement. Several theoretical models are generated from the discussions. This chapter also provides discussions of theoretical contributions in the relevance of four theories, i.e. motivation, KM, organisational culture, and leadership; and also the implications for practitioners. It ends with a summary for the chapter.

## 8.1 Key determinants of RKS

This study has examined six key determinants of RKS: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. This section is divided into several subsections, discussing all the six key determinants. In addition, it uncovers the differences and similarities between Pre-1992 and Post-1992 universities concerning the desired determinants.

### 8.1.1 Motivator and inhibitor factors

The results indicate that the motivator and inhibitor factors are common in both Pre-1992 and Post-1992 universities. From the findings, it is revealed that research-academics in both types of universities engage in RKS for common reasons, in which their RKS engagement is aiming to serve both personal and academic purposes (see Figure 8.1). This motivator factors can be summarised in six different elements, which include the following: (1) sharing for research-knowledge for fulfilling academic requirements; (2) sharing for research-knowledge for self-interest; (3) sharing for research-knowledge for research productivity; (4) sharing for research-knowledge for establishing oneself as a researcher; (5) sharing for research-knowledge for fulfilling university requirements; (6) sharing for research-knowledge for career development.

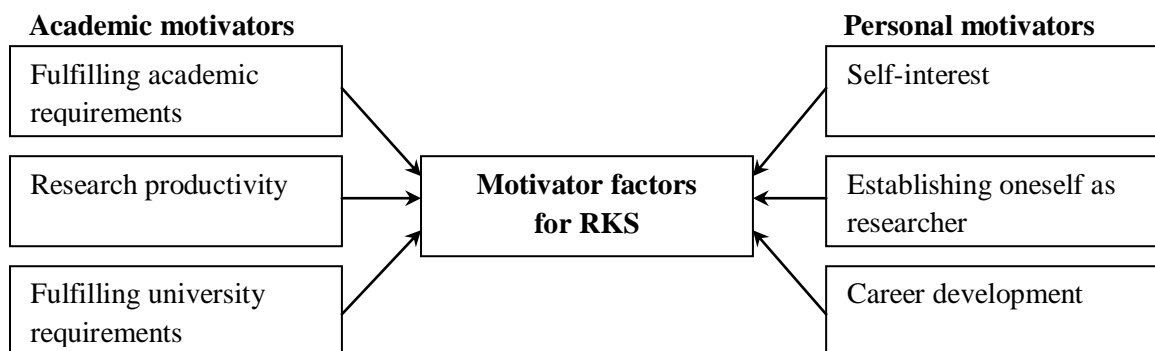


Figure 8.1 Academic and personal motivator factors

Additionally, the results also disclose that the inhibitor factors of RKS are common for both Pre-1992 and Post-1992 universities. The inhibitor factors are found to be more personal for each individual research-academics in both types of universities. A feeling of insecurity that the ideas might get stolen and lack of confidence are among the general reasons that inhibit research-academics to engage in RKS. Apart from that, employment insecurity (i.e. fear of losing power) and working time insecurity (i.e. time constraint) are other factors that make research-academics unwilling to share their research-knowledge. From the findings, it can be concluded that “trust” is one critical element that affect the whole process of RKS. The level of trust that individual research-academics place in their workplace, management, and fellow colleagues has significant impact on their involvement in RKS (see Figure 8.2). The element of trust will be discussed in further detail in section 8.1.2.

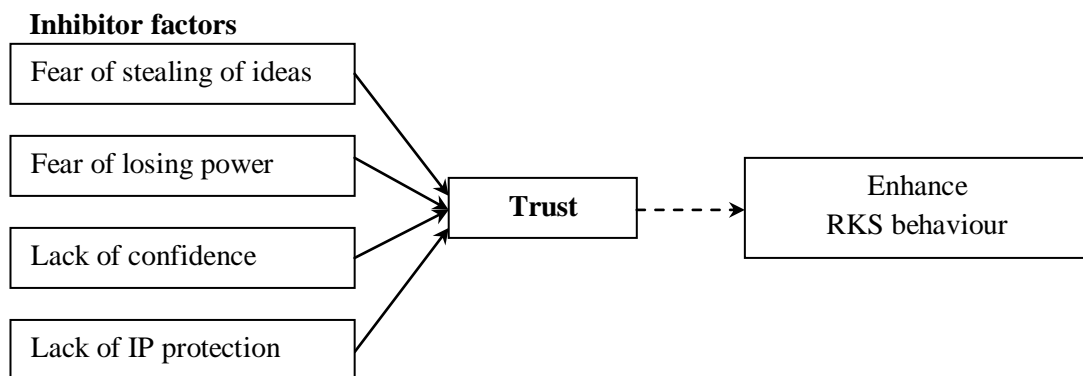


Figure 8.2 The link between inhibitor factors and trust

### 8.1.2 RKS process and types of knowledge

This section combines two key determinants, i.e. RKS process and the types of knowledge shared due to the close interconnectivity between the two determinants. This study reveals that research-academics are not sharing their research-knowledge every day at all times. A basic timeline of a research project, comprising of six different stages (i.e. research ideas, research proposal, research design, research methodology, research results, and published research); was used. This study reveals that RKS only occur at certain stage of the research process. Figure 8.3 shows a process-oriented RKS (PORKS) model resulted from both types of universities.

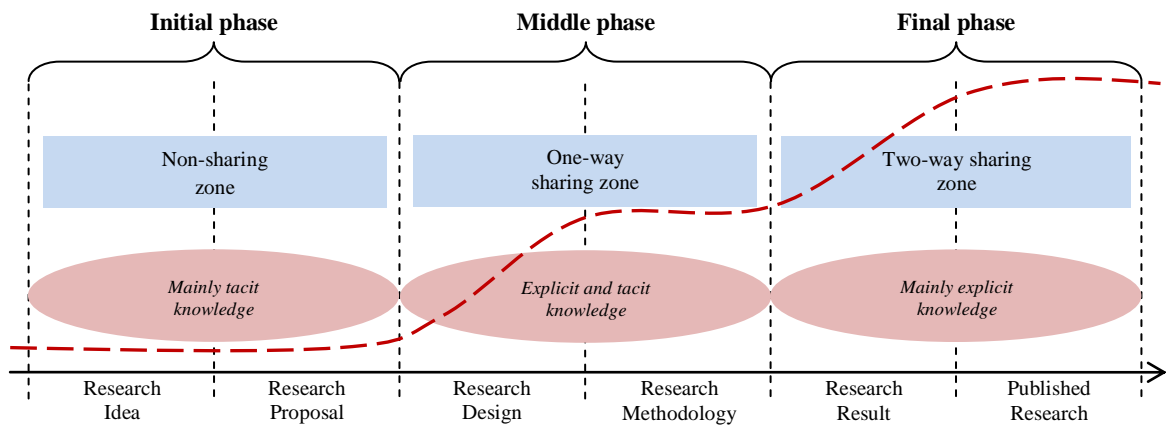


Figure 8.3 Process-oriented RKS (PORKS) model

The dotted red line in Figure 8.3 indicates the degree of sharing of research-knowledge in both Pre-1992 and Post-1992 universities, which is broken down into three phases: 1) initial phase (i.e. research ideas and proposal); 2) middle phase (i.e. research design and methodology); and 3) final phase (i.e. research result and published research). Evidently, the sharing of explicit knowledge appears more than tacit knowledge. Clearly, the initial phase is characterised by “non-sharing zone”. Research-academics in both Pre-1992 and Post-1992 universities agreed that at these stages the ideas are still immature and not fully formed. Hence at these “embryonic” stages, where ideas are generally tacit in nature; they are most risky. They decide until the ideas are well developed, no RKS activity occurs at these so called “fragile” stages. It is interesting to note that, although the “not sharing” trend line at this phase was same for both types of universities, the reasons behind it are contradicting.

In Post-1992 universities, the findings reveal that the key reason for not sharing at research ideas and research proposals stages are due to the fear of ideas being “stolen”. This substantiates a statement by Huber (2001, pg. 76) that employees “who had valuable knowledge were reluctant, or at least hesitant, to share it, and sometimes successfully avoided sharing it”. It can be argued that since the implicit research culture in Post-1992 universities is still undeveloped, where the involvement of research-academics in RKS is mainly pushed by the university research policy or strategy; so most of the research-academics are active carrying out research in order to meet the university target. These research-academics are striving to search for new and novel research ideas. Thus, those with research ideas in mind, resist sharing that

idea with other colleagues as they fear the ideas being “robbed”. Even if the ideas are converted into a proposal, they still think that it is risky to let anyone know about it as the ideas are still under-development and immature. In short, for risk avoidance purpose, they tend to hoard their knowledge at the first two stages. This substantiates the above discussion that the overall research culture in Post-1992 universities is not yet established.

As stated earlier, some research-academics in Pre-1992 universities also do not share their research-knowledge at research ideas and research proposal stages. However, the reason is different from those found in Post-1992 universities. Rather, this is due to the competitive atmosphere in Pre-1992 universities. The results reveal that some of research-academics in Pre-1992 universities do not share their research-knowledge at any stages except the last two stages, i.e. research result and published research. Pre-1992 universities have different philosophy than Post-1992 universities, where they are more research-focused; whereas Post-1992 universities are more teaching-oriented (Deem, 2006). Research is a very important component in Pre-1992 universities’ mission and a key indicator of its performance (Bai et al., 2008). Earlier, Shattock (2000) also confirmed that there is a research-intensive nature in Pre-1992 universities. Clearly, the rivalry environment in Pre-1992 universities has affected the RKS activity within the university. Research-academics at large engage in RKS, and hence due to the competitive individual climate within the university, they are competing with one another to produce better research output. Their ultimate aim is higher ranked publication. Hence, the competitive atmosphere in Pre-1992 universities has made research-academics become more individualistic and choose to work in “silo”.

It is interesting to note that in some extent, at this initial phase research-academics in both types of universities might share their research-knowledge with small groups of colleagues who they trust. Trust is the “magic ingredient” that links strong ties and knowledge (Levin et al., 2002). In other words, trust is the glue that holds people together sociologically, where sharing of research-knowledge can be held without any fear or resistance. Therefore, it is most likely that those research-academics do not share their research-knowledge in public, but only to groups of colleagues that

they trust. This is because, when sharing research-knowledge with someone based on trust, the fear of ideas being stolen or plagiarised is no longer an issue. Remarkably, this study has noted an interesting finding, i.e. even though at the initial phase research-academics are generally towards hoarding their research-knowledge, but with “trust”, they are still sharing within small group of people.

On the other hand, as shown in Figure 8.3, the middle phase, (i.e. research design and research methodology) is characterised by “one-way sharing zone”. The findings indicate that research-academics in both types of universities tend to seek knowledge from other colleagues who they believe have the knowledge that can assist their research design and methodology; but at the same time, they hoard their own ideas or content of research. Instead of “two-way” sharing, research-academics in both Pre-1992 and Post-1992 universities choose “knowledge seeking”, where individual research-academics act as knowledge seekers, attempting to acquire knowledge from other people (Hsieh, 2009). Thus, at this middle phase, research-knowledge is not mutually shared, but it is more towards knowledge seeking (one-way shared). Research-academics in both Pre-1992 and Post-1992 universities take initiatives to retrieve knowledge from other knowledgeable person. The one-way shared zone consists of both explicit and tacit knowledge. Clearly, knowledge seeking may be held via different platforms, including formal meetings, informal conversations or discussions, research seminars, research presentations, research training, and others.

Lastly is the final phase, consisting of research results and published research. Obviously, this is represented by “two-way sharing zone”, where research-knowledge is mutually shared. This trend line is common for both Pre-1992 and Post-1992 universities. The findings show that at this phase, explicit knowledge is mainly shared, which basically appear in written documents like research journals, articles, or books. However, the results also indicate that research-academics in both types of universities agree that at some points, they may share tacit knowledge unconsciously while sharing explicit knowledge, especially when interacting with other colleagues personally. This ties back to previous work by Nonaka et al.’s (2000b, pg. 8) that “knowledge is created through interactions between tacit and explicit knowledge, rather than from tacit or explicit knowledge alone”. In other

words, it is strongly argued that at this phase, while sharing explicit knowledge, research-academics are actually sharing tacit knowledge without being aware about it. It can be argued that the sharing of tacit knowledge is also “tacit” in nature, where the knowledge is implied without being explicitly expressed. For instance, when sharing research results in a research conference or research seminars, it is most likely that the presenter not only delivers his/her explicit knowledge, but also instinctively communicates the tacit knowledge, which embedded in his/her mind. This is in line to Gertler’s (2003, pg. 78) definition of tacit knowledge, “an essential complement to explicit knowledge in the sense that it supports the acquisition and transmission of explicit knowledge through tacitly held constructs such as the rules enabling speech, reading, and writing”.

Thorpe et al. (2006) recognised knowledge asset as “entrepreneur”. The behaviour of “academic entrepreneurship” is an “income generating” behaviour (Balázs, 1996). In other words, “knowledge entrepreneur” is someone who is capable of generating income to a university through RKS. Therefore, to some degree, active research-academics tend to be more individualistic in terms of RKS. As reported earlier in this study, research-academics in Pre-1992 universities are more individualistic due to their “knowledge entrepreneur” behaviour. Through RKS, they gain a competitive advantage to generate income to the university and ultimately succeed in their career.

Overall, this study suggests that the concept of RKS is different from the common ideas of knowledge sharing in other sectors. As a result, the term “knowledge sharing management” is introduced. Figure 8.4 illustrates the knowledge sharing management (KSM) model applicable for HE settings, which comprises of three main processes, i.e. knowledge hoarding, knowledge seeking, and knowledge sharing.

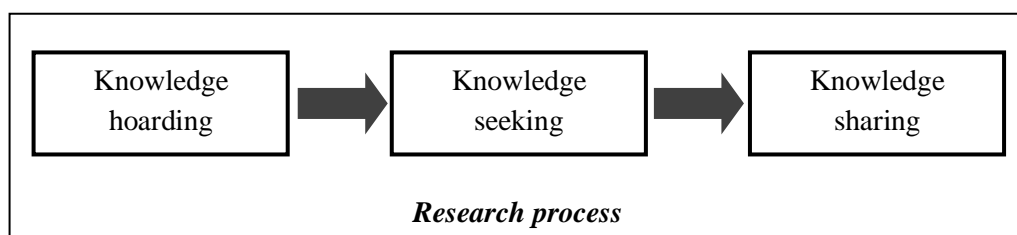


Figure 8.4 Knowledge sharing management (KSM) model



KSM is a process where research-knowledge (mainly tacit knowledge) is hoarded at the initial phase of a research process. This is akin to Cheng et al.'s (2009) suggestion that instead of knowledge sharing, knowledge hoarding could be prevalent in academic institutions due to the non-exclusivity and non-rivalry of public goods. This finding has rejected a claim made earlier by Konstantinou (2010, pp. 826), where knowledge hoarding leads to inefficiency, fragmentation or breakdown in an organisation. Then, at the second phase, knowledge seeking (one-way sharing) is crucial, which basically replaces knowledge sharing (two-way sharing) – this may involve both tacit and explicit knowledge sequentially. Lastly, mutual knowledge sharing occurs in the final phase of a research process, which involves both tacit and explicit knowledge simultaneously.

This finding has challenged Nonaka and Takeuchi's (1995) SECI spiral model, where, in academia the sharing of research-knowledge does not follow the conversion of tacit and explicit knowledge. Rather, the process of RKS is distinctive, where both tacit and explicit knowledge are hoarded, sought, and shared sequentially based on the timeline of a research project. This is in line with Glisby & Holden (2003) argument that the SECI model only appropriate for the Japanese management cultural practices, and is not necessarily applicable for other environments. This study has confirmed that the SECI model is inapplicable for RKS in HEIs settings. In addition to that, this study also supports criticism made by Klein (2008) that the development of SECI will not be enough to explain the conversion of knowledge. In line with Klein's arguments, this study indicates that the conversion of tacit knowledge requires personal interaction or facilitation.

### **8.1.3 Channels of communication**

This study has indicated that channels of communication used to share research-knowledge are common in both Pre-1992 and Post-1992 universities. Although, the findings disclose that face-to-face interaction is the most preferred channel to share research-knowledge, the choice of communication channel is much depending on the RKS process. It has been reported that at the initial phase (i.e. research ideas and research proposals) research-academics in both types of universities prefer face-to-

face communication as compared to other channels. Since this phase mainly involves the passing out and/or seeking tacit knowledge, the human or personal interaction is important. On the other hand, at the middle phase (i.e. research designs and research methodologies) research-academics in both types of universities are comfortable to use any of the channels (i.e. face-to-face, virtual, and written). However, this choice is depending on the types of knowledge shared. The results indicate that in order to share tacit knowledge, they choose either face-to-face or virtual communication. As reported in Chapter 5 and 6, research-academics in both types of universities perceived virtual communication (e.g. Skype video/voice call or other video conferring) similar to face-to-face, where they can also see the body language and facial expression of the person that they share the knowledge with. If the sharing of research-knowledge involves only explicit knowledge, then they are comfortable to communicate via written channel like printed documents or paperwork. Likewise, at the final phase (i.e. research results and published research), research-academics in both Pre-1992 and Post-1992 universities also choose either written or face-to-face channels. The sharing of research-knowledge through research conferences or seminars will obviously involve face-to-face interactions, whereas if the research-knowledge is shared in the form of research publications, it is generally shared via written channel. Overall, with respect to RKS, the choice of communication channels is made based on the research timeline of a particular research project.

#### **8.1.4 The influence of KS enablers on RKS behaviour**

Results in both Pre-1992 and Post-1992 universities indicate that “softer” issues like people and organisation are key enablers of RKS as compared to IT. This study has found that the need of IT is less important in supporting research-academics to engage in RKS. The following sections discuss all the three key determinants in detail. The first and second parts of discussion present the differences between Pre-1992 and Post-1992 universities concerning the “people” and “organisation” as key enablers of RKS. Although IT is a less important enabler, this study has shown slight difference between Pre-1992 and Post-1992 universities with regard to IT. This is discussed in the third section.

### ***People as an enabler***

People consist of both leaders and employees, which is one of the critical determinants affecting the success of knowledge sharing. In this study, it refers to formal and informal interactions between individual research-academics with research-leaders, specifically professors; or with their colleagues. The findings indicate different scenario in Pre-1992 and Post-1992 universities with regard to people enabler. The results show that research-leaders, particularly professors in Pre-1992 universities are more supportive. Using interactive approach, they act as mentors who motivate, guide, encourage and assist research-academics when it comes to RKS. They are not only inspiring research-academics to contribute, develop and learn, be innovative, and be creative with regard to RKS; but also act as role model through leading by example. However, in Post-1992 universities, research-leaders' roles, specifically professors are less effective. The roles of research-leaders in both types of universities are discussed in further details in section 8.15.

### ***Organisation as an enabler***

Organisation factor refers to elements like organisation culture, structure, and policy that affect the degree of RKS engagement. From the findings, the element of organisation can be broken down into two aspects, i.e. organisation culture and organisation structure. The following two parts discuss these two aspects in detail.

#### **Organisation culture**

This study indicates that the “soft” aspects like culture are potentially more important for promoting RKS among research-academics; than the “hard” ones (e.g. technology). This is akin to Wang and Noe’s suggestions that softer issues like culture and climate are one of the critical motivational factors for knowledge sharing. Both qualitative and statistical findings show that research culture both explicitly and implicitly; in Pre-1992 universities has been well established as compared to Post-1992 universities. The involvement of research-academics in Pre-1992 universities in RKS is not pushed by the university research policies but intrinsically-driven by the strong implicit research culture within the university. In other words, RKS has been a norm in Pre-1992 universities, in which research-academics are naturally motivated

to engage in RKS. As suggested by Locke (2011), Pre-1992 universities are reasonably stable in terms of research.

This signifies that in Pre-1992 universities, the urgency to engage in RKS does not follow the “top-down” approach. Rather, research-academics believe that RKS is crucial for them. This findings tie back to previous research on culture and subculture (Sackman, 1992); explicit and implicit cultures (Ahmed, 1998); and visible and invisible cultures (Schein, 1992, 2004). The explicit culture refers to rules and regulations, policies and procedures, goals, external buildings, clothing, behaviour modes, regulations, stories, myths, languages and rites (Ahmed, 1998; Sackman, 1992; Schein, 1992, 2004). Whilst Sackman uses the term “subculture”, Ahmed and Schein use the word “implicit” and “invisible” respectively as to represent the “non-explicit” culture. The terms “subculture”, “implicit” and “invisible” culture encompass the same meaning, i.e. typical values, beliefs, and norms that influence the way people perceive, think, feel, and behave towards specific goals. Therefore, strong implicit culture is critical for RKS, which makes research-academics intrinsically-driven to engage in RKS and ultimately lead to higher university research performance.

The findings suggest that the Post-1992 universities are keen to improve its explicit research culture, while neglecting the importance to alter the implicit culture. Their research-academics have a different set of standards with respect to RKS as compared to research-academics in Pre-1992 universities. In light of this, it can be argued that university research culture is composed by its implicit culture. This is because although university research culture is improved explicitly through the executions of various research policies; without being able to change research-academics’ value, belief, and behaviour, the university is more likely to fail in establishing its university research culture as a whole. Table 8.1 summarises the key criteria of implicit culture in both Pre-1992 and Post-1992 universities, which provides critical insights to this question. ‘Implicit culture 1’ represents Pre-1992 universities, whereas ‘implicit culture 2’ signifies Post-1992 universities.

Table 8.1 Implicit culture in Pre-1992 vs. Post-1992 universities

<b>Pre-1992 universities towards implicit culture I</b>	<b>Post-1992 universities towards implicit culture II</b>
Research savvy	Less research savvy
Intrinsically-driven	Extrinsically-driven
Scattered	Clustered
Silo-based approach	Group-based approach
Individualism	Collectivism
Interactive approach by research-leaders	Top-down approach by research-leaders

In some extent, it is difficult to distinctly articulate organisational culture but members in the organisations know it when they sense it. Put simply, organisation culture is the way “things are done” in an organisation. In this study, it is how research-academics engage in RKS, what they believe about RKS, what motivate them to engage in RKS – and all these express something about the “personality” of that university. Regardless of the size, sector, industry, or age of business, culture affects organisational performances (Fisher & Alford, 2000). Since Pre-1992 universities are established both explicit and implicit culture, where their research-academics are naturally involved (or self-driven) in RKS; the research performance in Pre-1992 universities is arguably higher than those of Post-1992 universities. Undoubtedly, much advanced research performance in Pre-1992 universities determines their capacity to succeed in both reputational purposes and financial incentives.

The question is: do Pre-1992 universities have better research culture both explicit and implicit, which determines better research performance? Or whether both types of universities have valid implicit cultures that still contribute to high research performance? As shown in Table 8.1, individual research-academic in Pre-1992 universities is capable to engage in RKS. They are more research savvy, who mostly possess not only ‘know-what’ but also ‘know-how’ skills, more shrewd and mature and also highly confidence to engage in RKS. These research-academics are intrinsically-driven to involve in RKS, in which their self-motivation in terms of RKS is high. As a result, the RKS pattern in Pre-1992 universities are more scattered since individual research-academics are independently competent in RKS. Hence, the RKS engagement condition is likely to be a silo-based approach. In addition to that,

unlike Pre-1992 universities, research-academics in Post-1992 universities are more collective in performing RKS. This is because the atmosphere in Post-1992 universities concerning RKS is less competitive than those of Pre-1992 universities.

Most importantly, the findings indicate that in Pre-1992 universities, research-leaders, particularly professors use an interactive approach that would allow research-academics to: (1) get advice, guidance, and assistance in terms of good practice of RKS; (2) seek knowledge in terms of research ideas, designs or methodologies; (3) create linkages based on professors' networks for RKS purposes; and (4) develop research ideas that can enhance RKS engagement and enrich research output. Although research-academics are intrinsically-driven to engage in RKS, supports gained from research-leaders is critical to increase the involvement of individual research-academics in RKS. Research-leaders, particularly professors, are much closer to the individual research-academic. The findings indicate that based on the interactive approach, research-academics are more encouraged to engage in RKS. For example, through effective mentoring or coaching process, the professors use their experiences, skills and network to guide research-academics in terms of RKS. Most importantly, these research-leaders will direct research-academics to more research output rather quickly by providing purposeful research policy guidance. In other words, they provide supports on how to involve in RKS and not only give them instructions on what to do.

In addition to that, due to the competitive atmosphere in Pre-1992 universities with regard to RKS, research-academics are more individualistic in gaining competitive advantage in RKS. In contrast, research-academics in Post-1992 universities at large are less research savvy. Some of them are capable research-academics who consist of senior and active research-academics, but most of the research-academics in Post-1992 universities have less exposure in terms of RKS engagement and lacking of 'know-how' skills. Hence, this has reduced their confidence level in engaging in RKS. In addition to that, the findings show that their involvement in RKS is extrinsically-driven, where it is guided or pushed by the university research policy. The findings also indicate that research-academics in Post-1992 universities

tend to be more clustered, where they rely much on the university research centre and hence the RKS follows a group-based approach.

Additionally, this study has disclosed that in Post-1992 universities, there is lacking of close interaction between research-leaders, particularly professors and research-academics. Rather, the approach taken is more top-down, where the attention is paid more on designing, developing, and implementing research policy, and not really hand-to-hand supporting research-academics to engage in RKS. Unlike Pre-1992 universities, professors in Post-1992 universities have less personal interaction with individual research-academics through mentoring or coaching, for instance. In other words, research-leaders in Post-1992 are more supportive in giving instructions on “what to do” through the development and execution of research policy, but less supportive in guiding on “how to do” through personal interactions.

Overall, it can be argued that stable implicit culture together with strong explicit culture in Pre-1992 universities contributes to better research performance. This is because research-academics value RKS, they are mostly capable in RKS, plus sufficient supports from research-leaders have positively guided them on how to produce more research output effectively. Rather, the imbalance implicit culture in Post-1992 universities has made them fallen short in producing higher research performance. The Post-1992 universities may be depending much on research-leaders and other senior or active research-academics to produce more research outputs. This group of active research-academics are more research savvy and intrinsically-motivated to engage in RKS. However, there is only small number of active research-academics in Post-1992 universities. For that reason, the research performance in Post-1992 universities is apparently ineffective as compared to Pre-1992 universities.

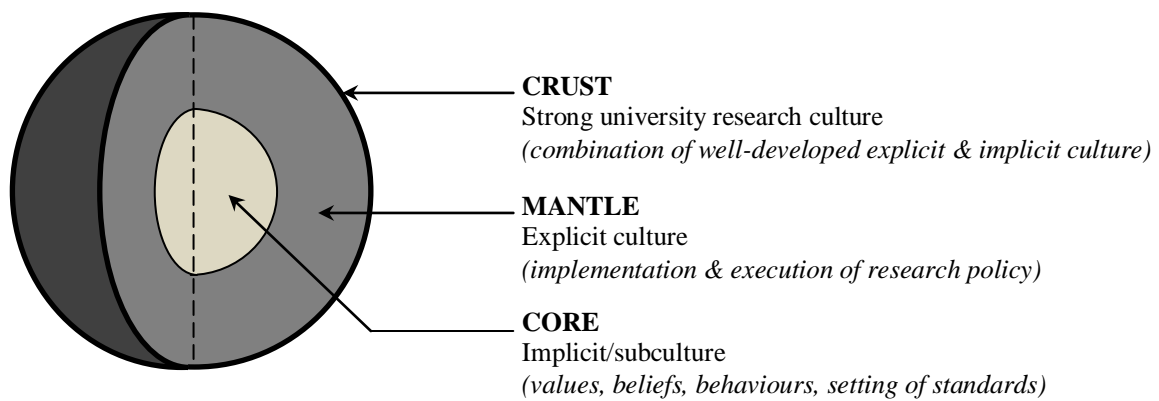


Figure 8.5 Research culture-earth model

The earth's layers are used to explain the university research culture building up upon the concept of organisational culture as discussed above. Figure 8.5 illustrates the three layers of the earth, consisting of core, mantle, and crust. The inner layer of the earth is the "core", which represents the implicit culture of a university. This layer signifies how research-academics value RKS, what their beliefs towards RKS are, how they behave when engaging in RKS, and what standards they set to achieve in terms of RKS. The core layer of the earth has a great pressure that it cannot melt, even though the temperature is extremely high. Similarly, the implicit culture of a university also has a "great pressure", as it deals with the norms that individual research-academics carry with them. But once it is established, it is not easily "melt", in which it has the capacity to change the whole image of the university.

The middle layer of the earth is "mantle", which represents the explicit culture of a university, where the research policy (i.e. research strategy and event) are developed and executed. Since the earth is very hot inside, the mantle plays a very important role as the flow of the heat takes place here. Similarly, explicit culture is very important to ensure that the development and execution of research policy are effective to support and promote RKS within the university. Although the organisational culture is largely composed by the implicit culture, the explicit culture cannot be neglected as it is an essential layer to support implicit culture, which then leads to a strong university research culture. Without this layer, the whole RKS process is likely to experience a failing state. Finally, the outer layer is the tough



solid “crust”, the surface on which we are living. This represents the current status of university research culture, which combines both explicit and implicit culture. Over time, as the heat rises up and the gas builds up, volcanoes erupt. At the same time, when there is a clash between explicit culture and implicit culture, problems occur in the university. These problems may come in different forms – e.g. research-academics feel pressure to engage in RKS, have lack of motivation to continue doing RKS, achieve lower research performance and thus, the university research performance would be diminished.

Surprisingly, this study has discovered that research-academics in Post-1992 universities regard those research policies as huge pressures, where they are struggling to cope with. In line with the explanation of explicit and implicit cultures stated by Ahmed (1998), this study suggests that the Post-1992 universities should not only be concerned with improving their explicit culture, but to alter firstly the implicit culture within the university. Changing the explicit culture is just the “tip of the iceberg”, where the problems are much bigger than it seems. It is crucial for the Post-1992 universities to change the values, beliefs, norms and premises (i.e. implicit culture) of research-academics so that their involvement in RKS is not forced by the university research policies. Rather, research-academics should naturally engage in the RKS. In other words, their involvement should be more self-driven or intrinsically driven by their own beliefs. Such scenario will happen if RKS activity is becoming a norm embedded in the university research culture. From the findings, it can be argued that Post-1992 universities so far only manage to improve the explicit culture, not implicit. The imbalance between explicit and implicit culture in the Post-1992 universities has distinguished them from Pre-1992 universities.

As a whole, strong implicit research culture does not by itself produce higher level of university research performance. But weak implicit research culture makes university research performance impossible, no matter how strong explicit research culture may be. To improve implicit research culture will therefore always improve university research performance.

### Organisation structure

Only small difference exists with respect to organisation factor, i.e. research centre; while the rest are common in both types of universities. The findings reported that research centre is the key predictor for RKS in Post-1992 universities, where most of their resources for research as well as research expertise are consolidated in the research centre. In other words, most of the RKS activities in Post-1992 universities are monopoly by the research centre. Again, this strengthens the argument that the RKS pattern in Post-1992 universities is clustered, in which research-academics are not self-motivated to engage in RKS. In contrast, research centre in Pre-1992 universities are less significant. Research seminars held within departments or subject groups are reported to be a more supportive predictor for RKS. This shows that in Pre-1992 universities, the resources for research are not monopolized by the research centre. Research expertise can be found not only in the research centre but exists in every departments or subject groups. This is therefore supports the argument that RKS pattern in Pre-1992 universities are more scattered and not ruled by the external forces but is more intrinsic. The rest of research strategies (e.g. research workshop, research budget, and sabbatical policy) and research events (e.g. research meeting, research conference, and research forum) are fairly common in both types of universities, where research-academics recognised them as other predictors for RKS.

### *IT as an enabler*

Although there is no difference concerning IT enabler in both types of universities, the findings indicate that IT infrastructure (e.g. research database, email, and data analysis software) is one of the critical determinants for RKS. This finding is akin to Berlanga et al. (2008) who suggest that technology and infrastructure can be crucial for the process of sharing knowledge. Despite of the commonality between the two types of universities, the results show that Pre-1992 universities have acquired slightly advanced IT facilities as compared to Post-1992 universities. They have developed several digital media infrastructure in assisting RKS, which includes the application of Webinars (i.e. virtual workshops), Podcasts, (i.e. a series of audio or video digital-media files that are distributed over the Internet), and Vodcasts (i.e.

video podcasts); on the university websites. Higher budget might have enabled Pre-1992 universities implementing such IT advancement so as to support and promote RKS within the university. However, this study has confirmed that “softer” issues like formal and informal interaction between people, trust, and supports from research-leaders are more significant than those “hard” issues (i.e. technological infrastructure) with respect to RKS. This finding has substantiated Golden & Raghuram (2010), who reported that the high technology support implemented in the organisation is less important in supporting knowledge sharing among employees than those “softer” issues.

### **8.1.5 The influence of research-leaders on RKS**

This study reveals interesting yet surprising findings in both Pre-1992 and Post-1992 universities. Despite agreeing that there should be a strong relationship between research-academics’ involvement in RKS and research-leaders’ supports, research-academics in Post-1992 universities reported that currently, there is lacking of support gained from research-leaders. Overall, research-academics in Post-1992 universities are expecting to have close and personal interaction with research-leaders, specifically professors. Leader’s support and commitment is known as one of the major critical success factors in enhancing knowledge sharing in business organisations (Gagné, 2009; Lin, 2007).

It has been disclosed that in Post-1992 universities, research-leaders follows the “top-down” approach rather than interactive approach. In other words, they tend to support RKS in terms of the “hard side”, like developing and implementing research policies; and tend to neglect the “soft side”, i.e. having personal and close relationship with research-academics through mentoring or supervising, for instance. Generally, research-leaders in Post-1992 universities are seen as someone who only tells research-academics “what” they are expected to do, but not showing them “how” to achieve those expectations. They are less likely acted as a mentor to facilitate RKS among research-academics. As reported in Chapter 5, research-academics expressed their hopes of getting a mentor to facilitate their RKS activity. At the very least they require a mentor who can listen to their problems and advice

them on how to get on with all the RKS demands. This is in line with Ayres' (2006) report that mentoring programmes help employees to cope with the challenge of the workplace. At the same time, it substantiates Williams et al. (2009) findings of significant correlation between mentoring and individual learning.

It is interesting to note that “mentoring” is one of the research policies in Post-1992 universities, but the findings indicate that mentoring in terms of RKS does not take place as a common practice by the research-leaders, particularly professors. In Pre-1992 universities however, mentoring is a common practice that professors use to personally interact with research-academics. Here, the idea of mentoring system is that the professors can guide, advice, and assist research-academics, where the ultimate aim is to enrich RKS output. In other words, “mentoring” in Pre-1992 universities means professors' experience, skills, visions, and networks are fully utilised to help young research-academics to develop their research interest and hence increase the level of RKS output.

This study has broken down research-leaders into two categories: (1) formal research-leaders, including those at the top university level (i.e. Pro Vice Chancellor of Research and Director of Research), middle level (i.e. Dean of Research and Associate Dean of Research); and (2) informal research-leaders, i.e. the professors who are at the low university level. Figure 8.6 shows basic roles of research-leaders at both formal and informal, resulted from this study.

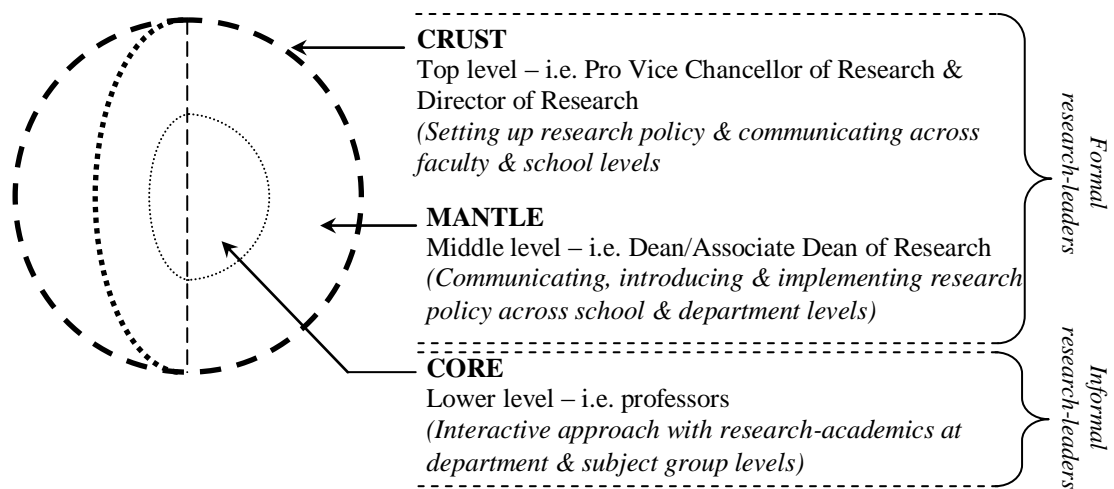


Figure 8.6 Link between research culture-earth model and roles of formal and informal research-leaders

Figure 8.6 illustrates the interconnectivity between university research culture and basic roles of both formal and informal research-leaders. The outer layer, i.e. the crust, represents the research-leaders at the top university level, including Pro Vice Chancellor of Research and Director of Research. Those are research-leaders who have formal authorities and roles in setting up research policies, aiming to increase university research performance. They are responsible to communicate those policies across faculty and school levels. Most importantly, they must ensure that the research policies are passing out to research-leaders at the middle level. Then, the middle layer, i.e. the mantle, refers to research-leaders at the middle university level, like the Dean/Associate Dean of Research. It consists of formal research-leaders with formal authorities and roles concerning research activity. Their most important role is to communicate the research policies across the school, and down to department level. In general, they are those formal research-leaders who commonly introduce the research policy set in the university and at the same time present those policies to everyone within the school and department in order to establish research credibility.

On the other hand, the inner layer, i.e. the core, represents informal research-leaders. They are those professors who have informal authorities and roles concerning research. These professors are closest to the research-academics at the department or subject group level. In general, despite their informal roles, their responsibilities are critical in supporting research activity. Through interactive approach with research-

academics, professors can facilitate, shape and creating supportive university research culture, where research-academics practice and engage in research. Being a mentor, coach, or facilitator, professors can build strong implicit research culture, where together everyone connects with each other; they develop strong relationships, and take initiative to engage in RKS. This supports previous work by Macfarlane (2011), who regards professors as “intellectual leaders”, who act as role models, mentors, advocates, guardians, acquirers, and ambassadors.

As suggested by Bright et al., (2012), a professor is comparable to a gardener. A gardener is any person who is skilful in gardening. A gardener cultivates and cares for a garden, lawn or flower. It is gardener’s responsibility to take care of soil type and condition, seed selection and requirement, keep the soil moist by watering, sun and shade patterns, and so forth. The plants then grow under the right conditions, in which gardener shapes toward a desired outcome. Similarly, a professor is someone who is expert in research. A professor supports and responsible for a department, subject group, unit, team, or individual research-academics. Research-academics engage in research in response to these. It is professor’s responsibility to facilitate research-academics by using their experiences, skills and network to guide research-academics in terms of RKS, and most importantly, how to produce more research output effectively. In short, the key role of professors is to develop capable research-academics. Like a gardener who set up a lattice that helps to shape the growth of the plant, but cannot determine the pattern of growth; a professor also can only provides the support and guidance but cannot force research-academics to carry out research and be active. The professor initiates strong implicit research culture and it becomes the “lattice” upon which RKS grows within the university.

The findings indicate that the roles of research-leaders at both top and middle university levels are common in Pre-1992 and Post-1992 universities, where the roles of these groups of research-leaders in designing, developing, executing, and communicating research policies across faculty, school and department; are effective. However, major difference found with regard to the roles of professors. Although the findings indicate that professors in Post-1992 universities believe that they have been supporting research-academics concerning RKS, the feedback gained by research-

academics in Post-1992 universities has denied this belief. There is a widening chasm between professors and research-academics in Post-1992 universities. Results reveal that professors' roles in Post-1992 universities tend to be more "top-down" and quite rigid in some extent, where the attention is not paid on hand-to-hand or interactive supports, i.e. emphasising on the "how" factor; but more towards the "what" factor, like giving out instruction and telling what research-academics are expected to produce. It is most likely that in Post-1992 universities, professors are just another "senior research-academics" who are also busy working on their own research as to help enhancing the university research performance. The result supports earlier work by Evans et al., 2011, who states that some professors are found to provide minimal leadership and offering little time to others, where they are only focusing on sustaining and expanding their own research activity and enhancing their own profile. For that reason, they might have overlooked their key responsibility, i.e. to interactively support, guide, motivate, and encourage research-academics in terms of RKS.

Apart from that, the findings also reveal that research policies set up at by the research-leaders at the top university level leaves burdens on research-academics in Post-1992 universities. They feel that research-leaders fail to entice them with "carrot" but hit them with "stick" as to drive them forward in terms of RKS. In response to use of the 'stick', people will do as little as they can get away with and hence affecting the quality of performance (Whitmore, 1992). Such scenario could have a reverse effect towards the university research implicit culture and can lower down the level of research performance. The findings imply that when setting up a particular research policy, it is essential for research-leaders at the top university level becomes more realistic by taking into account both "hard" and "soft" elements. Therefore, when a particular research policy is designed and implemented within the university, it is appropriate and most importantly can fit with university's resources (hard) people's capability (soft).

On the other hand, the findings show that research-leaders in Pre-1992 universities, particularly professors are effectively supportive when it comes to RKS. Research-academics at large see these professors as role models, inspirers, and also mentors

who play significant roles in motivating research-academics to engage in RKS. In other words, they make research-academics aware “what” is targeted on them and most importantly assist and make them aware on “how” to achieve those targets. This is akin to Artail’s (2006) and Abou-Zeid’s (2008) explanations that leaders can facilitate/build a knowledge sharing culture that motivates staff to understand, value, and participate in knowledge sharing. It is interesting to note that although research-academics in Pre-1992 universities tend to be more individualistic, in some extent, they still regard the supports from research-leaders are important. The results indicate that they agree that there is a significantly close relationships between their RKS engagement and research-leaders’ supports. The question is which specific research-leaders are important here – top, middle or lower? From the aforementioned discussion, it is clear that in general, all research-leaders across university levels are crucial for RKS. Clearly, more emphasis is down to professors as they are closest to research-academics, be it in the department, subject group, unit, team, or individual. However, having professors’ supports alone, without an appropriately realistic research policy set up, implemented, and communicated effectively to everyone within the university; will not produce capable research-academics and guarantee higher level of university research performance.

As a summary, the roles of research-leaders in both types of universities can be explained in two different perspectives. The first perspective is, in Pre-1992 universities, both formal research-leaders’ and professors’ roles are critical as they are not only responsible to maintain the university research performance, but they also have to make sure that the university is at the comparable state with the advancement of research. Their research policies need to have competitive edge in order to sustain their achievements in research performance for both reputational purposes and financial incentives. The second perspective is, in Post-1992 universities, formal research-leaders’ roles are also critical as they must ensure that the research policies set up are appropriate and realistic to be accomplished. At the same time professors’ roles are even more critical in order to make sure that the university implicit research culture is much stronger, where research-academics’ mindset is effectively altered towards engaging in RKS.



## **8.2 Associated issues**

This study has uncovered three associated issues in both Pre-1992 and Post-1992 universities, i.e. the impact of the REF, the impact of the university workload system and the impact of research-academic's career phase. These three issues are interconnected with the six key determinants of RKS. The following subsections discuss these two issues in detail.

### **8.2.1 The impact of the REF on RKS behaviour**

This study reveals interesting results in Pre-1992 and Post-1992 universities with respect to the impact of the REF. In Post-1992 universities the huge pressure for RKS engagement comes from the university, whereas in Pre-1992 universities, the pressure comes from the REF. The REF has been seen as both “carrot” and “stick” by research-academics in Pre-1992 universities. The first group of research-academics are those who view the REF as a motivator factor that drives them forward in RKS. The findings indicate that the first group consists of those senior or active research-academics who have good research track record, and they believe that the REF inspires them to produce higher ranked journals. The second group of research-academics are those who view the REF as a pressure that force them to publish in higher rank journals. The results show that this is the group of research-academics who are still new to RKS and still building their groundwork in terms of research. Clearly, since research is a key performance indicator in Pre-1992 universities, the atmosphere in the university is rather competitive, i.e. everyone is targeting to submit papers so as to be included in the REF.

In contrast, the finding indicates that in Post-1992 universities, only small groups of research-academics see the REF as pressure, and they are consisted of the senior or active research-academics, who are concerned in keeping their publications in the higher ranked journals. The results show that the rest of research-academics do not see the REF as a pressure for them to involve in RKS. This is because they are not aiming to be included in the REF. They do not actually consider in meeting the REF standard. In other words, this group of research-academics are the “non-REF-able” people who just do not bother submitting for the REF. As discussed earlier, the involvement of research-academics in RKS in Post-1992 universities are not

intrinsically-driven or self-driven. Rather, their engagement is pushed or forced by the university research policy. As a result, they tend to engage in RKS as little as they can get away with in order to meet the university's requirement. This is contradicting to Pre-1992 universities, where research-academics are all aiming for the REF submission.

On the whole, the REF might have adverse impact on RKS activity both in Pre-1992 and Post-1992 universities. This study uncovers that the universities in the UK are now more towards the "REF-directed" that rush academic excellence through RKS activity, particularly publications. The REF indirectly forces research-academic to aim high in producing higher ranked publications. Unfortunately, the forces might be "too high", especially for Post-1992 universities. In Pre-1992 universities, the impact of the REF is much stronger as research-academics are all aiming at the highest level in accordance to the REF, otherwise, they may jeopardise their jobs. Although current scenario in Post-1992 is not as competitive as in Pre-1992 universities, they are climbing up the same ladder – aiming for the REF as it is one of the key criteria for future funding.

A criticism made on the REF is that the framework has too narrow a conception of acceptable academic output (Kahn-Harris, 2011). He argues that although it is important to fight the sensibility of the REF, the exercise is unlikely to go away anytime soon. Instead of finding ways to find an alternative for the REF, Kahn-Harris suggests that it is more critical to broaden the framework from within, i.e. allow a wider range of material to become acceptable to the REF. He concluded that by broadening up the REF framework, it might loosen up the stranglehold of the exercise. On the other hand, Weller (2011) argued that traditional publishing outlets as reinforced by the REF have clear bias towards research outputs as money flows – resulted from the REF. Inevitably there is a tendency to emphasise research in these outlets only. Weller refers to the idea of digital scholarship, where he argues that as a practical alternative to the REF. He argues that the universities' online reputation through digital scholarship is nowadays becoming the main brand of the universities in the UK. Pearce et al. (2011, pg. 5) define digital scholarship as "more than just using information and communication technologies to research, teach and

collaborate, but it is embracing the open values, ideology and potential of technologies born of peer-to-peer networking and wiki ways of working in order to benefit both the academy and society”.

In general, the findings imply that both types of universities are left with no other option to choose when it comes to the issue of the REF. By meeting the standard set by the REF, the universities can secure their reputations and attract more external funding, which then help them to attract high quality students locally and internationally. It is interesting to note that first, the REF pressures the universities and then the universities pressures their people. The universities are left with limited choice – they attempt to meet the REF targets so as to secure future funding. At the same time, the research-academics also left with limited option – they attempt to meet the university targets so as to help them progress well in their career.

### **8.2.2 The impact of university workload system on RKS behaviour**

This study also discovers that the university workload system is a distinctive element that distinguishes Post-1992 universities from Pre-1992 universities. A proper workload system helps research-academics to balance up between RKS, teaching, and administrative tasks. Workload varies among research-academics based on career phase as well as their involvement in RKS and administration. Research-academics in Post-1992 universities complain that time is a big constraint for them to engage actively in RKS. This is akin to Nonnecke and Preece’s findings (2001) that one of the most frequently cited reasons for not sharing knowledge is the lack of time due to greater prioritization of other interests. It has been reported that in Post-1992 universities, research-academics need to juggle all three activities (i.e. RKS, teaching, and administrative works) at the same time.

This finding indicates that research-academics in Post-1992 universities have heavy teaching loads. The heavy teaching load has been an issue for them since they are not only expected to teach more, but at the same time they are required to engage in RKS and meet the university research targets. Thus, workload system is now a big issue in Post-1992 universities. Interestingly, research-leaders across hierarchical level in Post-1992 universities have substantiated this issue, in which heavy teaching is now

a major constraint that hold back research-academics from engaging in RKS. This is in line with Hew and Hara's (2007) report that the little amount of time set aside by individuals in their daily schedule inhibits individuals to share their knowledge.

Interestingly, in Pre-1992 universities, both research-academics and research-leaders argue that the complaint about "heavy teaching loads" is just an excuse for not involving in RKS. They claim that in Pre-1992 universities, research-academics also need to teach. Although they agree that research-academics in Post-1992 universities might be doing more teaching than them, they argue about the quality of teaching. They claim that in Pre-1992 universities teaching is more challenging as research-academics are dealing with more high quality students. Thus, although they might be teaching less hours, the preparation required for that teaching is claimed as extensive. It is also indicated from the results that Pre-1992 universities are now facing acute pressure in terms of teaching. The university is currently recruiting more students, especially international students from which the university can generate more income. Although research is the key indicator of university performance, teaching is now becoming a vital activity in Pre-1992 universities. In order to cope with such challenges and to avoid jeopardising the university research performance, "teaching-only" post has been introduced in some Pre-1992 universities, i.e. recruiting someone to engage only on teaching so as to enable other research-academics have more time to engage in RKS.

### **8.2.3 The impact of research-academic's career phase on RKS involvement**

This issue is linked to the second issue (i.e. the impact of university workload system on RKS behaviour). The finding has indicated that in terms of teaching, both types of universities are now facing similar scenario. At one extreme (i.e. Post-1992 universities), research-academics are facing heavy teaching loads; and at the other extreme (i.e. Pre-1992 universities), research-academics are dealing with highly challenging students, plus the increasing number of students. Therefore, is the heavy teaching load a real issue or just an excuse for not engaging in RKS? It can be argued that this depends much on the behaviour of individual research-academics with regard to RKS. This is because, if the university removes the burden of heavy

teaching on research-academics and give them more hours to engage in RKS, will they engage in RKS actively? Will they capable to meet the university research targets?

Heavy teaching load could be one of the inhibitors that hold back research-academics from engaging in RKS. However, less teaching hour does not guarantee active RKS involvement among research-academics. Rather, the findings suggest that the RKS involvement pattern is much depending upon different types of research-academics, which is determined by their career phases - see Figure 8.7. The first type is a “self-driven” research-academic, which consists of research-academics with high self-motivation to involve in RKS. They are motivated to engage in RKS despite of other constraints that might limit or slow down their involvements. They do not require close support from research-leaders, specifically professors; either through mentoring or other interactive approaches. They are those senior and active research-academics with excellent research track record. The second type is a “support-driven” research-academic, which represents someone whose motivation to engage in RKS is driven by other factors, including supports from professors or other colleagues. Their involvements in RKS are easily affected by constraints like teaching or administrative works. They are those research-academics who are at the early career phase. The last type is a combination of the first two types, i.e. “self- & support-driven”. It consists of research-academics who are intrinsically self-motivated, but lacking of confidence to engage RKS. This group of research-academics tend to seek guidance and supports from professors as well as other colleagues. They are not easily affected by constraints but without supports from other people their involvement in RKS will be distorted. They are those research-academics who are at the mid career phase.

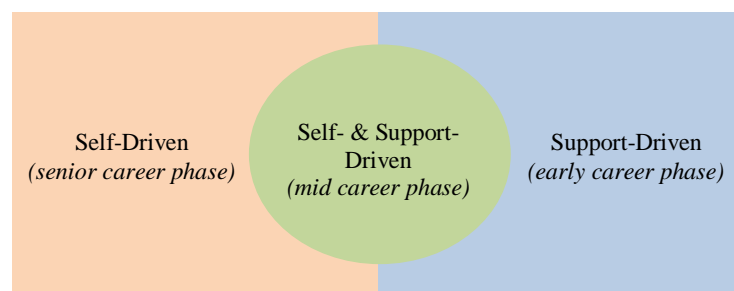


Figure 8.7 Types of research-academics across career phase

### **8.3 Theoretical contributions**

The theoretical contributions of this study are: 1) the development of a context-specific RKS model – see Figure 9.3; 2) validation of existing theories; 3) adding values to the existing theories. This study emphasised on four theories with regard to knowledge sharing in HEIs, including motivation, KM, organisational culture, and leadership theories. The following subsections discussed all of these theories in detail.

#### **8.3.1 Motivation theory**

A growing body of literature has investigated why people share or not share knowledge. Many have discussed the influence of extrinsic and intrinsic motivation in knowledge sharing. Hsu and Lin (2008) found that blogging is largely driven by intrinsic motivation (i.e. enjoyment) rather than extrinsic motivation. Similarly, Liao et al (2011) also confirmed that extrinsic rewards are less important for bloggers. Earlier, Bock et al. (2005) argued that extrinsic rewards shall not be stressed as a primary motivator within KS initiatives. At the same time, a quantitative study by Hung et al. (2011) in a university in Taiwan found that intrinsic reward (i.e. reputation feedback) has the strongest significant effect to support knowledge sharing as compared to extrinsic reward like economic incentives. This study reveals that the motivation to engage in RKS is significantly influenced by intrinsic rewards. In other words, the RKS engagement is largely driven by intrinsic motivation. With regard to RKS, the intrinsic motivation is broken down into academic and personal agenda. The academic agenda consists of factors like growing body of knowledge, contribution to the university, enhancing research performance, enhancing teaching quality, looking for co-authorship and motivated by the REF. The personal agenda includes awareness of the importance of knowledge sharing, career development, personal interest, and building up networking.

Apart from intrinsic motivation, this study also reveals that extrinsic reward also plays important roles. As confirmed by Bandyopadhyay & Pathak (2007) that individuals incur certain payoffs, which include both extrinsic and intrinsic rewards; when sharing their knowledge with other person. For RKS, the two specific extrinsic

rewards come from external factors, i.e., 1) the university expectation; and 2) the REF target. For example, an extrinsically motivated research-academic who have no interest in RKS may engage in RKS because they want the reward for achieving the university's expectation or the REF target. In this case, the reward would be a journal publication or being included in the REF, which in return not only enhance the university research performance but also adding value to the person's individual research profile. In other words, individual research-academics may dislike RKS, but the possibility of a journal publication or being included in the REF will be enough to keep them motivated in order for them to put forth the effort to engage in RKS. It is interesting to note that with regard to RKS, the REF is a "double-edge sword", which has both intrinsic and extrinsic values. As stated earlier, research-academics are both intrinsically and extrinsically driven by the REF when engaging in RKS. In other words, some of them see the REF as a "stick" that has forced them to stay motivated and put forth the effort to engage in RKS, whereas some others see the REF as a "carrot" that entice them to actively engage in RKS.

This study confirms the motivation theories that extrinsic and intrinsic rewards are influential factors that drive people to share knowledge. Although the literature is becoming rich with discussions of extrinsic and intrinsic rewards concerning knowledge sharing, virtually no study had been conducted to explore characteristics of extrinsic and intrinsic rewards concerning RKS. With regard to RKS, the characteristics of extrinsic and intrinsic rewards are distinctive as compared to those at commercial sectors as discussed in previous studies. This insight will be useful for supporting knowledge sharing in HEIs, specifically in the relevance of research activity.

This study also substantiates previous studies concerning factors that inhibit people from sharing knowledge. Factors like fear of losing power (Yao et al., 2007); lack confidence and low competency (Lin et al., 2009); lack of trust (Chen & Hung, 2010; Nichani & Hung, 2002); the non-availability of IP protection (Riege, 2005); and time constraint (Nonnecke & Preece, 2001); diminished the motivation to share knowledge. This study has revealed the same inhibitors with regard to RKS. Research-academics sometimes fear of losing power and becoming less competitive

and hence, they tend to hoard their research-knowledge. They also resist sharing their research-knowledge when lacking of confident or less research savvy. RKS also largely occurs when there is trust among colleagues or with research-leaders. Research-academics also hoard their research-knowledge when the IP protection is not available as to protect their research-ideas. They also tend not to engage in RKS when they have spent most of their times carrying out other tasks. Apart from that another unique factor that inhibits research-academics from sharing research-knowledge has been uncovered – and that is, fear of stealing of ideas. It has been found that when sharing the undeveloped or immature ideas at the initial stages of a research timeline (i.e. research ideas and research proposal), research-academics resist sharing their research-knowledge. This additional insight has enriched the body of knowledge concerning the motivation theories related to knowledge sharing.

### **8.3.2 KM theory**

The findings reported from this study have also added value to the body of literature concerning KM theory. The first one is it stresses the importance of the context-specific knowledge sharing. Although many researchers have paid attention on knowledge sharing in HE settings (Hung et al., 2011; Cheng, et al., 2009; Kidwell, 2000; Metcalfe, 2006; Sohail & Daud, 2009), no attention is paid on exploring knowledge sharing in the relevance of research (i.e. RKS). This study examines the RKS, which takes place among research-academics in HEIs. Based on a specific definition for RKS, this study enriches KM theory, by giving distinctive insights with regard to RKS.

The second one is this study has developed an original process-oriented RKS (PORKS) model. The PORKS model shows the unique sharing pattern of research-knowledge that does not take place at anytime. This study uncovers that research-knowledge is being hoarded at the initial phase of a research timeline, (i.e. research ideas and research proposal) as the sharing of immature and undeveloped ideas opens the risks of ideas being stolen or copied. Therefore, instead of sharing, research-knowledge is being hoarded at this initial phase, which is recognised as the “non-



sharing zone” in this study. At the middle phase (i.e. research design and research methodology) research-academics seek out research-knowledge from other people who they believe has the knowledge that can assist their research design and methodology. In this study, this is known as “one-way sharing zone” because when seeking particular research-knowledge from other people, they do not share their own research-knowledge. At the final phase, which is recognised as “two-way sharing zone” in this study, research-academics freely and mutually share their research-knowledge with other people without any fear. This could be done through presenting papers at research conferences, research seminars or informal conversations. These insights apparently add value to the body of knowledge and will be useful to support KM theory.

The third one is, this study suggests a distinctive RKS pattern for HEIs, presented in Knowledge Sharing Management (KSM) model. The KSM is an original contribution of this study, which adds new knowledge to the KM theory. The RKS process follows a unique sequence beginning with knowledge hoarding (i.e. non-sharing), continues with knowledge seeking (i.e. one-way sharing), and ends with knowledge sharing (i.e. two-way knowledge sharing). This study reveals that the content of research-knowledge is less shared by research-academics before reaching the final results in the form of publications. With regard to the types of knowledge (i.e. tacit and explicit), this study reveals that the sharing of tacit knowledge is unconsciously occurs. Thus, this adds knowledge to Polanyi’s (1966) idea that tacit knowledge is an integral part of all knowing and rejects Nonaka & Takeuchi’s work that tacit and explicit are two separate types of knowledge. This study also confirms that the sharing of tacit knowledge is also tacit in nature, where research-academics are less likely aware when exactly that knowledge is shared or passed to other people. This adds value to Tsoukas’ (1996) and Gertler’s (2003) ideas that separating tacit and explicit knowledge is impractical as tacit knowledge is critically complemented and supported explicit knowledge.

The fourth one is this finding lead to evaluation of Nonaka and Takeuchi’s (1995) SECI spiral model, specifically for RKS. The SECI may not applicable to knowledge associated with different types of asset (i.e. research-knowledge), where the

conversion from tacit to explicit or vice versa does not follow the spiralling process. Research-knowledge is complex, multifaceted and unique. The SECI model does not seem to explain effectively this sort of ‘problematic’ knowledge. This study supports Klein’s (2008) suggestion that the development of tacit research-knowledge requires personal interaction like mentoring or coaching, learning-by-doing, learning-by-watching, double loop learning and hands on experience. It can be argued that although Nonaka’ and Takeuchi’s theory is considered valuable and attracts attention from many researchers, the model is not appropriate for a practical tool for HE settings, particularly research-knowledge.

### **8.3.3 Organisational culture theory**

Literature suggests that the working culture of an organisation influence knowledge sharing behaviour, which then affect organisational performance. Politis (2004) found that organisational culture is one of the critical factors contributing to creating and leveraging knowledge within the organisations. An empirical work by De Long & Fahey (2000) in fifty organisations has confirmed that there is significant relationship between supportive organisational culture and successful knowledge sharing. More recently, Zheng et al. (2010) also prove that organisational culture has the strongest effect on knowledge sharing, which then influence the organisational effectiveness. Clearly, supportive organisational culture is a key prerequisite for knowledge sharing. Although many studies have discussed how organisational culture affects knowledge sharing behaviour, no study had been conducted to explore a distinctive types of organisational culture in a context-specific area, i.e. research-culture in HE settings.

Most theories of culture differ in their focus on the various “layers” of culture. Schein (1992) proposes the visibility and invisibility characteristics of culture. Sackman (1992) suggests the term “culture” and “subculture”, whereas Ahmed (1998) uses the term “explicit” and “implicit” culture in distinguishing the different layers of culture. Although many theories focus on the continuum of organisational culture, no attention is paid on a context-specific culture, i.e. research-culture in HEIs. This study has generated a new culture model, which gives useful insights and

adds value to the organisational culture theories. Drawing upon Ahmed's (1998) work, this study employs the word "explicit" and "implicit" culture and uses the earth-model in order to explain the different layers of research-culture of a particular university.

The organisational culture theory has been advanced by presenting the dichotomy of explicit and implicit culture in an original "research culture-earth model". This study has broken down the continuum of research-culture into three layers, i.e. core, mantle, and crust; based on the earth layers. The core layer represents the implicit culture; the mantle layer, refers to explicit culture; and the crust layer, signifies the combination of both implicit and explicit cultures. The planet earth is intricately bound up with and dependent on each other, making the earth and all that lives upon it into one living organism. The earth layers are interdependent on one another, where each component is important and one cannot function well without the others. Similarly, both explicit and implicit research cultures are mutually supporting one another. The effective explicit and implicit research cultures will lead to stronger "crust" layer, which reflect on a good research image of a particular university both internally and externally. In some extent, this model is original, in which it emphasises on university research-culture, where the impact of implicit research-culture is discussed thoroughly. Strong implicit culture does not by itself produce good research performance. But weak implicit culture makes good research performance impossible, no matter how supportive the explicit culture may be. Both explicit and implicit cultures serve an important part in achieving the university research target.

This study learns that both explicit and implicit culture of a particular university has different impact on RKS behaviour. The explicit culture, which refers to the implementation and execution of research policies, has less influence on RKS as compared to implicit culture. Implicit culture, which represents the values, beliefs, behaviour, and setting of standards of individual research-academics towards RKS, plays much crucial roles. The implicit culture is more tacit and intangible in nature. The explicit culture is just the "tip of the iceberg", in which the problems are much bigger than it seems. The implicit culture is where the real problem lies. It has been

found that in order to enhance RKS behaviour, the universities need to emphasise on maturing the implicit culture as there lays the values, beliefs, behaviour and setting of standard, in which research-academics hold on to whether or not to engage in RKS. This insight advanced the body of literature concerning organisational culture theory, particularly research culture in HEIs.

#### **8.3.4 Leadership theory**

The body of knowledge has witnessed rich discussions about leadership. Many studies have confirmed that leader's support and commitment is one of the major critical success factors in enhancing knowledge sharing in business organisations (Damodaran & Olphert, 2000; Fliaster, 2004; Akhavan et al., 2006; Lin, 2007b; Gagné, 2009). In an empirical work by Jayasingam et al. (2010), leadership has been found as a critical factor that influences and motivates knowledge workers to contribute and participate actively in creating, sharing, and using knowledge effectively. Leaders' roles are also critical in facilitating or building a knowledge sharing culture that motivates staff to understand, value, and participate in knowledge sharing (Artail, 2006; Abou-Zeid, 2008). Despite this richness, virtually very little attention has been paid on a specific type of leaders, i.e. research-leaders. The empirical work of this study enriches the leadership theory not only by emphasising on this specific type of leaders but also revealing the roles of research-leaders both formal and informal.

It has been recognised that research-leaders' roles are determined by two key elements. The first element is the type of research-leaders. There are two types of research-leaders in this study, 1) formal research-leaders, which refers to those at the top university level (i.e. Pro Vice Chancellor of Research and Director of Research) and middle level (i.e. Dean of Research and Associate Dean of Research); and 2) informal research-leaders, which represents the professors who are at the low university level. This study found that different types of research-leaders play different roles in order to support and promote RKS within the university. Although all types of research-leaders are important to enhance RKS behaviour, the professors'

roles appears very critical as they are the closest to research-academics within the department, subject group, unit, or team.

This study has revealed that research-leaders at the top level are responsible to set up research policies and communicate across faculty and school levels, whereas at the middle level, research-leaders are responsible to communicate, introduce, and implement research policies across school and department levels. The formal research-leaders' roles are inevitably important to support RKS within the university. Most importantly, their roles bring up to effective explicit culture within the university. This insight adds value to the leadership theory, especially in HE settings.

The leadership theory has been advanced by an originally new “interactive research-leadership structure model” generated from this study, which presents the best practice of relationship between professors and research-academics. This model emphasised on the roles of professors in supporting RKS among research-academics. This model illustrates the boundaryless structure of research-leadership in supporting RKS. The empirical work of this study has uncovered that the interactive relationship between professors and research-academics is significant to enhance RKS engagement. The roles of professors in supporting RKS is compared with the roles of gardener, who is skilful in gardening, cultivates and cares for a garden, lawn or flower, and responsible for the plants growth. Likewise, professors are those who expert in research, promote RKS among research-academics, and responsible to facilitate RKS among research-academics by using their experiences, skills and networks, which ultimately aiming at producing more research outputs. Most importantly, an effective professor will help creating strong implicit research-culture within a university.

Research-leaders' role is also determined by research-academics' career phase. This is only emphasised on professors' roles. Since the characteristics of research-academics are varied based on their career phases, the roles of professors are also varied. Research-academics' career phase are ranging from early, mid, and senior. This study has discovered that the more senior research-academics the lesser support and guidance they require from professors. They are known as “self-driven”

research-academics. Those at the early career phase, which are known as “support-driven” research-academics however, require support and guidance from professors. At the mid career phases, research-academics can either be “self-driven” or “support-driven”. They are those research-academics are self-motivated to engage in RKS but lacking of confidence to progress. Thus, in some extent they need support and guidance from professors to drive them forward. This finding has advanced the body of literature of leadership theories.

#### **8.4 Practical implications**

The findings have several implications for practitioners. This study has established better understanding of six critical issues concerning RKS: (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. Such understanding may enhance RKS engagement in HEIs, and eventually lead to higher levels of research performance. Based on the theoretical and empirical works, this study has come up with ten implications to practitioners.

The first implication is the findings provide generalisability in terms of the common key enablers for RKS, which are utilised by both Pre-1992 and Post-1992 universities in a way to promote RKS behaviour among research-academics. These enablers include people, organisation, and IT. These enablers refer to the important factors (e.g. leadership, organisational culture, and IT infrastructure) that can enhance RKS engagement among research-academics. The findings suggest that these enablers are interrelated to one another. For example, interactive relationships between research-leaders and research-academics are crucial for RKS engagement. Leaders are responsible for the implementation of advanced technological infrastructures within the workplace. At the same time, leadership is also one of major contributing factors for effective organisational culture. As concluded by Schein (2004) organisational culture and leadership are two sides of the same coin. This notifies the interdependent of all the three enablers in supporting RKS.

Therefore, it is very important for HEIs to ensure that all three enablers are functioning well in order to enhance RKS behaviour and hence lead to better organisational research performance.

The second implication is, this study has discovered a key difference that distinguishes Post-1992 universities from Pre-1992 universities – that is, the implicit culture. Here, the implicit research culture in Post-1992 universities is less effective as compared to Pre-1992 universities. It has been revealed that systematic research policies alone may not determine the success of research performance. Here, professors play critical roles in order to help shape and improve the mindset of research-academics towards RKS. The suggested interactive relationship between professors and research-academics may enhance RKS engagement. Specifically, this study put forward the roles of professors in supporting RKS among research-academics. Professors' roles are not only critical as to maintain their own research track record, but mostly crucial to guide, advice, encourage, and motivate research-academics in order to engage in RKS. Their roles in developing research-academics through interactive relationship like mentoring, formal and informal conversations are essential in enhancing university research performance.

The third implication is, since professors' roles have been recognised as very critical in enhancing RKS behaviour and thus lead to better university research performance, their roles and functions should be made more formal. Professors are those informal research-leaders with unclear authority. If their roles are made more formal and explicit, in some extent professors will have clearer authority over the RKS activity within the university. Such authority will make them aware of their roles as one of the key research-leaders to promote RKS among research-academics. As suggested earlier by Macfarlane (2012b), since professors is seen as an intellectual asset to institutions, their roles needs to be recognised explicitly for both moral and functional value. It would be good to explicitly documented that the roles and functions of professors, is not only to enhance university research performance through their own research track records, but most importantly, through the development of research-academics on becoming more research savvy.

The fourth implication is, the findings show that research-academics in Post-1992 universities are more attached to the university research centres. In other words, the resources and expertise in terms of RKS are more condensed into these research centres. Although the research centres is operated across departments, they are determined by the specific discipline of individual research-academics. In other words, research centres are more likely to have a critical mass of people with similar research interests. This is undoubtedly valuable for RKS but in some extent it does create boundaries for multidisciplinary research. At the Pre-1992 universities, research-academics are less attached to the research centres, and thus, their RKS engagement pattern is more scattered, in which it creates opportunities for multidisciplinary research. Since multidisciplinary research is recognised as high quality research by research assessments like the REF, Post-1992 universities may want to consider diversifying their research centres into multidisciplinary area of interests, which is purposeful to enhance university research performance.

The fifth implication is, this study discusses about the issue of knowledge sharing management, in which the KSM model has been proposed. Unlike knowledge sharing in commercial sectors, the KSM model notifies that research-knowledge is not shared at all times. It has been revealed that with regard to RKS, research timeline or research phase plays a critical role. There is a need of hoarding and seeking research-knowledge at different phases across a research timeline. This is clearly distinctive from other process of knowledge sharing that is commonly discussed in previous studies.

The sixth implication is the findings of this study can be utilised into practice. It is common now that at the university research events (e.g. seminars, workshops, and conferences) published papers or working papers are presented, where it discusses more about the content of a particular research. It is suggested that the successful research-academics who have got their paper published to reveal the process of their research rather than only sharing their results. Research results are undoubtedly valuable, but people are more interested to know how these successful people develop their ideas, who they work with, how they get their papers published, how to submit papers in the higher ranked journals, and how they deal with editors. Such



knowledge is most likely being hoard before anyone get their paper published, but once that is formalised in a journal, they should not continue hoarding their knowledge and experience but share it with other colleagues at any of the university research events. Therefore, the sharing of best practices by these successful research-academics will help other colleagues to effectively pursue RKS by learning from those knowledge and experiences. Hence, this will lead to higher levels of research performance.

The seventh implication is, this study obviously has implications on research-leaders at all hierarchy levels. Research-leaders need to understand why research-academics incline to engage in RKS and what inhibit them from doing so. It is very common that research-leaders support RKS through “hard” element like setting up new research policies. However, it is mostly important that research-leaders understand the challenges faced by research-academics contributed from the university research target. Research-leaders should not be seen as someone who only gives out orders or execute the policies. Rather, they should be seen as someone who can provide ways on how to achieve such targets. Although, it seems that professors’ roles are mostly crucial here, research-leaders at both top and middle levels are inevitably important too. They must ensure that the set up research policies are practical, realistic and on top of all, achievable so that those policies have no adverse impact on research-academics. For example, when implementing, adding or changing a particular research policy (e.g. workload system, mentoring system, or a reward system), they need to be aware that the policy is not converted into pressures among research-academics. Those research policies should be appropriately fit in with the university resources like financial and research-academics’ capability.

The eighth implication is, this study discusses the issue of the REF with respect to the RKS at both Pre-1992 and Post-1992 universities. From the findings, it has been predicted that the REF will widen the gap between Pre-1992 universities and Post-1992 universities. This is because with sufficient resources and skilful research-academics, the Pre-1992 universities are more likely to meet targets set by the REF. However, in Post-1992 universities, although they are catching up, they are only emphasising on active research-academics who can submit for the REF. In the

meantime, they are actually pushing away those potential research-academics who are interested in pursuing RKS but not yet capable to go for the REF. Developing RKS skills among this group of research-academics is critical for Post-1992 universities as these people might be potential research-academics who can continue enhancing university research performance in the long term. Using the REF as measurement for high quality research, the government might deliberately want to develop concentrations on certain subject area. However, the implication of the REF as a National Strategy as what reported in this study is that, the REF has indirectly forced the Post-1992 universities to give up particular research inputs into developing “REF-able” research-academics. Such approach is anti-productive as attention is much given to meet up with the REF and not for the long term stability or establishment of research performance.

The ninth implication is this study also suggests how universities should respond to the REF. For Pre-1992 universities, the pressure for research-academics is certainly higher. However, since their research-academics are more research savvy, plus strong supports given by research-leaders, especially the professors, they can cope easily with the pressure and eventually meet the university targets concerning the REF. For Post-1992 universities, such scenario is quite unlikely. Research-leaders in Post-1992 universities should be more realistic in catching up with the REF. The empirical work of this study reveals that Post-1992 universities are pushing hard trying to perform better in the REF. This may be a wrong approach for some of the Post-1992 universities since they have smaller group of research-academics who are capable in RKS, plus their resources are less sufficient as compared to Pre-1992 universities. They may target for the REF in order to attain good reputation or for financial purposes, but that is not the only option they have. They may need to focus on the other research agenda like knowledge transfer partnership projects, collaborations, or consultancy works.

And finally, the finding also has an implication on Pre-1992 universities with regard to the workload system or time constraint issue. This study found that in order to cope with pressure from the REF, some Pre-1992 universities are opening “teaching-only” posts, where anyone employed on this post is not expected to do research.

Rather, they will only focus on teaching. The teaching-only post might jeopardise the quality of teaching and learning in Pre-1992 universities. They might lose their status as “research-informed” university in long term. In this respect, people may argue how a “teaching-only” fellow, without doing any research able to teach at the research-informed universities. This could be an alarming signal for Pre-1992 universities as the idea of teaching-only post is clashing with the nature of the universities, where their teaching is led by research.

## 8.5 Summary

This chapter synthesises the main findings generated from this study. The first section discusses the six key determinants of RKS, in which both similarities and differences between Pre-1992 and Post-1992 were discussed. The motivator factors found in this study, which significantly influence RKS behaviour can be summarised in six different elements: (1) sharing for research-knowledge for fulfilling academic requirements; (2) sharing for research-knowledge for self-interest; (3) sharing for research-knowledge for research productivity; (4) sharing for research-knowledge for establishing oneself as a researcher; (5) sharing for research-knowledge for fulfilling university requirements; (6) sharing for research-knowledge for career development. The inhibitor factors are found to be more personal for each individual research-academics in both types of universities. “Trust” is a critical element that can influence the whole process of RKS.

Interestingly, this study reveals that RKS follows distinctive process, which explained through the “knowledge sharing management” (KSM) model in this study. KSM begins with *knowledge hoarding*, followed with *knowledge seeking*, and ends with *knowledge sharing*. This finding has criticised Nonaka and Takeuchi’s (1995) SECI spiral model, in which RKS appears not following the conversion of tacit and explicit knowledge. Rather, the process of RKS is distinctive, where both tacit and explicit knowledge are hoarded, sought, and shared sequentially based on the timeline of a research project. A process-oriented RKS (PORKS) model is suggested based on the result found from both types of universities. The PORKS model portrays the three phases of RKS process: 1) initial phase (i.e. research ideas and

proposal); 2) middle phase (i.e. research design and methodology); and 3) final phase (i.e. research result and published research).

This study has indicated that channels of communication used to share research-knowledge are common in both Pre-1992 and Post-1992 universities. The research timeline is found to be an influential factor that determines the choice of channels of communication chooses for RKS. Results in both Pre-1992 and Post-1992 universities indicate that “softer” issues like people and organisation are key enablers of RKS as compared to IT. In this study, the need of IT infrastructure is less important in supporting research-academics to engage in RKS. However, there are two major differences that widen the gap between Pre-1992 and Post-1992 universities with regard to RKS. These differences occur due to a less effective “functionality” of both *people* and *organisation* as enablers in supporting RKS. They are the university research culture (i.e. organisation) and research-leadership (i.e. people).

The analysis suggests that research-academics in Pre-1992 universities are more individualistic in gaining competitive advantage in terms of RKS engagement. They are intrinsically-driven to engage in RKS. They are more research savvy and have more exposure in terms of RKS, and hence they are more confident to engage in RKS. This study suggests that there is a strong implicit research-culture in Pre-1992 universities, which has naturally motivated research-academics to engage in RKS. Most importantly, there is a close interaction between professors and research-academics, in which professors share their experience, expertise, skills, visions, and networks with research-academics. This interactive relationship has developed research interest among research-academics and also increased the level of research output in Pre-1992 universities.

On the other hand, research-academics in Post-1992 universities are less research savvy and they have less exposure in terms of RKS, and hence they are lacking of confidence to engage in RKS. The results show that they are extrinsically-driven or largely pushed/guided by university research policy in terms of RKS engagement. It is also found that research-academics in Post-1992 universities tend to be more

clustered and attached to research centres, where resources for research and research expertise are consolidated in the university research centre. This is contradicting with Pre-1992 universities, in which the resources for research and research expertise are more scattered, not only in research centre but in every individual research-academics. Most importantly, the results indicate that research-leaders in Post-1992 universities paid more attention on designing, developing, and implementing research policy and not closely hand-to-hand supporting research-academics to engage in RKS and produce more research outputs. They seem to give more instruction on “what to do” but not actually show “how to do”. This study suggests that research policy alone may not necessarily lead to the success of research performance. Rather, the implicit culture is critical in determining the differences between Pre-1992 and Post-1992 universities’ research performance. The explicit and implicit culture is explained using the “research culture-earth model”.

The second section presents the three associated issues emerged from the findings. This includes the impact of the REF, the impact of the university workload system, and the impact of research academic’s career phase; on RKS involvement. Several theoretical models are generated from the discussions. Clearly, the REF is seen as both “carrot” and “stick” by research-academics in Pre-1992 universities. Some views the REF as a motivator factor that drives them forward in RKS, whereas others view the REF as a pressure that forces them to publish in higher rank journals. In Post-1992 universities, the REF is only seen as the “stick”, which pressures them to engage in RKS, especially produces publication in higher ranked journals. Overall, the REF might have adverse impact on RKS activity both in Pre-1992 and Post-1992 universities.

This study also discovers that the university workload system is a distinctive element that distinguishes Post-1992 universities from Pre-1992 universities. This finding reveals that research-academics in Post-1992 universities have heavy teaching loads as compared to those in Pre-1992 universities. As a result, time is the main constraint for their RKS engagement. Lastly, the findings suggest that the RKS involvement pattern is much depending upon different types of research-academics, which is determined by their career phases, i.e. “self-driven” research-academic (i.e. senior

career research-academics), consisting of research-academics with high self-motivation to involve in RKS; “support-driven” research-academic (early career research-academics), which represents someone whose motivation to engage in RKS is driven by other factors, including supports from professors or other colleagues; and “self- & support-driven” (i.e. mid career research-academics), consisting of research-academics who are intrinsically self-motivated, but lacking of confidence to engage RKS. Finally, this chapter discusses the implications of this study both theoretically and practically. The implications for practitioners mainly derived from the key differences between the two types of universities.

This study has several major contributions to the body of knowledge. Apart from developing a context-specific RKS model, this study also validates the existing theories in relation to knowledge sharing. Most importantly, it adds value to the body of literature concerning motivation, KM, organisational culture, and leadership theories. In terms of motivation theory, this study reveals that the motivation to engage in RKS is significantly influenced by intrinsic rewards, which can be broken down into academic and personal agenda. This study also reveals that extrinsic reward (i.e. the university expectation and the REF target) also plays important roles. Although the literature is becoming rich with discussions of extrinsic and intrinsic rewards concerning knowledge sharing, the results show in this study are distinctively important to support knowledge sharing in HEIs, specifically in the relevance of research activity.

With regard to KM theory, this study has developed a PORKS model, which uncovers the unique sharing pattern of research-knowledge that does not take place at anytime. Rather it follows a distinctive process – knowledge hoarding-knowledge seeking-knowledge sharing. The findings also lead to evaluation of Nonaka and Takeuchi’s (1995) SECI spiral model, which may not applicable to knowledge associated with different types of asset (i.e. research-knowledge), where the conversion from tacit to explicit or vice versa does not follow the spiralling process. For organisational culture theory, since no study had explored a distinctive type of organisational culture in a context-specific area, i.e. research-culture in HE settings, this study has advanced the body of literature. A new “research culture-earth model”

has been generated from this study. Unlike previous theories of organisational culture, this study has broken down the continuum of research-culture into three earth-layers, i.e. core, mantle, and crust. This study learns that both explicit and implicit culture of a particular university has different impact on RKS behaviour. And lastly, for the leadership theory, although the body of knowledge has witnessed rich discussions about leadership, with regard to RKS, it has been recognised that research-leaders' roles are determined by two key elements, i.e. the type of research-leaders and research-academics' career phase. Here, the roles of professors in supporting RKS engagement among research-academics are very critical.

Furthermore, this study also provides several implications for practitioners. It provides generalisability in terms of the common key enablers for RKS, which are utilised by both Pre-1992 and Post-1992 universities in a way to promote RKS behaviour among research-academics. Since it has been revealed that systematic research policies alone may not determine the success of research performance, the interactive relationship between professors and research-academics is very crucial in order to help shape and improve the mindset of research-academics towards RKS. It also suggested that professors' roles should make more formal and explicit, so that in some extent they will have clearer authority over the RKS activity within the university. This also recommends that, the Post-1992 universities may want to consider diversifying their research centres into multidisciplinary area of interests, which is purposeful to enhance university research performance. It is also suggested that the successful research-academics who have got their paper published to reveal the process of their research in research events like research seminar; rather than only sharing their results.

# Chapter 9

*“The best way to predict your future is to create it”  
Abraham Lincoln (1809-1865)*

## **Summary**

### **Introduction**

This chapter summarises the findings of this study. It starts with the summary of the two key differences with regard to RKS that differentiate the Pre-1992 universities with Post-1992 universities. The first one is the university research culture and the other one is research-leadership. The chapter then presents a context-specific RKS model generated from this study, and ends with the summary for this chapter.



## **9.1 Summary of the findings**

The findings discussed in Chapter 8 indicate that most of the key determinants of RKS are mainly common in both Pre-1992 and Post-1992 universities. This includes motivator and inhibitor factors for or against sharing research-knowledge; RKS process; types of knowledge shared; channel of communications used for sharing research-knowledge; and IT as an enabler. However, there are two major differences that widen the gap between Pre-1992 and Post-1992 universities with regard to RKS. These differences occur due to a less effective “functionality” of both *people* and *organisation* as enablers in supporting RKS. They are the university research culture (i.e. organisation) and research-leadership (i.e. people). The following two subsections highlight these key differences.

### **9.1.1 University research culture**

As Wang and Noe (2010) concluded in their review of knowledge sharing research, softer issue like organisational culture is one of the key determinants of knowledge sharing. In HEIs settings, this study also proves that university research culture is critical for RKS. Remarkably, there is a gap between Pre-1992 and Post-1992 universities concerning this issue. It is found that research culture in Pre-1992 universities is more established as compared to Post-1992 universities. Pre-1992 universities have strongly effective explicit culture as well as implicit culture, in which the universities are not only succeed in developing, implementing and maintaining effective research policies (i.e. explicit culture), but also able to cultivate strong implicit culture.

The elements that differentiate the implicit research-culture in Pre-1992 and Post-1992 universities can be summarised into four different aspects – see Table 8.1. The first aspect is research capability. Due to the nature of Pre-1992 universities as so-called “research-intensive” universities, research-academics are largely exposed to RKS. Each one of them, starting from the early career, mid career and down to senior career research-academic; is aware of the need to involve in RKS, where the ultimate aim is higher ranked publication. RKS engagement has become research-academics’ beliefs and norms. With such exposure, they are more research savvy and confident

to engage in RKS. In contrast, research-academics in Post-1992 universities are a step behind. Since the nature of Post-1992 universities are more “teaching-intensive”, research-academics are less exposed to RKS. Although there are research-academics who are active in RKS, the numbers are small. The rest of research-academics are less research savvy. Most importantly, since they have exposure to RKS, their “know-how” skill is lesser and hence, they have less confident to engage in RKS.

The second aspect is research-academics’ behaviour. It has been discovered that research-academics in Pre-1992 universities are more self-motivated. Their involvement in RKS is not determined or forced by the university research policies. Rather, they are intrinsically-driven or self-driven to engage in RKS. This is clearly due to the nature of Pre-1992 universities that is more “research-intensive” and so every research-academics is aware of the need to engage in RKS and aiming for more research output. Conversely, in Post-1992 universities, the involvement of research-academics in RKS is extrinsically-driven, in which it is not naturally driven by their own self-motivation. Although they are aware of the importance of involving in RKS for their career, only small numbers of research-academics are naturally motivated to engage in RKS without being forced or controlled by other factors. Due to the nature of Post-1992 universities that are more “teaching-intensive”, majority of research-academics are not intrinsically-driven to engage in RKS. Rather, they are much more driven by the university research policies.

The third aspect is the RKS engagement style. In Pre-1992 universities, since research-academics are largely self-motivated to engage in RKS, they are more independent. As a result the RKS engagement in Pre-1992 universities is more scattered, where research-academics tend to work in silos. This creates the individualism and isolation atmosphere within the university. In Post-1992 universities however, since research-academics at large are less independent, the RKS involvement is more clustered. They tend to work more in groups. Here, the university research centre plays important roles, where the resources for research like research experts; are monopolized by the research centre. This creates the

collectivism atmosphere in Post-1992 universities. Figure 9.1 depicts the RKS engagement style in both types of universities.

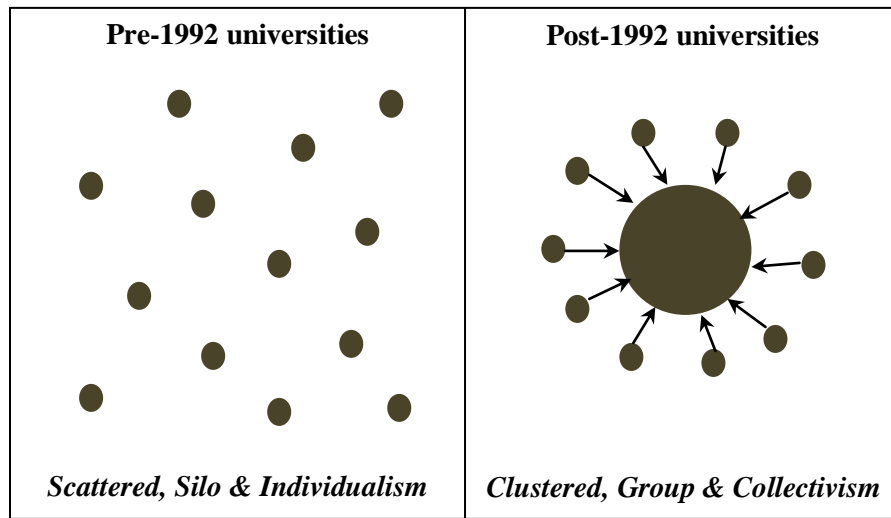


Figure 9.1 RKS engagement style in Pre-1992 universities vs. Post-1992 universities

The fourth aspect is the research-leaders' support. It has been noted that research-leaders in Pre-1992 universities, particularly professors use interactive approach in order to support RKS among research-academics. The interactive approach includes giving advice, guidance, and assistance in terms of good practice of RKS. Through this approach, research-academics will have the opportunities to seek knowledge in terms of research ideas, designs or methodologies; create linkages based on professors' networks for RKS purposes; and develop research ideas that can enhance RKS engagement and enrich research output. In contrast, research-leaders in Post-1992 universities, particularly professors are less interactive. The RKS supports are more "top-down", in which they are more emphasising on developing and implementing research policies rather than building up close relationship with research-academics. They tend to support RKS by focusing on the "what" factor like what to be done and what is expected on them; but less emphasising on the "how" factor, for instance how to engage in RKS and how to achieve the expectation.

As a result, these four elements shape the implicit culture in both types of universities. In Pre-1992 universities, due to strong values, beliefs and norms among research-academics concerning RKS, the university implicit culture is more stable

and established. Most importantly, their implicit culture is parallel with the explicit culture. On the other hand, since majority research-academics in Post-1992 universities have a little exposure in RKS, less confident and lack of “know-how” skills, the university implicit culture is unparalleled with its explicit culture, which is more effective.

Therefore, it is critical for the Post-1992 universities to improve their implicit culture by instilling good practices of RKS, which could alter the values, beliefs, and norms of individual research-academics concerning RKS engagement. The good practices of RKS can be passed through professors and also senior or active research-academics to everyone within the university. This will slowly but steadily improved the implicit culture within the university through good practices, where it allows changes in people’s values, beliefs, and norms. Interactive approach between professors and research-academics in Pre-1992 universities can be a benchmark for Post-1992 universities in order to support RKS among research-academics.

In order to cultivate strong and stable implicit research-culture, it may involve things as basic as changes in the recruitment policy, for instance, the hiring of an individual academic is largely based on things relevant to RKS, including background of research, publication profiles, as well as interest to pursue research both for publications and teaching purposes; and also staff development, i.e. developing research-academics with “implicit culture I” characteristics. The Post-1992 universities should not only concentrate on senior or active research-academics to continue enhancing university research performance. Rather, it is crucial to guide those at early career; and at the same time develop those at mid career with sufficient “know-how” skills concerning RKS so that they will have more exposure in RKS, gain more confident, and become research savvy. Ultimately, the university implicit research culture can be altered effectively, and hence improve university research performance.

The process of developing and implementing research policies in the Post-1992 universities should be more practical and achievable. The research policies should fit the universities’ resources (e.g. financial), and people’s capability (e.g. “know-how”

skills). Most importantly, the research policies should not pressure the research-academics when engaging in RKS. Their involvements should come naturally rather than being pushed by the university research policies. Otherwise, as confirmed by Whitmore (1992) they will only do as little as they can get away with. Such scenario not only has negative impact on university research implicit culture, but is also unproductive for university research performance. The university research policies should be well understood and accepted by every research-academics. Open discussions, formal or informal conversations, or grapevine are useful ways of observations or inspections whether or not such policies are understood or accepted. Overall, it is critical for the Post-1992 universities to improve their implicit research culture so that every research-academics are committed and consciously motivated to engage in RKS. This is important to enhance the university research performance.

### **9.1.2 Research-leadership**

As Chawla & Joshi (2010) found in their empirical study of KM, leadership plays an essential role in creating, developing, and managing the organisational capabilities, including recruitment of staff; creating effective team; build and integrate the culture; use the IT and other supportive infrastructures; and develop rewards and recognition systems. Islam et al. (2011) in their empirical work have confirmed that leaders who take positive initiative in giving proper work environment through ensuring that the necessary support and proper organisational structure are in place; able to facilitate knowledge sharing among different functional groups. In HEIs context, this study has also proven that research-leaders have significant influence on RKS engagement among research-academics.

It is found that there is a gap between research-leadership in Pre-1992 and Post-1992 universities. This study has discovered that, in Pre-1992 research-leaders are not only supporting RKS through the development and implementation of research policies (i.e. research-leaders at top and middle levels) but also supporting RKS through daily interactions with research-academics, be it formal or informal (i.e. professors). It is shown that research-leaders across university levels in Pre-1992 universities have taken positive initiative in providing encouraging atmosphere in order to facilitate

RKS among research-academics. They create effective research culture supportive for RKS, both explicitly and implicitly. Most importantly, as stated earlier, professors in Pre-1992 universities used interactive approach to promote and motivate research-academics towards RKS engagement. Figure 9.2 illustrates the interactive research-leadership structure in Pre-1992 universities. The diamond-shaped represents the department, subject group, unit, or team, which consists of research-academics at all career phases. Different segments in the diamond dotted with black node, symbolised the professors. A line from one node to another show the interactive relationships between professors and research-academics, which is boundaryless. Overall, the influences of research-leaders in Pre-1992 universities have made research-academics more exposed in RKS, gain more confident to involve actively in RKS, and becomes research savvy. This study has confirmed that supports given by research-leaders are significantly related to RKS engagement among research-academics. In other words, research-leaders' supports matters more than anything else in defining the best research performance within the university.

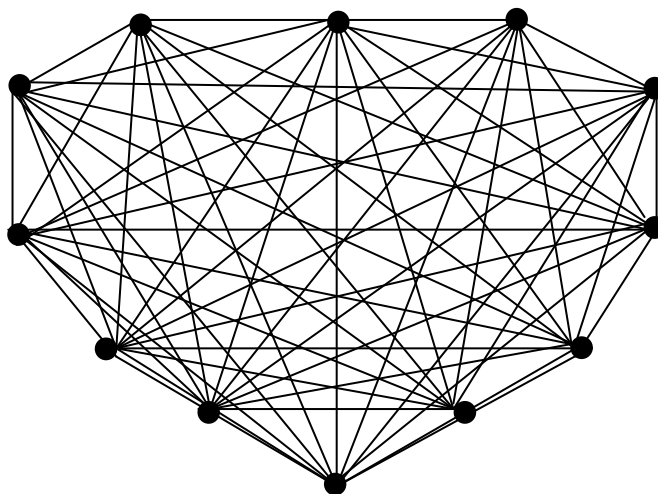


Figure 9.2 Interactive research-leadership structures in Pre-1992 universities

In contrast, it has been indicated that research-leaders in Post-1992 universities are only well supporting RKS at the “tip of the iceberg”. They have successfully set up, develop, and implement systematic research policies so as to enhance their research performance. On one hand, they have productively upgraded their university status so as to stay comparable with other so-called “research-intensive” universities. On the other hand, they have overlooked that since those policies are designed to

enhance research performance within the university, research-academics require specific encouragement and guidance. They need research-leaders not only to communicate those policies to them and tell them what they are expected to come out with, but they require research-leaders, especially professors to facilitate their learning process. Without such supports from professors, the set up policies will have an adverse impact on research-academics at large. Such supports and guidance may not be necessary for those senior or active research-academics, but it is crucial for the rest of research-academics. As shown in this study, the research policies implemented in Post-1992 universities have putting pressure on research-academics at large. They are expected to engage in RKS, but they are lacking of supports and guidance as how to achieve those expectations.

From the findings, it can be suggested that the Pro Vice Chancellor of Research and Director of Research should act as ambassador for the university, helping to spread and improve university research through confrontations and presentations. On top of that, it is crucial for them to observe how the university research policies are communicated and passed through everyone within the university. At the other layer, the Dean/Associate Dean of Research should observe how well those policies are accepted by research-academics. It is critical for them to emphasise on staff development concerning research activity and have much closer relationships with the professors in order to discuss the challenges that research-academics are facing in order to achieve the university research targets. Their roles should be viewed not only as “policy communicators”, but also someone who is approachable and practice “open-door policy”. This tie back to previous works by Fliaster (2004) and Chatzoglou and Vraimaki (2010), that by breaking down the hierarchies, organisations can create openness in communication, which allows people to contribute to practices and share knowledge. It has been found from the study that the autocratic, rigid top-down approach or “scare tactics” can affect motivation to engage in RKS and hence has adverse impact on the university research performance. This is because when research-academics feel that they are being forced to engage in RKS, they will just do as little as they can get away with and not willingly doing it so as to help enhancing the university research performance.

Most importantly, the roles of professors are critically essential since they are the closest to the research-academics whether at the department, subject group, unit, team or even individual level. It is constructive for professors to practice informal and friendly approach, by working more closely and interactively with research-academics using more face-to-face interactions and avoid being isolated doing own research works. Management-by-walking-around or joint lunches with the employees are useful for promoting knowledge sharing at the workplace (Fliaster, 2004). In other words, “personal touch” is potentially more effective to support RKS among research-academics. It is essential for professors to lead by example and walk around the department more often so that research-academics “feel” their existence so as to supports. This is akin to Bandura’s (1997) suggestion that leading by example exhibits a leader’s commitment to his/her work and offers guidance to subordinates on how to attain effective performance, and thus enhance subordinates’ efficacy through observational learning. As stated in Chapter 8, professors’ roles include giving advice, guidance, and assistance in terms of good practice of RKS and in terms of research ideas, designs or methodologies; mentoring, supervising or coaching; using their networks, relationships, and influences with other experts (e.g. editors) so as to bring research-academics into RKS, especially those at early career stage.

Professors should act as “knowledge builders”, who create opportunities and processes that stimulate and encourage RKS amongst research-academics, which then drive them to reciprocate and engage in RKS. They should become a research trendsetter for the school, department, or subject group, who take the lead in research, not only by providing target or vision, but also positively influence RKS implicit research culture. Professors are the “sounding board” for research-academics, whose suggestions, advices, and reactions are inspirations that induce them to engage in RKS. Their roles are not only to motivate, but most importantly to re-motivate research-academics when they feel de-motivated with RKS. They should value all research works produced by individual research-academics, even they are not the core research areas. They should congratulate and celebrate research achievements of individual research-academics and not just point out the downsides of that research. Such initiatives could establish strong belief in research-academics’



mind that they can work for better research. As a result, once the research-academics' beliefs, values, and mindset towards RKS are altered, the implicit research culture can be then improved.

## 9.2 Context-specific RKS model

As reported in earlier chapters, key determinants of RKS are mainly common in both Pre-1992 and Post-1992 universities. This includes motivator and inhibitor factors for or against sharing research-knowledge; RKS process; types of knowledge shared; channel of communications used for sharing research-knowledge; and also the function of IT as an enabler. However, there are two major differences that widen the gap between Pre-1992 and Post-1992 universities with regard to RKS. These differences occur due to a less effective “functionality” of both *people* and *organisation* as enablers in supporting research-knowledge sharing. They are the research-leadership (i.e. people enabler) and the university research culture (i.e. organisation enabler).

Based on these key differences between Pre-1992 and Post-1992 universities resulted from both qualitative and quantitative analysis, a model of context-specific RKS model is developed and depicted in Figure 9.3. This model summarises the overall results of this study in a diagram format. It integrates the three enablers together, where “people” highlights the key roles of research-leaders in supporting and promoting RKS; “organisation” indicates the establishment of both explicit and implicit cultures; and “IT” signifies the development of technological infrastructures that aid RKS. The model also incorporates the sequential process of RKS, begins with knowledge hoarding, knowledge seeking, and knowledge sharing, where both tacit and explicit knowledge are shared accordingly. Ultimately, these enablers lead to the university research performance.

This model is an original contribution of this study in relation to the nature and the process of RKS explored in eight UK universities, which includes both Pre-1992 and Post-1992 universities. Although this model may or may not be presentable for the

whole population of UK HEIs, it signals the key influential factors impacting RKS in HEIs. The two elements marked with a star (\*) in this model shows the key differences that widen the gap between Pre-1992 and Post-1992 universities. The first one is the role of research-leaders at the lower level (i.e. professors), which is more effective in Pre-1992 universities. The second one is the implicit culture, which is much stronger and established in Pre-1992 universities than Post-1992 universities.

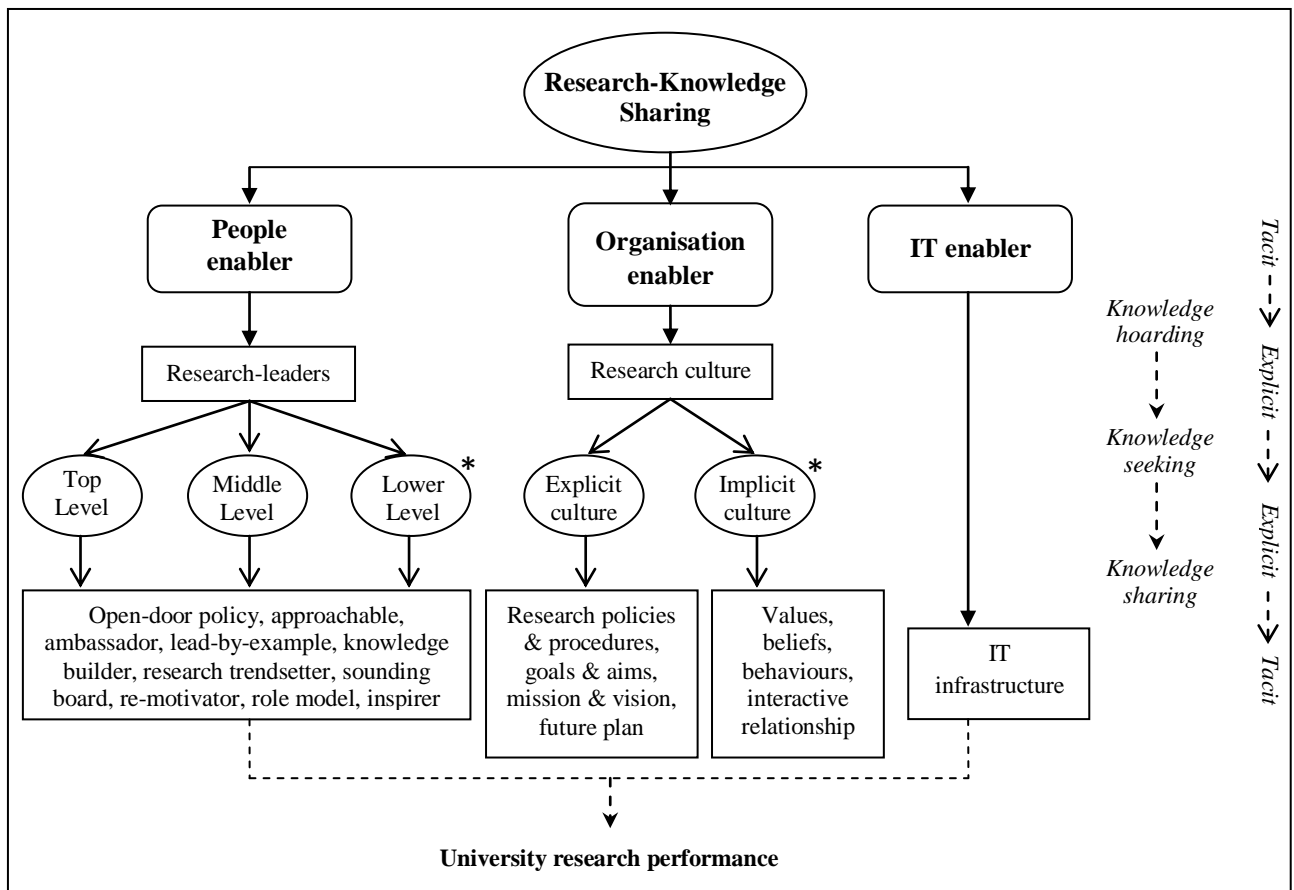


Figure 9.3 A context-specific RKS model

### 9.3 Summary

This study reveals that softer issue like organisational culture is one of the key determinants of RKS in HEIs. As reported earlier, most of the key determinants of RKS are mainly common in both Pre-1992 and Post-1992 universities. There are two major differences differentiate Pre-1992 and Post-1992 universities in relation to RKS. They are the university research culture, which resulted from the ineffective function of organisation enabler in Post-1992 universities; and research-leadership,

which resulted from the lacking of research-leaders' supports in Post-1992 universities (i.e. people enabler).

The elements that differentiate the implicit research-culture in Pre-1992 and Post-1992 universities can be summarised into four different aspects, i.e. research capability, research-academics' behaviour, the RKS engagement style, and the research-leaders' support. Research capability indicates that research-academics in Pre-1992 universities are more research-savvy, have more exposure in terms of RKS, and have more confident to engage in RKS; as compared to those in Post-1992 universities. Research-academics' behaviour indicates that research-academics in Pre-1992 universities are intrinsically-driven to engage in RKS, whereas in Post-1992 universities, research-academics are largely pushed or guided by the university research policy (i.e. extrinsically-driven). The RKS engagement style indicates that the way research-academics in Pre-1992 universities engaged in RKS is more scattered, whereas research-academics in Post-1992 universities are more attached to the university research centres. Research-leaders' support indicates that research-leaders in Pre-1992 universities, particularly professors are more supportive to encourage and motivating RKS engagement among research-academics; as compared to research-leaders in Post-1992 who paid more attention on designing, developing, and implementing research policy than interactively supporting research-academics in terms of RKS.

This study suggests that it is critical for the Post-1992 universities to improve their implicit culture by instilling good practices of RKS, which could alter the values, beliefs, and norms of individual research-academics concerning RKS engagement. In order to cultivate strong and stable implicit research-culture, it may involve things as basic as changes in the recruitment policy. This study also suggests that the process of developing and implementing research policies in the Post-1992 universities should be more practical and achievable taht can fit the universities' resources (e.g. financial), and people's capability (e.g. "know-how" skills). In terms of research-leadership, this study has proven that research-leaders have significant influence on RKS engagement among research-academics.

There is a gap between research-leadership in Pre-1992 and Post-1992 universities. It is revealed that in Pre-1992 research-leaders are not only supporting RKS through the development and implementation of research policies (i.e. research-leaders at top and middle levels) but also supporting RKS through daily interactions with research-academics, be it formal or informal (i.e. professors). The diamond model presents the interactive research-leadership structures in Pre-1992 universities. In contrast, research-leaders in Post-1992 universities tend to pay more attention in supporting RKS at the “tip of the iceberg”, through the development and implementation of systematic research policies so as to enhance their research performance; but tend to overlook the importance of staff development through the close relationship with research-academics. The roles of professors are critically important to enhance RKS behaviour among research-academics.

As a result of the overall study, this study has developed a context-specific RKS model. Although this may or may not be presentable for the whole population of UK HEIs, it portrays the whole findings of this study. The model indicates the two key differences found in this study that widen the gap between Pre-1992 and Post-1992 universities, i.e. the university research-culture and research-leadership.

## Chapter 10

*“Today we live in the age of science. The eternal questions are best answered, it is asserted, by putting queries directly to Nature and letting Nature itself answer”  
Lincoln and Guba (1985:7)*

### **Conclusion & future work**

#### **Introduction**

This final chapter concludes the study, outlines the achievements. It highlights how the research objectives are achieved. Then, limitations of the study are identified. The chapter provides suggestions of future research work and the directions for extending the research and ends with a summary for the chapter.

## 10.1 Concluding remarks

The focus of this study is the nature and process of RKS in UK HEIs by looking at the six key determinants that affecting knowledge sharing informed by literature and theories. They are (1) motivator and inhibitor for or against sharing research-knowledge; (2) RKS process; (3) types of knowledge shared; (4) channels of communications use for sharing research-knowledge; (5) the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT); and (6) the influence of research-leaders on RKS. The study was motivated by the fact that there is lacking of knowledge sharing research in HE settings, which is disproportionate to those in commercial sector; lacking of context-specific knowledge sharing research, particular research-knowledge, which is arguably critical in HEIs; the different types of university in the UK, where the best practice of RKS may differ.

This study mainly aims to explore the best practice of RKS within the boundary of the desired key determinants by investigating the Pre-1992 and Post-1992 universities. It also looks at the influence of research-leaders on RKS behaviour among research-academics. Within the boundary of the research objectives addressed in Chapter 1, six research questions are developed:

- 1) What makes research-academics willing or reluctant to share research-knowledge?
- 2) When do research-academics not share research-knowledge?
- 3) What is the type of knowledge shared in RKS?
- 4) What is the most preferred channel of communication use for RKS?
- 5) What is the functionality of KS enablers on RKS (i.e. people, organisation, and IT)?
- 6) How do research-leaders influence RKS behaviour among research-academics?

This study is exploratory in nature, which intends to emphasise the socially-constructed nature of reality in relation to the desired phenomenon. This study focusing on the in depth of data by uncovering the deep, complex and personal aspects of human experience and behaviour rather than the breadth and broader statements of the issues explored. It follows interpretive perspectives by taking the

desire for full richness of the data; and positivist perspective by consider the need for rigour and triangulation.

Due to the explorative nature of this study, semi-structured interviews were conducted with research-academics and research-leaders selected from eight UK universities. Two types of universities in the UK are identified for sampling, i.e. the Pre-1992 and the Post-1992. Four universities were selected from the Pre-1992 universities group, and another four universities were selected from Post-1992 universities group. These universities are selected according to the research performance measured by the RAE 2008 Power Ranking based on the Unit of Assessment 36 (i.e. Business and Management Studies). Purposive sampling was used in selecting participants from the eight universities. A sample frame of 60 participants was obtained from over 420 emails and personal contacts. Among the sample, 38 are research-academics and 22 are research-leaders. In the Pre-1992 universities group, there are 26 participants (16 research-academics and 10 research-leaders); in the Post-1992 universities group, there are 38 participants (22 research-academics and 12 research-leaders).

Open questions are used to explore facts that may not have been previously addressed by researchers. Four close-ended questions using five point Likert-type scales are used to measure perceptions on the role of research-leader's support. Each interview follows a structured inquiring into the 'what', 'why', 'when' and 'how' aspects. The qualitative data were analysed following the multiple coding procedure suggested by Strauss and Corbin (1990). In order to deal with very rich text-based data, computer assisted qualitative data analysis software (CAQDAS), i.e. NVivo (version 8) was employed. Qualitative data, e.g. similar comments on certain issue expressed by different participants, are counted, thus become categorical data that can be treated by quantitative analysis. The Fisher Exact Test in Chi-square was used to examine the difference on RKS issues between the two types of universities. Another set of quantitative data was generated from the five point Likert-type scale questions. The sequential data was analysed using ANOVA to examine variance between the two sample groups – Pre-1992 and Post-1992 universities. The

quantitative data analysis employed in this study was not to test research hypotheses, but to reinforce views developed from qualitative evidences.

This study found that most of the key determinants of research-knowledge sharing are mainly common in both Pre-1992 and Post-1992 universities. This includes motivator and inhibitor factors for or against sharing research-knowledge; RKS process; types of knowledge shared; channel of communications used for sharing research-knowledge; and also the function of IT as an enabler. However, there are two major differences that widen the gap between Pre-1992 and Post-1992 universities with regard to RKS, which occur due to a less effective “functionality” of both *people* and *organisation* as enablers in supporting RKS. They are the university research culture (i.e. organisation enabler) and research-leadership (i.e. people enabler). The results suggest that research-leaders, particularly professors in Pre-1992 universities are more supportive than those in Post-1992 universities. It is also found that an implicit research-culture is critical in determining the differences between Pre-1992 and Post-1992 universities’ research performance. Interestingly, this study reveals that research-knowledge sharing follows a distinctive process – *knowledge hoarding-knowledge seeking-knowledge sharing*. The findings shed lights on distinctive RKS process and culture that are specific to UK HEIs.

## **10.2 Accomplishment of research objectives**

Following the research findings and the discussion provided in chapter 8 and 9, the conclusion of this study is made in terms of the objectives achieved and the contributions to knowledge both theoretically and practically.

The six objectives of this study set in Chapter 1 have been achieved. The following details explain each of these objectives.

- ***To explore all the six key determinants concerning RKS in Pre-1992 and Post-1992 universities.***

The current state of all the six key determinants has been revealed. This include the identification of the motivator and inhibitor factors for or against sharing of



research-knowledge, the RKS process, the type of knowledge shared in RKS, the preferred channel of communication use for RKS, the influence of KS enablers on RKS behaviour (i.e. people, organisation, and IT) on RKS, and the influence of research-leaders on RKS behaviour.

- ***To examine the commonalities and differences between Pre-1992 and Post-1992 universities concerning the RKS.***

The key differences that widening the gap between Pre-1992 and Post-1992 universities have been identified and the key problems are due to a less effective “functionality” of both *people* and *organisation* enablers in supporting RKS in Post-1992 universities as compared to Pre-1992 universities. The key differences are research-leadership (i.e. people) and university research culture (i.e. organisation).

- ***To study the relationship between research-leaders and research-academics in terms of RKS.***

The study uncover that there is a significant relationship between research-leaders and research-academics concerning RKS. Research-leaders’ support and commitment has a major influence on RKS behaviour among research-academics.

- ***To review the current literature with regard to KS in commercial sectors.***

The study has reviewed the literature pertaining to KS in commercial sectors in Chapter 2, where the relevant theories and key determinants of KS have been discussed in depth. In addition to that, the study also reviewed the literature concerning KS in HE settings in Chapter 3.

- ***To reveal the distinctive characteristics of RKS in HE settings.***

The study identified two distinctive characteristics of RKS that differentiate RKS from KS commonly discussed in previous studies. The first characteristic is the sharing timeline, which is discussed using the PORKS model. The second characteristic is the sharing process, which is explained based on the KSM model. These insights advanced the KM theory.

- *To develop a theoretical framework of context-specific RKS process in HE settings.*

A context-specific RKS model that may be applicable for HE settings has been developed. This framework is build up on the basis of the three key enablers (i.e. people, organisation, and IT), where the commonalities and differences of RKS between Pre-1992 and Post-1992 universities are highlighted.

Knowledge sharing occurs in many different ways in many places. Yet no information about RKS is gathered due to less attention paid on the usage and practice of RKS in HEIs. Since the UK is well-known for its thriving research culture in HEIs, the importance of RKS is undeniable as it leads to better university research performance. This study has not only enriched the body of knowledge but has inspired initiatives concerning the study of RKS and advanced the literature. RKS does not occur all the times. It occurs in a unique sequence, which determined by the research timeline of a particular research project. The research timeline is divided into three separate phases, i.e. initial, middle and final.

Unlike the SECI model, the sharing of research-knowledge does not follow the conversion of tacit and explicit knowledge. RKS involves the process of, 1) knowledge hoarding, which occurs at the initial phase and known as “non-sharing zone”; 2) knowledge seeking, which takes place at the middle phase and known as “one-way sharing zone”; and 3) knowledge sharing, which happens at the final phase and known as “two-way sharing zone”. This distinctive characteristic has distinguished RKS from KS that is generally discussed in previous studies.

In a nutshell, research-academics’ engagement in RKS plays an important role in enhancing the university research performance. A stable implicit research culture within the university that supports RKS is more likely to lead to positive mindsets about RKS, whereas the pursuit of explicit culture alone will neglect the human development and capability, and thus lead to poor RKS engagement. Critical to RKS engagement is interactive relationship between professors and research-academics, which involves personal contact through mentoring, supervising, or formal and informal conversations. Creating the wellsprings of research-academics’ beliefs and

capability towards RKS are fundamental to the improvement of implicit research culture and thus, lead to better university research performance.

Research-academics' engagement in RKS will create a competitive advantage that ultimately results in superior value creation of a particular university. Understanding what motivate and inhibit research-academics from engaging in RKS, when they share or not share research-knowledge, and how the supports from research-leaders influence their RKS behaviour, holds the key to university research performance success.

### **10.3 Original contributions**

The results from both qualitative and quantitative analysis presented in this study add relevant and original contributions to the body of literature, which emphasise on four major theories. As stated earlier in Chapter 8, this study has added value to motivation, KM, organisational culture, and leadership theories. This section signifies the original contributions of this study to body of knowledge.

With regard to motivation theory in relation to knowledge sharing, this study originally reveals that the motivator factors that influence RKS is mainly separated into academic (e.g. contribution to university, job role) and personal elements (i.e. personal interest, career development). Apart from that, the inhibitor factors are distinguished into two categories, i.e. internal category (i.e. university pressure) and the external category (i.e. the REF pressure). Most importantly, this study has acknowledged that the research timeline of a specific research project has an impact on the RKS behaviour among research-academics. For instance at the initial stages of a research timeline (i.e. research ideas and research proposal), research-academics mostly resist sharing their research-knowledge. This finding is distinctively new insight to the motivation theory in relation to knowledge sharing.

Additionally, in terms of KM theory, this study has originally advanced the body of literature in two ways. First, a process-oriented RKS model (PORKS) is developed. This model is very unique and novel, in which it highlights the process of sharing

research-knowledge in three different phases (i.e. non-sharing zone, one-way sharing zone, and two-way sharing zone). The results also acknowledge that the types of knowledge shared across this process varied accordingly. The PORKS explicitly reveals how research-timeline of a specific research project influences the sharing of research-knowledge in HEIs. Second, this study has extended the body of knowledge by presenting the Knowledge Sharing Management (KSM) model. This model is original, in which it signifies that RKS follows a distinctive process, which begins with knowledge hoarding, followed with knowledge seeking, and ends with knowledge sharing. Clearly, research-knowledge is not shared at all times. This study reveals that the research timeline of a specific research project again has an impact on RKS.

Apart from that, in terms of organisational culture model, this study provides original insights about the influence of explicit and implicit culture in relation to RKS. Many studies has discussed about the dichotomy between explicit and implicit culture. However, this study specifically reveals that with regard to RKS, the implicit research-culture of a particular university is critical in determining the success of the university research performance. Interestingly, a “research culture-earth” model is used to explain the functions of both explicit and implicit research-culture in this study.

Lastly, this study has also advanced the leadership theory by emphasising on roles of research-leaders, especially professors. The findings have originally acknowledged that interactive relationship between professors and research-academics are critical so as to enhance RKS behaviours. By sharing experiences, expertise, skills, visions, and networks; professors can enhance research interests among research-academics and hence, lead to higher level of research outputs. Overall, this study has gained many useful insights, which are novel to the body of literature.

#### **10.4 Limitations of study**

Each study deals with some limitations, either caused by limited resources, by imperfections or by rational choices. This section addresses the restraints of this research.

##### ***Area-specific discipline***

The sample in this study is limited only to the Business and Management Studies area (i.e. UoA 36). The results are therefore rather specific and not generic to other disciplines. However, the choice of Business and Management Studies was made due to the acute pressure to achieve high performance in publication rankings compared to other STEM subjects. In addition to that, the Business and Management Studies are equally capable of contributing major intellectual innovations, by producing knowledge for developing and improving social technologies. Moreover, it is quite possible that even within one university, research process and culture in STEM research groups may be different from Social Science research groups in relation to the research performance measured by the RAE. Therefore choosing one UoA rather than multiple UoA can avoid inconsistency when research performance is compared, although this may affect the generalisability of this study.

##### ***Limited sample size***

This study is principally qualitative in nature. It involves interviews with 60 participants, ranging from research-academics and research-leaders from eight different universities, which includes Pre-1992 and Post-1992 universities. This sample size is obviously smaller than samples that normally presented in the quantitative studies. However, Patton (2002, pg. 245) asserts that “validity, meaningful, and insights generated from qualitative inquiry have more to do with the information richness of the cases selected...than with sample size”. Therefore, although the findings may not be presentable to generalise confirmatory concepts at this stage, this study has gathered considerably rich information from the participants in both types of universities.

### ***Limited to UK HE settings***

This study emphasises on universities in the UK HE settings only. Thus, the findings may not be presentable for larger HE community elsewhere. However, the context-specific RKS model generated from this study may be practical for research-leaders in other universities both nationally and internationally. This is because the model highlights the key influential factors that affecting RKS (i.e. university research culture and research-leadership). The findings may also be applicable to other sectors.

### ***Instrumental interpretation of qualitative data***

Since this study was mainly qualitative in nature, the analysis of data is inevitably susceptible to interpretation. However, when analysing the data, prior knowledge and influence of previous literature were avoided. All data was treated with open-mindedness and honest. In order to avoid this bias, triangulation has been used in this study as to establish consistency among the data, and establish credibility of the results (Lincoln & Guba, 1985).

## **10.5 Directions for future work**

Besides looking back on the research, this study concludes with looking into the future by providing some directions for further research. These research directions are partly based on the “shortcomings” of this study, and partly based on the findings, which suggest further exploration or testing.

### ***Wider area-specific discipline***

The study only emphasise on the Business and Management Studies area. It would be interesting to explore other subject area or discipline like STEM subjects. As stated earlier, research process and culture in STEM research groups may be different from Social Science research groups, and hence the practice of RKS may be different as well. Therefore, an in depth research examining other disciplines would be interesting.

### ***Wider settings within or outside HE context***

This study includes eight universities, ranging from Pre-1992 and Post-1992 universities in the UK, emphasising on an area of Business and Management Studies. First, it would be interesting to extend the study into larger HEIs populations in the UK. The quantitative research would be practical so as to target on larger samples. This study has explored RKS in depth by looking at human's behaviour and experiences within the boundary of six key determinants that affecting knowledge sharing. Thus, the results found in this study can act as groundwork for further expansion of study in future. Second, it is also worth to examine other HE settings outside the UK to see the commonality and dissimilarity with regard to the best practice of RKS. Most importantly, it would be good to know if the practice of RKS in the UK HEIs can be set as a benchmark for other universities outside the UK. Third, it would be more interesting to carry out a study outside HE settings, particularly other knowledge-intensive organisations, like R&D companies. It is good to know the best practice of RKS in this type of organisations. The study could be qualitative so as to explore in depth nature and process of RKS in such organisations; or it could be quantitative to obtain the breadth of knowledge about RKS. On top of that, it is interesting to examine if the key influential factors of RKS found in this study (i.e. university research culture and research-leadership) are common or different to those outside HE setting.

### ***Quantitative approach***

This study aims to explore in depth the key determinants of RKS in the UK HEIs, and hence the qualitative research approach was employed. It would be interesting to extend this study by using the quantitative method stemming from a positivist paradigm, which then allows the breadth of knowledge in relation to RKS practice. Utilising a series of tests and techniques, quantitative research can yield data that is projectable to a larger population, which has the ability to effectively translate data into easily quantifiable charts and graphs.

### ***Examining research-leaders across hierarchical levels***

This study has identified a significant relationship between research-academics and research-leaders in supporting RKS behaviour. It has uncovered that research-

leaders' roles varied across hierarchical levels within the university. Further research is required to examine in depth and wider roles of research-leaders in terms of hierarchical-based manifestations. It is interesting to find out specific roles played by the research-leaders at different levels and how they relate to research-academics' RKS engagement. The research can either be qualitative or quantitative.

### ***Examining RKS based on different career phase***

This study has uncovered that the behaviour of individual research-academics influence their involvement in RKS. Interestingly, research-academics' behaviour is varied across career phases. Research-academics at the early and mid career phases react differently towards RKS as compared to those at the senior phase. It would be interesting to explore the behaviours of research-academics based on these career phases. It is also good to integrate these career phases with research-leadership. The findings will then provide ways to effectively support research-academics based on their career phases.

The findings resulted from both qualitative and quantitative analysis of this study is crucial in opening new research avenues. It generates valuable new knowledge to inform the body of knowledge and practitioners, particularly research-leaders on the identification of key determinants that affecting the practice of RKS. Understanding the best practice of RKS, which mainly driven by not only strong explicit research-culture but also implicit research-culture, coupled with effectively interactive relationship between professors and research-academics could increase the level of research outputs within the university, and hence, lead to better university research performance. The results will be practical to develop specific research questions and propositions to guide future research in a more specific domain of interests in relation to context-specific knowledge sharing. For example, this study acknowledges that the most important area to be addressed in future is by focusing on social, behavioural, and cultural aspects of a context-specific knowledge sharing, which enable the researchers to generate more widespread success than most KM systems, which focused on promoting knowledge sharing through technological aspects.



In a nutshell, the results from this study are compelling in the context of demonstrating that RKS follows a distinctive process unlike other generic knowledge sharing; implicit research-culture is critical in determining the university research performance; and interactive supports from research-leaders, specifically professors are essential for RKS behaviour. This study opens new research avenues targeting on “softer” aspects of RKS, i.e. the impact of people and organisation enablers on context-specific knowledge sharing.

## **10.6 Summary**

This last chapter highlights the conclusion of this study. It first outlines the achievements of this study by presenting how the research objectives are accomplished in this study. The first objective (i.e. to explore all the six key determinants concerning RKS in Pre-1992 and Post-1992 universities) is achieved by revealing the current state of all the six key determinants. The second objective (i.e. to examine the commonalities and differences between Pre-1992 and Post-1992 universities concerning the RKS) is reached by recognising the key differences that widen the gap between Pre-1992 and Post-1992 universities. The third objective (i.e. to study the relationship between research-leaders and research-academics in terms of RKS) is accomplished by revealing that there is a significant relationship between research-leaders and research-academics concerning RKS. The fourth objective (i.e. to review the current literature with regard to KS in commercial sectors) is achieved by reviewing the literature in relation to KS in commercial sectors (Chapter 2) as well as the literature concerning KS in HE setting (Chapter 3). The fifth objective (i.e. to reveal the distinctive characteristics of RKS in HE settings) is reached by identifying the two distinctive characteristics of RKS that differentiate RKS from KS commonly discussed in previous studies. The last objective (i.e. to develop a theoretical framework of context-specific RKS process in HE settings) is achieved by developing a context-specific RKS model that may be applicable for HE settings.

Most importantly, this study suggests that research-leaders need to understand why research-academics decline or incline to engage in RKS. They should not only tell research-academics “what to do” but also show them “how to do”. This study also

recommends that research-leaders in Post-1992 universities should be more realistic in catching up with the REF. They should not over emphasised on the “REF-able” research-academics and overlook other research-academics who want to pursue in RKS engagement.

There are few limitations identified in this study. First, this study is focusing on one specific discipline, i.e. Business and Management Studies. Therefore, the results might rather be specific and not generic to other disciplines. Second, it has a limited sample size, which involves interviews with 60 participants from eight different universities, which includes Pre-1992 and Post-1992 universities. Therefore, the findings may not be presentable to generalise confirmatory concepts at this stage. Third, it is only limited to UK HE settings and hence, the findings may not be presentable for larger HE community elsewhere. However, the context-specific RKS model generated from this study may be practical for research-leaders in other universities both nationally and internationally. Fourth, this is primarily qualitative in nature. Therefore, the analysis of data is inevitably susceptible to interpretation. However, when analysing the data, prior knowledge and influence of previous literature were avoided, in which all data was treated with open-mindedness and honest.

Finally, this study offers the directions for future works, which are partly based on the “shortcomings” of this study, and partly based on the findings that suggest further exploration or testing. First, since this study only emphasises on the Business and Management Studies area, it would be interesting to explore other subject area or discipline like STEM subjects. Second, since this study only includes eight UK universities, ranging from Pre-1992 and Post-1992 universities, it would be interesting to investigate other HE settings outside the UK to see the commonality and dissimilarity concerning RKS. On top of that, it would be good to know if the practice of RKS in the UK HE settings can be benchmarked for other universities outside the UK. Third, since this study is mainly qualitative in nature, it would be interesting to extend this study by employing the quantitative method stemming from a positivist paradigm. Fourth, since this reveals a significant relationship between research-academics and research-leaders in supporting RKS behaviour, it is worth to

examine in depth and wider roles of research-leaders in terms of hierarchical-based manifestations.

And lastly, since this study uncovers that the behaviour of individual research-academics influence their involvement in RKS, it is interesting to explore the behaviours of research-academics based on their career phases. Overall, this study has significantly provided useful insights that research-academics' engagement in RKS will create a competitive advantage that ultimately results in superior value creation of a particular university. It provides insight that understanding the motivator and inhibitor for or against RKS, the distinctive process of RKS, the functions of people, organisation, and IT enablers in supporting RKS, and the influence of research-leaders' support, especially professors on RKS engagement; holds the key to the success of university research performance.

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## Appendix 1 Lists of universities for different university groups

Post-1992 universities that are former polytechnics
<ul style="list-style-type: none"><li>• Anglia Ruskin University</li><li>• Birmingham City University</li><li>• University of Brighton</li><li>• Bournemouth University</li><li>• University of Central Lancashire</li><li>• Coventry University</li><li>• De Montfort University</li><li>• University of East London</li><li>• Edinburgh Napier University</li><li>• University of Glamorgan</li><li>• Glasgow Caledonian University</li><li>• University of Greenwich</li><li>• University of Hertfordshire</li><li>• University of Huddersfield</li><li>• Kingston University</li><li>• Leeds Metropolitan University</li><li>• University of Lincoln</li><li>• Liverpool John Moores University</li><li>• London Metropolitan University</li><li>• London South Bank University</li><li>• Manchester Metropolitan University</li><li>• Middlesex University</li><li>• Northumbria University</li><li>• Nottingham Trent University</li><li>• Oxford Brookes University</li><li>• University of Plymouth</li><li>• University of Portsmouth</li><li>• Sheffield Hallam University</li><li>• Staffordshire University</li><li>• University of Sunderland</li><li>• Teesside University</li><li>• University of West London</li><li>• University of the West of England</li><li>• University of Westminster</li><li>• University of Wolverhampton</li></ul>

Post-1992 universities

### Russel Group

- University of Birmingham
- University of Bristol
- University of Cambridge
- Cardiff University
- University of Edinburgh
- University of Glasgow
- Imperial College London
- King's College London
- University of Leeds
- University of Liverpool
- London School of Economics & Political Science
- University of Manchester
- Newcastle University
- University of Nottingham
- University of Oxford
- Queen's University Belfast
- University of Sheffield
- University of Southampton
- University College London
- University of Warwick

Russell Group universities

### University Alliance

- Aberystwyth University
- Bournemouth University
- University of Bradford
- De Montfort University
- University of Glamorgan
- Glasgow Caledonian University
- University of Gloucestershire
- University of Hertfordshire
- University of Huddersfield
- University of Lincoln
- Liverpool John Moores University
- Manchester Metropolitan University
- Northumbria University
- Nottingham Trent University
- The Open University
- Oxford Brookes University
- University of Plymouth
- University of Portsmouth
- University of Salford
- Sheffield Hallam University
- University of Wales Institute, Cardiff
- University of Wales, Newport
- University of the West of England

University Alliances universities



### Million+

- University of Abertay Dundee
- Anglia Ruskin University
- Bath Spa University
- University of Bedfordshire
- Birmingham University
- University of Bolton
- Buckinghamshire New University
- University of Central Lancashire
- Coventry University
- University of Derby
- University of East London
- Edinburgh Napier University
- University of Greenwich
- Kingston University
- Leeds Metropolitan University
- London Metropolitan University
- London South Bank University
- Middlesex University
- The University of Northampton
- Roehampton University
- Southampton Solent University
- Staffordshire University
- University of Sunderland
- Teesside University
- Thames Valley University
- University of the West of Scotland
- The University of Wolverhampton

Million+ universities

## GuildHE

- Arts University College Bournemouth
- Bishop Grosseteste University College Lincoln
- Buckinghamshire New University
- Harper Adams University College
- Leeds Trinity University College
- Newman University College
- Norwich University College of the Arts
- Ravensbourne College of Design & Communication
- Rose Bruford College
- Royal Agricultural College
- St Mary's University College Twickenham
- The Liverpool Institute for Performing Arts
- University College Birmingham
- University College Falmouth
- University College Plymouth St Mark & St John
- University for the Creative Arts
- University of Cumbria
- University of Winchester
- University of Worcester
- Writtle College
- York St John University

### **Associate Members**

- American InterContinental University
- Anglo-European College of Chiropractic
- Bradford College
- Glyndwr University / Prifysgol Glyndwr
- Holborn College
- Leeds College of Art
- Plymouth College of Art
- Regent's College
- The British School of Osteopathy
- The Tavistock & Portman NHS Trust

GuildHE universities

### **Unaffiliated Universities**

- Aberdeen University
- Aston University
- Bangor University
- University of Brighton
- Brunel University
- Canterbury Christ Church University
- Chester University
- Chichester University
- City University
- Dundee University
- Edge Hill University
- Glamorgan University
- Glyndŵr University
- Heriot-Watt University
- Hull University
- Keele University
- Lampeter University
- University of the Arts, London
- Queen Margaret University
- Robert Gordon University
- Stirling University
- University Of Strathclyde
- Swansea University
- Ulster University
- Westminster University

Unaffiliated universities

## **Appendix 2 *An example of recruitment email***

Dear (*Research-Academic/Research-Leaders*),

My name is Nor Ashmiza. I am undertaking a research project for a doctoral programme in the Department of Strategy and Business Systems at the University of Portsmouth.

The title of this study is “Key determinants of research-knowledge sharing in UK HEIs”. It is aims to explore the critical issues of knowledge sharing in HEIs settings.

The purpose of this email is to ask for your participation in an interview with regard to the mentioned topic. The interview will last one hour to one hour and a half, depending on the information provided by you. A date and time will be arranged at your convenience. I would be very grateful if you could make an appointment to participate in the interview. I will contact you by email or telephone in the near future to confirm your availability and arrange the details regarding the day, time and place of the interview.

I would appreciate your support to this study. However, your participation is entirely voluntary. There will be no personal risk from participating in this study. The information you provide will be kept strictly confidential. Personal data is not collected and the results will not be disclosed in disaggregated form so as to ensure anonymity. The ethics for this study has been approved by the PBS ethics committee.

If you have any doubts or concerns about this study, please do not hesitate to contact me using the contact details stated below.

Thank you in advance for your cooperation. Your participation in this research is highly appreciated.

Yours sincerely,

Nor Ashmiza Mahamed Ismail

.....

Doctoral Researcher and PTHP Lecturer  
Department of Strategy and Business Systems  
Portsmouth Business School  
University of Portsmouth  
PO1 3DE  
Portsmouth  
Email: [ash.mahamed@port.ac.uk](mailto:ash.mahamed@port.ac.uk)  
Tel: 023xxxxxxx

**Appendix 3** *An example of participant consent form*



**CONSENT FORM**

**Title of Project** : **Key Determinants of Research-Knowledge Sharing in UK HEIs**

Name : Nor Ashmiza Mahamed Ismail  
Email : [ash.mahamed@port.ac.uk](mailto:ash.mahamed@port.ac.uk)  
Telephone : 078xxxxxxx (mobile) 023xxxxxxx (office)  
Director of Study : Dr Mark Xu (mark.xu@port.ac.uk)  
Supervisory Teams : Dr Michael Wood (michael.wood@port.ac.uk)  
Mrs Christine Welch (christine.welch@port.ac.uk)  
Address : Department of Strategy and Business Systems  
Portsmouth Business School, Richmond Building  
Portland Street, Portsmouth, PO1 3DE

**Please Initial Box**

1. I confirm that I have read and understand the information sheet for the above study and/or have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.
3. I agree to take part in the above study.
- (Include if appropriate or delete):*
4. I agree to the interview being audio recorded
5. I agree to the use of anonymised quotes in publications

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of Researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

#### Appendix 4 *Semi-structure interview questions*

Questions for research-academics	Topics
1. What motivate you to share research-knowledge and why?	Motivator and inhibitor factors for RKS
2. What inhibit you from sharing research-knowledge and why?	
3. Referring to a basic research timeline, when you do share and not share your research-knowledge?	RKS process
4. Do you normally share both tacit and explicit knowledge together or separately and why?	Types of knowledge shared in RKS
5. What types of knowledge you normally share with regard to research?	
6. What is the most preferred channel of communication you use when sharing research-knowledge and why?	Preffered channels of communication for RKS
7. How research-leaders influence your RKS behaviour?	The influence of research-leaders on RKS behaviour
8. How your interaction with research-leaders and other colleagues supports your RKS behaviour?	
9. What are the IT infrastructures available in the university to support RKS activity?	The influence of enablers for knowledge sharing on RKS
10. Do you personally think there is a relationship between your RKS behaviour and research-leaders?	
11. What kind of support you expect to gain from research-leaders in terms of RKS?	

Questions for research-leaders	Topics
1. What motivate research-academics to share research-knowledge and why?	Motivator and inhibitor factors of RKS
2. What inhibit research-academics from sharing research-knowledge and why?	
3. Do you think your role as research-leaders influence research-academics RKS behaviour and why?	The influence of research-leaders on RKS behaviour
4. How do you interact with research-academics in order to enhance their RKS behaviour?	
5. What are the IT infrastructures available in the university to support RKS activity?	The influence of enablers for knowledge sharing on RKS
6. Do you personally think there is a relationship between research-leaders and RKS behaviour among research-academics and why?	
7. What kind of support you provide to research-academics in order to support their RKS engagement?	

## Appendix 5 *Likert-scale Questions*

Questions for research-academics	1	2	3	4	5
12. I personally believe that research-leaders have influenced my RKS behaviour					
13. I personally believe that the support gained by research-leaders is effective					
14. I personally believe that the university research policy is effective to support my RKS behaviour					
15. I personally believe that there should be a strong relationship between research-leaders and RKS behaviour among research-academics					

Questions for research-leaders	1	2	3	4	5
1. I personally believe that my role as research-leaders have influenced RKS behaviour among research-academics					
2. I personally believe that my support towards RKS engagement is effective					
3. I personally believe that the university research policy is effective to support RKS behaviour among research-academics					
4. I personally believe that there should be a strong relationship between research-leaders and RKS behaviour among research-academics					

*Note: 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree*

## Appendix 6 An example of transcription files stored in NVivo

The screenshot displays the NVivo software interface for a project named "04 Main Phase RA (relationship).nvp". The interface includes a menu bar, a toolbar, and a main workspace. On the left, there is a "Sources" pane with a tree view showing "Internals", "Externals", "Memos", and "Search Folders". The main workspace is divided into a table of sources and a text editor.

Name	Nodes	References	Created On	Created By	Modified On	Modified By
Post ISAAC	75	92	06/06/2011 15:23	ASH MAHAMED	03/08/2011 15:29	ASH MAHAMED
Post JACKY	68	86	06/06/2011 15:23	ASH MAHAMED	03/08/2011 16:25	ASH MAHAMED
Post KIRK	72	104	06/06/2011 15:23	ASH MAHAMED	08/08/2011 11:45	ASH MAHAMED
Pre ALEXANDRA	106	158	06/06/2011 15:24	ASH MAHAMED	10/08/2011 12:21	ASH MAHAMED
Pre BRITTANY	68	73	06/06/2011 15:24	ASH MAHAMED	19/08/2011 03:05	ASH MAHAMED
Pre CHUA	42	60	06/06/2011 15:24	ASH MAHAMED	08/08/2011 16:24	ASH MAHAMED
Pre DOHERTY	94	121	06/06/2011 15:24	ASH MAHAMED	08/08/2011 16:24	ASH MAHAMED

Below the table, there is a text editor showing a transcription snippet:

not sharing...so yeah, obviously here...not sharing, not sharing [laugh]...because then you know if we're all involved in the process it means we're all contributing but if we are here and you share all your ideas, it is very easy to steal this ideas.

The highest risk is here [pointing at research idea], the lowest risk will be at the end of the project. And I obviously share most here.

I think I've known a couple of phases that people put a lot of work and then suddenly senior researcher has been added as a name to the project and didn't contribute at all especially you know I'm Polish and I know this practice has been quite frequent in the early stages, especially when people doing PhD. But you know if you have a good supervisor and he contributes...he doesn't write, but you know, guides you, helps you with evaluation and helps you with structuring things properly, this is part of contribution, that's fine. But I know people who just you know out of the blue two of you or yourself write a paper and then you have to put his name because if not you won't progress so you know, I think that's



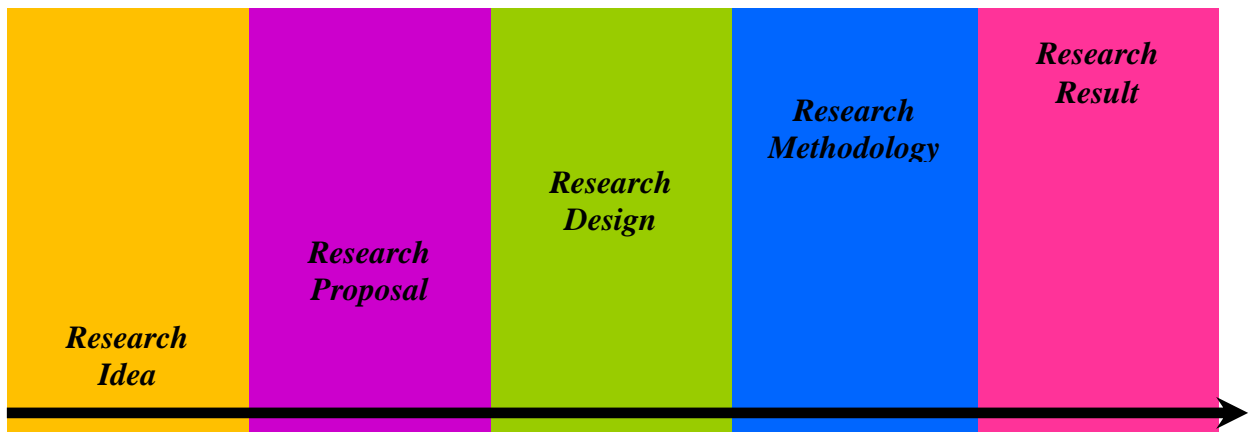
## Appendix 7 An example of tree nodes in NVivo

The screenshot displays the NVivo software interface for a project named "04 Main Phase RA (relationship).nvp". The "Tree Nodes" view is active, showing a hierarchical structure of nodes. The left sidebar contains navigation options: Free Nodes, Tree Nodes (selected), Cases, Relationships, Matrices, Search Folders, and All Nodes. Below this are other project components: Sources, Nodes (selected), Sets, Queries, Models, Links, Classifications, and Folders. The main window shows a search for "Tree Nodes" with "Find Now" and "Clear" buttons. The "Tree Nodes" table is as follows:

Name	Sources	References
01 Why share	0	0
Sharing knowledge	0	0
Academic	0	0
Adding to body of knowledge	10	10
Contributing into teaching	8	11
Contribution to the university	4	5
Enhance research productivity	8	10
Helping other researchers	1	1
Job role	5	5
Looking for co-authorship	2	2
Motivated by the REF	7	7
Personal	0	0
Awareness to share knowledge	21	24
Building up networking	0	0
Career development	10	12
Fulfillment of intrinsic reward	3	3
Gaining self-recognition	2	2
Personal interest	6	7
Internal	0	0

The status bar at the bottom indicates the user is ASH MAHAMED with 191 items in the project.

**Appendix 8** *Research timeline*



**A basic research timeline of a research project**

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## To share or not to share? Research-knowledge sharing in higher education institution: preliminary results

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**Abstract:** The world has witnessed that knowledge has become a valuable resource and asset in a new economy, which demands people not only to create knowledge but also to attain, apply and share knowledge effectively. Knowledge sharing is viewed as a natural activity in higher education institutions (HEIs), especially in relation to its core activity, i.e., research. This study focuses on the nature of research-knowledge sharing in a university, exploring three aspects:

- 1 why sharing
- 2 why not sharing
- 3 what and when to share.

Since there is a dearth of research examining knowledge sharing in academia, a qualitative approach has been employed in order to gain in-depth understanding and insights about the desired phenomenon. This study suggests that the way research-knowledge is shared does not follow a single standard pattern. The results generate original insights into the issues and have practical implications for university academics and leaders.

**Keywords:** explicit and tacit knowledge; knowledge sharing; research-knowledge sharing.

**Reference** to this paper should be made as follows: Ismail, N.A.M., Xu, M.X., Wood, M. and Welch, C. (xxxx) 'To share or not to share? Research-knowledge sharing in higher education institution: preliminary results', *Int. J. Information Technology and Management*, Vol. X, No. Y, pp.000-000.

**Biographical notes:** Nor Ashmiza Mahamed Ismail is a Lecturer at University of Portsmouth. Her multidisciplinary research interests include knowledge management, leadership, organisational culture, and organisational behaviour.

*(For submission to Studies in Higher Education)*

**The Grass Looks Greener on the Other Side?  
Research-Knowledge Sharing in Pre-92 and Post-92 universities**

**Nor Ashmiza Mahamed Ismail\*, Mark Xu, Michael Wood**  
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University of Portsmouth, Portsmouth PO1 3DE, UK*

**Abstract**

Research is on the top strategic agenda of all UK higher education institutions. Research knowledge sharing is a critical factor affecting university research output and performance. Despite the breadth of research into knowledge sharing in commercial sectors, there is lacking of research into how research knowledge is shared in UK higher education institutions, in particular, whether research knowledge sharing is different between so-called “research-leading” universities and “teaching” universities.

This study examined the practice of research knowledge sharing and identified the key determinants that lead to better research performance in UK HEIs. The study is based on 60 interviews with research leaders and researchers selected from eight UK universities - 4 Pre-1992 and 4 Post-1992 universities. The study found that research-knowledge sharing is influenced by the three enablers – people, organisational and IT, but implicit research culture is critical in determining the differences between Pre-1992 and Post-1992 University’s research performance. In addition, research knowledge sharing follows a distinctive process – knowledge hoarding-knowledge seeking-knowledge sharing. The findings shed lights on distinctive knowledge sharing culture and process that are specific to UK HEIs.

**Keywords:** knowledge sharing, organisational culture, research-knowledge, UK higher education

*(For submission to Knowledge Management Research & Practice)*

## **Knowledge Sharing in University Research: The Impact of Leader Engagement**

Nor Ashmiza Mahamed Ismail<sup>1</sup>

Dr Christine Welch<sup>1</sup>

Dr Mark Xu<sup>1</sup>

<sup>1</sup>Department of Strategy & Business Systems, University of Portsmouth, UK

### **Abstract**

Links between knowledge sharing practice and organisational performance have long been demonstrated. Knowledge sharing is frequently linked to leadership support and commitment, which can have a strong influence on knowledge sharing practice. Although much research has been conducted to explore knowledge sharing in commercial organizations, there is a dearth of research into knowledge sharing processes in higher education, particularly in relation to University research activity. The study discussed here attempts to remedy this. Universities have been likened to knowledge factories and, clearly, academics share the results of their research through publication. However, it is interesting to consider the extent to which knowledge sharing occurs between colleagues during the research process. What are the motivator and inhibitor factors for sharing (or not sharing) research-knowledge? To what extent does research leadership impact on research culture to promote interactions among groups of colleagues, and can such interactions enhance a University's research profile?

**Keywords:** culture; knowledge communities; knowledge sharing; trust

## Appendix 10 Quantitative results

### Motivator factors: academic aspect

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university *	27	100.0%	0	.0%	27	100.0%
Growing body of knowledge	27	100.0%	0	.0%	27	100.0%
Types of university * Enhancing research productivity	27	100.0%	0	.0%	27	100.0%
Types of university * Enhancing teaching quality	27	100.0%	0	.0%	27	100.0%
Types of university * Job role	27	100.0%	0	.0%	27	100.0%
Types of university * Looking for co-authorship	27	100.0%	0	.0%	27	100.0%
Types of university * Contribution to the university	27	100.0%	0	.0%	27	100.0%
Types of university * Motivated to the REF	27	100.0%	0	.0%	27	100.0%

**Types of university \* Growing body of knowledge**

**Crosstab**

			Growing body of knowledge		Total
			Yes	No	
Types of university	Pre-1992 University	Count	6	10	16
		% within Types of university	37.5%	62.5%	100.0%
	Post-1992 University	Count	5	6	11
		% within Types of university	45.5%	54.5%	100.0%
Total		Count	11	16	27
		% within Types of university	40.7%	59.3%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.171 <sup>a</sup>	1	.679		
Continuity Correction <sup>b</sup>	.000	1	.988		
Likelihood Ratio	.170	1	.680		
Fisher's Exact Test				.710	.492
Linear-by-Linear Association	.165	1	.685		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.48.

b. Computed only for a 2x2 table

**Types of university \* Job role**

**Crosstab**

Count

		Types of university		Total
		Pre-1992 University	Post-1992 University	
Job role	Yes	3	2	5
	No	13	9	22
Total		16	11	27

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.001 <sup>a</sup>	1	.970	1.000	.684
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.001	1	.970		
Fisher's Exact Test					
Linear-by-Linear Association	.001	1	.971		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.04.

b. Computed only for a 2x2 table



**Types of university \* Looking for co-authorship**

**Crosstab**

			Looking for co-authorship		Total
			Yes	No	
Types of university	Pre-1992 University	Count	0	16	16
		% within Types of university	.0%	100.0%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	2	25	27
		% within Types of university	7.4%	92.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.142 <sup>a</sup>	1	.076		
Continuity Correction <sup>b</sup>	1.050	1	.305		
Likelihood Ratio	3.828	1	.050		
Fisher's Exact Test				.157	.157
Linear-by-Linear Association	3.025	1	.082		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .81.

b. Computed only for a 2x2 table

**Types of university \* Contribution to the university**

**Crosstab**

			Contribution to the university		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	4	23	27
		% within Types of university	14.8%	85.2%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.482 <sup>a</sup>	1	.488	.624	.455
Continuity Correction <sup>b</sup>	.020	1	.886		
Likelihood Ratio	.508	1	.476		
Fisher's Exact Test					
Linear-by-Linear Association	.464	1	.496		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.63.

b. Computed only for a 2x2 table

**Types of university \* Motivated by the REF**

**Crosstab**

			Motivated by the REF		Total
			Yes	No	
Types of university	Pre-1992 University	Count	8	8	16
		% within Types of university	50.0%	50.0%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	8	19	27
		% within Types of university	29.6%	70.4%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.816 <sup>a</sup>	1	.005		
Continuity Correction <sup>b</sup>	5.602	1	.018		
Likelihood Ratio	10.635	1	.001		
Fisher's Exact Test				.008	.006
Linear-by-Linear Association	7.526	1	.006		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.26.

b. Computed only for a 2x2 table

**Enhancing research productivity \* Types of university**

**Crosstab**

Count

		Types of university		Total
		Pre-1992 University	Post-1992 University	
Enhancing research productivity	Yes	4	4	8
	No	12	7	19
Total		16	11	27

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.404 <sup>a</sup>	1	.525	.675	.414
Continuity Correction <sup>b</sup>	.043	1	.836		
Likelihood Ratio	.400	1	.527		
Fisher's Exact Test					
Linear-by-Linear Association	.389	1	.533		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.26.

b. Computed only for a 2x2 table

**Enhancing teaching quality \* Types of university**

**Crosstab**

Count

		Types of university		Total
		Pre-1992 University	Post-1992 University	
Enhancing teaching quality	Yes	5	2	7
	No	11	9	20
Total		16	11	27

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	.580 <sup>a</sup>	1	.446	.662	.383
Continuity Correction <sup>b</sup>	.099	1	.753		
Likelihood Ratio	.597	1	.440		
Fisher's Exact Test					
Linear-by-Linear Association	.558	1	.455		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.85.

b. Computed only for a 2x2 table

**University pressure \* Types of university**

**Crosstab**

Count

		Types of university		Total
		Pre-1992 University	Post-1992 University	
Enhancing teaching quality	Yes	5	2	7
	No	11	9	20
Total		16	11	27

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.909 <sup>a</sup>	1	.027	.042	.033
Continuity Correction <sup>b</sup>	3.241	1	.072		
Likelihood Ratio	5.489	1	.019		
Fisher's Exact Test					
Linear-by-Linear Association	4.727	1	.030		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.67.

b. Computed only for a 2x2 table

**The REF pressure \* Types of university**

**Crosstab**

Count

		Types of university		Total
		Pre-1992 University	Post-1992 University	
The REF pressure	Yes	9	3	12
	No	7	8	15
Total		16	11	27

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.217 <sup>a</sup>	1	.137	.239	.137
Continuity Correction <sup>b</sup>	1.199	1	.274		
Likelihood Ratio	2.275	1	.131		
Fisher's Exact Test					
Linear-by-Linear Association	2.135	1	.144		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.89.

b. Computed only for a 2x2 table

**Motivator factors: personal aspect**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Awareness of the importance of RKS engagement* Types of university	27	100.0%	0	.0%	27	100.0%
Career development * Types of university	27	100.0%	0	.0%	27	100.0%
Personal interest * Types of university	27	100.0%	0	.0%	27	100.0%
Building up networking * Types of university	27	100.0%	0	.0%	27	100.0%



**Awareness of the importance of RKS engagement \* Types of university**

**Crosstab**

			Types of university		Total
			Pre-1992 University	Post-1992 University	
Awareness of the importance of RKS engagement	Yes	Count % within Awareness of the importance of RKS engagement	13 56.5%	10 43.5%	23 100.0%
	No	Count % within Awareness of the importance of RKS engagement	3 75.0%	1 25.0%	4 100.0%
Total		Count % within Awareness of the importance of RKS engagement	16 59.3%	11 40.7%	27 100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.482 <sup>a</sup>	1	.488		
Continuity Correction <sup>b</sup>	.020	1	.886		
Likelihood Ratio	.508	1	.476		
Fisher's Exact Test				.624	.455
Linear-by-Linear Association	.464	1	.496		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.63.

b. Computed only for a 2x2 table

**Career development \* Types of university**

**Crosstab**

			Types of university		Total
			Pre-1992 University	Post-1992 University	
Career development	Yes	Count	6	5	11
		% within Career development	54.5%	45.5%	100.0%
	No	Count	10	6	16
		% within Career development	62.5%	37.5%	100.0%
Total		Count	16	11	27
		% within Career development	59.3%	40.7%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.171 <sup>a</sup>	1	.679		
Continuity Correction <sup>b</sup>	.000	1	.988		
Likelihood Ratio	.170	1	.680		
Fisher's Exact Test				.710	.492
Linear-by-Linear Association	.165	1	.685		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.48.

b. Computed only for a 2x2 table

***Personal interest \* Types of university***

**Crosstab**

			Types of university		Total
			Pre-1992 University	Post-1992 University	
Personal interest	Yes	Count	5	2	7
		% within Personal interest	71.4%	28.6%	100.0%
	No	Count	11	9	20
		% within Personal interest	55.0%	45.0%	100.0%
Total		Count	16	11	27
		% within Personal interest	59.3%	40.7%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.580 <sup>a</sup>	1	.446		
Continuity Correction <sup>b</sup>	.099	1	.753		
Likelihood Ratio	.597	1	.440		
Fisher's Exact Test				.662	.383
Linear-by-Linear Association	.558	1	.455		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.85.

b. Computed only for a 2x2 table

***Building up networking \* Types of university***

**Crosstab**

			Types of university		Total
			Pre-1992 University	Post-1992 University	
Building up networking	Yes	Count	0	1	1
		% within Building up networking	.0%	100.0%	100.0%
	No	Count	16	10	26
		% within Building up networking	61.5%	38.5%	100.0%
Total		Count	16	11	27
		% within Building up networking	59.3%	40.7%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.510 <sup>a</sup>	1	.219		
Continuity Correction <sup>b</sup>	.037	1	.848		
Likelihood Ratio	1.852	1	.174		
Fisher's Exact Test				.407	.407
Linear-by-Linear Association	1.455	1	.228		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .41.

b. Computed only for a 2x2 table

**Inhibitor factors**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university * Fear of stealing of ideas	27	100.0%	0	.0%	27	100.0%
Types of university * Lack of confidence	27	100.0%	0	.0%	27	100.0%
Types of university * Fear of losing power	27	100.0%	0	.0%	27	100.0%
Types of university * Lack of trust	27	100.0%	0	.0%	27	100.0%
Types of university * Time constraint	27	100.0%	0	.0%	27	100.0%
Types of university * Unavailability of IP protection	27	100.0%	0	.0%	27	100.0%

**Types of university \* Fear of stealing of ideas**

**Crosstab**

			Fear of stealing of ideas		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	5	6	11
		% within Types of university	45.5%	54.5%	100.0%
Total		Count	8	19	27
		% within Types of university	29.6%	70.4%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.229 <sup>a</sup>	1	.135		
Continuity Correction <sup>b</sup>	1.133	1	.287		
Likelihood Ratio	2.215	1	.137		
Fisher's Exact Test				.206	.144
Linear-by-Linear Association	2.147	1	.143		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.26.

b. Computed only for a 2x2 table

**Types of university \* Lack of confidence**

**Crosstab**

			Lack of confidence		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	4	7	11
		% within Types of university	36.4%	63.6%	100.0%
Total		Count	5	22	27
		% within Types of university	18.5%	81.5%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.918 <sup>a</sup>	1	.048	.125	.071
Continuity Correction <sup>b</sup>	2.176	1	.140		
Likelihood Ratio	3.973	1	.046		
Fisher's Exact Test					
Linear-by-Linear Association	3.772	1	.052		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.04.

b. Computed only for a 2x2 table



**Types of university \* Fear of losing power**

**Crosstab**

			Fear of losing power		Total
			Yes	No	
Types of university	Pre-1992 University	Count	4	12	16
		% within Types of university	25.0%	75.0%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	6	21	27
		% within Types of university	22.2%	77.8%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.175 <sup>a</sup>	1	.675	1.000	.528
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.178	1	.673		
Fisher's Exact Test					
Linear-by-Linear Association	.169	1	.681		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.44.

b. Computed only for a 2x2 table

**Types of university \* Lack of trust**

**Crosstab**

			Lack of trust		Total
			Yes	No	
Types of university	Pre-1992 University	Count	4	12	16
		% within Types of university	25.0%	75.0%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	6	21	27
		% within Types of university	22.2%	77.8%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.175 <sup>a</sup>	1	.675	1.000	.528
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.178	1	.673		
Fisher's Exact Test					
Linear-by-Linear Association	.169	1	.681		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.44.

b. Computed only for a 2x2 table

**Types of university \* Time constraint**

**Crosstab**

			Time constraint		Total
			Yes	No	
Types of university	Pre-1992 University	Count	0	16	16
		% within Types of university	.0%	100.0%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	2	25	27
		% within Types of university	7.4%	92.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.142 <sup>a</sup>	1	.076		
Continuity Correction <sup>b</sup>	1.050	1	.305		
Likelihood Ratio	3.828	1	.050		
Fisher's Exact Test				.157	.157
Linear-by-Linear Association	3.025	1	.082		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .81.

b. Computed only for a 2x2 table

**Types of university \* Unavailability of IP protection**

**Crosstab**

			Unavailability of IP protection		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.320 <sup>a</sup>	1	.128		
Continuity Correction <sup>b</sup>	.810	1	.368		
Likelihood Ratio	3.394	1	.065		
Fisher's Exact Test				.248	.191
Linear-by-Linear Association	2.234	1	.135		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**RKS process**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university * Not sharing research idea	27	100.0%	0	.0%	27	100.0%
Types of university * Not sharing research proposal	27	100.0%	0	.0%	27	100.0%
Types of university * Not sharing research design	27	100.0%	0	.0%	27	100.0%
Types of university * Not sharing research methodology	27	100.0%	0	.0%	27	100.0%
Types of university * Only sharing research result	27	100.0%	0	.0%	27	100.0%

**Types of university \* Not sharing research idea**

**Crosstab**

			Not sharing research idea		Total
			Yes	No	
Types of university	Pre-1992 University	Count	6	10	16
		% within Types of university	37.5%	62.5%	100.0%
	Post-1992 University	Count	9	2	11
		% within Types of university	81.8%	18.2%	100.0%
Total		Count	15	12	27
		% within Types of university	55.6%	44.4%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.185 <sup>a</sup>	1	.023	.047	.028
Continuity Correction <sup>b</sup>	3.546	1	.060		
Likelihood Ratio	5.495	1	.019		
Fisher's Exact Test					
Linear-by-Linear Association	4.993	1	.025		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.89.

b. Computed only for a 2x2 table

**Types of university \* Not sharing research proposal**

**Crosstab**

		Not sharing research proposal		Total
		Yes	No	
Types of university	Pre-1992 University	Count 3	13	16
		% within Types of university 18.8%	81.3%	100.0%
	Post-1992 University	Count 6	5	11
		% within Types of university 54.5%	45.5%	100.0%
Total		Count 9	18	27
		% within Types of university 33.3%	66.7%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.759 <sup>a</sup>	1	.053	.097	.064
Continuity Correction <sup>b</sup>	2.320	1	.128		
Likelihood Ratio	3.771	1	.052		
Fisher's Exact Test					
Linear-by-Linear Association	3.619	1	.057		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.67.

b. Computed only for a 2x2 table

**Types of university \* Not sharing research design**

**Crosstab**

			Not sharing research design		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	5	6	11
		% within Types of university	45.5%	54.5%	100.0%
Total		Count	6	21	27
		% within Types of university	22.2%	77.8%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.797 <sup>a</sup>	1	.016		
Continuity Correction <sup>b</sup>	3.750	1	.053		
Likelihood Ratio	5.965	1	.015		
Fisher's Exact Test				.027	.027
Linear-by-Linear Association	5.582	1	.018		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.44.

b. Computed only for a 2x2 table



**Types of university \* Not sharing research methodology**

**Crosstab**

			Not sharing research methodology		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	3	8	11
		% within Types of university	27.3%	72.7%	100.0%
Total		Count	4	23	27
		% within Types of university	14.8%	85.2%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.283 <sup>a</sup>	1	.131		
Continuity Correction <sup>b</sup>	.921	1	.337		
Likelihood Ratio	2.280	1	.131		
Fisher's Exact Test				.273	.169
Linear-by-Linear Association	2.198	1	.138		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.63.

b. Computed only for a 2x2 table

**Types of university \* Only sharing research result**

**Crosstab**

			Only sharing research result		Total
			Yes	No	
Types of university	Pre-1992 University	Count	6	10	16
		% within Types of university	37.5%	62.5%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	6	21	27
		% within Types of university	22.2%	77.8%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.304 <sup>a</sup>	1	.021		
Continuity Correction <sup>b</sup>	3.356	1	.067		
Likelihood Ratio	7.434	1	.006		
Fisher's Exact Test				.054	.027
Linear-by-Linear Association	5.107	1	.024		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.44.

b. Computed only for a 2x2 table

**Types of knowledge shared**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university * Sharing both tacit and explicit knowledge	27	100.0%	0	.0%	27	100.0%
Types of university * Sharing mainly explicit knowledge	27	100.0%	0	.0%	27	100.0%
Types of university * Sharing only explicit knowledge	27	100.0%	0	.0%	27	100.0%

**Types of university \* Sharing both tacit and explicit knowledge**

**Crosstab**

			Sharing both tacit and explicit knowledge		Total
			Yes	No	
Types of university	Pre-1992 University	Count	9	7	16
		% within Types of university	56.3%	43.8%	100.0%
	Post-1992 University	Count	8	3	11
		% within Types of university	72.7%	27.3%	100.0%
Total		Count	17	10	27
		% within Types of university	63.0%	37.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.759 <sup>a</sup>	1	.384		
Continuity Correction <sup>b</sup>	.217	1	.641		
Likelihood Ratio	.773	1	.379		
Fisher's Exact Test				.448	.324
Linear-by-Linear Association	.731	1	.393		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.07.

b. Computed only for a 2x2 table

**Types of university \* Sharing mainly explicit knowledge**

**Crosstab**

			Sharing mainly explicit knowledge		Total
			Yes	No	
Types of university	Pre-1992 University	Count	4	12	16
		% within Types of university	25.0%	75.0%	100.0%
	Post-1992 University	Count	3	8	11
		% within Types of university	27.3%	72.7%	100.0%
Total		Count	7	20	27
		% within Types of university	25.9%	74.1%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.018 <sup>a</sup>	1	.895	1.000	.617
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.017	1	.895		
Fisher's Exact Test					
Linear-by-Linear Association	.017	1	.897		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.85.

b. Computed only for a 2x2 table

**Types of university \* Sharing only explicit knowledge**

**Crosstab**

			Sharing only explicit knowledge		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.320 <sup>a</sup>	1	.128		
Continuity Correction <sup>b</sup>	.810	1	.368		
Likelihood Ratio	3.394	1	.065		
Fisher's Exact Test				.248	.191
Linear-by-Linear Association	2.234	1	.135		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**Channels of communications used for RKS**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university * Face-to-face	27	100.0%	0	.0%	27	100.0%
Types of university * Face-to-face and virtual	27	100.0%	0	.0%	27	100.0%
Types of university * All three channels	27	100.0%	0	.0%	27	100.0%
Types of university * Written	27	100.0%	0	.0%	27	100.0%
Types of university * Virtual	27	100.0%	0	.0%	27	100.0%

**Types of university \* Face-to-face**

**Crosstab**

			Face-to-face		Total
			Yes	No	
Types of university	Pre-1992 University	Count	5	11	16
		% within Types of university	31.3%	68.8%	100.0%
	Post-1992 University	Count	7	4	11
		% within Types of university	63.6%	36.4%	100.0%
Total		Count	12	15	27
		% within Types of university	44.4%	55.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.769 <sup>a</sup>	1	.096	.130	.102
Continuity Correction <sup>b</sup>	1.613	1	.204		
Likelihood Ratio	2.801	1	.094		
Fisher's Exact Test					
Linear-by-Linear Association	2.666	1	.102		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.89.

b. Computed only for a 2x2 table



**Types of university \* Face-to-face and virtual**

**Crosstab**

			Face-to-face and virtual		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	3	8	11
		% within Types of university	27.3%	72.7%	100.0%
Total		Count	5	22	27
		% within Types of university	18.5%	81.5%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.943 <sup>a</sup>	1	.332		
Continuity Correction <sup>b</sup>	.218	1	.641		
Likelihood Ratio	.927	1	.336		
Fisher's Exact Test				.370	.316
Linear-by-Linear Association	.908	1	.341		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.04.

b. Computed only for a 2x2 table

**Types of university \* All three channels**

**Crosstab**

			All three channels		Total
			Yes	No	
Types of university	Pre-1992 University	Count	4	12	16
		% within Types of university	25.0%	75.0%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	5	22	27
		% within Types of university	18.5%	81.5%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.093 <sup>a</sup>	1	.296		
Continuity Correction <sup>b</sup>	.293	1	.588		
Likelihood Ratio	1.178	1	.278		
Fisher's Exact Test				.618	.302
Linear-by-Linear Association	1.053	1	.305		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.04.

b. Computed only for a 2x2 table

**Types of university \* Written**

**Crosstab**

			Written		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.320 <sup>a</sup>	1	.128		
Continuity Correction <sup>b</sup>	.810	1	.368		
Likelihood Ratio	3.394	1	.065		
Fisher's Exact Test				.248	.191
Linear-by-Linear Association	2.234	1	.135		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**Types of university \* Virtual**

**Crosstab**

			Virtual		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	2	25	27
		% within Types of university	7.4%	92.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.485 <sup>a</sup>	1	.223		
Continuity Correction <sup>b</sup>	.222	1	.638		
Likelihood Ratio	2.202	1	.138		
Fisher's Exact Test				.499	.342
Linear-by-Linear Association	1.430	1	.232		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .81.

b. Computed only for a 2x2 table

**KS enablers: People**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university * Research-leader as inspirer	27	100.0%	0	.0%	27	100.0%
Types of university * Formal & informal interaction with other colleagues	27	100.0%	0	.0%	27	100.0%
Types of university * Research-leader as mentor	27	100.0%	0	.0%	27	100.0%
Types of university * Research-leader as role model	27	100.0%	0	.0%	27	100.0%

**Types of university \* Research-leader as inspirer**

**Crosstab**

			Research-leader as inspirer		Total
			Yes	No	
Types of university	Pre-1992 University	Count	9	7	16
		% within Types of university	56.3%	43.8%	100.0%
	Post-1992 University	Count	8	3	11
		% within Types of university	72.7%	27.3%	100.0%
Total		Count	17	10	27
		% within Types of university	63.0%	37.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.759 <sup>a</sup>	1	.384		
Continuity Correction <sup>b</sup>	.217	1	.641		
Likelihood Ratio	.773	1	.379		
Fisher's Exact Test				.448	.324
Linear-by-Linear Association	.731	1	.393		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.07.

b. Computed only for a 2x2 table

**Types of university \* Formal & informal interaction with other colleagues**

**Crosstab**

			Formal & informal interaction with other colleagues		Total
			Yes	No	
Types of university	Pre-1992 University	Count	6	10	16
		% within Types of university	37.5%	62.5%	100.0%
	Post-1992 University	Count	5	6	11
		% within Types of university	45.5%	54.5%	100.0%
Total		Count	11	16	27
		% within Types of university	40.7%	59.3%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.171 <sup>a</sup>	1	.679		
Continuity Correction <sup>b</sup>	.000	1	.988		
Likelihood Ratio	.170	1	.680		
Fisher's Exact Test				.710	.492
Linear-by-Linear Association	.165	1	.685		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.48.

b. Computed only for a 2x2 table

**Types of university \* Research-leader as mentor**

**Crosstab**

			Research-leader as mentor		Total
			Yes	No	
Types of university	Pre-1992 University	Count	6	10	16
		% within Types of university	37.5%	62.5%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	7	20	27
		% within Types of university	25.9%	74.1%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.739 <sup>a</sup>	1	.098		
Continuity Correction <sup>b</sup>	1.460	1	.227		
Likelihood Ratio	3.031	1	.082		
Fisher's Exact Test				.183	.112
Linear-by-Linear Association	2.638	1	.104		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.85.

b. Computed only for a 2x2 table



**Types of university \* Research-leader as role model**

**Crosstab**

			Research-leader as role model		Total
			Yes	No	
Types of university	Pre-1992 University	Count	5	11	16
		% within Types of university	31.3%	68.8%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	5	22	27
		% within Types of university	18.5%	81.5%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.219 <sup>a</sup>	1	.040		
Continuity Correction <sup>b</sup>	2.402	1	.121		
Likelihood Ratio	6.000	1	.014		
Fisher's Exact Test				.060	.054
Linear-by-Linear Association	4.062	1	.044		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.04.

b. Computed only for a 2x2 table

**KS enablers: Organisation – Research strategy**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university *	27	100.0%	0	.0%	27	100.0%
Research budget						
Types of university *	27	100.0%	0	.0%	27	100.0%
Research centre						
Types of university *	27	100.0%	0	.0%	27	100.0%
Workload system						
Types of university *	27	100.0%	0	.0%	27	100.0%
Mentoring system						
Types of university *	27	100.0%	0	.0%	27	100.0%
Newsletter						
Types of university *	27	100.0%	0	.0%	27	100.0%
University research publication						
Types of university *	27	100.0%	0	.0%	27	100.0%
Working paper series						
Types of university * Annual review	27	100.0%	0	.0%	27	100.0%
Types of university *	27	100.0%	0	.0%	27	100.0%
Intellectual property support						
Types of university *	27	100.0%	0	.0%	27	100.0%
Research incentives						
Types of university *	27	100.0%	0	.0%	27	100.0%
Research academy						
Types of university *	27	100.0%	0	.0%	27	100.0%
Sabbatical policy						

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university *	27	100.0%	0	.0%	27	100.0%
Research budget						
Types of university *	27	100.0%	0	.0%	27	100.0%
Research centre						
Types of university *	27	100.0%	0	.0%	27	100.0%
Workload system						
Types of university *	27	100.0%	0	.0%	27	100.0%
Mentoring system						
Types of university *	27	100.0%	0	.0%	27	100.0%
Newsletter						
Types of university *	27	100.0%	0	.0%	27	100.0%
University research publication						
Types of university *	27	100.0%	0	.0%	27	100.0%
Working paper series						
Types of university * Annual review	27	100.0%	0	.0%	27	100.0%
Types of university *	27	100.0%	0	.0%	27	100.0%
Intellectual property support						
Types of university *	27	100.0%	0	.0%	27	100.0%
Research incentives						
Types of university *	27	100.0%	0	.0%	27	100.0%
Research academy						
Types of university *	27	100.0%	0	.0%	27	100.0%
Sabbatical policy						
Types of university * Special interest group	27	100.0%	0	.0%	27	100.0%

**Types of university \* Research budget**

**Crosstab**

			Research budget		Total
			Yes	No	
Types of university	Pre-1992 University	Count	4	12	16
		% within Types of university	25.0%	75.0%	100.0%
	Post-1992 University	Count	6	5	11
		% within Types of university	54.5%	45.5%	100.0%
Total		Count	10	17	27
		% within Types of university	37.0%	63.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.440 <sup>a</sup>	1	.118		
Continuity Correction <sup>b</sup>	1.338	1	.247		
Likelihood Ratio	2.441	1	.118		
Fisher's Exact Test				.224	.124
Linear-by-Linear Association	2.350	1	.125		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.07.

b. Computed only for a 2x2 table

**Types of university \* Research centre**

**Crosstab**

			Research centre		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	5	6	11
		% within Types of university	45.5%	54.5%	100.0%
Total		Count	6	21	27
		% within Types of university	22.2%	77.8%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.797 <sup>a</sup>	1	.016		
Continuity Correction <sup>b</sup>	3.750	1	.053		
Likelihood Ratio	5.965	1	.015		
Fisher's Exact Test				.027	.027
Linear-by-Linear Association	5.582	1	.018		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.44.

b. Computed only for a 2x2 table

**Types of university \* Workload system**

**Crosstab**

			Workload system		Total
			Yes	No	
Types of university	Pre-1992 University	Count	6	10	16
		% within Types of university	37.5%	62.5%	100.0%
	Post-1992 University	Count	4	7	11
		% within Types of university	36.4%	63.6%	100.0%
Total		Count	10	17	27
		% within Types of university	37.0%	63.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.004 <sup>a</sup>	1	.952	1.000	.637
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.004	1	.952		
Fisher's Exact Test					
Linear-by-Linear Association	.003	1	.953		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.07.

b. Computed only for a 2x2 table

**Types of university \* Mentoring system**

**Crosstab**

			Mentoring system		Total
			Yes	No	
Types of university	Pre-1992 University	Count	7	9	16
		% within Types of university	43.8%	56.3%	100.0%
	Post-1992 University	Count	3	8	11
		% within Types of university	27.3%	72.7%	100.0%
Total		Count	10	17	27
		% within Types of university	37.0%	63.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.759 <sup>a</sup>	1	.384		
Continuity Correction <sup>b</sup>	.217	1	.641		
Likelihood Ratio	.773	1	.379		
Fisher's Exact Test				.448	.324
Linear-by-Linear Association	.731	1	.393		
N of Valid Cases	27				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.07.

b. Computed only for a 2x2 table

**Types of university \* Newsletter**

**Crosstab**

			Newsletter		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	5	22	27
		% within Types of university	18.5%	81.5%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.001 <sup>a</sup>	1	.970	1.000	.684
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.001	1	.970		
Fisher's Exact Test					
Linear-by-Linear Association	.001	1	.971		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.04.

b. Computed only for a 2x2 table



**Types of university \* University research publication**

**Crosstab**

			University research publication		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.940 <sup>a</sup>	1	.332		
Continuity Correction <sup>b</sup>	.120	1	.729		
Likelihood Ratio	.925	1	.336		
Fisher's Exact Test				.549	.357
Linear-by-Linear Association	.905	1	.341		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**Types of university \* Working paper series**

**Crosstab**

			Working paper series		Total
			Yes	No	
Types of university	Pre-1992 University	Count	5	11	16
		% within Types of university	31.3%	68.8%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	6	21	27
		% within Types of university	22.2%	77.8%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.852 <sup>a</sup>	1	.174	.350	.189
Continuity Correction <sup>b</sup>	.792	1	.374		
Likelihood Ratio	2.027	1	.154		
Fisher's Exact Test					
Linear-by-Linear Association	1.783	1	.182		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.44.

b. Computed only for a 2x2 table

**Types of university \* Annual review**

**Crosstab**

			Annual review		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.077 <sup>a</sup>	1	.782	1.000	.643
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.078	1	.780		
Fisher's Exact Test					
Linear-by-Linear Association	.074	1	.786		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**Types of university \* Intellectual property support**

**Crosstab**

			Intellectual property support		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.077 <sup>a</sup>	1	.782	1.000	.643
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.078	1	.780		
Fisher's Exact Test					
Linear-by-Linear Association	.074	1	.786		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**Types of university \* Research incentives**

**Crosstab**

			Research incentives		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.077 <sup>a</sup>	1	.782		
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.078	1	.780		
Fisher's Exact Test				1.000	.643
Linear-by-Linear Association	.074	1	.786		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**Types of university \* Research academy**

**Crosstab**

			Research academy		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	1	26	27
		% within Types of university	3.7%	96.3%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.714 <sup>a</sup>	1	.398	1.000	.593
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	1.073	1	.300		
Fisher's Exact Test					
Linear-by-Linear Association	.688	1	.407		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .41.

b. Computed only for a 2x2 table

**Types of university \* Sabbatical policy**

**Crosstab**

			Sabbatical policy		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	2	25	27
		% within Types of university	7.4%	92.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.485 <sup>a</sup>	1	.223		
Continuity Correction <sup>b</sup>	.222	1	.638		
Likelihood Ratio	2.202	1	.138		
Fisher's Exact Test				.499	.342
Linear-by-Linear Association	1.430	1	.232		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .81.

b. Computed only for a 2x2 table

**Types of university \* Special interest group**

**Crosstab**

			Special interest group		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	1	26	27
		% within Types of university	3.7%	96.3%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.714 <sup>a</sup>	1	.398	1.000	.593
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	1.073	1	.300		
Fisher's Exact Test					
Linear-by-Linear Association	.688	1	.407		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .41.

b. Computed only for a 2x2 table



**KS enablers: Organisation – Research event**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university * Research seminar	27	100.0%	0	.0%	27	100.0%
Types of university * Research conference	27	100.0%	0	.0%	27	100.0%
Types of university * Research meeting	27	100.0%	0	.0%	27	100.0%
Types of university * Research workshop	27	100.0%	0	.0%	27	100.0%
Types of university * Away day	27	100.0%	0	.0%	27	100.0%
Types of university * Inaugural lecture	27	100.0%	0	.0%	27	100.0%
Types of university * Research forum	27	100.0%	0	.0%	27	100.0%
Types of university * Lunch time meeting	27	100.0%	0	.0%	27	100.0%

**Types of university \* Research seminar**

**Crosstab**

			Research seminar		Total
			Yes	No	
Types of university	Pre-1992 University	Count	13	3	16
		% within Types of university	81.3%	18.8%	100.0%
	Post-1992 University	Count	7	4	11
		% within Types of university	63.6%	36.4%	100.0%
Total		Count	20	7	27
		% within Types of university	74.1%	25.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.053 <sup>a</sup>	1	.305		
Continuity Correction <sup>b</sup>	.336	1	.562		
Likelihood Ratio	1.040	1	.308		
Fisher's Exact Test				.391	.279
Linear-by-Linear Association	1.014	1	.314		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.85.

b. Computed only for a 2x2 table

**Types of university \* Research conference**

**Crosstab**

			Research conference		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	5	22	27
		% within Types of university	18.5%	81.5%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.001 <sup>a</sup>	1	.970	1.000	.684
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.001	1	.970		
Fisher's Exact Test					
Linear-by-Linear Association	.001	1	.971		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.04.

b. Computed only for a 2x2 table

**Types of university \* Research meeting**

**Crosstab**

			Research meeting		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	4	23	27
		% within Types of university	14.8%	85.2%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.167 <sup>a</sup>	1	.683	1.000	.545
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.164	1	.685		
Fisher's Exact Test					
Linear-by-Linear Association	.161	1	.689		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.63.

b. Computed only for a 2x2 table

**Types of university \* Research workshop**

**Crosstab**

			Research workshop		Total
			Yes	No	
Types of university	Pre-1992 University	Count	0	16	16
		% within Types of university	.0%	100.0%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	2	25	27
		% within Types of university	7.4%	92.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.142 <sup>a</sup>	1	.076	.157	.157
Continuity Correction <sup>b</sup>	1.050	1	.305		
Likelihood Ratio	3.828	1	.050		
Fisher's Exact Test					
Linear-by-Linear Association	3.025	1	.082		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .81.

b. Computed only for a 2x2 table

**Types of university \* Away day**

**Crosstab**

			Away day		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.077 <sup>a</sup>	1	.782	1.000	.643
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.078	1	.780		
Fisher's Exact Test					
Linear-by-Linear Association	.074	1	.786		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**Types of university \* Inaugural lecture**

**Crosstab**

			Inaugural lecture		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	2	25	27
		% within Types of university	7.4%	92.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.077 <sup>a</sup>	1	.782	1.000	.658
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.075	1	.784		
Fisher's Exact Test					
Linear-by-Linear Association	.074	1	.786		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .81.

b. Computed only for a 2x2 table

**Types of university \* Research forum**

**Crosstab**

			Research forum		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	2	25	27
		% within Types of university	7.4%	92.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.077 <sup>a</sup>	1	.782	1.000	.658
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.075	1	.784		
Fisher's Exact Test					
Linear-by-Linear Association	.074	1	.786		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .81.

b. Computed only for a 2x2 table



**Types of university \* Lunch time meeting**

**Crosstab**

			Lunch time meeting		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	2	25	27
		% within Types of university	7.4%	92.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.485 <sup>a</sup>	1	.223	.499	.342
Continuity Correction <sup>b</sup>	.222	1	.638		
Likelihood Ratio	2.202	1	.138		
Fisher's Exact Test					
Linear-by-Linear Association	1.430	1	.232		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .81.

b. Computed only for a 2x2 table

**KS enablers: IT**

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Types of university * Research database	27	100.0%	0	.0%	27	100.0%
Types of university * Email	27	100.0%	0	.0%	27	100.0%
Types of university * Data analysis software	27	100.0%	0	.0%	27	100.0%
Types of university * University website	27	100.0%	0	.0%	27	100.0%
Types of university * Digital media	27	100.0%	0	.0%	27	100.0%
Types of university * Online research repository	27	100.0%	0	.0%	27	100.0%

**Types of university \* Research database**

**Crosstab**

			Research database		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	5	6	11
		% within Types of university	45.5%	54.5%	100.0%
Total		Count	8	19	27
		% within Types of university	29.6%	70.4%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.229 <sup>a</sup>	1	.135		
Continuity Correction <sup>b</sup>	1.133	1	.287		
Likelihood Ratio	2.215	1	.137		
Fisher's Exact Test				.206	.144
Linear-by-Linear Association	2.147	1	.143		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.26.

b. Computed only for a 2x2 table

**Types of university \* Email**

**Crosstab**

			Email		Total
			Yes	No	
Types of university	Pre-1992 University	Count	3	13	16
		% within Types of university	18.8%	81.3%	100.0%
	Post-1992 University	Count	2	9	11
		% within Types of university	18.2%	81.8%	100.0%
Total		Count	5	22	27
		% within Types of university	18.5%	81.5%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.001 <sup>a</sup>	1	.970	1.000	.684
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.001	1	.970		
Fisher's Exact Test					
Linear-by-Linear Association	.001	1	.971		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.04.

b. Computed only for a 2x2 table

**Types of university \* Data analysis software**

**Crosstab**

			Data analysis software		Total
			Yes	No	
Types of university	Pre-1992 University	Count	2	14	16
		% within Types of university	12.5%	87.5%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	3	24	27
		% within Types of university	11.1%	88.9%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.077 <sup>a</sup>	1	.782	1.000	.643
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.078	1	.780		
Fisher's Exact Test					
Linear-by-Linear Association	.074	1	.786		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.22.

b. Computed only for a 2x2 table

**Types of university \* University website**

**Crosstab**

			University website		Total
			Yes	No	
Types of university	Pre-1992 University	Count	5	11	16
		% within Types of university	31.3%	68.8%	100.0%
	Post-1992 University	Count	1	10	11
		% within Types of university	9.1%	90.9%	100.0%
Total		Count	6	21	27
		% within Types of university	22.2%	77.8%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.852 <sup>a</sup>	1	.174	.350	.189
Continuity Correction <sup>b</sup>	.792	1	.374		
Likelihood Ratio	2.027	1	.154		
Fisher's Exact Test					
Linear-by-Linear Association	1.783	1	.182		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.44.

b. Computed only for a 2x2 table

**Types of university \* Digital media**

**Crosstab**

			Digital media		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	1	26	27
		% within Types of university	3.7%	96.3%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.714 <sup>a</sup>	1	.398	1.000	.593
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	1.073	1	.300		
Fisher's Exact Test					
Linear-by-Linear Association	.688	1	.407		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .41.

b. Computed only for a 2x2 table

### Types of university \* Online research repository

Crosstab

			Online research repository		Total
			Yes	No	
Types of university	Pre-1992 University	Count	1	15	16
		% within Types of university	6.3%	93.8%	100.0%
	Post-1992 University	Count	0	11	11
		% within Types of university	.0%	100.0%	100.0%
Total		Count	1	26	27
		% within Types of university	3.7%	96.3%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.714 <sup>a</sup>	1	.398	1.000	.593
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	1.073	1	.300		
Fisher's Exact Test					
Linear-by-Linear Association	.688	1	.407		
N of Valid Cases	27				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .41.

b. Computed only for a 2x2 table



**The influence of research-leaders on RKS: research-academics' responses**

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
Degree of influence	Between Groups	22.917	1	22.917	16.975	.000
	Within Groups	33.750	25	1.350		
	Total	56.667	26			
Effectiveness of support	Between Groups	23.056	1	23.056	14.943	.001
	Within Groups	38.574	25	1.543		
	Total	61.630	26			
Effectiveness of research policy	Between Groups	20.485	1	20.485	18.172	.000
	Within Groups	28.182	25	1.127		
	Total	48.667	26			
Degree of relationship	Between Groups	2.832	1	2.832	5.090	.033
	Within Groups	13.909	25	.556		
	Total	16.741	26			

## Oneway

### Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Degree of influence	Pre-1992 University	16	3.88	1.204	.301	3.23	4.52	1	5
	Post-1992 University	11	2.00	1.095	.330	1.26	2.74	1	4
	Total	27	3.11	1.476	.284	2.53	3.70	1	5
Effectiveness of support	Pre-1992 University	16	4.06	1.436	.359	3.30	4.83	1	5
	Post-1992 University	11	2.18	.874	.263	1.59	2.77	1	4
	Total	27	3.30	1.540	.296	2.69	3.91	1	5
Effectiveness of research policy	Pre-1992 University	16	3.50	1.265	.316	2.83	4.17	1	5
	Post-1992 University	11	1.73	.647	.195	1.29	2.16	1	3
	Total	27	2.78	1.368	.263	2.24	3.32	1	5
Degree of relationship	Pre-1992 University	16	4.25	.931	.233	3.75	4.75	2	5
	Post-1992 University	11	4.91	.302	.091	4.71	5.11	4	5
	Total	27	4.52	.802	.154	4.20	4.84	2	5

**The influence of research-leaders on RKS: research-leaders' responses**

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
Degree of influence	Between Groups	.033	1	.033	.481	.500
	Within Groups	.900	13	.069		
	Total	.933	14			
Effectiveness of support	Between Groups	.033	1	.033	.255	.622
	Within Groups	1.700	13	.131		
	Total	1.733	14			
Effectiveness of research policy	Between Groups	2.700	1	2.700	39.000	.000
	Within Groups	.900	13	.069		
	Total	3.600	14			
Degree of relationship	Between Groups	.033	1	.033	.481	.500
	Within Groups	.900	13	.069		
	Total	.933	14			

## Oneway

### Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Degree of influence	Pre-1992 University	10	4.10	.316	.100	3.87	4.33	4	5
	Post-1992 University	5	4.00	.000	.000	4.00	4.00	4	4
	Total	15	4.07	.258	.067	3.92	4.21	4	5
Effectiveness of support	Pre-1992 University	10	4.10	.316	.100	3.87	4.33	4	5
	Post-1992 University	5	4.20	.447	.200	3.64	4.76	4	5
	Total	15	4.13	.352	.091	3.94	4.33	4	5
Effectiveness of research policy	Pre-1992 University	10	4.10	.316	.100	3.87	4.33	4	5
	Post-1992 University	5	5.00	.000	.000	5.00	5.00	5	5
	Total	15	4.40	.507	.131	4.12	4.68	4	5
Degree of relationship	Pre-1992 University	10	4.90	.316	.100	4.67	5.13	4	5
	Post-1992 University	5	5.00	.000	.000	5.00	5.00	5	5
	Total	15	4.93	.258	.067	4.79	5.08	4	5