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The potential for collaboration as a policy strategy to attract external sources of funding for business research: a case study of a regional university

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**The potential for collaboration as a
policy strategy to attract external
sources of funding for business
research:
A case study of
a regional university**

A DISSERTATION

BY

NJAU GITU

SUBMITTED TO THE GRADUATE COLLEGE OF MANAGEMENT,
SOUTHERN CROSS UNIVERSITY, AUSTRALIA
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF BUSINESS ADMINISTRATION

March 2008

Declaration

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, there is no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of a university or other institute of higher learning except where due acknowledgement is made in the text.

.....

Njau Gitu
March 2008

DEDICATED TO

THE GREAT ARCHITECT OF THE UNIVERSE

MY STRENGTH AND REDEEMER

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March 2008

Abstract

Collaboration is identified within the supply chain management discipline as a strategy that helps to link inter-institutional business research operations in order to achieve a shared market opportunity. Through collaboration, institutions should aim at maintaining a competitive advantage in their core areas of operation.

Researchers have begun to appreciate that through collaboration they are able to achieve combined synergies through effective use of available yet at times scarce resources particularly for research. In the Australian universities research sector collaboration has assumed importance in light of the changing public sector funding environment which is similar to the changes taking place in other parts of the world.

The absence of a comprehensive operational policy on research collaboration at regional Universities in Australia would most likely hinder their capacity to attract funding from external sources for their business research function. Although the strategy of collaboration is widely advocated, no formal studies have been conducted and published in the context of the Australian regional university sector prior to this research.

This thesis set out to fill this perceived gap in the literature by examining the policy issues likely to affect research collaboration at regional universities. For this purpose a research objective and five research questions were identified and defined. The research adopted a qualitative, inductive, theory-building exploratory approach with case study being the main research methodology. The researcher opted for a single case study of a regional university in Australia, where 30 in-depth interviews and an additional 12 interviews representing research partner and beneficiary institutions were conducted.

Upon data collection and data analysis, the following findings emerged:

- researchers were keen to be involved in the development of the policy to facilitate the process of collaboration
- adequate funding is essential for collaboration to achieve the desired results
- the regional university policy on collaboration is reflected in relations with external institutions, there is encouragement for the conduct of joint research with stakeholders
- the policy on collaboration impacts on university's research focus, and should be comprehensively addressed
- for the policy on collaboration to become operationally feasible the guidelines should have specific objectives with measurable outcomes.

Further to these findings, it has been concluded that:

- a comprehensive policy addressing the concerns of all stakeholders should be employed to facilitate the process of collaboration
- sharing of information within and among partners should lead to synergies and opportunities for additional funding
- the university policy on collaboration reflection in external relations *should* help in recognising the institution as a regionally, nationally and internationally recognised research university
- the regional university impact on research focus should be comprehensively addressed in the policy on research collaboration, and
- for the policy to become operationally feasible the guidelines *should* have specific objectives with measurable outcomes.

Based upon the surveyed literature (Chapter 2), the analysis of field data (Chapter 4), the researcher's understanding of the capacity, importance and relevance of collaboration as a strategy to attract external funding for business research, a conceptual model has emerged. The model enables the researcher to shed light on the research issue, the policy

issues likely to affect collaboration at a regional university. The empirical research findings derived from this research have further implications for theory, policy and practice. Finally, the conclusions and implications provide a valid foundation for further research. This will be imperative in order to obtain a deeper understanding of the underlying issues.

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Abbreviations

ABS	Australia Bureau of Statistics
AG	Australian Government
ARC	Australia Research Council
ASLaRC	Aged Care Services Learning and Research Collaboration
APICS	Association of Operations Management
ATNU	Australia Technology Network of Universities
ATP	Australia Technology Park
AUCEA	Australia Universities Community Engagement Alliance
BAA	Backing Australia s Ability
BIHECC	Business Industry and Higher Education Collaboration Council
CASR	Collaboration Structural Reform Fund
CBI	Confederation of British industry
CDSJ	Centre for Cultural Diversity and social Justice
CEDAR	Centre for Enterprise Development and Research
CIAP	College of Indigenous Australian Peoples Gnibi
CIRCLE	Collaborative Indigenous Research Centre for Learning and Education
CPFR	Collaborative Planning, Forecasting and Replenishment
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEST	Department of Education Science and Training
DOARS	Designated Areas of Research Strength
DR	Developing Researcher

EAG	Expert Advisory Group
ECR	Early Career Researcher
ECU	Edith Cowan University
EDRI	Enterprise Development Research institute
ES	Established Researcher
FB	Faculty of Business
GCM	Graduate College of Management
Go8	Group of Eight Universities
HECS	Higher Education Contribution Scheme
KTP	Knowledge Transfer Partnership
IARU	International Alliance of Research Universities
IRUA	Innovative Research Universities Australia
NGU	New Generation Universities
NR	New Researcher
NZPBRF	New Zealand Performance Based Research Fund
OECD	Organisation for Economic Cooperation and Development
PMC	Porsche Motor Company
PR	Promising Researcher
RAE	UK Research Assessment Exercise
RAF	Research Accessibility Framework
R&D	Research and Development
RDIUA	Regional Distance Intensive Universities Australia
RPA	Research Performance Assessment
RQF	Research Quality Framework

RRA	Registered Research Agency
RRUTC	Rolls-Royce University Technology Centres
RRTAC	Research and Research Training Advisory Committee
RRT/KI	Research and Research Training on Knowledge and Innovation
RRTMP	Research and Research Training Management Plan
SCM	Supply Chain Management
SCOM	School of Commerce and Management
SCU	Southern Cross University
STHM	School of Tourism and Hospitality Management
SMEs	Small and Medium-sized Enterprises
SPIRT	Strategic Partnerships with Industry and Training
SU	Stanford University
UB	University of Ballarat
UK	United Kingdom
UNE	University of New England
US	University of Sussex
USA	United States of America
USC	University of Sunshine Coast
USNSF	United States National Science Foundation
USQ	University of Southern Queensland
UTC	University Technology Centre
VICS	Voluntary Interindustry Commerce Standards Association
WIPO	World Intellectual Property Organisation (WIPO)

Chapter 1 Introduction

1.1 Background to the research

Collaboration between institutions is identified within the supply chain management discipline as a strategy that helps to link business research operations in order to achieve a shared market opportunity. Through collaboration, institutions should aim at maintaining a competitive advantage in their core areas of operation. Collaboration involves those that will be affected by the strategic change in the change agenda, through identification of strategic issues, strategic decision making process, the setting of priorities and the planning of strategic change or the translation of stated strategy into the institution decision-making process (Johnson, Scholes & Whittington 2005). As a strategy, collaboration has the capacity to transform the performance of institutions which are focused on addressing complex issues and where opportunities exist for improved customer service (Ballou 2004; Langabeer 2002; Mentzer 2001).

There has been a significant body of literature developed on collaboration. The literature has emerged primarily from within the discipline of supply chain management and draws from a range of management and institutional theories (Drucker 1969; Ellram 1990; Fawcett, Ellram & Ogden 2007; Wisner, Leong & Tan 2005). Although there exists a large body of literature, collaboration has not been adequately researched in the regional institutional context (Ballou 2004; Cole & Engstrom 1993; Lambert 2003).

In reviewing the literature on collaboration from an institutional perspective, it became apparent that there are perceived key driving forces which appear to be primarily external and institution-specific (Coyle, Bardi & Langley 2003) and that the underlying objective of collaboration should be for the benefit of the institution and stakeholders (AUCEA 2005; Dodgson 2005; Mentzer 2001; Wallis 2006). Collaboration as a strategy to attract funding for business research at a regional university should be goal-oriented. In this regard collaboration should endeavour to increase an institution's overall performance in

terms of efficiency, effectiveness, productivity, and/or competitiveness (Cervini 2005; Council of Supply Chain Management Professionals 2005; Kemp 1999; OECD Forum 2004).

The literature survey revealed that institutions have begun embracing the concept of collaboration as the way forward to raise additional funding for research, this in light of reduced public sector funding to institutions, particularly for business research ((Dodgson 2005; Temple, Story & Delaforce 2005; Yoffie & Kwak 2006). The challenge that the institutions face is to convince the business community that they are capable of undertaking cutting-edge research which is attractive, has commercial value and is relevant to the community (Baverstock 2005; Chubb 2006; Clark 2006; Lambert 2003; Larkins 2006). The empirical evidence suggests strongly that the institutions that collaborate in an endeavour to increase their competitiveness *have largely been successful in fulfilling their objectives* (Armitage 2007; Frost & Sullivan 2006; Goddard 2000; Hackett 2000; Harryson 2005; Kostner 2006; Lambert 2003; Lunsford & Bruce 2001; Sheehan 2006; Yves & Gary 1998). Further, the benefits of collaboration extend beyond the regional universities and their staff to other stakeholders including research partners and beneficiary organisations/institutions (Barratt & Olivera 2001; Billington, Cordon & Vollmann 2006; Bradshaw 2001; Simatupang & Sridharan 2004a).

There is empirical evidence that indicates that even within the government, universities are being encouraged to collaborate. A discussion paper on research titled 'New Knowledge, New Opportunities' released by the former Minister for Education Training and Youth Affairs, Dr D.A. Kemp outlined the Howard Government's vision for the future of higher education research in Australia. To enable university research to maximise its potential, the discussion paper was built around a number of themes:

- the need to support and reward research excellence
- the need to build critical mass in areas of opportunity
- the need to capitalise on returns on investment in research
- the need to promote the role of universities in regional, economic social and cultural development.

The changes announced are necessitated by budgetary constraints and the need to make best use of available resources to ensure that the Research and Research Training Management Plan (RRTMP) in Australia maintains world class standards (Bishop 2006; Kemp 1999; Nelson 2005; Nelson 2005a).

In support of the position taken by the Howard Government, an increasing number of academic scholars opine that the institutions that fail to embrace the concept, process and capacity of collaboration (developed from this research) risk the prospect of losing out in a competitively global environment (Baverstock 2006; Blackadder 2005; Kaplan 2001; Lambert 2003). Upon greater analysis it is has become evident that **collaboration** is consistently advocated by academic scholars and institutional managers.

The primary purpose of this thesis is to determine the policy issues that are likely to affect research collaboration from a regional institutional perspective.

1.2 Research issues and research questions

The research issue addressed in this research that underpins the entire processes of literature review, data collection and data analysis is the following:

The potential for collaboration as a policy strategy to attract external sources of funding for business research.

In an endeavour to address the research issue the research question formulated for this study is the following:

What are the policy issues possibly affecting research collaboration at a regional university?

The researcher argues that there is need for a comprehensive policy on research collaboration at the regional university. The researcher further opines that the various strategic decisions on the various types, strategies and concepts of research collaboration have the capacity to impact on the outcome of funding efforts.

The literature review on research collaboration provides limited assistance on how to tackle the research issue. However, as a result of further scrutiny and analysis of the literature the researcher was able to gain certain insights. This culminated in the definition of five research questions to address the research issue.

Research Question 1:

In the first instance there are an increasing number of academic scholars that have begun to embrace the concept, process and capacity of collaboration. The academic scholars tend to prescribe that for collaboration to be effective there *should* be effective policies in place with input from stakeholders (Bradshaw 2001; Simatupang & Sridharan 2004b; Whipple et al. 2002). The empirical evidence supports this view, which is amplified by the fact that through research collaboration, universities extend boundaries of knowledge with handsome returns to the institutions (Bradshaw 2001; Corbett et al. 1999; Lambert 2003; Nickless 2006).

The first research question (RQ1) aimed at ascertaining the role played by the staff in the development of the policy on research collaboration at the regional university:

RQ1: How is the regional university policy on collaboration developed?

Research Question 2:

The key elements necessary for successful collaboration are the availability of human, physical and financial resources. Prior to any collaborative research agreement it is imperative that the stakeholders agree on their key competencies, for universities they have the requisite skill set and the physical infrastructure, while the businesses have the requisite financial resources (Baverstock 2006; Johnson, Scholes & Whittington 2005; Lambert 2003).

The second research question (RQ2) attempted to ascertain funding sources and the impact of the regional university policy on research collaboration:

RQ2: How is the regional university policy on collaboration funded?

Research Question 3:

The regional university, the institution which is the primary focus of this research, is part of a grouping of universities described and reviewed on an annual basis by the Australia Government's Department of Education, Science and Training (DEST), as Regional Distance Intensive University Australia (RDIUA). The RDIUA are universities, which have their main campuses located in regional Australia (DEST, 2007).

The third question (RQ3) attempted to establish how the university policy on collaboration is reflected in relation to external institutions.

RQ 3: How is the regional university policy on collaboration reflected in relations with external institutions?

Research Question 4:

The regional university's strategic plan states that its aim is to be a dynamic learning community recognised for distinctive achievements in teaching and research. The programmes are innovative and linked to targeted research which is regionally valued and internationally significant (Southern Cross University 2005).

The fourth research question aims at ascertaining how the regional university policy on collaboration impacts on the university's research focus.

RQ 4: How does the regional university policy on collaboration impact on the university's research focus?

Research Question 5:

The operational strategies of a policy are important in order to create value for stakeholders. Strategy is not just an aim in itself but a set of paths and choices for

achieving the institution's immediate and future goals (Hubbard 2004; Kubr 2002; Mintzberg 1988).

The fifth research question aimed to ascertain the operational strategies of the regional university on collaboration.

RQ 5: What are the operational strategies of the regional university policy on collaboration?

The five research questions identified from the literature review in Chapter 2 of this thesis have been used to direct the focus of data collection and data analysis and in the process assist in the addressing the research issue.

1.3 Justification for the research

1.3.1 Unresearched area: research collaboration from a regional institutional perspective

Despite the large body of literature on collaboration and the extensive range of academic research conducted, research collaboration from a regional institutional perspective is regarded by scholars as the most understudied phenomenon in institutional management (Ballou 2004; Coyle, Bardi & Langley 2003; Lambert 2003; Langabeer 2002; Mentzer 2001). The absence of an established theoretical framework and a scarcity of empirical research being conducted on research collaboration from a regional institutional perspective have required the researcher to pursue an inductive theory-building approach rather than a deductive, theory-testing approach. Incidentally, this strategy has been advocated by scholars as a means towards achieving the objective of research collaboration (Frost & Sullivan 2006; Goddard 2000; Johnson, Scholes & Whittington 2005).

1.3.2 The relevance of collaboration

The extensive amount of research that has been carried out globally seems to suggest that the phenomenon of research collaboration is more than an institutional management fad. As a matter of fact collaboration has become a reality among tertiary institutions, federal, state and local government bodies, private sector professional associations and community organisations.

In Australia, strong factions have emerged among higher educational institutions. The following groups have emerged: the Group of Eight Universities (Go8), Innovative Research Universities Australia (IRUA) and the Australian Technology Network (ATN). Each group has developed its own set of objectives and administrative requirements and they have joint liaison on major sectoral concerns (Sheehan 2006). These institutions collaborate to pitch for public as well as private sector funding for their research functions (Baverstock 2006; Illing 2006; Nickless 2006).

1.3.3 Inadequate case study research

The conduct of academic research in the social sciences has been dominated by positivist thinking based upon deductive theory-testing research (Eisenhardt 1989; Parkhe 1993; Perry & Coote 1994; Perry, Riege & Brown 1998). From the foregoing it is clear that there is a need for an alternative approach that provides the opportunity to gain insights into new phenomena being studied (Morse 1999a, 1999b; Neuman 1991, 2007; Yen 2003) .

These new insights can be gained by using a case study approach, particularly where the research is exploratory, inductive and theory-building rather than explanatory, deductive and theory testing. In this research the case study methodology has been adopted since it provides deep and rich information (Eisenhardt 1989; Parkhe 1993; Patton 1990; Yin

1994) as discussed in Section 3.2. Further justification for case study research is provided in Chapter 3.

1.3.4 Usefulness of the research findings

The findings of this study will be useful for the following reasons. The first reason relates to the research framework developed from the literature synthesis (Chapter 2) to clarify the research questions and to shed light on the research issue. The thesis findings will confirm the research framework and constitute a starting point for further research, as discussed in Section 5.6.

Second, the research findings will provide policy guidance for regional institutional management to understand the role and importance of collaboration as a strategy to attract external funding for business research. Third, the findings to this research will add to the body of knowledge of research collaboration from a regional institutional perspective.

1.4 Methodology

This section provides an overview of the research methodology. A more complete and detailed description of the adopted research methodology is provided in Chapter 3.

The literature on research methodologies has disclosed that the application of case studies as a qualitative research methodology has been recognised by a number of academic scholars (Eisenhardt, K. 1991; Eisenhardt, K. M. 1989; Huberman & Miles 1994; Parkhe 1993; Patton 1990; Perry 1998; Yin 1993, 1994). In its basic form a qualitative research approach seems to take precedence over quantitative research methods in new research areas where the phenomenon under examination is not particularly well understood (Parkhe 1993; Vlosky & Wilson 1997).

The adoption of case study research is deemed to be an appropriate research methodology when 'how' and 'what' questions, like the research issue of this study (as outlined in Section 1.2) are posed (Perry 1998). The purpose of raising questions of this type is to develop a deep understanding of the factors affecting the phenomenon being researched (Borsch & Arthur 1995; Yin 1994). In line with this school of thought is the notion that case studies are best suited for research where the researcher is interested in understanding dynamic contemporary events over which the researcher has little or no control (Neuman 1994, 2007; Yin 1994).

A single case study design also frequently referred to as 'classic' (Yin 1994, p. 45) study design is deemed appropriate for this thesis. This research is *unique*. In other words, the finding of other similar cases is highly unlikely and the phenomenon could not be researched if this single case was not investigated. The study meets one of the set of circumstances that justify the conduct of a single case study (Yin 1994). The single case selected for this research was a regional university in Australia.

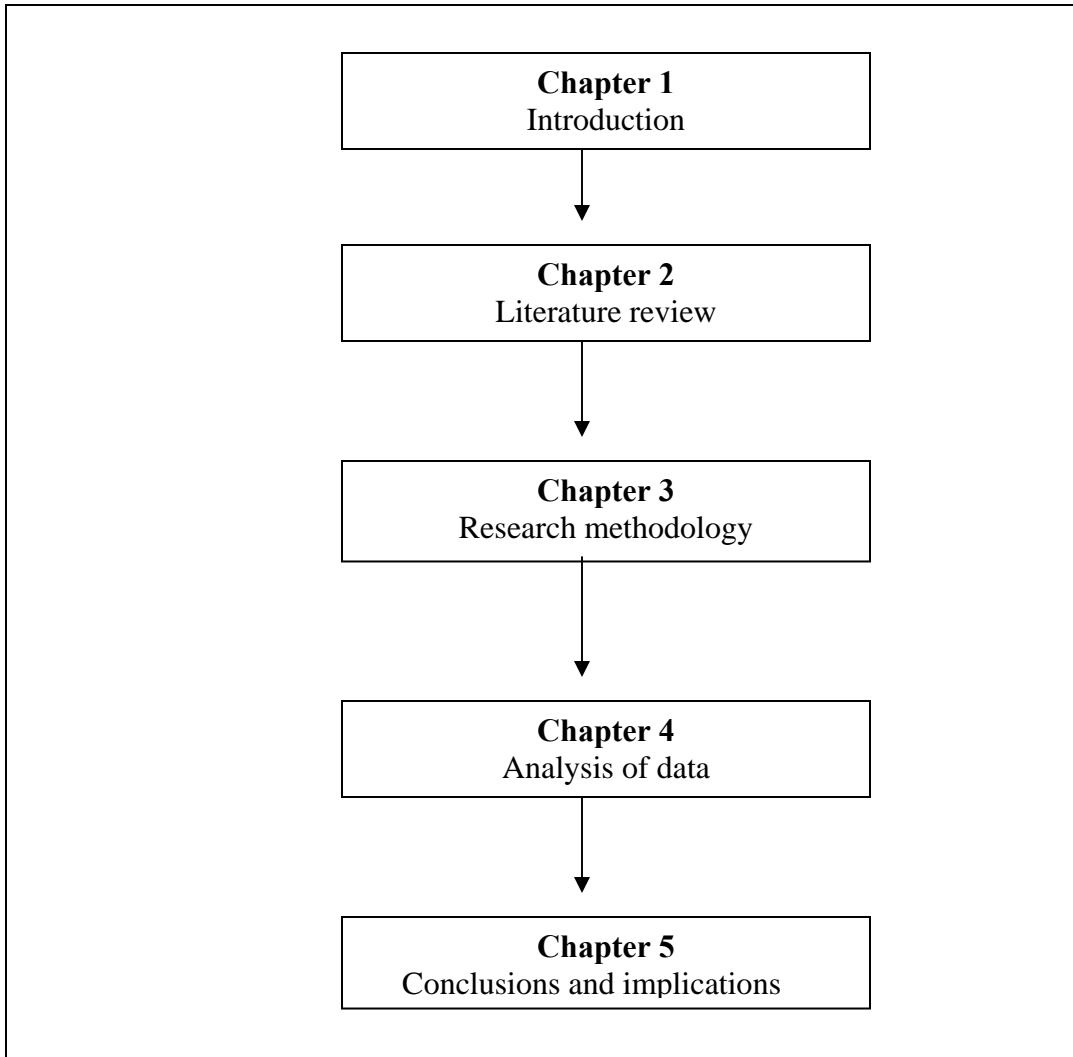
The researcher paid particular attention to achieving validity and reliability in order to enhance the quality of overall research effort (Lincoln & Guba 1985; Patton 1990; Yin 1994), in addition to the design of sound case study procedures by means of case study interview protocol and the maintenance of a case study case database (Yin 1994).

Finally, the selection of sample size in qualitative research is determined by what the researcher wants to know, as well as the resources and time available (Patton 1990; Yin 1994). The researcher conducted 42 in-depth interviews, 30 drawn from the regional university and 12 from research partner and beneficiary institutions/ organisations.

1.5 Outline of this thesis

This research has adopted a five-chapter research structure based upon Perry's structured approach to presenting theses (Perry 1998) Figure 1.1 outlines the structure of this thesis.

Figure 1.1. A five-chapter research structure



Source: Developed for this research from Perry; 1998

Chapter 1 presents the background to the research (1.1.), the research issue (1.2.), the five research questions (1.2.), the justification for the research (1.3.), the methodology (1.4), the outline of the thesis (1.5.), definitions (1.6.), delimitations of scope (1.7.) and conclusions (1.8).

Chapter 2 reviews the extant literature on collaborative institutional supply chain management and provides an overview of the following components: rationale and background to the study (2.2.), supply chain management (2.3.), collaborative

institutional supply chain management (2.4.). Thereafter the research framework adopted for the thesis is portrayed (2.5.), and the chapter is concluded (2.6). In fact the literature review enabled the researcher to identify a research gap and to formulate the research issue and five research questions. This constitutes the starting- point of doctoral research.

Chapter 3 outlines definitions of research strategies in social sciences and business research methods (3.2.), the justification for the choice of the interpretive paradigm (3.3.), the research design including model building from this research (3.4.), criteria for judging quality of case study design (3.5.), criteria for selecting a single case study (3.6.), the research execution including data collection for the case study (3.7.) and case analysis procedure (3.8.). In the last two sections, limitations of case study research (3.9.), and ethical considerations (3.10.) are discussed.

Chapter 4 describes the background of the institutional case study and case study participants (4.2.), and presents the patterns of data for Research Question 1 (4.3.), Research Question 2 (4.4.), Research Question 3 (4.5.), Research Question 4 (4.6.), and Research Question 5 (4.7.). The analysis of field data collected from in-depth interviews is depicted using quotations, descriptions, figures and tables. In particular direct quotations are used extensively and frequently in order to compare, contrast and substantiate the findings.

Chapter 5 discusses the conclusions about the five research questions (5.2.), presents the conclusions about the research issue (5.3.), unveils implications for theory, policy and practice (5.4.), presents limitations of this case study research (5.5.), suggests areas for further research (5.6.) and states a final conclusion (5.7.).

1.6 Definitions

The definitions adopted by researchers are often not uniform. Therefore, key and controversial terms need to be operationally defined in order to establish positions taken in doctoral research. The following definitions will form the basis for data collection procedures. This enables the researcher to put boundaries around the findings (Perry, . 1998).

A case study is defined here as a research method that focuses upon a specific situation or phenomenon in the real-life context by collecting data from multiple sources about a specific aspect of interest, and comprehensively analysing this phenomenon with the intention of developing a theory (Punch 2003; Theodorson & Theodorson 1969; Yin 1994). The justification for this definition is provided in Section 3.2.

Collaboration is defined as the interaction within and across institutions and involves the harnessing of resources to achieve set goals, the object being to make participating institutions/organisations win together (Ballou 2004; Hiam 2003; Mentzer, et al. 2001). The justification for this definition is provided in Section 2.3.

Policy is an overall guide for action which translates to a standing plan that specifies the institutions/organisations general response to a designated problem or situation (Davidson & Griffin 2000; Stewart 1999). The justification for this definition is provided in Section 2.5

Strategy is defined as the direction and scope of an institution over the long term, which achieves advantage for the institution through its configuration of resources within a changing environment, to meet the needs of customers and to fulfill stakeholders' expectations (Hubbard 2004; Mintzrberg 1988; Porter 1996). The justification for this definition is provided in Section 2.5.

Research is defined as one of the many ways of knowing and understanding; this involves creative work undertaken on a systematic basis in order to increase the stock of knowledge (ABS 1998; Mertens 2005). Business research is an organised, systematic, data-based, critical, objective, scientific inquiry or investigation into a specific problem, to find answers or solutions (Dane 1990; Sekaran 2003). The justification for this definition is provided in Section 2.5.

Region is a precise term that describes a comprehensive and functional structure existing as an independent area within the national economy (Howard 2001). The justification for this definition is provided in Section 2.5.

1.7 Delimitations of scope

This research has distinct delimitations of scope that restrict the generalisability of the findings – that is, its focus on a regional university in Australia and its restriction to select participants.

This research has examined the policy issues likely to affect research collaboration at a regional university in Australia. The primary data were collected exclusively in regional Australia and from a specific institution.

The informants for this study are restricted to research and administrative staff at the regional university in addition to staff from research partners and beneficiary institutions/organisations. The regional university research staff have varying research experience, they were recommended based on their involvement or likely involvement with collaborative research at the regional university. The administrative staff selected are those who offer legal and administrative support for collaborative research, while staff from research partner and beneficiary institutions/organisations were recommended based on their research collaborative experience with the regional university.

In view of the above two limitations there is a need to conduct further research if conclusions and implications from this research are to be applied to regional or metropolitan universities in Australia or indeed universities in other countries.

1.8 Conclusion

This chapter has laid the foundation for this research. First, the background to the research was presented (1.1). Second, the research problem and five research questions were introduced (1.2.). Third, a justification for this research endeavour was presented (1.3.), and the adopted methodology was briefly described and justified (1.4). Fifth, the thesis was outlined (1.5.), and key definitions were presented (1.6.). Last, the delimitations of the research were stated and expounded (1.7.) and the Chapter was finally concluded (1.8.)

Based upon these foundations, this study can proceed with the details of the research in the following chapters to propose a model for research funding. Chapter 2 will follow with a survey of the literature on collaboration from a regional institutional context.

Chapter 2 Literature Review

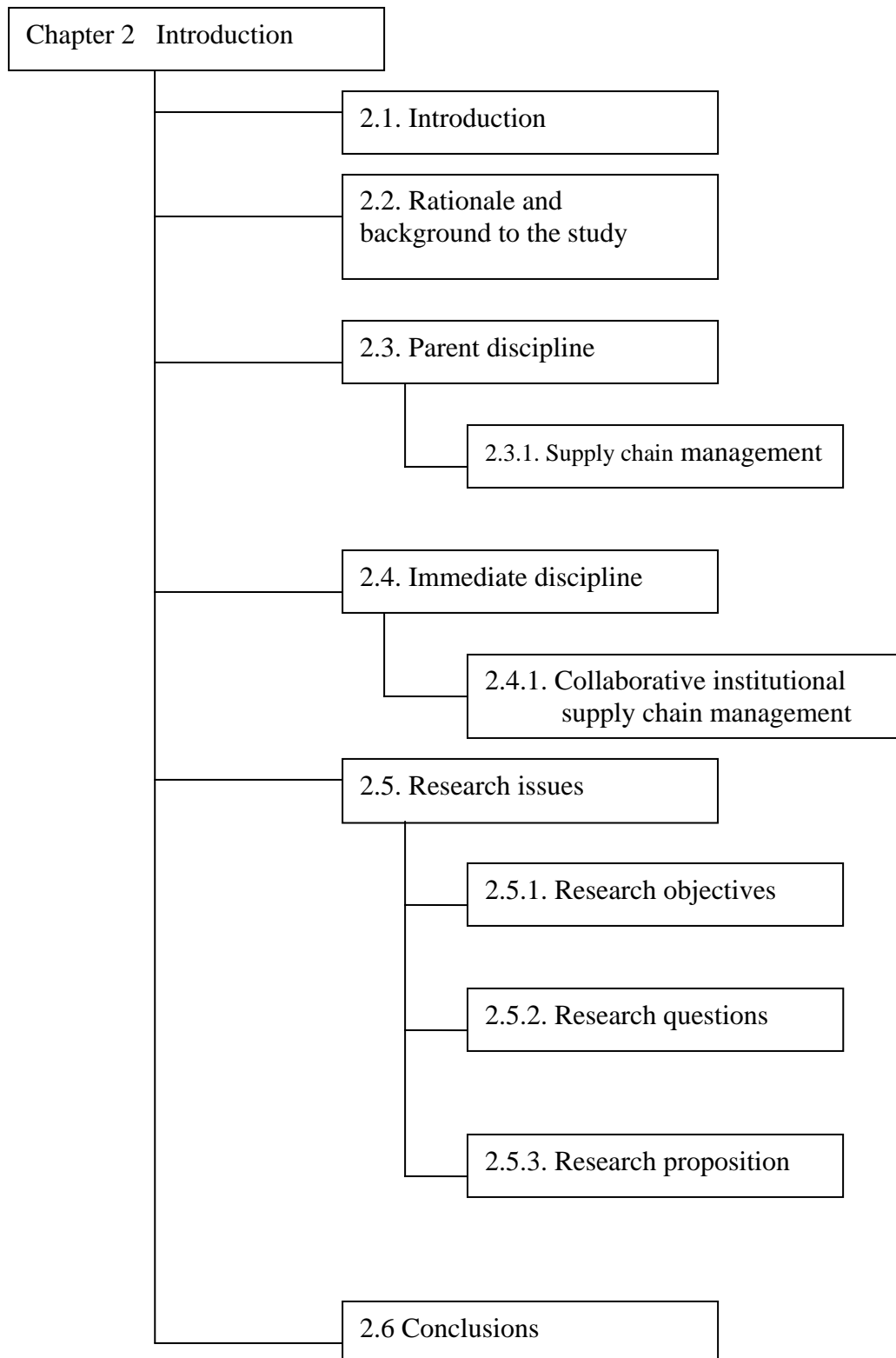
2.1 Introduction

In the first chapter, a foundation of this study was provided. The chapter explained briefly the background to the research, the research issue and questions, the justification for the research, and a summary of the research model and issues.

The literature survey in this chapter will review the current body of literature and is presented in six sections. Section One is the introduction to the literature review and provides a detailed outline of what will be contained in this chapter. Section Two explains the rationale and background to the study, and justifies the importance attributed to the link between academic and professional practice. Section Three defines and describes the parent discipline of supply chain management that provides the theoretical basis to the study. Section Four introduces and defines the immediate discipline ‘collaborative institutional supply chain management’ applicable to a regional university (Southern Cross University) that will be the mainstay in the data collection and analysis of this thesis. Section Five presents the research issues and defines the research question and research propositions. The last section, Section Six, concludes the literature review.

The structure of Chapter 2 on the literature review is graphically outlined in Figure 2.1:

Figure 2.1. Structure of Chapter 2



Source: developed for this study

In this section an introduction to the chapter on the literature review has been provided with a graphic illustration in Figure 2.1. The next section presents the rationale and background to this study.

2.2 Rationale and background to the study

In the previous section an introduction to the chapter on literature review was presented. This section examines the rationale and background to this study, and justifies its importance that commands academic and professional practice.

The changing public sector research funding environment for universities in Australia.

The previous federal government in Australia announced planned changes in funding to universities. The Research Quality Framework (RQF) was the proposed model under which research funding to universities and other Public Funded Research Institutions (PFRI) would be based. This system involved assessment of the quality and impact of research. There were major concerns raised at the Higher Education Summit (HES) panel ‘Winners and losers from the RQF’ with regard to reduced public research funding to universities in Australia (Higher Education Summit 2006; Larkins 2006; Nelson 2005a).

Research funding impact on the Regional Distance Intensive Universities Australia (RDIUA) and Southern Cross University (SCU)

The review of funding by the government under the RQF was a source of concern to the RDIUA which expressed fears that funding for research was likely to decline. In the run-up to the release of the RQF there was a spirited effort by the Group of Eight Universities (Go8) to sideline other universities and in the process access a larger proportion of the research funding from the government (Poole 2005).

The RQF funding proposals will pose a challenge to the research activities of RDIUA and SCU. The envisaged changes in the research funding environment to universities prompted SCU and the then grouping styled as New Generation Universities (NGUs) to hold discussions and strategise on the way forward (Baverstock 2005). While the consultations were ongoing, the implementation of the RQF was announced by the Minister of Education, Science and Training the Hon. Julie Bishop after receiving the RQF-Development Advisory Group (DAG) report headed by the chief scientist Jim Peacock (Bishop 2006).

The Research and Research Training Management Plan (RRTMP) of SCU pointed out that the single biggest threat facing the University was the proposed introduction of the RQF. The implication of the RQF to SCU was that the block research funding of six million dollars by the federal government would be based on quality of research and hence discriminate against applied research which is the area of research strength at SCU (Baverstock 2006).

The then federal government through the Minister of Education, Science and Training had reiterated that universities and Public Research Agencies (PRA) must demonstrate that they deserve funding because the government must be able to justify to taxpayers the current expenditure on scientific research and also have a base in order to move forward (BAA 2006; Morris 2006a).

According to the RQF-DAG, the assessment of research impact would be based on actual outcomes and their assessable impact, however prospective impact is not part of the RQF, and therefore no minimum quality rating is necessary for impact assessment. There was emphasis that impact from which the research is derived must be sound. The report identified research groupings as the units of impact assessment and proposed that universities should research on areas of benefit to the governments, business and the community (Gallagher 2006).

RQF and the Research Assessment Exercise (RAE) in Britain

In Britain the Research Assessment Exercise (RAE) which was similar to the RQF ended after almost 20 years. With pressure from an influential group of vice-chancellors, the then Chancellor Gordon Brown abolished that exhaustive system, in which the work of every United Kingdom researcher was assessed by 67 subject panels. Major critics regarded this as a waste of funds. They argued that funding should be decided by research impact, measured by the number of citations in academic journals, or the type of grants an institution has won. But the plan for change has been recently damaged by a study that found that it would be more expensive to abolish the existing system than to keep it. The study also found ditching the RQF-like system would widen the gap between teaching and research (Morton 2006).

The way forward for RDIUA and SCU

By working through the university regional groupings like the RDIUA, SCU can reach out to the business community more effectively. The regional groupings would lower the cost of promotion by providing a forum where the universities can reach out to potential supporters within the industry and the business community (Yoffie & Kwak 2006).

This study attempt to allay the fear often expressed that the support received from the private sector and community organisations is merely to fill the void left by public funding (Cervini 2005). The thesis is in line with the university's strategic objective of increasing non-government revenue, through involvement in commercial activities with an acceptable return on investment (Southern Cross University 2005).

In this section the rationale and background to this study has been examined with the justification of its importance that commands both academic and professional practice. The next section presents the parent discipline of supply chain management.

2.3 Parent discipline

In the previous section the rationale and background to this study was presented. In this section background development, definition and meaning of the discipline of the supply chain management is provided, along with a review of extant recognised writings, comprising of major schools of thought, the current status of research in the field and the research gap that this thesis will fill.

2.3.1 Supply chain management: background, definition and meaning

The early history of the supply chain initiative can be traced to early beginnings in the textile industry with the quick response program and, much later, to efficient consumer response in the grocery industry. According to Ballou (2004) goods that people want are not necessarily produced where they reside, therefore there is the need for an efficient mechanism to get goods and services where consumers need them. This line of thought was supported by Drucker (1969) and cited in Ballou (2004) who stated that physical distribution is the entire process of business. The concept of physical distribution has been redefined to reflect modern management practices with a variety of institutions, organisations, and companies focusing on the entire supply chain management process (Ballou 2004; Drucker 1969).

As the discipline gained importance over the years, different scholars have endeavoured to define the supply chain and how it fits into the modern management functions of institutions and organisations. Ballou (2004) and various authors have offered the following scholarly definitions of supply chain management. They further argue that the discipline features prominently alongside others like finance, administration, human resources and technical services in the organisational hierarchy of institutions and organisations.

According to Ellram (1990) supply chain represents a new form of coalition activity where management encompasses the flow of goods throughout the distribution channel from the supplier to the customer

Larson and Rogers (1998), and Stank, Keller and Daugherty (2001), merged various ideas into the following definition: 'Supply chain management is the coordination of activities, within and between vertically linked firms for the purpose of serving customers at a profit.' (Larson & Rogers 1998 p.1–5, Stank, Keller & Daugherty 2001, p.30).

Supply chain management is also defined as a collaborative-based strategy that links inter institutional business operations to achieve a shared market opportunity (Bowersox, Closs & Stank 1999; Stank, Keller & Daugherty 2001).

A range of scholarly, institutional and management definitions, has emerged from the literature on supply chain management. They are graphically depicted in Table 2.1.

Table 2.1 Supply chain management and collaboration scholarly definitions

Researcher / Author(s)	Definition of supply chain management

Figure removed due to copyright restrictions

Researcher / Author(s)	Definition of supply chain management
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Source: Drucker(1969),Supply Chain Council (SCC),(1997),Larsen and Rogers(1998), Ellram(1990), Stank,Kellr and Daughterty (2001),Institute of Supply Management (ISM)(2001),C Mentzer (2001), Langabeer(2002), Blackstone and Cox(2004).Ballou (2004),Council of Supply Chain Management Professionals (CSCMP)(2005), Wilsner, Leong and Tan (2005).APICS 2006, Fawcett, Ellram and Ogden (2007)

The definitions of supply chain management that are summarised in Table 2.1 have distinct similarities, but each of them has a different focus depending on the scholar or the institution. A noteworthy development is the redefinition of the supply chain discipline by the institutions that have changed their names over the years (Wisner, Leong & Tan 2005). The repeated redefinition of the term ‘supply chain’ is an indication of the dynamic changes taking place among the practitioners of the supply chain management discipline. Common themes emerging from the definitions are a focus on the utilisation of resources to improve the institutional performance and a focus on the process of delivering value to clients and stakeholders. Ballou’s (2004) definition is applicable to the institutions of higher learning which have human, technical and physical resources that they could harness to attract support from the business community.

The variety of definitions of supply chain discipline has revealed the various concepts that emerge from the literature on supply chain management. Supply chain management is operationally defined as ‘the logical interaction within and across institutions with the aim of improving customer service delivery thorough optimal use of available resources’ (Fawcett, Ellram & Ogden 2007 p.8).

In this sub-section the scholarly definition and meaning of supply chain management has been clarified. The following sub-section examines the major schools of thought and current status of research.

2.3.2 Major schools of thought and current status of research

In the previous sub-section the scholarly and management definitions of supply chain management were discussed. In this sub-section the major schools of thought and the current status of research in supply chain collaboration is presented.

Research conducted by the University of Tennessee outlined the following factors that enable supply chain collaboration to work (Mentzer 2001).

- **Common interest** – The parties involved have a stake in the results of the collaborative effort and should ensure that they are continuously committed.
- **Openness** – The collaboration partners should openly discuss their practices and processes. This includes sharing information that is considered propriety.
- **Mutual help** – The partners while addressing their supply chain problems or opportunities should seek cross-institution solutions.
- **Clear expectations** – The partners must understand what is expected of them.
- **Leadership** – For collaboration to succeed there is need for leadership from the institutions and organisations participating.
- **Co-operation** – The partners should focus on problem solving and not seek scapegoats for failure.
- **Trust** – Trust is a cardinal principle; this must be evident throughout the institutions at every management level and functional area.
- **Benefit sharing** – A collaborative relationship requires that partners share the risks. An example of risk arrangement is the buy-back agreements in the book industry where publishers buy back unsold books from retailers and thereby share the risk of retaining too much inventory (Sheffi 2005).

- **Advanced Technology** – Advanced technology is essential to enable a collaborative effort across the supply chain. This allows communication channels to remain open, and helps breakdown barriers between institutions, technology further speeds up information flows and can turn data into useful collaborative information. Availability of technology alone is not enough and it should ideally be complimented with human contribution (Mentzer 2001).

Collaborative Planning, Forecasting and Replenishment (CPFR)

In order to forecast requirements among industry players collaboration calls for more than data sharing and includes a cooperative process of identifying discrepancies and fixing trading partners' needs so that their actions can be harmonised. Plans have been developed and among them the Collaborative Planning, Forecasting and Replenishment (CPFR) process which was developed by an industry consortium of retailers and manufacturers of consumer packaged manufactured goods (Langabeer 2002). The process of CPFR calls for sharing sales and order forecasts. This also creates a scenario of identifying exceptions in case of data mismatch and the remedial measures to be taken. The trading partners jointly develop long-term projections rather than depend on independently generated forecasts (Sherman 1998; Stank, Keller & Daugherty 2001).

The main objective of CPFR is to improve relationships within the retail supply and demand other objectives include:

- Alignment of the supply chain around a common process, common formats and common performance metrics.
- Sharing of one common forecast and demand plan, based on downstream point of sale data, which ensures that suppliers, manufacturers, distributors and retailers share common business and demand plans.
- Communication of issues around meeting and prioritising demand and managing supply allocations within a collaborative framework.
- Advanced notification of both retail and trade level promotions in order to plan the future without experiencing demand variations or fluctuations. Among the

factors that cause this is lack of visibility into consumer demand. This is referred to as the bullwhip effect.

- Better visibility of demand, inventory and shipment data through the supply chain, by sharing common technology and messaging formats between parties in the chain (Langabeer 2002).

The CPFR guidelines have been developed by industry executives under the Voluntary Inter-industry Commerce Standards Association (VICS) to coordinate supply chain coordination in the retail industry between retailers, manufacturers and suppliers (VICS 2006). The overall global objective of VICS is to improve product availability to the consumer by providing leadership and encouragement in the identification, development and implementation of volunteer standards, protocols, guidelines and other mechanisms which when properly utilised lead to better anticipation of and reaction to changes in consumer demand for these products with subsequent optimisation of production and transport costs (Langabeer 2002;VICS 2006).

The VICS committee has been the driving force behind the CPFR and the standards have been accepted by some of the worlds major firms, among them Hewlett Packard, Proctor & Gamble, and Wal-Mart.

The CPFR guidelines allow the creation of a common trading framework which means:

- a. Common language
- b. Common process models
- c. Common data standards

The emphasis here is on sharing a common philosophy or paradigm. In addition the business process has to be well defined and detailed and the these processes must be translated into specific and common data standards (Langabeer 2002).

Application of CPFR

An example of a company which successfully used CPFR is Superdrug Stores (SS) of the United Kingdom (UK). The company operates more than 700 drug stores in the UK. They launched a CPFR pilot project with Johnson and Johnson (J&J) in the year 2000. The result of the initiative was a 13 per cent reduction of Superdrug's inventory levels, an in-store availability improvement of 1.6 per cent and better relationship with Johnson and Johnson (Sheffi 2005).

In this sub-section the major schools of thought and the current status of research in supply chain collaboration have been discussed. In the following sub-section the key driving forces to supply chain management are presented.

2.3.3 Key driving forces and principles of supply chain management

In the previous sub-section the major schools of thought and the current status of research in supply chain collaboration were presented. In this sub-section the key driving forces and principles of the discipline of supply chain management are identified.

Coyle, Bardi and Langley (2003) suggest that more changes occurred in the world's economy in the 1990s than in the previous nine decades of the twentieth century. The present era is one of continuous change in all spheres of business which is inevitable, however growth and improvement are optional. Coyle, Bardi and Langely (2003) further point out that the five key driving forces behind businesses and, in effect, behind the discipline and profession of supply chain management are:

- The empowered customer
- Power shift in the supply chain
- Deregulation
- Globalisation
- Technology

The empowered customer

Institutions and organisations have to understand their customers and the environment in which they are operating. The analysis examines the customers in their major groupings or segments as this has a major impact on the supply chain. The customers today are better informed and therefore able to make informed decisions which require efficient service (Coyle, Bardi & Langley 2003).

Power shift in the supply chain

There has been a shift of dominance in supply chains from the manufactures to large retailers like Wal-Mart, Kmart and Woolworths among others. The shift has resulted in the consolidation of power at the retail end. The large retailers are able to exert pressure back in the retail chain and force manufactures change their logistics and supply chain strategies (Coyle, Bardi & Langley 2003).

Deregulation

Modern businesses infrastructure is based on transportation, communication, energy and financial systems. In the recent past these legs of business operations have undergone fundamental changes due to government deregulation. The net effect of this is that it provides opportunities for competition and innovation in the supply chain which would result in lower prices (Coyle, Bardi & Langley 2003).

Globalisation

Globalisation has replaced the cold war of the post-World War II era as the driving force for world economics. The concept of a global market place has the same meaning to all enterprises and individual customers. The changes that have taken place in government policies and the emergence of new technologies have made the global economy concept a fact of life. Supply chain management can now be labeled global supply chain

management and presents special challenges for governments, institutions/ organisations and business enterprises (Coyle, Bardi & Langley 2003; Friedman 1999).

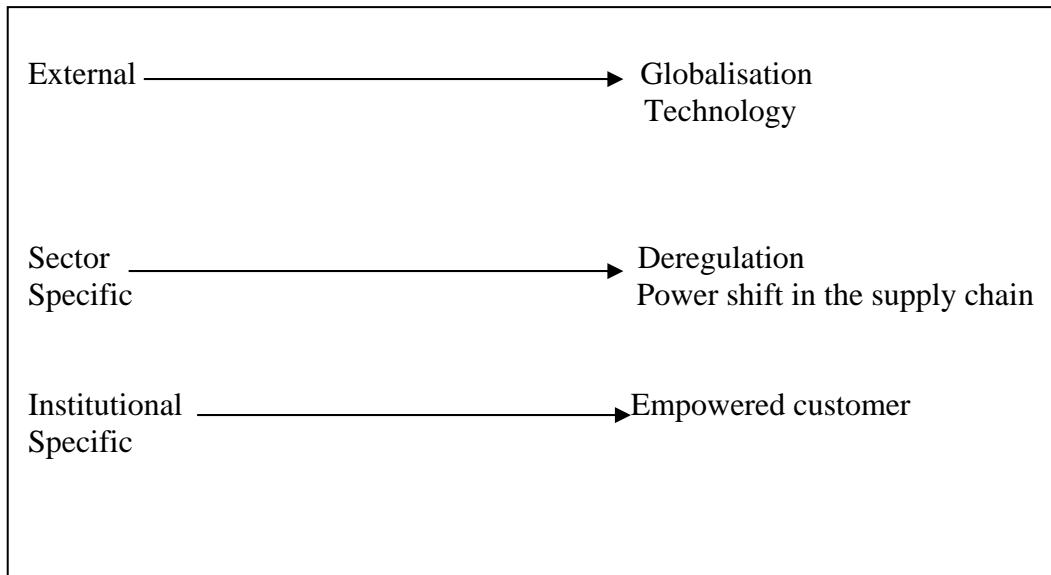
Technology

Technology is a facilitator of change. It enables institutions and companies to implement strategies on a macro and micro basis. Technology has enabled the introduction of distance learning from the virtual or the geographically split university.

The five key driving forces of businesses have resulted in the development of modern supply chain management concepts: collaboration, partnerships, strategic alliances, joint ventures, networks and engagement. These concepts have become part of the vocabulary of the logistics and supply chain profession (Coyle, Bardi & Langley 2003).

The key driving forces for supply chain management can be categorised under external, sector/industry and institutional as depicted in Figure 2.2.

Figure 2.2. Driving forces to supply chain management



Source: adapted from Coyle, Bardi & Langley (2003)

As outlined in Figure 2.2 the external forces influencing the supply chain are globalisation and technology, the sector-specific factors are deregulation and power shifts in the supply chain while at the institutional level the empowered customer is a major factor.

Supply chain management principles

Management of the supply chain would greatly benefit those involved in it. These include suppliers, manufacturers, distributors and customers. The benefits would accrue if all the players behaved as part of the same company. According to Hintlian Jamie Andersen Consulting Strategic Services Practise (ACSSP), quoted in Coppacino (1997, p 17-19), the following are seven principles which institutions and enterprises should follow to manage the complex nature of supply chains to build a long-term competitive advantage:

1. **Begin with the customer** by understanding their values and requirements. Through grouping customers it is possible to align the institutions' operations to meet customers' needs.
2. **Manage logistics assets** across the supply chain, not just within the institution or enterprise. Collaboration among the players in the supply chain enables those involved to determine how information will be shared.
3. **Organise customer management** to ensure that customers are provided with generic information across the supply chain.
4. **Integrate sales and operations planning** as the basis for a more responsive supply chain. A good example is to have a single forecast which requires sharing real-time demand forecasts within the institution/enterprise and across the supply chain.
5. **Leverage manufacturing and sourcing** to ensure there is flexibility and efficient operations. In manufacturing concerns, automatic replenishment programs can be linked

to production planning and scheduling. At the institutional level it requires understanding the customers' needs, responding appropriately and linking these to the planning process.

6. Focus on strategic alliances and relationship management across channel partners. In order to manage the supply chain it is important to have a partnership relationship.

7. Develop customer-driven performance measures . These ultimately drive the behaviour of all channel members. A complete supply chain solution requires the development of measures and performance criteria that track the economic performance of the supply chain (Copacino 1997, p 17–19).

In this sub-section the key driving forces and principles which have helped in shaping the modern supply chain management discipline have been identified and outlined. In the next sub-section the new concepts of supply chain management are briefly introduced.

2.3.4 Supply chain management concepts

In the previous sub-section the key driving forces and principles of modern supply chain management discipline were presented. In this sub-section the new concepts of supply chain management collaboration, partnerships, strategic alliances, joint ventures and networks are discussed briefly.

According Coyle, Bardi and Langley (2003) to the following are the main modern supply chain management concepts:

- Collaboration
- Partnerships
- Strategic Alliances
- Joint ventures
- Networks

Collaboration

Collaboration involves those that will be affected by the strategic change in the change agenda, through identification of strategic issues, the strategic decision making process, the setting of priorities and the planning of strategic change or the translation of stated strategy into the institution's decision-making process (Johnson, Scholes & Whittington 2005).

Partnerships

Partnership involves sharing of responsibility for projects and the parties that are jointly involved in planning and implementation.

For a partnership to succeed there are certain basic requirements that need to be in place. These include:

- Availability of time and motivation for trying a new contact to the target institution or company
- Existence of a concrete proposal to be presented, preferably in the business field of the potential partner
- Experience, knowledge and domain of what is going to be proposed
- Awareness of the specific legislation on fiscal incentives, or other benefits that may provide or facilitate the implementation of the proposal
- Patience for negotiating and perseverance during the negotiation period
- Flexibility, to be able to take advantage of new opportunities that may emerge
- Implementation of the proposal and maintenance of the control over the process
- Constant evaluation of the process, with the purpose of giving feed back to the partner and maintaining the quality
- Competent and available team to sustain the implementation
- Judicial support in the elaboration of the agreement or other legal requirements (Billington, Cordon and Vollman 2006).

Many of the above proposed requirements are related to personal interactive actions, since it is extremely necessary to count on people who are motivated and want to create new situations and opportunities. Experience has shown that, in the beginning, a few people are voluntarily available for helping out in the implementation of new projects, however, as the project advances and the results begin to show up, new adepts start joining the team to help and be part of it (UNESCO 1998). Billington, Cordon and Vollmann (2006) suggest that in a partnership each party creates a mutual benefit, rather than try and gain primary control of the relationship.

Strategic alliances

Partnerships and alliances involve parties, people who define national and institutional policies. These may include pedagogic professionals in general, researchers and students, administrative and technical personnel in higher education institutions, the working world and groups of the community. They therefore constitute a powerful force for administrating transformations. Non-governmental organisations are also fundamental agents in the process of change. Therefore, partnerships based on common interests, mutual respect and credibility should be the key drivers for renovation in the sphere of higher education (UNESCO 1998).

A strategic alliance is a state of being joined or associated. The purpose is that through the alliance the parties become stronger. The outcome of this union is that the parties involved benefit mutually. Among the institutions of higher learning like universities this approach would be ideal.

Joint ventures

The Association for Operations Management (APICS) defines a joint venture as an agreement between two or more firms to risk equity capital to attempt a specific business objective. The agreement would have to be discussed and finalised among the RDIUA

where they would contribute resources in order to attract external sources of funding for business research (APICS 2006; Blackstone & Cox 2004).

Networks

Networking involves institutions with similar interests or concerns which interact and remain in informal contact for mutual assistance or support. Networking helps to develop a system of building relationships for mutual benefit to the parties. This may be for immediate or future benefits and the arrangements can be based on mutual understanding without necessarily having formal agreements. In order to strengthen these networks it may be necessary to formalise the arrangements. In the case of the RDIUA they have a commonality based on their regional location and hence an opportunity to formalise their structure to ensure that they could build on their synergies (Developed for this study).

2.3.4.1 Summary

In this section background development, definition and meaning of the discipline of supply chain management was provided, along with a review of extant recognised writings, comprising of major schools of thought, the current status of research in the field. The key driving forces to the discipline of supply chain management and the new concepts of supply chain management – **collaboration**, partnerships, strategic alliances, joint ventures and networks were also outlined. **The literature identifies the policy issues likely to affect supply chain collaboration as the research gap that this thesis will fill.** The next section reviews the main focus of the practical application that will be the mainstay in the data collection and analysis that will assist in addressing the research gap.

2.4 Immediate discipline - collaborative institutional supply chain management

In the previous section the background development, definition and meaning of the discipline of supply chain management was presented.. This section presents a review of collaborative practical applications from an institutional perspective that will be the mainstay of data collection and analysis of the thesis. The review addresses major writings in collaboration, the current state of research in the field and identifies the research gap in the literature.

2.4.1 Professional association definitions of supply chain management and collaboration

The APICS (Association for Operations Management) dictionary describes the supply chain as including all processes from the initial raw materials to the ultimate consumption of the finished product linking across supplier-user companies (Blackstone & Cox 2004).

Debate about the actual definition of supply chain management is ongoing among the different professional associations representing the discipline. This has necessitated a number of changes within the discipline that have evolved.

In order to reflect the new focus taking place in the supply chain management function the membership of NAPM voted to change its name to ISM in 2001. This necessitated the redefinition of supply management as follows:

The identification, acquisition, access, positioning and management of resources which an organisation requires , or potentially needs, in order to attainment of its strategic objectives (ISM 2001)

The Council of Logistics Management (CLM) the precursor to the Council of Supply Chain Management Professionals (CSCMP) defined supply chain management as:

...the systematic, strategic coordination of the traditional business functions and tactics across these business functions within a particular company and across businesses within the supply chain for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole. (Wisner, Leong & Tan 2005 p.6–7. Council of Supply Chain Management Professionals 2005)

The CSCMP was previously known as the National Council of Physical Distribution Management (NCPDM) and was founded in January 1963. The NCPDM was formed by a combined group of visionary managers, consultants and educators who envisioned the integration of transportation, warehousing, and inventory as the way forward for the supply chain discipline. The reasoning behind the change was that the function of physical distribution was gaining importance in corporate circles and within the business community. In later years the association's focus was broadened and reflected in a change of name to the Council of Logistics Management (CLM) in 1985. In the year 2004 the council of CLM voted to change the name to CSCMP effective 2005.

The change in name necessitated a redefinition by the council of supply chain as:

the planning and management of all activities involved in sourcing and procurement, conversion [or “manufacturing operations”] and all logistics management activities. Importantly, it also includes coordination and collaboration with channels partners, which can be suppliers, intermediaries, third party service providers and customers.’ (Council of Supply Chain Management Professionals 2005)

]

The professional association the Supply Chain Council (SCC) defines the supply chain as:

‘[m]anaging supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer.’
(Wisner, Leong & Tan 2005 p.6–7; Supply Chain Council 1997)

Scholarly definition of supply chain management collaboration

In the past supply chains were considered linear and straight forward. With the onset of competition among institutions, they are now characterised by complex interactions, in a handful of key business processes within multiple functions. The interactions are variously described as ‘webs’ because they occur at multiple levels – strategic, operational and tactical. They are focused on addressing complex business decisions in a non-linear fashion (Langabeer 2002).

The term supply chain emphasises logistical interactions that take place among the functions of marketing logistics and production within a firm and across legal separate institutions and organisations. There are opportunities that exist for customer service improvement which can be achieved through collaboration (Ballou 2004).

Mentzer (2001) suggests that supply chain management collaboration is a means by which institutions in the supply chain work together towards common objectives. The characteristics of this collaboration are sharing of:

- Information
- Knowledge
- Risk
- Benefits.

The sharing entails understanding how institutions operate and make decisions. This goes deeper than cooperation. Collaboration is mutual goal-setting and goes far beyond a written contract (Mentzer 2001).

At the community level, collaboration between universities, government and the regional communities provides knowledge-based economic development between universities and their communities (Garlick 2001). This line of thought is supported by the fact that socially robust knowledge can be produced in a variety of settings, generally in the form of networks where the membership is open, flexible and may change over time. These ultimately function as catalysts of collaboration (Gibbons 2005). A working definition of collaboration describes the process as the interaction between culture and technology (Frost & Sullivan 2006).

The literature on collaboration has emerged from a range of scholarly, institutional and management definitions which are graphically depicted in Table 2.2.

Table 2.2. Collaboration definitions

Researcher/Author(s)	Definition of collaboration
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Figure removed due to copyright restrictions

Source: Cole and Engestrom (1993), Hutchins (1995), Wenger (1998), Mentzer (2001), Garlick (2001), Hiam (2003), Coyle, Bardi and Langley (2003), Ballou (2004), Gibbons (2005), Johnson, Scholes and Whittington (2005), Frost and Sullivan (2006).

In summary collaboration may be defined as mutual goal setting combined with the provision of knowledge in an open environment which facilitates interaction between academia and business (operational definition prepared specifically for this research)

The scholarly definitions of collaboration as presented in Table 2.2 should provide practitioners with guidelines and accelerate the implementation of this practice.

In this sub-section the scholarly definitions of several professional and industry collaborative groups, which have been developed to research aspects of supply chain collaboration as the immediate discipline were offered. In the following sub-section the importance of collaboration is emphasised and different types of collaboration, key variables, attributes and drivers are presented.

2.4.2 Collaboration types, key variables, attributes and drivers

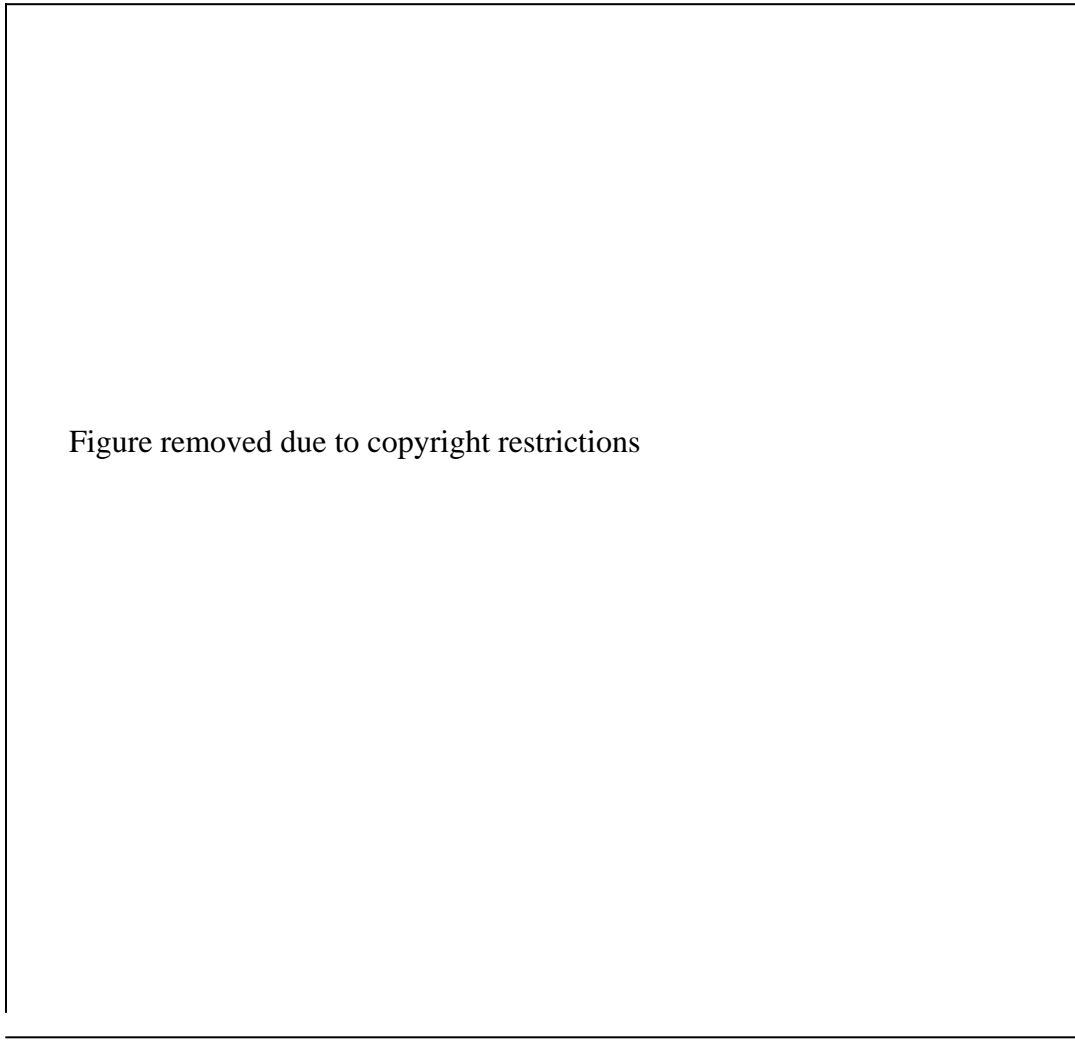
The previous sub-section discussed the definitions, of several professional and industry collaborative groups.. This sub-section emphasises the importance of collaboration and discusses the different types of collaboration their application along with the key variables, attributes and drivers necessary for successful collaboration as suggested by various scholars.

Collaboration among supply chain partners is a vital ingredient for supply chain success and to the ultimate goal of integration. Collaboration should incorporate planning strategy and tactics (Coyle, Bardi & Langley 2003). In collaboration the implication is to be non-

competitive, the object being not to make one institution win and the other lose but rather to win together (Hiam 2003).

Typically there are three different types of collaboration as depicted in Figure 2.3.

Figure 2.3. Types of Collaboration



Source C. John Langely (2003) Ph.D the management of business logistics a supply chain perspective.

Coyle Bardi and Langley (2003) suggest that collaboration occurs when institutions and companies work together for mutual benefit. The authors classify collaboration into three categories as shown in Figure 2.3:

- Vertical collaboration
- Horizontal collaboration
- Full collaboration

Vertical collaboration

This is the traditional linkage between firms in the supply chain – retailers, distributors, manufacturers and parts and material suppliers.

Horizontal collaboration

In horizontal collaboration business arrangements are between institutions or firms that have parallel or cooperating positions in the logistics or supply chain process. This is a mechanism for finding out and eliminating hidden costs in the supply chain and enabling joint product design, sourcing, manufacturing and logistics.

Full collaboration

This is the dynamic combination of both vertical and horizontal collaboration. Full collaboration ensures dramatic efficiency gains with all benefits accruing to all members of the collaboration. There is a need for an agreed method of sharing gains and losses to ensure the success of collaboration (Coyle, Bardi & Langley 2003).

For business research at universities the most appropriate type and nature of collaboration would be horizontal collaboration with a view to developing to full collaboration which would ensure dramatic efficiency gains with all benefits accruing to all members of the collaboration

Key variables, attributes and drivers necessary for successful collaboration

The key variables attributes and drivers for successful collaboration are summarised and presented in the Table 2.3:

Table 2.3. Key variables, attributes and drivers for successful collaboratio

Figure removed due to copyright restrictions

Source: Etzkowitz, Webster and Healy (1998), Burton Jones (1999), Lunsford and Bruce (2001) Mentzer(2001), Bradshaw(2001), Lambert (2003), Howard Partners (2003), Coyle, Bardi and Langley(2003), Yip(2003), Blackstone & Cox (2004), Schein(2004), DEST and Howard Partners (2005), Johnson, Scholes and Whittington (2005), Caenegem(2006), Collaboratories (2006).

For collaboration to yield the desired results the key variables, attributes and drivers as outlined in Table 2.3 need to be in place within and among all the participating institutions.

This sub-section emphasised the importance of collaboration and discussed the different types of collaboration and their application along with the key variables, attributes and drivers necessary for successful collaboration as suggested by various scholars. In the next sub-section the application of prescribed theory to practical issues is provided with particular focus on university/community collaboration, the role of government in supporting collaboration, experiences with collaboration within the manufacturing sector, supply chain integration, and the impact of collaboration on business at the global level.

2.4.3 Application of prescribed theory to practical issues by universities

In the previous sub-section the key variables, attributes and drivers necessary for successful collaboration as suggested by various scholars were presented. In the following sub-section this study provides the application of prescribed theory to practical issues. It lays emphasis on the role of government, university/community collaboration, collaborative experiences in the manufacturing sector, supply chain integration, global collaboration and impact on business.

Lunsford and Bruce (2001) suggest various attributes of collaboration which help determine whether collaboration can work. The authors state that the 1990s witnessed increasing attention to collaboration in research, education, business and development. The interest was driven by how people or institutions might work together more efficiently to accomplish what no single institution or person could do. They offered the following attributes for collaboration as:

- The mechanism through which institutions would be able to capture knowledge created by their members in light of the information-based economy.
- The means by which new technologies would provide more effective ways to collaborate.

According to Hackett (2000), after the Second World War, the cost of undertaking scientific research has become prohibitive, prompting scientific institutions to jointly

seek funding from government and multinational consortiums. In order to understand better how collaborative enterprises work and to promote further collaboration the United States National Science Foundation (U.S.N.S.F) has funded new projects to study and to implement interdisciplinary teams (Hackett 2000).

2.4.3.1. The Business, Industry and Higher Education Collaboration Council (BIHECC) Collaboration and Structural Reform Fund (CASR)

The federal government in Australia is encouraging universities to collaborate and reach out to businesses and seek their support in funding research programmes which would be of benefit to the businesses, industry and the community. To achieve this the government, through Department of Education Science and Training (DEST), has established the Business, Industry and Higher Education Collaboration Council (BIHECC). The Council's mandate is to improve communication between the business/industry and higher education sectors. The council manages the Collaboration and Structural Reform Fund (CASR) whose objective is to achieve higher teaching, learning, research and innovation by promoting structural reform and collaboration. According to CASR collaboration can occur among universities and between universities and other research and educational providers. Collaboration can also occur between universities and business, industry and professional associations, it may also occur between universities and their regional or local communities (DEST 2006).

2.4.3.2. University collaboration

International Alliance of Research Universities (IARU)

At the international level is a group of universities under the aegis of the International Alliance of Research Universities (IARU) comprising the Australian National University (ANU), the Universities of California (Berkeley), Cambridge, Yale, Oxford, Peking, Copenhagen, ETH Zurich, Tokyo, and the National University of Singapore. These ten universities have teamed up to collaborate among themselves, with governments and

businesses, on four strategic research topics: migration, longevity and health, energy resources and environment and security. The group's aim is to influence their governments on the research issues aforementioned for a better world (Armitage 2007; IARU 2007)

Rolls-Royce University Technology Centres (RRUTC)-Knowledge transfer

One of the most effective ways of knowledge transfer is collaborative research, in which university and business work together on shared problems. They develop mutual trust and are likely to achieve major outcomes. An example of this collaboration is provided by the establishment of Rolls-Royce University Technology Centres (RRUTC) in the UK. The RRUTCs are research centres located at universities and address the future technological needs of the company. The different University Technology Centres (UTCs) deal with specific pieces of engine technology. The UTC at University of Sussex concentrates on experimental and theoretical investigations into the cooling and sealing of advanced gas turbine engines. The university-based groups work with the company's research and engineering teams. As a result of their interaction researchers have published cutting-edge research which has been presented in various conferences (Lambert 2003).

Carnegie Mellon University community collaboration

A practical example of collaboration among university and community groups is provided by Carnegie Mellon University. This is a well-established university-community collaboration on a range of issues related to community literacy. The project and the research carried out within it have identified, described, and enacted the intercultural collaboration that serves as the vision and mission for the community centre and adumbrated a theory of rivalling, a critical practice that is constitutive of effective youth involvement in the community. This example could be emulated in the case of collaboration among regional universities and the business community (Carnegie Mellon University 2006).

Stanford University Collaboration through use of information technology

The model developed by Stanford University (SU) emphasises that collaboration involves the harnessing of resources within an institution and between institutions in order to achieve set goals (Ballou 2004; Mentzer, 2001; Mentzer, et al, 2001). In view of the fact that the cost of business research has been rising, it has become prudent for institutions and researchers alike to develop mechanisms that will assist in attracting and sharing the available resources. The concept of collaboration can enable institutions and researchers to work together on joint projects even though they may be physically apart. Through the use of information technology, institutions and researchers can be able to share information and data and communicate with each other (Stanford University 2006).

Universities in Germany and Porsche Motor Company (PMC) training collaboration

Harryson (2005) explains that there are six lessons to be learned from the example set by PMC in its arrangement with universities in projects for which it lacks the requisite expertise.

Every year the company brings in nearly 600 students who are working on their Masters degrees into its research and development facility in Weissach, Germany. The students work along with 2000 staff engineers for four to six months.

The annual budget is US\$30 million which finances paid internships for the students and also supports external university research or research-based studies conducted exclusively for PMC. This arrangement allows the company to employ ten staff specialists in basic research compared to 200 employed at BMW and Mercedes-Benz. A student costs the manufacturer 15% of what a full-time employee costs, hence the savings are substantial.

The students focus on basic research and development and participate in every stage of product development. Safety and quality remain largely the province of Porsche's employees and strategic suppliers. Interns are also involved in commercialising their work, which is not the case in university-industry alliances.

The students help PMC identify new suppliers for the technologies they develop and they collaborate on production techniques that combine the latest research from their universities with suppliers' real-world experiences.

The internships are open to students worldwide but most interns hail from local universities because they are required to labour on its premises. The work is intense at an average of 60 hours per week and integration with staff engineers is complete.

The criteria for selecting the 2000 students from those who apply each year are emphasise passion, creativity, and the strategic relevance of their thesis topics to the company's practical research and development problems. The first screening is conducted by the corporate human resource organisation; the second by the units that employ the students.

The company offers fewer than 10% of its interns full-time jobs. The possibility of landing one of those prize positions motivates the students/interns. Those not fortunate enough to stay with the company become part of the alumni network that provides advice on research and technology. The alumni meet several times a year in a castle in southern Germany or Austria at company expense where they enjoy elegant meals and early test-drives of the company's latest models.

The lessons to be learnt are:

1. Value creativity and passion over high grades. Students/interns who love product or industry perform the best.

2. Use of the website – PMC keeps costs low by managing the application and selection process online.
3. Treat interns like employees – this ensures effective collaboration between staff and students.
4. Focus on communication and presentation. The students are encouraged to make regular presentations to other parts of the company emphasising strong visuals rather than detailed reports.
5. Deploy students in any activities that add value. The interns are given challenging and at times sensitive tasks such as identifying new suppliers and support commercialisation to experience the full cycle of innovation and help transform research efforts into business value for PMC.
6. Build loyalty. The company ensures that students will continue to support the brand by providing stimulating and rewarding work during their internships and by maintaining active alumni networks.

The company, through in-sourcing student expertise, can explore more promising ideas and move them to production faster than its competitors (Harryson 2005).

This example from Porsche Motor Company goes to show how the universities through collaborative arrangements can tap resources for research for the benefit of both academia and industry.

Universities groupings in Australia and collaboration

There are four main groupings of Australian universities. The groups were primarily formed to promote the unique mutual objectives of the member universities. These include marketing advantages, practical benefits of collaboration, and the increased lobbying power that comes from being part of a group. The four main groupings currently active are:

- Group of Eight (Go8)
- Australian Technology Network (ATN)

- Innovative Research Universities Australia (IRU Australia)
- New Generation Universities (NGU)

The NGU, though an informal university grouping, voted to disband in early 2007. This study has identified a grouping of universities described and reviewed on an annual basis by the Australia Government, Ministry of Education, Department of Education, Science and Training (DEST), as Regional Distance Intensive University Australia (RDIUA). The RDIUA comprises universities which have their main campuses located in regional Australia (DEST 2007). The details of membership and composition of the existing formal group of universities are provided in the appendices.

The membership to any of these groups does not in itself necessarily signify anything special about the member universities. There are universities that are not part of any of these groupings that have their own set of strengths and foci. Other Australian universities have international connections that might be more important to them than any domestic groupings. However, the groupings do represent universities that have a similar style and focus and the formation of these groups will most likely accentuate these similarities. The university groups lobby for special consideration for accessing additional funding from the Commonwealth Government and the business community (Sheehan 2006).

The Group of Eight (Go8) collaborative example

The Go8 works to ensure a consistent and sustainable policy environment which maximises the wide-ranging economic, social and cultural benefits to the Australian community of higher education and which ensures Australian universities are recognised as among the best in the world. This group collaborates by pitching for research funds and in the process they are able to jointly attract the bulk of the research funds from the Federal government in Australia and in the process attract additional commercial funding for research from the business community (Go8 2006)

Australia Technology Park (ATP) Innovations Pty Ltd, collaboration among four universities in Australia

ATP Innovations Pty Ltd, is a collaborative venture owned by the University of Sydney (USYD), University of New South Wales (UNSW), University Technology Sydney (UTS), and the Australian National University (ANU). ATP Innovations is a technology commercialisation hub which supports emerging businesses in the bio-technology, Information Communications Technology (ICT) and electronics sectors (ATP 2007).

Collaboration and the university region link

According to Goddard (2000) the response of higher education to regional needs focuses on the processes which link components within the university and region into a learning system.

The university/region value-added management process is depicted in Figure 2.4.

Figure 2.4. The university/region value-added management process

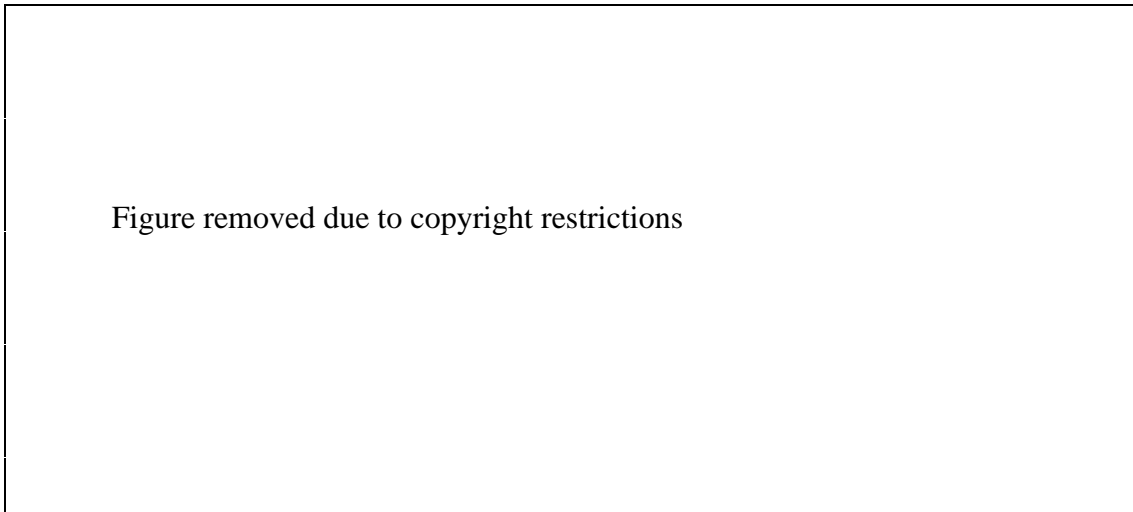
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Source: Goddard (2000), response of Higher Education Institutions (HEIs) to regional needs

At university the challenge is to link research, teaching and community service roles by internal funding, staff development, incentives and communication which make these activities responsive to regional needs comprising of skills, innovation, culture and community. These linkages represent ‘value added management processes’ (Goddard 2000).

Yves and Gary (1998) categorise the prepared and unprepared qualities in institutions that are necessary for collaboration the qualities are depicted in Table 2.4.

Table 2.4. Qualities of institutions that are and not collaborative-ready



Source: Alliance Advantage the art of creating value through partnering, Yves & Gary (1998) p.254

Institutions and organisations need to be proactive in preparation for collaboration. In addition, they should be creative and focus on opportunities beyond their immediate boundaries (Yves & Gary 1998).

2.4.3.3. Global collaboration and impact on businesses

In the global context, Frost and Sullivan (2006) suggest that collaboration capability is a forward-looking construct that represents an institution or organisation’s orientation and

infrastructure to collaborate. The global collaboration index model is depicted in Figure 2.5.

Figure 2.5. The Global collaboration index

Figure removed due to copyright restrictions

Source: Frost & Sullivan (2006) Meetings around the world: The impact of collaboration on business performance

The global collaboration index Figure 2.5 indicates that the culture and structure of an institution or organisation and the degree of application of the collaboration infrastructure are prerequisites for effective collaboration. The model further illustrates that collaborative capability goes along with an open entrepreneurial culture applied to a decentralised institutional organisational structure and employed across a wide breadth of interactive strategic planning activities. This should also encompass collaborative technology for strategic planning and strategy implementation.

Collaboration quality is the degree of collaboration within an institution/organisation. The key drivers are infrastructure, processes and culture inherent in the institution/enterprise. Collaboration capability combined with collaboration quality lead to institution performance measured in terms of growth, quality, innovation and profitability (Frost & Sullivan 2006).

The impact of collaboration on business

The impact of collaboration on business is authenticated by research commissioned by Microsoft and Verizon Business. The international study was undertaken by Frost and Sullivan in the year 2006. Microsoft is the world leader in software, services and solutions that help people, institutions and businesses achieve their full potential. Verizon Business, a unit of Verizon Communications, is a leading provider of advanced communications and information technology (IT) solutions to large businesses and government customers worldwide. Frost and Sullivan is a global growth consulting company which has partnered with clients to develop innovative strategies.

The basic finding of the study, titled 'Meetings around the World: The Impact of Collaboration on Business Performance', was that the main business performance drivers are:

- collaboration
- the company's strategic orientation
- market turbulence

Among the three business performance drivers, collaboration was found to have the most significant impact. In analysing the results further (Kostner 2006) states that collaboration impacts on the gold standards of performance, namely:

- profitability,
- profit growth,
- sales growth

The conclusion is that as a general rule, global companies that collaborate perform better while those that collaborate less do not perform as well (Microsoft 2006; Verizonbusiness 2006; Frost & Sullivan 2006)

The manufacturing sector experience

The manufacturing sector provides many useful examples of the importance of collaboration in the supply chain. The Supply Chain Council (SCC) was formed to establish a framework to enable manufacturers and their suppliers to build a stronger supply chain and reap the benefits of improved supply chain management. The SCC was incorporated as a non-profit organisation to provide services and support for further increasing its membership. To demonstrate the importance attached to the supply chain profession, the SCC membership grew from 73 members to more than 300 including some of the world's largest manufacturers in one year (1997). The Council has developed a supply chain operations reference model (SCOR) to assist companies in evaluating their supply chain performance, identifying weak areas, and developing improvement solutions (Supply Chain Council 1997).

Supply chain integration

In another collaborative initiative, several leading manufacturers joined with the National Institute of Standards and Technology (NIST) to create a new organisation that would improve and standardise communication and business processes throughout manufacturing supply chains and to share the results with other interested firms. This group, the National Initiative for Supply Chain Integration (NISCI) was formed after a NIST study showed that an overwhelming majority of companies comprising manufacturing supply chains are either small- or medium-sized businesses that lack the resources of larger firms. With a consortium of businesses, non-profit groups, and academic institutions, the plan is to identify specific supply chain initiatives, then select teams of members to research and implement best practices (NIST 2006,).

In this sub-section the application of prescribed theory to practical issues with emphasis on government role, university/community, and collaborative experiences in the manufacturing sector, supply chain integration, global collaboration and impact on

business were discussed. The next sub-section enumerates the benefits of university business collaboration..

2.4.3.4. The benefits of university/business collaboration

The previous sub-section outlined the application of prescribed theory to practical issues. In this sub-section the benefits of university business collaboration are presented with emphasis on how collaboration helps overcome competition along with the relationship between business performance and collaboration.

According to the Confederation of Business Industries (CBI) of the UK cited by Bradshaw (2001), there are potential benefits to be derived from collaboration between universities and industry. These are summarised in Table 2.5;

Table 2.5. Collaboration benefits between universities and business

Figure removed due to copyright restrictions

*Source: Partnership for research and innovation between industry and universities (CBI)
UK 2001*

The differences between universities and industry lie in the extent and diversity of their resource base. Companies have considerably greater financial resources as well as state-of-the-art or modern physical resources. Universities on the other hand have considerable human and knowledge resources. This diversity of experience can be drawn upon in collaboration and synergy that may offer a competitive edge leading to successful innovation (Bradshaw 2001).

In Australia the Minister for Education, Science and Training (2006) pointed out that universities are increasing their focus on commercialisation of research outcomes as a source of additional revenue, which is comparable to that earned in UK and Canada. To achieve this the universities are employing more commercialisation support staff. The government is encouraging collaboration in the leadership of universities and greater focus on university strengths in their areas of research (Nickless 2006).

Collaboration and competition

Collaboration between institutions/organisations could play a crucial role in seeking to achieve advantages or to avoid competition. Institutions/organisations may compete in certain research areas and collaborate in others as depicted in Figure 2.6 which shows an example in a commercial set-up.

Figure 2.6. Collaboration and competition

Figure removed due to copyright restrictions

Source: Exploring corporate strategy Johnson, Scholes & Whittington (2005) p. 262

As outlined in Figure 2.6, where there is competition, collaboration can help enterprises/institutions to:

- **Increase selling power** by building close links with customers as in the example of the motor and aerospace industries.
- **Increase buying power.** Institutions/organisations are able to link their suppliers into their Enterprise Resource Planning system (ERP). The ERP is an integrated information technology (IT) system aimed at integrating the entire institutional/enterprise business operations including research and development, finance, manufacturing, operations and warehousing. In the pharmaceutical industry companies' profitability was aided by the fragmented nature of their buyers the individual doctors. The governments then intervened by requiring doctors to collaborate with centralised government drug-specifying agencies and this has resulted in coordinated buying power.
- **Build barriers** to entry or avoid substitution. Institutions can collaborate to invest in marketing their skills in research. Trade associations help to promote generic

features like safety standards with technical specifications to pre-empt the possibility of substitution. These efforts however could be thwarted by collaborative efforts of other organisations seeking to gain entry.

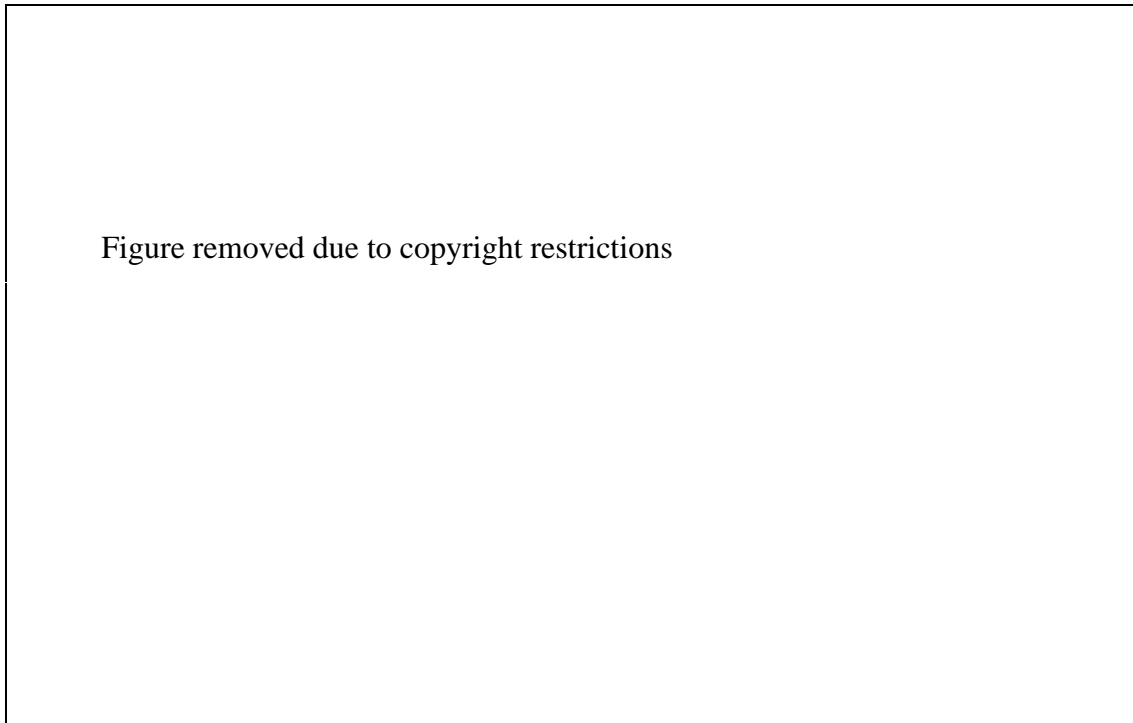
- **Gain entry to new areas:** institutions seeking to work beyond their traditional boundaries may need to collaborate with others to gain entry into new areas. They may also benefit from knowledge of the local market knowledge and utilise the existing infrastructure like research and development, information systems and distribution channels.
- **Share work** with customers: an example is the public sector tax department where customers assess their own income tax through designed software packages.
- **Increase the utility of public sector investment** through collaboration among different departments to issues that cut across various professional fields like research, safety and drug abuse (Johnson, Scholes & Whittington 2005) .

Business performance and collaboration

A classic example of the benefits of collaboration is the ‘super-collaborative’ or ‘super-supplier’ relationship. Super collaboration is a special relation developed between manufacturers and suppliers to jointly identify areas of cost cutting which yield benefits which are shared. This concept was developed by the Honda Motor Company (HMC) of America with its suppliers in the 1990s. There were significant payoffs which reduced costs for the company by 19 per cent during a time when the consumer price index rose by 11 per cent. Another Japanese car maker Toyota Motor Corporation has (TMC) used this model to overtake its main American competitors Ford Motor Company (FMC) and General Motors Corporation (GMC) (Billington, Cordon & Vollmann 2006) .

According to a community innovation survey conducted in the United Kingdom on the relationship between business performance and collaboration, there was a significant difference between the performance of business enterprises which used a university as a partner and those that did not. The results of the survey are depicted in Table 2.6.

Table 2.6. The relationship between business performance and collaboration



Source: Community Innovation Survey, (UK), DTI/IONS,2001.

The results of the survey on the relationship between business performance and collaboration as illustrated in Table 2.6 confirm that companies which used universities and other research and education institutions as a source of information or as a partner tended to be significantly more successful than those that did not. The other findings are that as a result of collaboration the companies are likely to have increased their market share, improved the quality of their goods and services and significantly lowered their labour costs (Lambert 2003).

Collaborative research focuses on pre-competitive areas, this refers to areas that are sufficiently removed from the development of an end product, process or service for each institution or company involved to feel comfortable working together which ultimately leads to potential benefits. The research extends boundaries of knowledge and offers returns to universities (Bradshaw 2001).

In this sub-section the benefits of university business collaboration were presented with an emphasis on how collaboration can help overcome competition along with the relationship between business performance and collaboration. The next sub-section presents a conceptual model for supply chain collaboration.

2.4.4 A conceptual model for supply chain collaboration

In the previous sub-section the benefits of university business collaboration were enumerated.. This sub-section presents a conceptual collaboration model that establishes the link between shared supply chain processes through a web of decision synchronisation, information sharing and incentive alignment to the actual performance and feedback.

The concept of collaboration consists of information sharing, decision synchronisation and incentive alignment (Simatupang & Sridharan 2004a).

Information sharing

Information sharing enables institutions to receive and share timely and relevant information. The institution decision makers can then come up with appropriate plans to ensure the success of the collaborative initiative. Effective information sharing provides a shared basis for concerted actions by interdependent firms (Whipple 2002). Information sharing facilitates dealing with issues about requirements, the process of fulfilment and performance.

Decision synchronisation

Decision synchronisation refers to joint decision making in planning and operational contexts. These joint decisions are used to guide logistics inside an individual chain member institution. The planning context integrates decisions about long-term planning and measures such as selecting target markets, product assortments, customer service level, promoting and forecasting. Decision synchronisation encourages the chain members to have a sense of belonging in which all decisions work toward a common goal of serving end customers (Simatupang & Sridharan,.2004b). Decision synchronisation thus contributes to a reputation of on-time delivery and consistent product availability (Bowersox, Closs & Keller 2000) .

Incentive alignment

Incentive alignment refers to the degree to which chain members share costs, risks and benefits. Costs such as administration and technology need to be shared fairly amongst the chain members to maintain the commitment of each party to the collaborative effort. Supply chain members commit to the collaborative efforts if they can realise and capture relevant benefits that contribute to their future survival (Kaplan 2001).

In collaboration the participating institutions prospect for better practices and ideas through benchmarking their current collaborative practices to other collaborative initiatives.

The conceptual model for supply chain management is depicted in Figure 2.7

Figure 2.7. A conceptual model for supply chain collaboration

Figure removed due to copyright restrictions

Source: Simatupang (2004b), Emerald Full text-Benchmarking supply chain collaboration.

The conceptual model for supply chain performance system illustrated in Figure 2.7, establishes the link between shared supply chain processes through a web of decision synchronisation, information sharing and incentive alignment to the actual performance and feedback.

Johnson, Scholes and Whittington (2005) suggest that there is a need for mutual understanding and trust for collaboration to be successful. The institutions must have common goals and aspirations even if not the same capacities. The institutions must cooperate and put the necessary resources and mechanisms in place to achieve their desired goals and take advantage of their research and development activities.

Super collaboration or super supplier is a term which under certain circumstances is applied to each specific customer supplier relationship. There are four conditions which are required for super collaboration to take off.

- Procurement has to be focused on enhancing competitive advantage
- A genuine market opportunity must exist
- All functions in both organisations must be committed to making the relationship work
- A strong communication and evaluation structure needs to be in place. (Billington, Cordon & Vollmann 2006).

Supply chain collaboration requires a reasonable amount of effort from all participating members to ensure the attainment of potential benefits (IMD 2006; Barratt & Olivera 2001; Corbett et al. 1999).

Collaboration between universities and project end-users in government, businesses and industry have been cited by the RQF-DAG as one of the possible ways to measure the impact of the research undertaken. The RQF proposed that future research funding by the commonwealth to universities and publicly funded research institutions be based on the quality and the impact of the research. The RQF-DAG, however, conceded that global impact metrics are underdeveloped but it may be possible to employ qualitative and quantitative indicators where appropriate to support claims of impact (Illing 2006a, p.25).

There has been a further recommendation that development agencies should act as facilitators of university-business relationships through actively seeking out companies in the regions which could benefit from working with universities (Lambert 2003).

This sub-section has discussed a conceptual collaboration model that establishes the link between shared supply chain processes through a web of decision synchronisation, information sharing and incentive alignment to the actual performance and feedback. In the following sub-section the SCU vision, mission and objectives in relation to collaboration are briefly discussed.

2.4.5 Collaboration: Southern Cross University (SCU)

The previous section discussed a conceptual collaboration model.. This sub-section briefly focuses on the SCU vision, mission and objectives in relation to collaboration along with the research funding threat to the University.

SCU vision, mission and objectives

Southern Cross University **vision** states that the University is to be a dynamic learning community recognised for distinctive achievements in teaching and **research** and for playing a leading role in **supporting regional development** with an **international presence**. A critical component of SCU's **mission is research** which is **regionally valued** and **internationally significant**.

The university has identified among its key **objectives**:

- To be the most research-intensive regional university in Australia
- To take a prime role in the intellectual, economic, environmental, social and cultural development of the northern New South Wales region
- To increase the non-government revenue stream through involvement in commercial activities with an acceptable return on investment. (Southern Cross University 2005).

Research funding threat to Southern Cross University (SCU)

The Research and Research Training Management Plan (RRTMP) of SCU points out that the single biggest threat facing the University is the proposed introduction of the RQF (Southern Cross University 2006). The implication of the RQF to SCU is that the block research funding from the federal government, currently valued at A\$ 6,000,000, would be based on quality of research and hence discriminate against applied research which is area of research strength at SCU (Baverstock 2006). With the imminent implementation of the RQF by the then Howard Government, the research objective was seen to be whether SCU as a regional institution was able to respond to the changes taking place in public research funding to universities.

In conclusion this section has defined collaboration and reviewed the major writings on collaboration, the current state of research and the institutional practical application of the immediate discipline that will be the mainstay of the data collection and analysis of the thesis. The following section presents the research issues underlying this thesis. and identifies the research objective and questions.

2.5 Research issues

The previous section has defined collaboration and reviewed the major writings on collaboration. **The research gap that has been identified in the literature will address the policy issues possibly affecting research collaboration at a regional university.**

The literature underscores the fact that the study of the policy issues likely to affect research collaboration at a regional university have not been carried out. This section outlines the research issues underlying this study, the research issues are based upon the research gap derived from the literature, where the research objective and research questions have been formulated.

2.5.1 Research objective

The research objective is the broad issue that the researcher will examine in greater detail by addressing the research questions in a qualitative research project, or research hypotheses in a quantitative research project. The research objective outlines the boundary around the research without necessarily specifying the type of research that should be carried out (Emory & Cooper 1991).

In this thesis the research objective is to examine whether one particular regional university, among other RDIUAs, is able to respond to the changes taking place in the public sector research funding to universities in Australia.

The literature traces the changes that have occurred in the public sector research funding to universities in Australia over the last decade. Australia stands out among OECD countries as one of the members where the proportion of Gross Domestic Product (GDP) spent on research and development has declined as the economy has grown (Morris 2006). The implementation of the RQF would further reduce the level of funding to regional universities as its design is likely to favour the Go8, ATN and IRUA groupings of universities due to its demand on high administrative requirements which SCU and other RDIUA universities are unlikely to meet due to cost considerations (Baverstock 2005).

SCU's strategic plan includes the following among its key objectives:

- To be one of the most research-intensive universities.
- To take a prime role in the intellectual, economic, environmental, social and cultural development of the region.
- To increase non-government revenue stream through involvement in commercial activities with an acceptable return on investment (Southern Cross University 2005).

The research objective for this research is formulated as follows:

To propose a model whereby the regional university will be able to respond to the changing, public sector research funding to universities in Australia.

2.5.2 Research question

The research issues or the research questions evolve and are based on the research objective earlier formulated. The research issues or the research questions endeavour to address and highlight the research objective. In this study the research question defined to address the research objective is as follows:

What are the policy issues possibly affecting research collaboration at the regional university?

Policy is an overall guide for action which translates to a standing plan that specifies the institution's/organisation's general response to a designated problem or situation (Davidson & Griffin 2000). The definition of policy by the Association of Operations Management (APICS) states that this is a definitive statement of what needs to be done in an institution. The *American Heritage Dictionary* further describes policy as a plan or course of action, as of a government, institution, business or political party, intended to influence and determine decisions, actions, and other matters that affect them from time to time. In effect policy may be described as a purposeful course of action (Stewart 1999).

The research objective having been defined and the research question formulated, the following sections provide a brief background regarding the rationale underlying the broad and specific research questions.

Section One deals with regional university policy on collaboration development. Section Two examines regional university policy on collaboration funding, Section Three examines regional university policy on collaboration with external institutions. Section Four examines regional university policy on the impact of collaboration on the University's research focus. And finally, Section Five examines regional university policy on operational strategies related to collaboration.

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The specific questions on policy issues possibly affecting research collaboration are depicted in the Table 2.7.

Table 2.7. Specific research questions

Research Question 1	How is the regional university policy on collaboration developed?
Research Question 2	How is the regional university policy on collaboration funded?
Research Question 3	How is the regional university policy on collaboration reflected in its relations with external institutions?
Research Question 4	How does the regional university policy on collaboration impact on the university's research focus?
Research Question 5	What are the operational strategies of the regional university policy on collaboration?

Source: developed for this research.

The broad research question will help incorporate the staff at the regional university who are involved or likely to be involved with research collaboration. The concept of collaboration in this context enables the harnessing of resources within an institution and between institutions to achieve pre-determined goals, which are of mutual benefit to the institutions (Hiam 2003; Mentzer 2001).

Research Question 1: How is the regional university policy on collaboration developed?

In the first specific research question the main aim is to ascertain the role played by the staff in the development of the policy on collaboration at the regional university. This is considered important in view of the fact that the policy implications have a higher bearing on staff directly involved with research collaboration at the institution..

The first specific research question will address the issue of whether the staff who are involved in implementing the plan of action or policy operation have an input into its formulation. It should be appreciated that strategy implementation is more encompassing than strategy formulation (Kubr 2002).

The other aspects that the research question will address in the regional university policy on collaboration is whether the policy was developed by staff with responsibility for collaboration, how readily available the policy is to staff, how the policy identifies staff involved with collaboration with their levels of authority, whether the policy has a sunset clause and whether it is regularly reviewed with input from the staff involved with collaboration.

Research Question 2: How is the regional university policy on collaboration funded?

The second specific research question as outlined in Table 2.7 seeks the opinion of staff on the funding mechanism in place for the policy on collaboration. The research question aims to determine how well the resources are utilised and particularly whether these resources are adequate and available on time for staff to be involved with collaboration.

Lambert (2003b) explains that resources – human, physical and financial – are important for successful collaborative arrangements between universities and businesses. It is imperative that prior to any collaboration, the institutions involved agree on their key competencies. Universities must have the requisite skill set and the physical

infrastructure. The missing component is the financial resources which could be augmented by businesses on mutually agreed terms.

Baverstock (2006) states that SCU has in place the human, physical and financial resources necessary for collaboration. While the University has been involved in several collaborative arrangements, however the institution would achieve better research outcomes with additional resources. This research will identify policy bottlenecks that hinder access to the extra funds required for collaboration.

This specific research question will further address the issue of whether the regional university's policy provides for adequate funds for collaboration, whether it provides a mechanism of assessing members' contributions to collaborative tasks, whether the policy lays emphasis on the importance and value of collaborative research and whether there is encouragement to share information within the regional university and among partners.

Research Question 3: How is the regional university policy on collaboration reflected in its relations with external institutions?

This specific research question endeavours to ascertain how the regional university's policy on collaboration is reflected in its relations with external institutions. Southern Cross University was a member of one of the university groupings earlier explained, namely the New Generation Universities which are relatively young in that they were formed in the last twenty years. This research has identified a new grouping of universities described and reviewed on an annual basis by the Australian Government's, Department of Education, Science and Training (DEST), as Regional Distance Intensive University Australia (RDIUA). The RDIUA is comprised of universities which have their main campuses located in regional Australia (DEST 2007) (Operational definition prepared specifically for this research).

'Region' is a precise term that describes a comprehensive and functional structure existing as an independent area within the national economy (Howard 2001) .

Southern Cross University fits the profile of a regional university and this research will examine how well the policy on research collaboration is reflected in the relationship with other institutions in order to attract external funding for business research.

This research question will ascertain whether the regional university policy on collaboration offers guidance on the University's relations with external partners, how it encourages the joint conduct of relevant research with stakeholders and if the policy is able to identify the University as a regionally, nationally and internationally recognised research institution.

Research Question 4: How does the regional university policy on collaboration impact on the University's research focus?

This specific research question seeks staff opinion on the regional university policy on collaboration with regard to the research focus of the university.

According to Organisation for Economic Cooperation and Development (OECD), research and development comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge (EAG(a)RQF DEST 2005). The transfer of knowledge is described as the successful application of knowledge created by researchers which they may be effected by researchers or others within the university (EAG(c)RQF DEST 2005).

Research has been variously defined. Mertens (2005) suggests that research is one of the different means to know and understand, a process of systematic inquiry. Dane (1990) describes research as critical analysis involving questions and answers about specific issues. Finally business research is defined as an organised, systematic, data based,

critical, objective, scientific inquiry or investigation into a specific problem, to find answers or solutions (DEST 2006; Robert Gordon University 2006; Sekaran 2003).

The University's strategic plan clearly states that the intention of the University is to be a research-intensive regional university, which will take a major role in the economic development of the Northern New South Wales region, more fundamentally the University intends to increase non-government revenue through viable commercial activities.

This research question attempts to ascertain how SCU's policy on collaboration reflects on the importance of regional research to the University, whether the policy encourages the conduct of internationally significant/topical research, whether the policy helps promote the University's research strength and whether the policy identifies the institution as a research-intensive university.

Research Question 5: What are the operational strategies of the regional university policy on collaboration?

This specific research question aims to determine the operational strategies and the intellectual property (IP) arrangements of the University's policy on collaboration. In defining the policy it is imperative that the policy or plans of action have a strategy which would result in the action plan's implementation. In more precise terms the research question seeks the opinion of staff on whether the SCU's strategic plan which incorporates its vision, mission, objectives and outcomes is reflected in University policy on collaboration.

Various scholars have endeavoured to give an operational definition of strategy, Hubbard (2004) states that strategy is about creating value for key stakeholders and customers. This line of thought had earlier been suggested by Mintzberg (1998) who described strategy as being one of those decisions which have a high medium-term to long-term impact on the activities of the institution. This includes the implementation of those

decisions to create value for stakeholders. The key realisation is that public institutions like universities are expected to deliver results to the federal, state and local governments, in addition to the businesses and the communities where they are located.

The importance of strategy is further emphasised by Kubr (2002) who states that it is not just an aim in itself but a set of paths and choices for achieving the institution's immediate and future goals. Strategy is the creation of a unique and valuable position involving a different set of activities in the process creating fit among the institutions' activities (Hubbard 2004; Porter 1996).

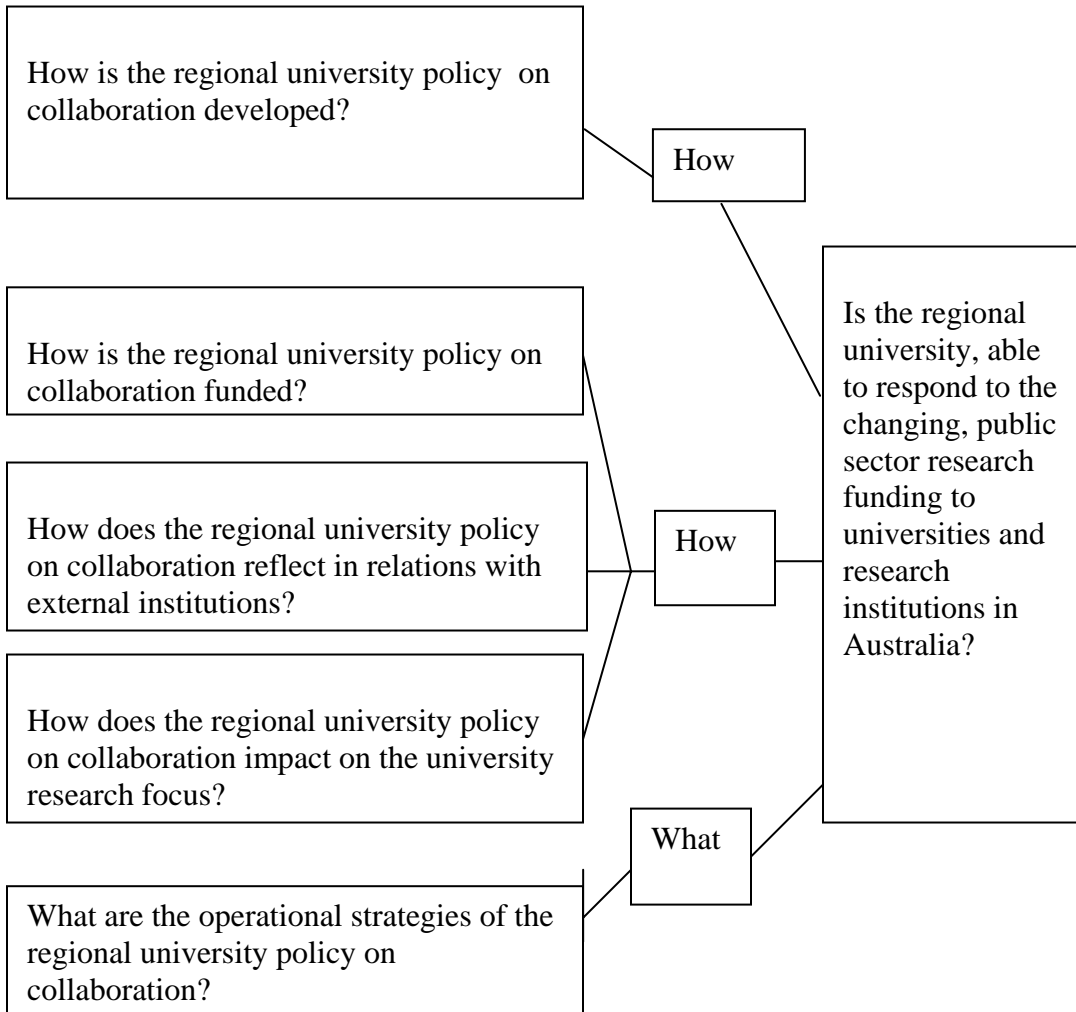
This research question will address the issue of Intellectual Property (IP). The *Journal of intellectual property management* defines IP as a product of the intellect that has commercial value, including copyrighted property such as literary or artistic works, and ideational property, such as patents, appellations of origin, business methods, and industrial processes (Caenegem 2006).

The legal definition of IP is that property that can be protected under Federal law, including copyrightable works, ideas, discoveries and inventions, The GRC at SCU states that the University has a flexible approach to IP arrangements. SCU is a Registered Research Agency (RRA) with the commonwealth and therefore eligible for Research and Development (R&D) tax concessions which is an incentive to undertake research (Southern Cross University 2006; IP law 2006)

In summary this specific research question will determine whether SCU's policy on collaboration is reflected in its vision, mission and objectives, how the outcomes are measured, whether the policy incorporates flexible negotiation and intellectual property arrangements while dealing with partners and stakeholders.

The research question and research issue are depicted in Figure 2. 8.

Figure 2.8. Research questions and research issue



Source: developed for this research

2.5.3 Research proposition

This research study proposes that there are policy issues possibly affecting research collaboration at the regional university. The study will examine the policy issues and propose a model whereby the University is able to use collaboration as a strategy to attract external funding for business research.

2.6 Conclusion

In this chapter there has been a clear demonstration that the public sector research funding environment in Australia is changing due to policy changes of the federal government. The literature further confirmed the likely introduction of the Research Quality Framework (RQF) with an implementation schedule outlined by the government through the Education ministry. The former Minister for Education, Science and Training appointed the Development Advisory Group (DAG) to the RQF to oversee the transition from the previous funding model to the proposed one recommended by the Expert Advisory Group to The RQF (Bishop 2006). There was evidence emanating from the literature that the major university groupings and particularly the Group of Eight (Go8) will attract the bulk of public sector research funding under the RQF model as a result of having lobbied collectively to the Expert Advisory Group (EAG) of the RQF, for the inclusion of a funding model based on quality and impact of research which is favourable to the group. According to the Research and Research Training Advisory Committee (RRTAC) at Southern Cross University, the RQF would be maintained even if there was a change of government in Australia. Regional universities are likely to receive less research funding under the RQF model. One of the reasons for this is attributed to the high administrative costs associated with the RQF compliance which the universities may not be able to afford (Baverstock 2007; Morris 2006; Poole 2005).

The literature has underscored the importance of collaboration among institutions as a strategy to attract research funding from both the public and private sectors. There is a need for institutions that collaborate to have the key variables in place. These include the policies, legal framework, resources, institutional culture and the capacity to relate with other institutions.

From the literature the policy issues likely to affect research collaboration at a regional university like Southern Cross University have not been studied and researched in depth. The identification of this **research gap** forms the basis for the researcher to formulate a research issue, regarding regional university's ability to respond to the changing public

research funding environment. This and the research question constitute the basis of the doctoral research.

The literature on research collaboration as a strategy to attract external sources of funding for business research having been reviewed and the research issue having been identified, the following chapter presents, expounds and justifies the methodology adopted for the study.

Chapter 3 Research Methodology

3.1 Introduction

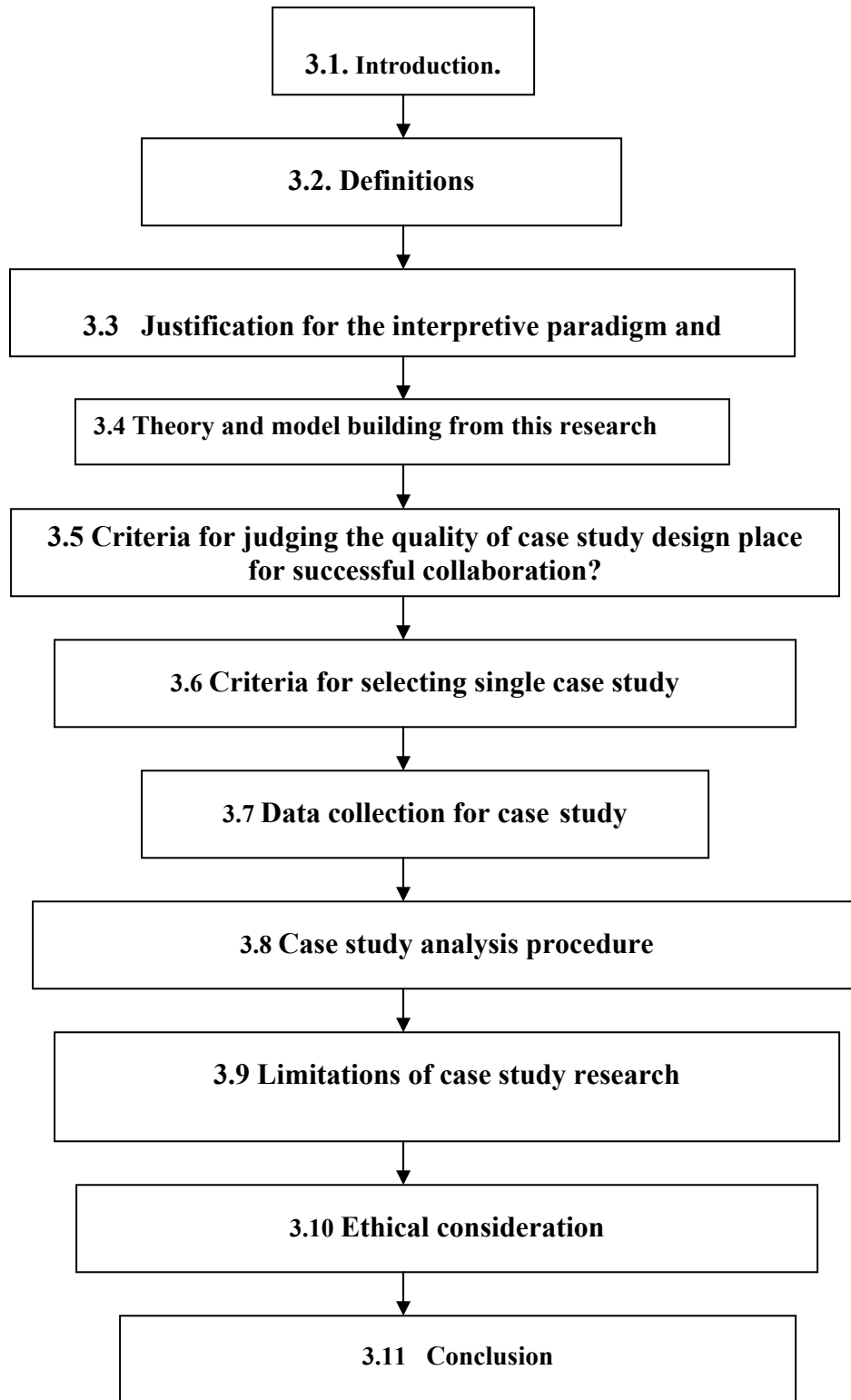
In Chapter 2, the literature regarding the changing public research funding environment at universities was synthesised. This led to the identification of the research gap, the emergence of the research issue and the development of the research questions. The purpose of Chapter 3 is to develop a suitable methodology which will assist in examining the research issue and further explore the research questions. This chapter aims to present, describe and justify the appropriateness of the case study method as the main methodology in examining the potential for collaboration as a policy strategy to attract external funding for business research.

The chapter comprises the following sections:

Section One is an introduction to Chapter 3. Section Two examines the definitions of research strategies in social sciences and business research methods and formulates the research issue and research questions. Section Three explores the research paradigms and justifies the use of the case study methodology within scientific research in order to analyse the research problem and the research questions. Section Four outlines the theory and model building from this research. Section Five highlights the criteria for judging quality of case study design. Section Six discusses the criteria for single case study research. Section Seven assesses issues concerning the methods of data collection and focuses on interviews, survey techniques and instruments, types of questionnaire surveys, measurement techniques and pilot surveys. Section Eight considers the analysis of case study evidence. Section Nine focuses on limitations of case study research. Section Ten identifies ethical considerations. Section Eleven presents the conclusion.

The structure of Chapter 3 is depicted in Figure 3.1.

Figure 3.1 structure of Chapter 3



Source: developed for this research

3.2 Definitions

This section aims at isolating and defining the different research strategies commonly used in social science research. There are two different types of research which will be explored and explained. The broad research problem and the research questions will be presented.

3.2.1 Research strategies

According to Yin (1989, 1994) there are five research strategies:

- experiment
- survey
- archival analysis
- history
- the case study method.

In each of the strategies there is a unique way of collecting and analysing empirical evidence. In the process of analysis there emerge advantages and disadvantages for each strategy. Where experiments are conducted the research allows the evaluation of causal relationships among variables. The independent variable is manipulated and its effects upon the dependent variables are measured (Zikmund 1997). In experimental research there is need for control over behavioural events (Coolican 1990; Yin 1989). A sample survey is a method of data collection based upon communication with a representative sample of individuals. Surveys are conducted to quantify certain factual information although there are aspects of it that may be of a qualitative nature (Zikmund 1997). Archival analysis and history are research strategies that deal with contemporary events and thus are frequently reliant upon business records (Yin 1994). A case study is a detailed examination of one setting, or a single subject, a single depository of documents, or one particular event (Bogdan & Biklen 2007; Merriam 1988; Stake 1994; Yin 1989). Case studies vary in their complexity; both novices and experienced researchers

undertake them, however, characteristically they are easier to accomplish than multi-site or multi-subject studies (Bogdan & Biklen 2007; Scott 1965). Case study research as a research methodology is a distinctive form of 'empirical inquiry' (Yin 1989, p.23). The case study is a strategy of investigating an empirical topic by following a set of specified procedures (Yin 1994).

For this research the case study methodology is the preferred research technique as the thesis examines the potential for collaboration as a strategy to attract external funding for business research. Table 3.1 depicts the research strategies in social science research and identifies the research strategy used in this research.

Table 3.1. Research strategies in social sciences

Research strategies in social science research	Research strategies used in this research
Experiment	No
Survey	No
Archival analysis	No
History	No
Case Study	Yes

Source: adapted from Yin (1994)

Identifying research strategies:

- **The type of research question posed.** The important condition for differentiating the various research strategies is to identify and determine the type of research question being posed. Yin (1994) categorises the basic research questions as ‘who’ ‘where’ ‘how’ and ‘why’ (p. 5). The ‘how’ and ‘why’ questions are likely to favour the use of case studies, histories or experiments as the preferred research strategies (Yin 1994).

- **The extent of control the researcher has over behavioural events.** The distinction among case studies, histories, and experiments is compounded by the degree of control the researcher has over behavioural events. Yin (1994) opines that the case study approach is preferred when the investigator has little control over behavioural events. In this study the researcher has interviewed the staff concerned with the business research function at the University. The context of the survey and command over behavioural variables have remained beyond the control of the investigator.
- **The degree of focus upon contemporary as opposed to historical events.** Another condition is concerned with the degree of focus upon contemporary events. The case study approach is preferred in investigating contemporary events as opposed to the historical method which is concerned with the past. The content of this study focuses upon funding for the business research function at a regional university which is a relevant and topical issue with the likely implementation of the Research Quality Framework (RQF) by the Commonwealth government in Australia (DEST 2007).

Table 3.2 depicts the three conditions and demonstrates how they are related to the five major research strategies in social sciences.

Table 3.2. Situations for the selection of the appropriate research strategies

Research Strategies	Research questions	Requires control over behavioural events	Focuses upon contemporary events
Experiment	How, Why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival analysis	Who, what, where, How many, how much	No	Yes / No
History	How, why	No	No
Case Study	How, Why	No	Yes

Source: adapted from Yin (1994: p. 6)

The case study method is appropriate and suitable for this research as it allows the researcher to examine the ‘how’ and ‘why’ type of question in an environment where it is not critical that the researcher controls the research setting.

3.2.2 Types of business research

According to Zikmund (1997) there are three types of business research:

- exploratory
- descriptive
- causal

The categorisation is based upon the fact that the selection method is not arbitrary. This is determined by the nature of the research problem and the degree of uncertainty of about the research problem. Exploratory research is conducted in an attempt to crystallise, clarify and define the nature of an ambiguous research problem with an expectation that subsequent research may be required to attain conclusive evidence (Zikmund 2000). Descriptive research or a diagnostic analysis is conducted in an endeavour to describe characteristics of a business phenomenon based upon some previous understanding of the nature of the research problem (Ticehurst & Veal 2000). In descriptive research there is no explanation of the cause of empirical findings, but there is an attempt to determine the answers to ‘who’ ‘what’ ‘when’ ‘where’ and ‘how’ questions (Zikmund 1997, p.38; Zikmund 2000). Dane (1990) explains the ‘who’ (p.10), the ‘what’ (p.14), the ‘where’ (p.16), the ‘why’ (p.17) and the ‘how’ (p.17).

The ‘who’ of research project involves three different questions:

- Who are the researchers?
- Who are the participants in the project?
- Who are the customers of the project?

The answers to these questions depend on how the project is evaluated.

The ‘what’ research is primarily concerned with the topic and the theory on which the research is based. The theory includes a **worldview** — that is, the basic untestable assumptions underlying all theory and research (Dane 1990 p.14).

The ‘where’ of research comprises the physical and social environment in which the research is conducted.

The 'when' refers to the timeframe of the research, which may affect the study's utility.

The 'why' focuses on the reasons for conducting the research. These include exploration, description, prediction, explanation and action.

The 'how' refers to the way the goals of the research affect its methods (Dane 1990).

Causal research is undertaken when the research problem has already been narrowly defined. The research attempts to identify cause-and-effect correlations among variables (Zikmund 2000). The categorisation corroborates Yin's (1994) distinction that separates exploratory, descriptive and explanatory research.

Another distinction is offered by (Dane 1990) who distinguishes 5 types of business research:

- exploratory
- descriptive
- predictive
- explanatory
- action.

Exploratory research endeavours to determine whether or not a certain phenomenon exists. Descriptive research attempts to examine a phenomenon to fully define it and differentiate it from other phenomena. Predictive research identifies relationships that enable the researcher to speculate about another element by knowing about one element. Explanatory research aims to examine cause-and-effect relationships between two or more phenomena – for example do economic hardships incline people towards religion? Action research is research conducted in an attempt to solve a research problem and requires finding a solution. This categorisation corresponds with (Rossman & Rallis 1998) who note four possible purposes of research: to explore, describe, explain or predict.

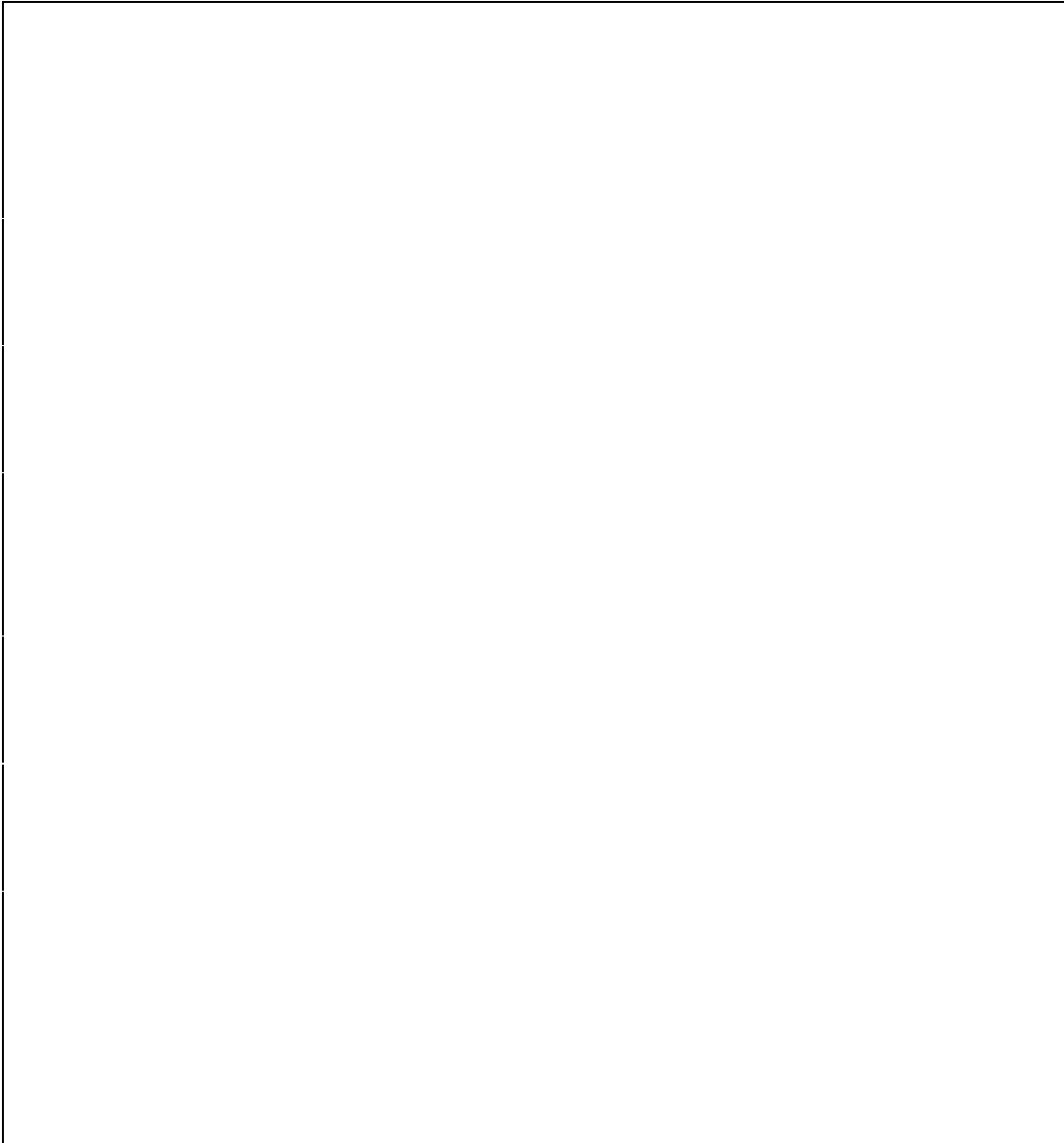
Perry (1995) differentiates between exploratory research and explanatory research. Exploratory research uses qualitative research procedures and poses the queries with regard to the variables involved. The formulated research questions will not be answered with a positive or negative answer but with a description or discussion (Perry 1995). Explanatory research uses quantitative research procedures and asks ‘how?’ and ‘why?’. The testable and measurable research hypotheses can be answered with a ‘yes’ or ‘no’ or a precise answer to the question ‘how many?’ Perry (1998) further sets out two major approaches to theory development, theory building and theory testing. Theory building or induction embraces the generating of theory from empirical data, while theory testing or deduction aims to verify a prior theory (Perry, C. 1998).

In summary there are a number of distinctive business research methods emanating from the literature they include :

- exploratory research
- descriptive research
- explanatory or causal research
- predictive research
- action research
- theory building
- theory testing

The business research methods cited are depicted in Table 3.3

Table 3.3. Business research methods



Source: Dane(1990),Yin (1994, Zikmund (1994), Perry (1995),Perry (1998) Gandolfi, (2001) p.107 unpublished DBA Thesis and prepared for this research

Yin (1994) explains that the hierarchical view of various research methods is a ‘misconception’ (p. 3). The author opines that a more pluralistic view of the different research methods is more appropriate. The distinct research strategies, for example experiment, survey, archival analysis, history and case study, could be applied to all research methods like exploratory research, descriptive research, explanatory or casual research, predictive research, action research, theory building and theory testing. The

analogy is depicted in Table 3.2. where Yin (1994) explains that three conditions associated with the context of research determine the research strategy they consist of the type of research question posed, the extent of control the researcher has over the actual behaviour events and the degree of focus upon contemporary as opposed to historical events. Hence hierarchy does not necessarily guide the research strategy (Gandolfi 2001; Yin 1989, 1994).

In the absence of a theoretical framework and scarcity of empirical research being conducted on research collaboration from a regional institutional perspective, this study has adopted an exploratory type of business research. The choice is deemed appropriate as an inductive theory building approach with the expectation from this thesis that subsequent research may be required to obtain further evidence (Zikmund 2000).

3.2.3 Research problem and research questions

The research issue has been presented in Sections 1.2 and 2.5. It is defined as:

**The potential for collaboration as a policy strategy to attract external sources
of funding for business research**

The research question posed is:

**What are the policy issues possibly affecting collaboration at a regional
university?**

3.3 Justification for the interpretive paradigm and methodology

The justification for the paradigm and methodology is informed by the researcher's ontological and epistemological view. As explained by Punch (1998) ontology refers to 'what exists in the world to the nature of reality: what is the form and nature of reality' and epistemology is 'the nature of knowledge claims, and to the question of what counts as knowledge: what is the relationship between the knower and the known?'(p.170). Ontologically the study of collaboration will rely on qualitative data and is likely to be subjective and understood through perceptions of the informants. From an epistemological point of view the researcher recognises the value of objectivity. Epistemology can also refer to the nature of the relationship between reality and the researcher (Perry, Riege & Brown 1998).

3.3.1 Research paradigms

There are philosophical assumptions which support the four different paradigms of positivism, critical theory, constructivism and realism. These underlie the social sciences relating to ontology, epistemology and methodology. As defined by Punch (1998) a paradigm is 'a set of assumptions about the social world, about what constitutes proper techniques and topics for inquiry' (p.28). A paradigm is further described by Guba and Lincoln (1994) as a 'basic belief system or worldview that guides the investigator' (p.105). The paradigm of a science includes its basic assumptions, the important questions to be answered, the research technologies to be used and what scientific research appears like. The term paradigm is used in different contexts in research and can be interpreted in several ways (Guba & Lincoln 1994; Hussey & Hussey 1997; Neuman 1991; Punch 1998).

The philosophical assumptions which support the four different paradigms underlying the social sciences relating to ontology, epistemology and methodology are presented in Table 3.4.

Table 3.4. Alternative inquiry paradigms

	Positivism	Critical theory	Constructivism	Realism
Item	(objective)	(interpretive)	(phenomenology)	(subjective)
Ontology (form and nature of reality)	<i>naive realism:</i> an apprehendable reality exists driven by immutable natural mechanisms. The investigator and reality are independent.	<i>historical realism:</i> 'virtual reality' shaped by social, economic, ethnic, political, cultural and gender values crystallised over time.	<i>critical relativism:</i> 'reality' is constructed by people, hence there is no 'truth'	<i>critical realism:</i> 'real' reality is only imperfectly and probabilistically apprehensible because of human mental limitations and the complexity of the world.
Epistemology (nature of the relationship between researcher and reality)	<i>objectivist:</i> 'one-way mirror' observer, findings are true	<i>subjectivist</i> value mediated findings	<i>subjectivist:</i> created findings	<i>modified objectivist:</i> observer seeks some objectivity, the research views variability through an 'open window'
Methodology (techniques of collecting data)	Experiments/ surveys: Verification of hypotheses, chiefly quantitative methods	Action research	In-depth unstructured interviews, participant observation	Case studies structured interviews, convergent interviews

Source: adapted from Lincoln and Guba (1985, 1994), Perry, Alizadek and Riege (1997)

The two basic research paradigms commonly used in modern research are the positivist and interpretative paradigms. The positivist research paradigm is associated with quantitative methods, while the interpretive research paradigm is used in qualitative methods. The two approaches have been the subject of debate regarding their advantages and disadvantages among researchers.

3.3.2 The interpretative and positivist paradigm

According to Neuman (2007, p.43; 1991, p.50) interpretative research is the ‘systematic analysis of socially meaningful action through the direct detailed observation of people in the natural setting in order to arrive at understandings and interpretations of how people create and maintain their social worlds’. In qualitative research the questions and methods are initially general and become focused as the study progresses. In qualitative research there is a need for participant observation to comprehend details of conversations in their context. The prevailing research methods include observations in field research, analysis of interview transcripts, conversation notes, documents and archival records (Neuman 1991, 2007; Yen 2003).

The positivists embrace the view that the social world exists externally and that positivist social science is the most common approach to research which can help establish facts about the external social world through a set of methods, as positivism is the natural science (Easterby-Smith, Thorpe & Lowe 1991; Gabriel 1990). The positivist paradigm involves specific methods where the researcher remains detached and objective, culminating in measurement of activities and relationships and taking large samples from the marketplace in order to test propositions. Positivist researchers assert that facts about a ‘single apprehensible reality’ (Perry et al.; 1998, p. 3) can be known, categorised and measured through experiments, surveys and statistics (Guba & Lincoln 1994; Neuman

1991; Tsoukas 1989). The natural and social sciences are construed as objective procedures with the principal purpose of seeking facts and causal relationships among

variables without advocating subjective interpretation (Deshpande 1983; Perry, Riege & Brown 1998). The primary mode of research inquiry for positivists is deductive theory testing (Perry Riege & Brown 1998). The positivist paradigm is inappropriate when approaching a social science phenomenon which involves human beings' opinions, values, attitudes, views and their real-life experiences. Positivists essentially separate themselves from the real world whereas researchers in critical theory, constructivism and realism participate in the real-life world in order to understand and express emergent properties and features (Perry, Riege & Brown 1998).

Table 3.5. presents the differences between the interpretive and positivist research paradigms.

Table 3.5. Differences between interpretive and positivist research paradigms

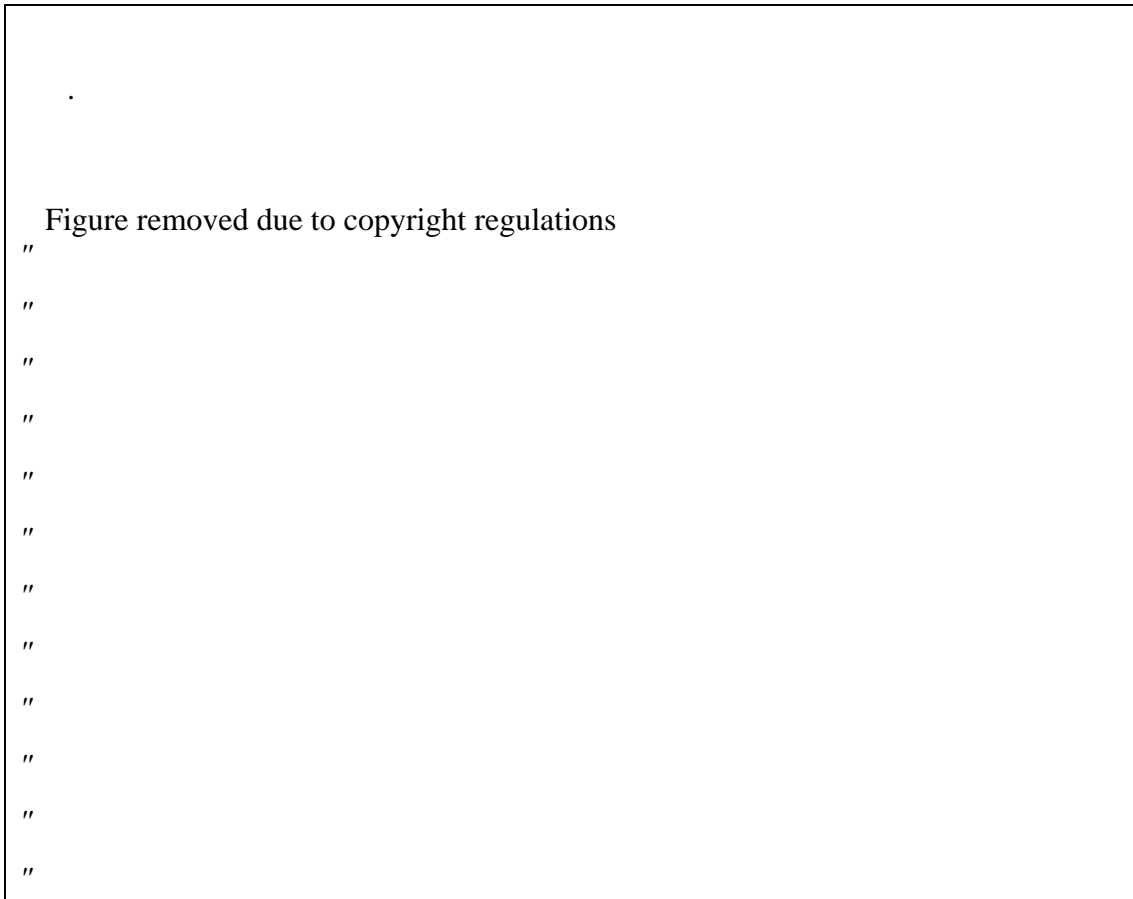


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Source: Perry and Coote (1994: p.103)

The interpretive research paradigm and the positivist research paradigms have distinct differences which needed to be carefully considered by every researcher.

Constructivism. The constructivism paradigm adopts a relativist ontology (Perry, Riege & Brown 1998). The constructivists view truth as a ‘construction’ in which reference is made to a type of belief system held in a particular context, they further claim that truth is the result of perspective and is relative (Crabtree & Miller 1992, 1999; Perry, Alizadek & Riege 1997; Perry, Riege & Brown 1998). The constructivists opine that realities appear as multiples that are socially and in addition experimentally based rather than objectively determined, however they are based on intangible mental constructions of individual persons (Perry, Alizadek & Riege 1997; Perry, Riege & Brown 1998). The

perceptions arising are regarded as 'reality' and the meaning is of more value than measurement. There is contention that constructivism and critical theory are similar in that both inquire about the ideologies and value that underlie a finding (Perry, Riege & Brown 1998). The knowledge created is produced through interaction between interviewer and informant/interviewee. It is imperative that the researcher should be passionate participant while undertaking fieldwork (Guba & Lincoln 1994, p.4). The constructivism approach excludes the real economic and technological dimension of business, therefore the constructivism paradigm is inappropriate for business research (Hunt 1991; Perry, Alizadek & Riege 1997; Perry, Riege & Brown 1998).

Realism. The realism paradigm is also referred to as the critical realism or postpositivist paradigm. The tendency is to create an understanding of the common reality of an economic system in which individuals work or operate independently (Perry, Alizadek & Riege 1997). Realists have a belief that there is one 'real' reality and hence the 'real' world to discover. This is despite the fact this may only be imperfect and probably apprehensive (Guba & Lincoln 1994; Perry, Alizadek & Riege 1997; Perry, Riege & Brown 1998; Tsoukas 1989). The realists accept the difference between the world and their perceptions as a result of the complexity of the world as well as human limitations (Perry, Alizadek & Riege 1997). Perception may not be regarded as reality as constructivists and critical theorists posit. Realists assert that perception is a window on to reality from which a picture of reality can be triangulated with other perceptions (Perry, Riege & Brown 1998: p.5). The realism paradigm does not go with the notion of many realities. There is the persistence that there is one reality, however a number of perceptions should be triangulated to have a better picture of the particular reality (Perry, Alizadek & Riege 1997; Perry, Riege & Brown 1998). The realism methodologies comprise qualitative case studies and convergent interviews. They do not necessarily investigate the cause and effect relationships, but focus on 'underlying causal tendencies or powers' (Perry, Riege & Brown 1998, p.6).

The methods used in social constructionist research can be contrasted directly with the eight features of classical positivist research. These methods are summarised in Table 3.6. and represent a composite picture of different authors rather than the viewpoint of any single author (Easterby-Smith, Mark, Thorpe & Lowe 2002).

Table 3.6. Contrasting implications of positivism and social construction

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Source: Easterby-Smith, Thorpe et al.2002: p.30

In summary the contrasting implications of positivism and social construction are dependent upon who the observer is, the human interests, the explanations, how research progresses, the concepts to be measured, the unit of analysis, generalisation and sampling. The researcher in this study is guided by the realism paradigm to investigate a previously un researched area on collaboration from a regional institutional perspective.

Acceptance of qualitative studies in social science

In the past qualitative methods were accepted only as an exploratory approach to inquiry that required further validation by quantitative methods (Angen 2000). Qualitative methods have now taken centre stage in social sciences research methodologies and are supported by modern authors such as (Miles & Huberman 1994; Perry & Coote 1994; Punch 1998; Yin 1994).

When qualitative methods are used data is textually represented and selection is based on each participant's contribution towards an emerging theory. In qualitative research the focus is on talk or words rather than numbers. This does not mean that it is devoid of measurement, or cannot be used to explain social phenomena (Morse 1999b). From the results the conclusions obtained from the theory should fit all scenarios that may be identified in the wider population.

It is further contended that qualitative research procedures are systematic and specific methods which require:

- observing patterns in data
- asking questions of these patterns. Continuing analysis, asking additional questions and seeking more data
- constructing conjectures – refuting or confirming these conjectures
- deliberately collecting data from specifically selected individuals or cases on targeted topics
- seek relationships with literature, modelling or diagramming (Morse 1999a) .

Qualitative research is subjective and uses analytic generalisation. The main features and key strengths of qualitative research are:

- its unique understanding of social phenomena which derives from its subjectivity.
- it studies people in their natural setting rather than in artificial or experimental ones
- it often employs several methods or adopts a multi-method approach to tackle important questions about social phenomena (Pope & Mays 2000) .

Punch (1998) suggests that the key characteristic of qualitative research is reflected in its design, in that it is naturalistic, preferring to study people, things and events in their natural settings. Perry and Coote (1994, p.103) state that ‘the interpretative qualitative approach utilises analytic generalisation rather than statistical generalisation and that authors, for example Yin (1994), in several management related disciplines advocate the uses of interpretative research methods’. The authors contend that prior reasoning and deductive analysis have contributed to most theories not necessarily being informed by data. According to Perry (2000) exploratory or theory-building research is qualitative and aims at identifying the variables involved.

3.3.3 Definitions of case study research

The case study is defined as a phenomenon which may occur in a bounded context. The case may be of an individual, a small group, an institution/organisation, a community or a nation (Miles & Huberman 1994; Punch, K.F 1998; Punch 2001; Vlosky & Wilson 1997).

Brewer and Hunter (1989) list six types of units which can be studied in social science research:

- individuals
- attributes of individuals

- actions and interactions
- residues and artefacts of behaviour
- settings
- incidents and events
- collectiveness.

Any of the above units may be the focus of case study research (Brewer & Hunter 1989) .

There are different types of cases. Stake (1994) distinguishes three main types:

- the intrinsic case study, where the study is undertaken to give the researcher a better understanding of the particular case
- the instrumental case study, where a particular case is examined to give insight to an issue, or to refine theory
- the collective case study, where the instrumental case study is expected to cover several cases, to learn more about the phenomenon, population or general condition (Punch 1998; Stake 1994).

The *Dictionary of Sociological Terms* defines case study as:

a method of studying social phenomena through the thorough analysis of an individual case. The case may be a person, a group, an episode, a process, a community, a society or any other unit of social life. All data relevant to the case are gathered and all available data are organised in terms of the case. The study method gives a unitary character to the data being studied by interrelating a variety of facts to a single case. It also provides an opportunity for the intensive analysis of many specific details that are often overlooked with other method (Punch 2001, p.153; Theodorson & Theodorson 1969).

The above definition highlights four main characteristics of case studies:

- the case is a bounded system in that it has boundaries. Yin (1984) points out that the boundaries between the case and context may not be clearly evident and the researcher has to identify and describe the boundaries of the case as clearly as possible
- the case needs to give focus to the research and make the logic and strategy of the research clear. In identifying the case it is imperative to determine the unit of analysis which is important in the analysis of data
- there is an explicit attempt to preserve the wholeness, unity and integrity or the holistic nature of the case. As it is not possible to study everything about even one case, specific focus is required and research questions help to define the focus
- the multiple sources of data and data collection methods are likely to be applied in a naturalistic setting. Case studies use sociological and anthropological field methods such as observations in natural settings, interviews and narrative reports. In other circumstances they may use questionnaires and numerical data, hence implying that case study is not necessarily a qualitative technique though the majority of case studies are qualitative (Punch 2001).

The idea about case study is that one case or a number of cases are studied in detail using whatever methods are appropriate (Punch 2001). The case study is a research strategy, which investigates an empirical topic by following a set of prespecified procedures (Yin 1994). From a historical perspective case study research has been used predominantly for exploratory research while another research methodology, for example survey designs, was required for later studies (Borsch & Arthur 1995). The implication therefore is that case study research had not been recognised as a comprehensive research strategy (Yin 1994).

In order to be recognised as a research strategy, case study research must contribute to theory building or theory generation and have a 'logic of design' (Adams & White 1994,

p.565). Case studies as teaching devices have been used in various academic disciplines, among them business, law, public policy and medicine (Perry 1998; Perry & Coote 1994; Yin 1994). Various scholars argue that case studies are not confined to teaching devices but have the capacity of being used as a methodology and research strategy (Adams & White 1994; Easton 1994; Huberman & Miles 1994; Parkhe 1993; Perry 1998; Perry, Alizadek & Riege 1997; Tsoukas 1989; Yin 1989, 1994). Case study research as an analytical tool in postgraduate research was conceptualised by Perry and Coote (1994) who defined the case study approach as ‘a methodology based on interviews which is used in a postgraduate thesis involving a body of knowledge’ (p. 102).

The case study method focuses upon a phenomenon within its real-life context by obtaining data from diverse sources to comprehensively investigate and analyse the phenomenon in-depth and in the process generate and build theory (Punch 2001; Yin 1994).

3.4 Theory and model building from this research

In case study research it is important to have a well-defined focus and to specify the kind of data to be systematically gathered (Mintzerberg 1979). The research questions developed and defined in Chapter 2 provide the basis. The definition of the research questions within a broad topic permits the researcher to be specific about the institution to be analysed and the kind of data to be gathered (Eisenhardt 1989).

Yin (1989) suggests that research questions play an important role within the research design framework. On the other hand Eisenhardt (1989) has a different view as to whether a researcher should develop a theory before entering the data collection phase. Yin (1989) further states that theory development prior to the collection of any case study data is an essential step in doing case studies. Yin’s (1989) prescriptive case study approach is to develop a theory from the literature review and thereafter define the relationship between those variables within the theory. This would serve as the basis for

covering the questions, propositions, unit of analysis, analytical logic procedures and form the basis for interpreting the findings.

Eisenhardt (1989) contends that in the first phase of theory building research, investigators should formulate a research problem and where possible specify potentially important variables with a degree of reference to extant literature. In contrast to Yin's (1989) view Eisenhardt (1989, p. 536) maintains that the 'investigator should avoid thinking about specific relationships between variables and theories as much as possible, especially at the outset of the process... since such attempts will result in bias and limit the findings'. In the context of Eisenhardt's (1989) prescription, a case study approach is to firstly formulate a research problem and identify potentially important variables that serve as the basis for designing the research strategy through which data can be specified and synthesised for theory building.

Induction and deduction are opposite ends of a continuum. Pure induction or grounded theory is at one end, while on the other end is deduction which lays emphasis on generation of theory derived from empirical data (Perry 1998).

3.5 Criteria for judging the quality of case study design

The major criticism directed at case study methodology is linked to the lack of scientific rigour. This is amplified by the perception that rich story telling conceded a lot of bias to the views of the researcher in the findings and conclusions of the research (Eisenhardt 1989; Parkhe 1993; Yin 1994). It may however be postulated that the lack of scientific rigour can permeate both qualitative and quantitative research. The absence of scientific rigour could result in inconsistency of logic, inadequate documentation, bias on the part of the investigator and failure to achieve appropriate theoretical generalisations from data.

There are four criteria commonly used to establish the credibility of empirically-based social research. As explained by Yin (1994) the case study methodology falls within the scope of these tests which include:

- construct validity
- internal validity
- external validity
- reliability.

Construct validity is the development of correct operational measures of the concepts being studied (Yin 1994). There are three tactics which can be implemented to increase construct validity during data collection, analysis and report writing. They include triangulation of data from multiple sources of evidence, establishment of a chain of evidence and having a draft report reviewed by informants (Yin 1994).

Internal validity is concerned with the determination of a causal relationship between variables (Yin 1994; Zikmund 1997). Further internal validity focuses on causal or explanatory studies and not for descriptive or exploratory studies (Yin 1994). In quantitative research internal validity ensures that variable x was caused by variable y and not an unknown variable z. Internal validity attempts to eradicate or minimise ambiguities and contradictions.

External validity helps to determine whether the research findings are generalisable beyond the immediate case study (Yin 1994). In quantitative research external validity deals with statistical generalisation while qualitative research aims for analytical generalisation (Perry 1998; Perry, Alizadek & Riege 1997; Tsoukas 1989; Yin 1994).

Reliability is the capacity and the ability of other investigators to achieve the same empirical findings and conclusions after carrying out the same procedures as the original study (Silverman 1993, 1997; Yin 1994). The implication is that the research findings should be reproducible if the interview techniques and procedures are consistent throughout the research process (Lincoln & Guba 1985; Yin 1994). It is important to

appreciate however that people's perceptions, attitudes and beliefs are subject to change over time. Hence empirical data collected by different researchers at different periods may not converge into one consistent picture. To enhance reliability in qualitative research it is necessary to document procedures followed in detail (Yin 1994).

Table 3.7. depicts the tests for establishing validity and reliability in case study research.

Table 3.7. Tests for establishing validity and reliability in case study research

Test	Meaning/ Definition	Case study tactic	Phase of research in which tactic occurs
Construct validity	The establishment of correct operational measures for the concepts being studied	<ul style="list-style-type: none"> • Multiple sources of evidence • Establish chains of evidence • Key informants review draft report 	<ul style="list-style-type: none"> • Data collection • Data collection • Composition of report
Internal validity	The establishments of causal relationships between variables	<ul style="list-style-type: none"> • Pattern matching • Explanation building • Time series analysis 	<ul style="list-style-type: none"> • Data analysis • Data analysis • Data analysis
External validity	The ability to generalise the results of the research	<ul style="list-style-type: none"> • Multiple-case design and the application of replication logic 	<ul style="list-style-type: none"> • Research design
Reliability	The degree to which measures are free from error and can be repeated	<ul style="list-style-type: none"> • Case study protocol • Case study database • Tape recordings and interview transcripts 	<ul style="list-style-type: none"> • Data collection • Data collection

Source: adapted from Yin (1994: p.34), Zikmund (1994), Silverman (1997)

The section has expounded on the tests for establishing validity and reliability in theoretical paradigms of positivism, critical theory and constructivism construct validity,

internal validity, external validity and reliability. This research will achieve quality through sound research design, data collection, data analysis and writing of the thesis.

3.6 Criteria for selecting a single case study methodology

In this section the criteria for selecting the single case study and the research design is examined and justified.

In undertaking this single case study, the researcher refers to the significance of a unique case study (Whyte & Whyte 1991):

Responding to the first report on Mondragon at the 1976 annual meeting of the American Sociological Association, a discussant dismissed the case as simply a human-interest story. The argument was that the success of the Mondragon depended on two conditions: the unique nature of the Basque culture and the genius of the founder, Father Jose Maria Arizmendiarieta. The fact that neither of these conditions could be reproduced anywhere else in the world, then the Mondragon story was without scientific or practical significance.

The most general answer to such criticism is that it is itself unscientific. One of the fundamental principles of science is that on discovering an exception to a law or generalisation, one does not rationalise it away and reaffirm the general principle. On the contrary one concentrates one's attention to the exception, in the hope that it will lead to a modification of the previously accepted generalisation, or to a more basic reformulation, opening up new avenues of scientific progress. (p.4)

The case study approach is the preferred strategy in situations where there is no control over relevant behaviours and the focus is on contemporary events (Yin 1989). The researcher has no control over the business research function of the regional university

and hence the choice of a case study approach as the most appropriate strategy for the research.

3.6.1 Four basic types of case study designs

Yin (1994) developed a matrix in which the researcher is confronted with two choices: the choice between a single-case or multiple-case design and the choice between a holistic and embedded design. This results in a typology in which four different types of research designs can be discriminated:

- single-case (holistic)
- single-Case (embedded)
- multiple-Case (holistic)
- multiple-Case (embedded).

The four types of designs for case studies are depicted in Table 3.8.

Table 3.8. Four types of designs for case studies

Type \ Number	Single-case designs	Multiple-case designs
Holistic (single unit of analysis)	Type 1	Type 3
Embedded (multiple unit of analysis)	Type 2	Type 4

Source: adapted from Yin (1994: p 39)

The single case study design shown in Table 3.8. (type I or type 2) also frequently referred to as a ‘classic’ case study (Yin 1994, p.45) would be appropriate if the research meets one of the following sets of circumstances:

- When the research investigates a critical case where a well formulated theory is tested with a clearly stated set of propositions whereby the study confirms, challenges, or extends existing theory and thus may constitute a significant contribution to knowledge and theory-building.
- When the nature of case is extreme or *unique*. In other words, the finding of other similar cases is highly unlikely and the phenomenon could not be researched if this single case was not investigated.
- When the case is considered revelatory this provides the opportunity to observe a prevalent phenomenon previously inaccessible to scientific investigation.

According to Yin (1994) the presence of only one of the criteria above is sufficient justification for a single study. The nature of this research satisfies the second criterion and therefore a single case study methodology (type 1) is appropriate for this research.

In case of other research, a multiple-case design is used for the following reasons:

Multiple case studies are more robust and promote outcomes that are powerful and compelling (Parkhe 1993; Yin 1994).

Multiple case studies are suitable for the description and investigation of complex phenomena (Yin 1994).

Multiple case studies can be used for theory generation (Patton 1990).

Multiple case studies provide a full variety of evidence (Yin 1994).

Multiple case studies use triangulation of evidence to achieve qualitative rigour in qualitative research (Yin 1994).

Multiple case studies are used in postgraduate research because they allow cross-case analysis to be used for richer theory-building (Perry 1998).

Multiple case studies can be viewed to be methodologically rigorous and built upon replication (Perry 1998; Yin 1994).

The choice between holistic and embedded single-case/multiple-case focuses on the unit of analysis. The unit of analysis helps to determine and define the object which the researcher would like to address in the research problem and research questions. According to Yin (1994) the unit of analysis is the case itself, or in other words the level of investigation (Zikmund 1997). A holistic design involves only one unit of analysis

(Yin 1994), whereas an embedded design includes sub-units such as divisions, departments, work groups and individuals (Zikmund 1997) .

In this research however, use of multiple-case design is inappropriate due to time and resource constraints, hence the choice of a single case design which involves only one unit of analysis – Southern Cross University, a new regional university in Australia,. The nature of this case is unique, the finding of other similar cases is unlikely if this case study was not investigated (Yin 1994, p. 45).

3.6.2 Criteria for selecting participants

There are no rules in qualitative research that can be applied to the determination of sample size. Opinions differ with regard to the number that should be considered (Perry & Coote 1994). Patton (1990) opines that the ‘size of sample depends on what you want to find out, how the findings will be used, and what resources including time you have for the study’ (p.184).

The foundation of purposeful sampling in qualitative research is the validity, meaningfulness and insights that be deduced from the participants selected (Patton 1990; Perry 1998)

According to the literature on case study methodology, the suggested number of conducted interviews is in the range of 20 to 50 participants. This figure corresponds with Perry’s recommendation that a PhD thesis ought to require approximately 35–50 interviews (1998).

For the purpose of this research, the qualifying criteria for informants to participate in interviews was based on their previous, current, or likely involvement with research collaboration at the University. Perry (1998) states that PhD interviews should involve several interviews within the hierarchical levels of an institution. In this case the

hierarchy of an informant within the University and the number of years of involvement with research were important.

To triangulate the research findings, views are sought from a selected group of informants through 'snowball sampling' (Fitzgerald 2007, p. 9). The process refers to the identification of informants from organisations which meet the criteria of research collaboration and those who have benefited from research outcomes of the University. The identified informants were then requested to recommend other informants who met the same criteria of the study.

3.7 Data collection for case study

This section reviews the data collection for case studies with a particular focus on in-depth interviews. Next, the interview questions based along the lines of those set in the interview guide and protocol are presented. A brief description of other case study data collection methods which include survey techniques and instruments, types of questionnaire surveys, measurement techniques, and pilot surveys are discussed. In the final sub-section the case study protocol is introduced and expounded.

The purpose of this research is to seek the opinion of staff involved with research on the policy issues possibly affecting research collaboration at a regional university in Australia. The policies would enable the university to respond to the changing public sector research funding environment through collaboration as a policy strategy to attract external sources funding for business research.

3.7.1 Interviews

Interviews have been variously defined by different authors as a 'conversation with a purpose' (Berg 1989, p. 13; Berg 1995, p.57; Berg 1998, p.66; Rossman & Rallis 1998. P. 124) or 'a purposeful conversation' (Bogdan & Biklen 1998, p 93). Interviews are

considered to be ‘essential sources of case study information’ (Yin 1994, p. 84). The literature review on research methodologies highlighted that interviews vary widely in type, form and purpose. The type of interview will depend upon the nature of the population, the topic for interview, the setting and the purpose of the study (Adams & Schvaneveldt 1991). Yin (1994) emphasises that interviews are essential tools for case study research due to the fact that most studies are about human affairs. The facts about certain matters or events or the informant’s/respondent’s opinion regarding events may be effectively harnessed (Bogdan & Biklen 1998). The interview is viewed as a dynamic, meaning-making occasion where the actual circumstance of the meaning construction is important (Berg 1998; Holstein & Gubrium 1995). The interviewees can be seen as ‘informants’ (Bogdan & Biklen: 1998: p. 32) rather than mere ‘respondents’ (Yin 1994, p. 84). The literature survey unveils a variety of categories of interviews and with a multitude of technical terms. The main types of interviews are depicted in Table 3.9.

Table 3.9. Major categories of interviews

Berg (1989) Berg(1995) Berg(1998) Berg(2001)	Dane (1990)	Adams & Schvaneveldt(1991)	Yin (1994)	Rossmann & Rallis(1998)
Unstandardised (informal) Interview	Unstructured, Unfocused or Nondirective Interview	Nondirective Interview	Open-ended interviews	Dialogic Interviews
Semi- Standardised (guided) interview	Partially structured Interviews (focused)	Focused interview	Focused interviews	Interview guide approach
Standardised (formal) interview	Highly structured Interviews (schedules)		Structured interviews	Standardised open-ended interview

Source: adapted from Berg (1989),(1995),(1998),(2001),Dane (1990), Adams & Schvaneveldt (1991) Yin (1994), Rosman & Rallis (1998) and prepared for this research

As outlined in Table 3.9 the first category embodies informal, unstandardised, unstructured, unfocussed, nondirective open-ended or dialogic interviews. The interview format is based on the premise that the interviewer may not know all the necessary questions in advance. It is incumbent on the interviewer to encourage the interviewee/informant to discuss a topic with little or no guidance and few questions (Dane 1990).

The second category of interviews consists of semi-standardised, partially structured, focused interviews or interviews with a guided approach. Semi-standardised guided interviews involve the implementation of predetermined questions which each interviewee is asked in a predetermined order. Douglas (1985) explains that the unstandardised interview may be useful for establishing rapport. Further the semi-standardised interviews allow the interviewer to probe beyond their prepared and standardised questions (Berg 1989; Berg 1998; Douglas 1985).

The third category comprises formal or standardised interviews which are highly structured. These interviews are orally administered questionnaires and are designed to elicit information through a set of predetermined questions. The same syllabus and interview questions are used for all the interviewees. There is a presumption that the wording of each question has equal meaning to each interviewee. This however requires authentication (Berg 1989; Berg 1998).

According to Douglas (1985) interviews involve use of strategies of interaction '*to optimise cooperative, mutual disclosure and a creative search for mutual understanding*' (p.25).

The research being a single case study of the University, there is a need to triangulate the data and methodology through interviews with research partners and beneficiary institutions/ organisations. The interview method is therefore considered appropriate for

this research. Patton (1990), states that through interviews informants would be able to provide rich information for the research.

This subsection has defined and discussed the interview as a data collection technique. The next subsection presents other case study data collection methods which include survey techniques and instruments, types of questionnaire surveys, measurement techniques, and pilot surveys.

3.7.2 Other case study data collection methods

The previous subsection defined and discussed the interview as a data collection technique. This sub-section presents other case study data collection methods which include survey techniques and instruments, types of questionnaire surveys, measurement techniques, and pilot surveys.

3.7.2.1 Survey techniques/instruments

The method most commonly used to collect primary data is the survey (Zikmund 2000). The survey is defined as ‘a research technique where information is obtained from a sample of people by use of a questionnaire’ (p.60).

Surveys are a common tool for business research. They provide quick inexpensive, efficient and accurate means to obtain information depending on the business needs. When surveys are conducted appropriately, they are flexible and valuable to institutions and business managers (Zikmund 1997).

In the 20th century, ‘survey data were obtained when individuals were requested to respond to questions put to them by human interviewers or to questions they read’ (Zikmund 2000, p.189). The two common data collection methods in a survey are, personal via the interview and distributed questionnaires (Zikmund 2000).

3.7.2.2 Questionnaire

This subsection focuses on the survey questionnaire as a case study data collection method.

The questionnaire survey involves quantification of response data. The survey is a useful methodology when data is required from a representative sample (Ticehurst & Veal 2000). The questionnaire becomes a written list of questions, the answers to which are recorded by the respondent (Kumar 1996). The questionnaire survey involves the 'gathering of information from individuals using a formally designed schedule of questions' (Ticehurst & Veal 2000, p.136). This is the technique normally used in management research and in most cases only a proportion or sample of total populations may be involved in a questionnaire survey (Ticehurst & Veal 2000).

The questionnaire's goals are to collect data with maximum reliability and validity, and obtain information that is relevant to the objective of the survey. The respondents are expected to read questions, understand and interpret what is expected and write down or record the answers without undue influence (Kumar 1996). Table 3.10 depicts the different types of questionnaire surveys with their descriptions and possible application.

Table 3.10. Types of questionnaire surveys

Questionnaire survey	Description/use
Household survey	Representative of a community includes all age and occupation groups.
Telephone survey	Quick, cheap and easy to apply but limited to subscribers only.
Postal / Mail survey	Useful for large samples at low cost, response rate could be low.
Customer survey	Referred to as visitor, on-site or user surveys. Useful for policy, planning or management.
Captive group survey	Refers to a situation where the subjects are members of a group.
Organisation surveys	A combination of telephone surveys, mail outs and captive group surveys depending on the purpose of the research. They are easy to follow up and have lower costs.
Electronic mail survey	Like the mail survey useful for large samples at very low cost but response is likely to be low.

Source: adapted from Ticehurst & Veal (2000)

The choice of a questionnaire depends on a number of considerations. Key among them are the target group, time, cost and the desired outcome. Self-enumeration surveys are those that are sent or left with respondents to complete. They are primarily postal or mail-out surveys and may also include hand-delivered questionnaires. The questionnaires are delivered to and/or collected from the respondents personally by the researcher; this method may result in an improved response rate. The disadvantage with this method is

the cost and the requirement that the questionnaire be straightforward. There could also be a difficulty in achieving a sufficient or quality of response (Jackson 1993) .

The choice of survey depends on the purpose of research, conducting questionnaire surveys requires careful thought and decision making. In effect data collection involves three types of information:

- respondent characteristics
- activities and behaviour
- attitudes and motivations.

The questions can be classified as ‘open ended’ where the interviewer asks questions without any range of answers, or ‘closed or pre-coded’ questions where a range of answers are provided and or a combination of the two approaches (Ticehurst & Veal 2000).

The interviews conducted for this research were based around a survey questionnaire, The first part sought the informant’s background information, their academic qualifications, years of involvement in research at previous and current institutions and their research field / discipline. The latter questions focused on policy on collaboration development, resources and impact on collaboration, institutional relations and collaboration, research focus and collaboration finally on collaboration policy operational strategies. In order to enrich data for this research interviews were also undertaken with twelve external members of the university, six research collaborators and six research beneficiary institutions organisations.

3.7.2.3 Measurement techniques

There are several types of attitude/opinion measurement techniques that may be used to measure responses:

- **Likert scales:** The respondents are asked for their response to statements signifying their agreement or disagreement.
- **Ranking :** the respondents are asked to rank items in of order of importance

- **Attitude statements:** The respondents are asked to show their attitudes towards a complex subject.
- **Semantic differential:** Researchers offer pairs of contrasting descriptors to respondents and request them to signify how the concept being studied relates to the descriptors (Ticehurst & Veal 2000).

3.7.2.4 Pilot surveys

Pilot surveys are a preliminary to questionnaire surveys, and are used to test questionnaire wording, sequencing and layout (Ticehurst & Veal 2000). Piloting the questionnaire allows the researcher to determine whether items are properly worded and if the response items ‘agree’ and ‘disagree’ are used as synonyms and whether are possible differences in implication (Rosenthal & Rosnow 1984, p.133). When the questionnaire is piloted the process helps in eliciting the relevant information sought in the study to address the research problem and question (Rosenthal & Rosnow 1984).

To strengthen the data collection process the researcher should undertake a pilot survey to test the questionnaire wording sequencing and layout. The outcome of the pilot helps in finalising the questionnaire format.

Advantages and disadvantages of questionnaire surveys identified by researchers

There are advantages and disadvantages of questionnaire surveys which have been identified by different researchers. Among the advantages of the questionnaire survey is the capacity to reach a large number of people at low cost. The advantages and disadvantages are depicted in Table 3.11.

Table 3.11. Advantages and disadvantages of questionnaire survey

Advantage/ researcher	Disadvantage/ researcher
Useful when the research questions indicate the need for relatively structured data and when data are required from samples representative of a defined wider population (Ticehurst & Veal 2000).	<ul style="list-style-type: none"> • Low response rate and self-selecting bias may emerge (Warwick & Lininger 1975)
<ul style="list-style-type: none"> • Ideal means of providing quantified information (Ticehurst & Veal 2000). 	<ul style="list-style-type: none"> • Applications are limited to a specified population (Clover & Balsey 1984; Jackson 1993)
<ul style="list-style-type: none"> • Provide a transparent set of research procedures the way information has been collected and analysed is clear (Ticehurst & Veal 2000). 	<ul style="list-style-type: none"> • There is no opportunity to clarify issues which respondents do not understand (Kumar 1996).
<ul style="list-style-type: none"> • Quantification can provide relatively complex information in understandable form (Ticehurst & Veal 2000) 	
<ul style="list-style-type: none"> • Methods like longitudinal surveys and repeated surveys provide the opportunity to study change over time, using comparable methodology (Ticehurst & Veal 2000) 	
<ul style="list-style-type: none"> • Surveys are an effective means of gathering a wide range of complex information(Ticehurst & Veal 2000). 	

<ul style="list-style-type: none"> • Surveys can be administered to large numbers of people and are more economical than interviews (Philips 1971) . 	
<ul style="list-style-type: none"> • Allow anonymity that is not provided by the interview technique (Rosenthal & Rosnow 1984). 	
<ul style="list-style-type: none"> • Require minimal personal support (Clover & Balsey 1984). 	
Advantage/ researcher	Disadvantage/ researcher
<ul style="list-style-type: none"> • They can be delivered to a sample in widely scattered locations covering a large geographic area (Clover & Balsey 1984). 	
<ul style="list-style-type: none"> • Provide opportunities to reach participants who are difficult to contact (Jackson 1993). 	

Source: adapted from Jackson (1993), Warwick & Lininger (1975), Rosenthal & Rosnow (1984), Clover & Basley (1984), Kumar (1996), Ticehurst & Veal(2000)

The advantages of the survey questionnaire far outweigh the disadvantages, as argued by the various scholars depicted in Table 3.9. However, the questionnaire survey technique is not considered appropriate for this research. The researcher is aware that the informants have a lot of information on the research issue and this would be restricted if a survey was carried out.

In this section the different case study data collection methods were discussed they include interviews, survey techniques and instruments, types of questionnaire surveys, measurement techniques, and pilot surveys. The following subsection focuses on case study protocol.

3.7.3 Case study protocol

The previous subsection defined and discussed other case study data collection methods. This sub-section focuses on case study protocol which is regarded as a major means of achieving reliability of case studies (Yin 1989).

A case study protocol transcends or is more than an instrument (Yin 1994). The protocol contains the case study instrument, procedures, general rules for using the instrument (Dick 1990). The researcher is enabled by the case study protocol to increase control over the conceptual environment (Cooper & Emory 1995). Yin (1989, 1994) postulates that a case study protocol should comprise four sections: the overview of case study, field procedure, case study questions and guide for the case study report. The four components are depicted in Table 3.12.

Table 3.12. Case study protocol requirements

Section	Characteristics
Overview of case study	<ul style="list-style-type: none">• Project objectives• Case study issues Relevant reading
Field Procedure	<ul style="list-style-type: none">• Credentials of cases• Access to cases• General sources of information• Procedural reminders
Case study questions	<ul style="list-style-type: none">• ‘Table Shells’ for specific array of data• Potential sources of information for answering questions
Guide for case study report	<ul style="list-style-type: none">• Outline• Format

Source: adapted from Yin (1989, 1990)

In the first section, the overview of the case study was outlined in Chapter 1 (introduction) and Chapter 2 (literature review) of this study. The background

information relevant to the thesis was surveyed and analysed in the review of the literature in Chapter 2.

The second section, the determination of field procedures, is essential in the case study protocol as the case study focuses on a real-life context, the policy issues that could possibly affect collaboration at a regional University.

In the third section, the list of case study questions is regarded as ‘the heart of protocol’ (Yin 1994, p. 69). The case study questions ought to be posed to the investigator, rather than to the respondents, the questions should act as ‘reminders to the investigator regarding the information that needs to be collected and why’ (Yin 1989, p.76). The interview questions are related to the research question which was established in Chapter 1 and Chapter 2 of the thesis and stated in Sections 1.2. and 2.5. The research question and related interview questions are depicted in Table 3.13.

Table 3.13. Research question and related interview questions

Research question (developed in the literature review)	Interview Questions (in the interview protocol)
What are the policy issues possibly affecting collaboration at a regional university?	How is the regional university policy on collaboration developed? (Questions 1–8)
	How is the regional university policy on collaboration funded? (Questions 9–14)
	How is the regional university policy on collaboration reflected in relations with external institutions? (Questions 15–17)
	How does the regional university policy on collaboration impact on the university’s research focus? (Questions 18–21)
	What are the operational strategies of the regional university policy on collaboration? (Questions 22–27)

Source: developed for this research

The five interview questions shown in Table 3.13 will address the research question on the policy issues possibly affecting collaboration at a regional university.

Yin (1989, 1994) opines that each interview question ought to be accompanied by several sources of evidence – for example annual reports, memos, internal documents and observations will ensure a smooth transition between research questions and the sources of evidence and facilitate the collection and analysis of data.

In the fourth and final section, the guide for the case study report is concerned with outline, format, and audience of the case study report.

The case study protocol provides a foundation, and presents the parameters for case study methodology for this research. The protocol further assists in establishing the validity and reliability of this study and enhances the quality of the outcome of thesis

In this section the data collection for case studies with particular emphasis on in-depth interviews was reviewed. The next section presents the procedure for analysis of data and information in case study.

3.8 Case study analysis procedure

The previous section reviewed data collection for case studies. This section deals with the analysis of data and information gathered from in-depth interviews and internal documents compiled within the framework of case study methodology.

The analysis of case study evidence is complicated and one of the least developed aspects of case study methodology (Eisenhardt 1989; Yin 1994). As posited by Yin (1994) there are no fixed formulas or recipes to guide an upcoming researcher. From the foregoing it must be emphasised that the analysis of data gathered from the interview process constitutes the basis of theory building, or theory generation in case studies (Eisenhardt 1989).

In case study research, data analysis consists of examining, categorising, tabulating and compiling empirical evidence to address the research questions (Miles & Huberman 1984; Yin 1994). According to Patton (1990) qualitative analysis is a continuing process which begins during the data collection phase of the research. This position is supported by Lincoln & Guba (1985) who advocate an exploratory approach to data analysis to achieve focus by placing raw data into categories and patterns in order to allow the investigator arrive at generalisations. As Yin (1994) further states, the essential outcome of analysing case study 'is to treat evidence fairly, to produce compelling analytical conclusions, and to rule out alternative interpretations' (p.103).

There are two strategies that emerge, one relying upon theoretical propositions and the other on developing a case description. The first strategy relying upon theoretical propositions embraces the view that the entire research is based upon theoretical propositions or the research questions in this study. The reliance upon such propositions enables the researcher to focus on certain data and in the process disregard other less relevant data. Yin (1994), states that the propositions are believed to organise the case study and to define 'alternative explanations' to be examined (p.104). The second strategy developing a case description is regarded as inferior and adopted in the absence of theoretical propositions (Yin 1994). For the purpose of this study, the researcher is inclined to adopt Yin's first general case study analysis strategy. This approach is line with the five well formulated research questions derived from the research issue and problem as determined in the literature review.

The technique employed in data analysis for this research is to use quotations from the interviews in order to justify conclusions. The findings of this research as depicted in Chapter 4, contain extensive quotations from the informants for illustration and substantiation of results (Bogdan & Biklen 1998, 2003, 2007).

Yin (1994), states that the opportunity to incorporate several sources of evidence constitutes a major strength of case-study methodology. The literature on case study

methodology discloses two views of the use of triangulation in attempt to reconcile facts. The convergent view, aims to demonstrate that all sources of evidence harmoniously conform to one fact. Real triangulation occurs when the researcher is able to collect information from different sources to corroborate the same fact or phenomenon (Crabtree & Miller 1992, 1999; Ely 1991; Yin 1994). The divergent view or non-convergent view applies when different sources of evidence address different facts (Yin 1994) .

In conclusion, the analysis of empirical case study evidence is frequently regarded as difficult. However the literature on case study discloses that there are a number of methods, techniques and procedures that have evolved. In this study the nature of the research issue has compelled the investigator to rely upon the interview process accompanied by internal documents in an endeavour to build and generate theories. The internal documents used to triangulate the research findings include annual plans, strategic plans, research reports and publications. The incorporation of multiple sources of evidence as well as the corroboratory process of triangulation will ensure that conclusions and findings will be authentic and therefore credible and convincing (Yin 1994).

3.9 Limitations of case study research

This section pinpoints and enumerates the limitations and criticisms of case study research and the possible strategies adopted in the context of this research to overcome them.

Yin (1994), states that the case study methodology is a distinct form of empirical inquiry. The case study research is rigorous, coherent, and based upon a perfectly justifiable philosophical position (Perry 1998). The case study is peculiar and has generated unique capacities and strengths, while at the same time it may have yielded a number of weaknesses. Table 3.14 depicts some of the limitations from various scholars and proposes strategies adopted in this research to overcome these limitations and criticisms.

Table 3.14. Limitations and criticisms of case study research

Limitations and criticisms of case study research	Source Proposed	strategies for overcoming shortcomings	Relevant text addressing limitations and criticisms
1. Development of theories that are unnecessarily complex	Eisenhardt: 1989 Parke: 1993	<ul style="list-style-type: none"> • Literature review • Research problem and research questions • Pilot interview protocol 	Chapter 2 Chapter 3
2. Difficult to conduct	Eisenhardt: 1989 Parke: 1993	<ul style="list-style-type: none"> • Case study protocol 	Chapter 3
3. External validity	Eisenhardt: 1989 Patton: 1990 Yin: 1989,1993,1994 Perry:1998	<ul style="list-style-type: none"> • Theoretical replication • Literal replication 	Chapter 3
4. Insufficient approach to lead to theory development	Miles & Hubermann: 1984 Eisenhardt: 1989 Parke: 1993	<ul style="list-style-type: none"> • Research methodology 	Chapter 2 Chapter 3
5. Researcher bias	Bonoma:1985 Bailey: 1987 Patton: 1990 Bailey: 1992 Yin: 1989,1993,1994	<ul style="list-style-type: none"> • Reviews with supervisor • Reviews with peers 	Chapter 3 Chapter 4 Chapter 5
6. Theory developed may be narrow and idiosyncratic	Eisenhardt; 1989 Yin: 1994	<ul style="list-style-type: none"> • Case design 	Chapter 2 Chapter 3

Source: Bailey (1982,1992), Miles & Hubermann (1984), Bonoma (1985), Yin (1989,1993,1994), Eisenhardt (1989), Patton (1990), Parke (1993), Perry (1998) and modified for this research

The first criticism levelled at case study design is the claim that empirical evidence gathered in the case design may result in complex theories. This research aims at developing a theory on the potential of collaboration as a strategy and is therefore exempt of this criticism. The literature, (Chapter 2) has been carefully reviewed from which emerge, the research problem and research questions. A pilot (Chapter 3) was carried out to test the interview protocol wording, sequencing and layout to ensure the study research elicits the relevant information sought (Rosenthal & Rosnow 1984; Ticehurst & Veal 2000).

The second criticism of case study research is that case study is regarded as one of the difficult methodologies of conducting research (Eisenhardt 1989; Parkhe 1993). The research has attempted to overcome this potential criticism through the development and use of a case study protocol comprising of the procedures and rules that the researcher used as a guide in conducting the case study research (Yin 1994).

The third criticism directed at case study research is that the ability to achieve external validity, which is linked to replication logic, is limited (Yin 1994). This criticism is based upon the comparison of a single case to a sample that is capable of statistical generalisation (Yin 1994). The research has endeavoured to overcome this criticism through triangulation of the methodology, through interviews with research partners and beneficiary organisation/institutions.

The fourth criticism of case study research is associated with theory development . This is not confined to case study method but pertains to all approaches to theory development resulting from research in the social sciences in which a certain phenomenon is observed in its context (Parkhe 1993). In this regard, there is no single research approach that is capable of achieving construct validity, internal validity, external validity and reliability concurrently (Parkhe 1993). This research has endeavoured to overcome this criticism by adopting a triangulated methodology through interviews with research partners and beneficiary organisation/institutions.

The fifth criticism directed at case study research is primarily concerned with researcher's bias (Bailey 1992; Hamel 1993). The researcher's bias may occur as a result of the subjectivity of the researcher and/or of the informants whom the researcher relies upon to develop an understanding of the research problem. As Bailey (1992) opines 'a good case researcher should desist from preconceived notions' (p.52). To overcome this criticism the researcher has discussed the research design, data analysis and findings with his supervisor, and academics involved with research collaboration at the university. This approach will result in a more reliable and more accurate understanding of the phenomenon. The concept of triangulation informs the researcher about the importance of rigour in the research process (Yin 1994) .

The final criticism of case study research is that the theory developed may be narrow and idiosyncratic (Eisenhardt 1989). The research has endeavoured to overcome this criticism in the research design by developing a research problem and questions (Chapter 2) and an interview protocol guide in Chapter 3.

To conclude, the case study research involves the collection of data where phenomena are observed in real life context and the focus of investigation depends on the depth and richness of data. The review of the literature has revealed that there exist genuine limitations of and criticisms directed at case study research. These limitations and criticisms may be overcome by strategies and tactics during the stages of literature review, research design, data analysis, conclusions and recommendations.

3.10 Ethical considerations

With the case study research having been settled on, a review of the ethical considerations connected with interviews-based case study was conducted. The literature review on research methodologies confirms that the issue of ethics is important in research involving human subjects (Babbie 1990; Bogdan & Biklen 1998; Cooper & Emory 1995; Emory & Cooper 1991).

According to Sekaran (2003) 'ethics in business research, refers to a code of conduct or expected societal norm of behaviour while conducting research' (p.17). Research ethics should primarily protect all parties taking part – that is, the interviewer, interviewee/informant and the institution from adverse consequences as a result of involvement in the research (Emory & Cooper 1991; Patton 1990; Sekaran, U 2000). The ethical considerations in academic and non-academic research should ensure that:

- All interviews were conducted at the discretion of individuals being interviewed.
- The interviewees were properly treated and thoroughly informed
- The identity of those interviewed was kept confidential
- Interviews were conducted with the institutions blessing
- Data and information gathered from the interviewees/informants was made available prior to analysis and final conclusions of the research.
- Data that may have been sensitive was removed at the discretion of the participants.
- The researcher made sure that research results were for the purpose of the academic research as outlined in the research protocol.

In conclusion, ethical considerations are of utmost importance to all parties involved in the research and ought to be considered and incorporated into the initial research design. To achieve this there is need to introduce ethical concerns of the research in the interview protocol when introducing the purpose of research.

3.11 Conclusion

This chapter has outlined and justified the appropriateness of the case study research method as the main research methodology in examining the potential for collaboration as a policy strategy to attract external sources of funding for business research. Chapter 3 has considered the issue of the quality of academic research which is manifested in the validity and reliability of the research. A single case design was adopted and the case study protocol described. The data analysis mechanisms were also discussed. The strategies to overcome the limitations and criticisms of the methodology were stated and justified. In the final two sections the importance of ethical considerations was addressed and the chapter was concluded.

In Chapter 4, the data generated by this research is analysed.

Chapter 4 Analysis of Data

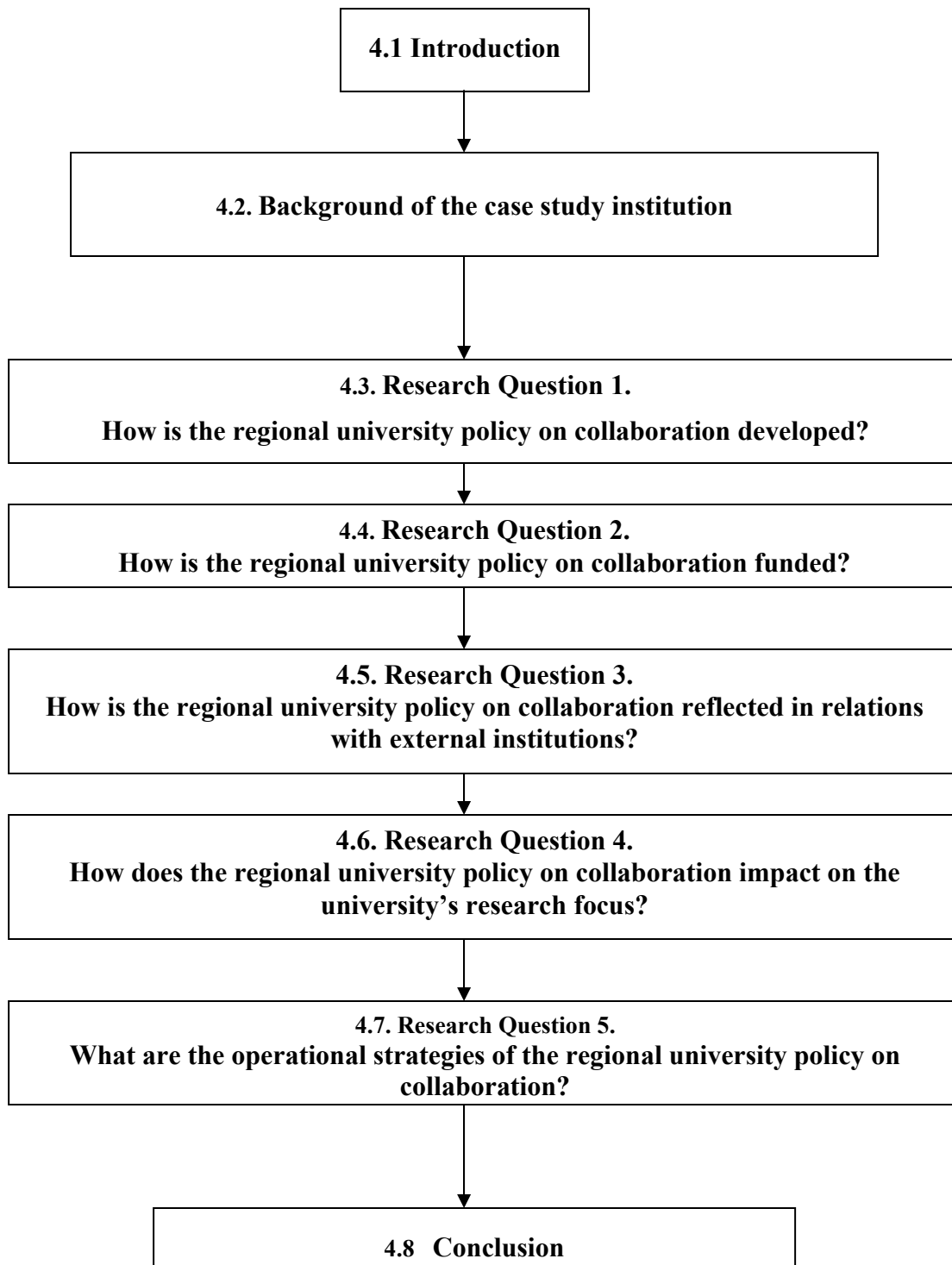
4.1 Introduction

In Chapter 1 the main structure of this research was introduced. The parent discipline of supply chain management and the immediate field of collaborative institutional supply chain management were reviewed in Chapter 2. In the literature review a link was established between theory and application, the research issue and research gap were identified. Chapter 3 described, discussed and justified the single case study as the appropriate research methodology adopted to collect and analyse data for this research. In this chapter the purpose is to present data from the primary sources to address each of the research questions.

This chapter encompasses eight sections. Section One presents an introduction to the chapter. Section Two examines the background of the case study organisation and profiles the case study participants. Section Three discusses the patterns of data for Research Question 1: How is the regional university policy on collaboration developed? Section Four surveys the patterns for data for Research Question 2: How is the regional university policy on collaboration funded? Section Five analyses the patterns for Research Question 3: How is regional university policy on collaboration reflected in relations with external institutions? Section Six describes the patterns for Research Question 4: How does the regional university policy on collaboration impact on the regional university research focus? Section Seven examines the patterns for Research Question 5: What are the operational strategies of the regional university policy on collaboration? The final section, Section Eight, presents the conclusion to Chapter 4.

The outline of Chapter 4 is graphically depicted in Figure 4.1.

Figure 4.1 Structure of Chapter 4.



Source: Developed for this research

4.2 Background to the case study institution

This section introduces the case study institution. As explained in Chapter 3 a single case study was selected for this research. Southern Cross University (SCU) is part of a grouping of universities described and reviewed on an annual basis by the commonwealth, Department of Education, Science and Training (DEST) as a Regional Distance Intensive University Australia (RDIUA). The RDIUA is comprised of universities which have their main campuses located in regional Australia (DEST 2007) (Operational definition prepared specifically for this research). The respondents were selected among staff at the SCU who were involved or likely to be involved with collaborative research. To triangulate the findings the researcher interviewed staff from institutions/organisations which had research partnerships with regional university and others which had benefited from the collaborative research outcomes conducted by the regional university and themselves.

The regional university informants' demographics were sought primarily to ascertain their suitability as respondents based on their educational qualifications, years of research at regional university or at a previous university or research institutions, their research field or discipline.

According to Miles and Huberman (1984) a case should be written as 'comprehensive narrative' (Patton 1990, p. 388). For the following reasons this has not been complied with in this study. The disclosure of detailed background information would enable an informed reader recognise the identity of the informants and their schools or research centres. There was concern that the regional university was small and had a profile of schools and research centres which were easily identified with their current heads of school or research directors. The informants were assured of confidentiality and anonymity as a pre-requisite for participating in this research.

The qualifying criteria for staff to participate in interviews in this research were based on their current, previous or likely involvement with research collaboration at the regional

university Perry (1998) states that PhD research should involve several interviews within the hierarchical levels of an institution. In this case the position of an informant within the University and the number of years of their involvement with research were important. The informants who were higher in the hierarchy had a correspondently greater number of years of involvement with research collaboration.

Among the informants were staff that worked for the University as casual staff or who were otherwise categorised as Early Career Researchers (ECRs). The ECRs had research collaboration experience of less than five years. This category of researchers, however, indicated that despite being involved in research collaboration they had never heard nor sighted the University policy on research collaboration.

In analysing the profile of each informant, there is evidence that seniority and years of research of the participant has provided an ‘information rich’ (Patton 1990, p. 169) basis for this study, which is considered to be a paramount contribution to be derived by employing a case study methodology. A summary of relevant personal elements is depicted in Table 4.1.

Table 4.1 Relevant profiles of the case study informants

Number of informants	Qualifications	Average number of years in research	Research discipline(s)/ Department
15	PhD/DBA	15	Business, law, social sciences, applied sciences
10	Postgraduate	5	Business, law social sciences, applied sciences
5	Not applicable	Not applicable	Legal, administration

Source: Analysis of field data

Table 4.1 shows the 30 informants from the University and their qualifications. They comprise 15 PhD/DBA holders and 10 postgraduate masters, diploma or certificate holders drawn from diverse research disciplines right across the University. The other five informants were from were administrative and legal support staff working in research partnerships at the University.

The Southern Cross University (SCU) Research and Research Training Advisory Committee (RRTAC) is a sub-committee of the SCU Academic Board and is responsible for establishing policies, guidelines and rules in relation to PhDs, Masters by Thesis degrees and other doctorates and their supervision (Southern Cross University 2007).

According to RRTAC, the informants are further classified into five categories comprising of Early Career Researcher (ECR); New Researcher (NR); Promising Researcher (PR); Developing Researcher (DR) and Established Researcher (ER). The categorisation of case study informants is as depicted in Table 4.2.

Table 4.2 Relevant categorisation of case study informants

Number of informants	Research categorisation	Years of research experience
5	ECR	1_5
5	NR	6_10
5	PR	11_15
5	DR	16_20
5	ER	>21

Source: SCU RRTAC (2007) and analysis of field data

Early Career Researchers (ECR)

Early Career Researchers are in the early stages of their postgraduate studies. In the course of their studies the University may contract them as research assistants in their respective disciplines.

New Researchers (NR)

New Researchers will typically have no or several publications in refereed journals (or the equivalent for the discipline).

Promising Researchers (PR)

Promising Researchers will typically show evidence of recent and current research activity. They will have five to ten publications in refereed journals in the last five years (or equivalent for the discipline) and one or two papers submitted or accepted for publication.

Developing Researchers (DR)

Developing researchers will have a strong record of publications in refereed journals (or equivalent for the discipline) of perhaps fifteen papers in the last five years. Typically they will have applied for several large external grants. In addition developed researchers will have applied for external research funding in the last 12 months.

Established Researchers (ER)

Researchers who have received an external grant of at least \$25,000 (or pro rata in the case of joint grants) normally will be considered to be Established Researchers.

An Established Researcher normally is a person whose Research Performance for the last three years (2005, 2006, 2007) has been at least double the average for the Faculty in at least two of the following three Performance Indicators – Research Income, DEST Publication Output (or equivalent for the discipline) or Higher Degree Research Student Completions; Established Researchers will have applied for external research funding in the last 12 months.

In this section, the background of the case institution and the profile of informants have been examined. The next five sections discuss the patterns of data for each of the research questions.

4.3 Research Question 1. How is the regional university policy on collaboration developed?

This section surveys the pattern of data for Research Question 1. The first part of the question sought to find out the informants' current or future involvement with the research policy on collaboration. The findings were that among the informants 83% (N=25) indicated they were involved or likely to be involved with research collaboration at the regional university. All of these informants were in one of the following categories: New Researchers, Promising Researchers, Developing Researchers or Established Researchers.

The remaining informants 17% (N=5) indicated that they were not involved or likely to be involved with research collaboration directly. Understandably these informants were the staff who offer administrative and legal support services to researchers. The opinions of these informants were sought with regard to their views on collaboration. They indicated that whereas they had been involved in offering administrative and legal support to researchers involved with collaboration, the administration and legal support was based on a 'case to case' basis and was guided by the prevailing procedures at times dictated by the donor partner. The sentiments were supported with statements, 'we have

had cases of researchers rushing to us to firm up contracts only a few days before the closing date’, ‘Researchers at times fail to appreciate the fact we have no control of other collaborating organisations’/institutions’ administration when contracts take longer than expected’ and ‘Researchers should be made aware that we are here to facilitate research collaboration and protect their interests and those of the University’. The informants were unanimous in saying that a policy well known to all the stakeholders would be most useful. This would help reduce the misunderstanding that was common between researchers and administrative and legal support staff when drawing up research partnership contracts. The informants were not interviewed further as they were unlikely to provide further insight on the policy of collaboration. They however were open to the idea of contributing towards the development of the policy.

The second part of the question sought the informants’ awareness with the policy on collaboration and their view on how the University policy on collaboration was developed. Among the informants 100% (N=25) indicated that they had no input in the guidelines and policy on research collaboration. This was backed by such statements as, ‘I qualify as an Established Researcher and this is the first time I have heard about the likely existence of a policy on research collaboration’, ‘As an Early Career Researcher my supervisor has not mentioned the policy on research collaboration’. The informants further claimed that as well as not being involved in the policy development, they were unaware of the document’s existence. The findings were supported with statements such as, ‘As a researcher I am not aware of the existence of the policy on research collaboration’, ‘we understand that if there might be a policy on research collaboration it would only known by the SCU Graduate Research College (GRC)’, ‘the policy on research collaboration is unknown to many of us in this university’, ‘As a researcher I have vaguely heard that there may exist a policy on research collaboration’, ‘if a policy on research collaboration did exist this should be circulated to all researchers’. The empirical findings for Question 1 are depicted in Table 4.3.

Table 4.3. Research question 1: Empirical findings

	Policy on collaboration development	Percentage %	Informants views and comments	Number of informants
1.	Involvement or likely involvement with research collaboration. No involvement or likely involvement with research collaboration.	83 17	Would appreciate avenues for greater involvement	(N=25) (N=5)
2.	Not aware of policy on collaboration	100	Would wish to have a policy on collaboration	(N=25)
3.	Involvement with policy on collaboration	100	The research staff would appreciate an opportunity to provide input into policy	(N=25)
4.	Availability of research collaboration guidelines Not available	60 40	A comprehensive policy should be made available to all staff.	(N=15) (N=10)
5.	Identification of researchers involved with collaboration	100	An ideal policy should be identify persons dealing with research collaboration	(N=25)

	Policy on collaboration development	Percentage %	Informants views and comments	Number of informants
6.	Outline of clear lines of authority	100	The policy should identify clear lines of authority	(N=25)
7.	Sunset clause for review	100	A sunset clause should be incorporated in the policy with input from those charged with the responsibility for research collaboration	(N=25)
8.	Regular review with input from persons involved with collaboration	100	Staff would appreciate input in review of the policy on collaboration.	(N=25)

Source: Analysis of field data

The first finding is that 83 per cent (N=25) of the staff are involved or likely to be involved with research collaboration while 17% (N=5) were not involved or unlikely to be involved with research collaboration. This is the category of informants who offer administrative and legal support to researchers. Their opinion on policy on research collaboration was backed with statements, ‘In the event that a policy on research collaboration is formulated we would appreciate an opportunity to provide input in the development’, ‘a policy would help researchers appreciate our role and importance in firming up research collaborative contracts’, ‘our role in the policy on research collaboration would be to help streamline procedures’.

The second finding is that of the staff who were involved or likely to be involved with collaboration, none of them (N=25) were aware of the University policy on collaboration.

The findings were backed with statements, 'as a promising researcher I have no knowledge of the policy on research collaboration', 'I am not aware of any policy on research collaboration'.

The third finding is that 100 per cent (N=25) of the staff charged with the responsibility for collaboration at the regional university were not involved in the development of the University policy on research collaboration. The finding was backed with statements such as 'as a developing researcher I have not been involved in the development of the policy on research collaboration'.

The fourth finding is that relevant sections of the University guidelines on research collaboration were only available to 60 per cent (N=15) of the informants involved with collaboration. The remaining 40 per cent (N=10) of the informants, although likely to be involved with research collaboration, had not been able to access the guidelines. The findings were backed by statements such as, 'as a researcher I feel frustrated at not being able to have access to the entire policy on collaboration', 'I have worked as part of a research team, however I have not been able to gain access to the guidelines on research collaboration'.

The fifth finding is that the University guidelines on research collaboration do not identify persons involved with collaboration at the institution. The finding was backed with statements such as, 'seeking partners for research partnership is frustrating as the policy guidelines are not clear about those in our school/centre who are involved with research collaboration', 'as researchers we could be working on similar collaborative projects but there is hardly any chance of knowing who else within the institution could be involved'.

The sixth finding is that University policy on research collaboration does not outline clear levels of authority for those responsible for research collaboration. The opinion was backed with statements such as 'as early career researchers we have difficulty in getting approvals for work due to lack of proper guidelines on the lines of responsibility', 'my

experience in this institution is that research collaboration is ad-hoc it depends on know who to get things done’, ‘with two business offices within the University the responsibility for collaboration is not clearly defined’.

The seventh finding is that the regional university guidelines on research collaboration do not have a sunset clause for review. The finding was backed with statements such as ‘a sunset clause would provide an opportunity for policy review’, ‘a sunset clause is the universal practice in policy formulation and the University should be no exception’, ‘the period of review should be in line with the strategic plan’.

In concluding the first question the eighth finding is that the absence of a University policy on research collaboration indicates that there is no opportunity for regular review with input from persons involved with collaboration. The informants further point out that a comprehensive policy on collaboration would be useful for the institution’s research development and partnership.

In this section the empirical findings for Research Question 1, on the development of the university policy on collaboration has been analysed and backed with statements from the informants. In the next section the empirical findings to Research Question 2, on the funding of the regional university policy on collaboration are analysed.

4.4 Research Question 2. How is the regional university policy on collaboration funded?

In the previous section the empirical findings for Research Question 1, on the development of the university policy on collaboration was analysed. In this section the empirical findings to Research Question 2, on the funding of the regional university policy on collaboration are analysed and backed with statements from informants.

This second interview question was designed to ascertain the funding and impact of the University policy on research collaboration. The analysis of empirical evidence has revealed a consistent need for adequate funding for research. The findings are depicted in Table 4.4.

Table 4.4 Research question 2: Empirical findings

	Funding of regional university policy on collaboration	Percentage %	Informants views and comments	Number of informants
1.	Inadequate provision of funding for research collaboration	100	The informants were unanimous that adequate funding for research collaboration is important	(N=25)
2.	Accessibility of funding for research collaboration	100	Funds are readily accessible there was concern about the block amount of 20% of the research collaborative grant apportioned to administration costs.	(N=25)
3.	Sourcing of funding from stakeholders	100	A clear mechanism has not been put in place to encourage funding from stakeholders	(N=25)

	Funding of regional university policy on collaboration	Percentage %	Informants views and comments	Number of informants
4.	Assessment of individual members contribution to collaborative task	100	Staff are clear about their tasks which are incorporated in the contract	(N=25)
5.	Emphasis on importance and value of collaborative research	100	The staff are appreciative and would like to participate more in collaborative research	(N=25)
6.	Sharing of information within the regional university and among partners	100	Staff are of the opinion that sharing of information within and among partners would lead to synergies and opportunities for further funding.	(N=25)

Source: Analysis of field data

The first finding is that the guidelines on research collaboration do not provide for adequate funds for collaboration. The opinion was backed with statements such as, ‘the university should set up a funding pool to encourage researchers to collaborate’, ‘there is need for seed capital to support infrastructure for collaborative research projects’ ‘our efforts to seek partners for collaboration are hampered by lack of funds’, and finally ‘there is never enough money available for research’.

The second finding is that the guidelines on research collaboration ensure that the funds provided for collaboration are easily accessible. The finding was supported by statements such as ‘once we secure the necessary funding approval for our projects from our external partners we are able to draw our funds from the university without any hindrances’.

The third finding is that the guidelines on research collaboration are not explicit about the notion of encouraging sourcing of funds from different stakeholders, government, national, state, local, industry partners, professional bodies, individual donors, benefactors and societies. The finding was backed with a statement, ‘in this institution there is a closed culture which forbids staff from understanding the value of collaboration which would lead to sourcing of additional funding’.

The fourth finding is that the guidelines on research collaboration have a mechanism of assessing individual staff members’ contributions to a collaborative task. This was supported by an informant who stated that, ‘the contracts drawn out for researchers clearly spell out their obligations and expectations’.

The fifth finding is that the University guidelines on research collaboration emphasise the importance and value of collaborative research.

In concluding the second question the sixth finding is that the University guidelines on research collaboration do not encourage the sharing of information within the institution and among the partners. The opinion was backed by informants’ statements such as ‘there is a limited link between how researchers give value to information between disciplines and external partners’, ‘as researchers we fail to appreciate that the information initially shared brings in double the yields to the parties involved’.

The informants indicated that there was an absence of a comprehensive guideline policy on collaboration funding. In this regard the informants were not certain to what extent funding was required. The funds allocated for collaboration were insufficient. They were

of the opinion that the University's proportion of 20% of the research collaborative grant as administrative fees was not fully understood or appreciated by researchers. As informants observed, 'researchers who obtain external funding are disappointed at the slice of funding that goes to central administration', 'the 20% of grants charged by the University as administrative overheads is high for donor agencies to offset, most proposals that reflect this provision are never approved by the external partners'. It would greatly assist the researchers if the breakdown was explained as this had an impact on the on the research collaborative outcome.

In this section the empirical findings for Research Question 2, on the funding of the regional university policy on collaboration were analysed and backed with statements from informants. In the next section the empirical findings to Research Question 3, on how the University policy on collaboration was reflected in relations with external institutions are analysed.

4.5 Research Question 3. How is the regional university policy on collaboration reflected in relations with external institutions?

In the previous section the empirical findings for Research Question 2, on the funding of the University policy on collaboration were analysed.. In this section empirical findings to Research Question 3, on the University policy on collaboration reflection in relations with external institutions are analysed and backed with statements from informants.

The third interview question attempted to ascertain how the policy on research collaboration is reflected in relations with external institutions. The analysis of the empirical evidence has unveiled a consistent pattern. The findings are depicted in Table 4.5.

Table 4.5 Research question 3: Empirical findings

	External institutional relations and regional university guidelines on collaboration	Percentage %	Informants views and comments	Number of informants
1.	guidelines on relations with external partners	100	The informants were unanimous that the guidelines are clear on relations with external partners	(N=25)
2.	Joint conduct of relevant research with stakeholders	100	Staff were of the view that this is encouraged	(N=25)
3.	Recognition of regional university	100	Staff were unanimous the guidelines identify the university as a regionally, nationally and internationally recognised	(N=25)

Source: Analysis of field data

The first finding is that the guidelines on research collaboration offer guidance on relations with external partners. The opinion was backed with statements such as, ‘as researchers have benefited by collaborating with other people especially where the project is multi-disciplinary’, ‘through collaborative research one is able to have a better understanding of other institutions’.

The second finding is that the regional university guidelines on research collaboration encourage the joint conduct of research with stakeholders. The finding was supported with a statement, ‘this is evident from the joint publications undertaken with stakeholders’.

In concluding the third question, the third finding is that the regional university guidelines on research collaboration identify the university as a regionally, nationally and internationally recognised institution. The opinion was supported by an informant who intoned, ‘SCU has the capacity for a higher profile and recognition.

In this section the empirical findings for Research Question 3, on the regional university policy on collaboration reflection in relations with external institutions were analysed and backed with statements from informants. In the following section the empirical findings to Research Question 4, on the regional university policy on collaboration impact on institutions research focus are analysed.

4.6 Research Question 4. How does the regional university policy on collaboration impact on the institutions research focus?

In the last section the empirical findings to Research Question 3, on the regional university policy on collaboration reflection in relations with external institutions were analysed.. In this section the empirical findings to Research Question 4, on the regional university policy on collaboration impact on institutions research focus are analysed supported with statements from informants.

This interview question focuses on how the University policy on research collaboration impacts on the institution’s research focus. The analysis of the empirical evidence has unveiled an inconsistent pattern. The findings are depicted in Table 4.6

Table 4.6 Research Question 4: Empirical findings

	Regional university research focus	Percentage %	Informants views and comments	Number of informants
1.	Importance of regional research.	100	The informants were unanimous that the guidelines are clear on the reflection of regional research.	(N=25)
2.	Internationally significant / topical research.	60 40	Majority of the informants were of the view that internationally significant research is encouraged. Not certain	(N=15) (N=10)
3.	Regional university research strength	100	The informants were unanimous that the guidelines are not clear on the reflection of regional research.	(N=25)
4.	Research intensive university	100	The guidelines do not identify the institution as a research intensive university	N=25

Source: Analysis of field data

The first finding is that the University policy on research collaboration reflects the importance of regional research. This was supported with the statements ‘the university being regional by geographic location must be seen to address regional research needs’,

‘the establishment of the Office of Regional Engagement (ORE) under the Graduate Research College (GRC) underpins the importance of regional research at Southern Cross University (SCU)’.

The second finding is that the University policy on research collaboration does not explicitly encourage internationally significant and topical research. Among the informants, 60 per cent (N=15) were of the opinion that internationally significant research is encouraged while 40 per cent (N=10) were not certain. The point worth noting here is that the 60 per cent who believed international research was encouraged were all Established, Developing and Promising researchers while the forty per cent who were uncertain about the proposition all belonged to the NR or ECR categories. The opinion was backed with a statement, ‘a regional university should maintain an international focus while expanding its regional identity, regional by geographic location but international by focus’.

The third finding is that the University policy on research collaboration does not promote its research strengths. The finding was supported with a statement, ‘there is a disconnection between the research activities carried out and the institutional research strength’.

In concluding the fourth question the fourth finding is that the regional university policy on research collaboration does not identify the institution as a research-intensive university. This opinion was backed with a strong statement, ‘I believe because we cannot fully grasp collaboration, its context and concept, we lose the sense of the University identity as a research-intensive institution’.

In this section the empirical findings for Research Question 4, on the impact of the regional university’s policy on collaboration on the institution’s research focus were analysed and supported with statements from informants. In the following section the empirical findings for Research Question 5, the operational strategies of the University policy on collaboration are analysed..

4.7 Research Question 5. What are the operational strategies of the regional university policy on collaboration?

In the previous section the empirical findings for Research Question 4, on the regional university policy on collaboration impact on institutions research focus were analysed. In this section, the empirical findings for Research Question 5, the operational strategies of the regional university policy on collaboration are analysed, supported by statements from informants.

This interview question aims to highlight the operational strategies of the University's policy on research collaboration. The analysis of the empirical evidence has unveiled an inconsistent pattern as depicted in Table 4.7

Table 4.7 Research Question 5: Empirical findings

	Strategy and operation	Percentage %	Informants views and comments	Number of informants
1.	Vision.	100	The informants were unanimous that the vision is reflected in the policy guidelines.	N=25
2.	Mission	100	The informants contend that the mission is reflected.	(N=25)
3.	Objectives	100	Informants were categorical that the policy guidelines do not have specific objectives.	(N=25)

	Strategy and operation	Percentage %	Informants views and comments	Number of informants
4.	Measurable outcomes	100	The policy guidelines do not contain measurable outcomes.	N=25)
5.	Flexible intellectual property arrangements	100	The university guidelines on collaboration incorporate intellectual property agreements	(N=25)
6.	Flexibility in negotiations with partners and stakeholders	100	They were unanimous that the guidelines provide for flexibility and would appreciate that they should be strengthened in future policy	(N=25)

Source: Analysis of field data

The first finding is that the guidelines on research collaboration are reflected in the vision of the regional university. This is despite the fact that as stated section 4.4. the informant's were not aware of the actual contents of the policy guidelines on collaboration.

The second finding is that the guidelines on research collaboration are entrenched in the mission statement of the University.

The third finding is that the guidelines on research collaboration do not have specific objectives. This was supported by the statements, 'while there are appropriate policy statements the implementation of policy is wanting' and 'we have a lot of words but very little action'.

The fourth finding is that the guidelines on research collaboration do not have measurable outcomes. This opinion was backed with a statement, ‘as a researcher we need a mechanism for assessing our performance’.

The fifth finding is that the University policy on research collaboration incorporates flexible intellectual property arrangements. This was supported by the following statements: ‘we feel that our interests as researchers and those of the University are safeguarded when contracts are drawn’. ‘I can publish papers from outcomes of jointly conducted research’ and ‘I am comfortable conducting joint research with partners under the current arrangements’.

In concluding the fifth question the sixth finding is that the University policy on research collaboration allows flexibility in negotiations with partners and stakeholders. This was supported with statements such as: ‘we are given a free hand to negotiate our terms of contract’, ‘in the last two decades collaboration in most institutions was an exception rather than the rule, in the current environment collaboration is the norm’.

In this section, the empirical findings for Research Question 5, the operational strategies of regional university policy on collaboration were analysed. The findings were supported by statements from informants. In the following subsection the triangulated research findings are analysed.

4.7.1 Triangulation of research findings

In the previous subsection, the empirical findings for Research Question 5, the operational strategies of the regional university policy on collaboration were analysed. In this subsection the triangulated research findings are analysed along with advantages and disadvantages of collaboration.

Yin (1994) states that the opportunity to incorporate several sources of evidence constitutes a major strength of case study methodology. The literature on case study methodology discloses two views of the use of triangulation. The convergent approach aims to demonstrate that all sources of evidence harmoniously conform to one fact. Real triangulation occurs when the researcher is able to collect information from different sources to corroborate the same fact or phenomenon (Crabtree & Miller 1992, 1999; Ely 1991; Yin 1994).

To triangulate the research findings, views were sought from a selected group of informants through 'snowball sampling' (Fitzgerald: 2007: p.9). The process involved the identification of informants from organisations which meet the criteria of research collaboration and those who have benefited from research outcomes of the University. Research collaborators organisations/ institutions had jointly funded research projects with the university while research beneficiary organisations / institutions had utilised research outcomes emanating from the university in the course of their work. The identified informants were then requested to recommend other informants who met the same criteria of the study.

The selected institutions and informants cannot be identified due to the confidentiality clause agreed upon before the interviews were conducted.

The informants were of the opinion that the relationship could be further strengthened if a comprehensive document detailing the research collaboration relationship was made available to all parties. The informants' opinions on research collaboration are summarised as depicted Table 4.8.

Table 4.8 Informants' opinions on research collaboration

Category of informants	Key factors, attributes for successful collaboration	Benefits for staff	Benefits for institutions/ organisations	Number of informants
Regional university staff	Common interest Trust, Openness Personal relationship, Mutual help Confidentiality Clear expectations Leadership Cooperation Documentation Benefit sharing Legal framework	Employment Networking opportunities, Career growth, Additional income Publication bonuses Internships	Additional sources of income stream. Shared resources. Practical application of research outcomes. Community engagement. Bridging the gap between academia and industry. Research Scholarships.	(N=30)
Research collaborators	Personal relationship, Trust, Confidentiality Mutual help Clear expectations Benefit sharing	Access to specialised skills. Joint publications, Employment Career growth Additional income Networking Opportunity for Expertise from the university, Knowledge advancement	Shared resources (Advanced technology, e.g. I.T, library). Access to specialised skills. Additional sources of income stream. Value added. Bridging the gap between organisations and academia.	(N=6)
Research beneficiaries	Personal relationship, Trust, Confidentiality Mutual help Clear expectations	Scholarships, Networking, Joint publications, Further research opportunities	Practical application of research outcomes. Improved informed services. Community engagement.	(N=6)

Source: Analysis of field data

The findings from the interviews indicate that the institutions/organisations had a close working research partnership with the regional university . The informants were able to identify key factors and attributes necessary for successful collaboration as depicted in Table 4.8. The informants further outlined the benefits of collaboration for staff and institutions involved in the research partnership and for the research beneficiaries. This was supported with statements such as ‘we need to encourage collaboration, in the process create awareness of the advantages of collaboration and the very real important outcomes of collaboration’.

The disadvantages of research collaboration were highlighted by informants. Policy on research collaboration should take cognisance of these. The disadvantages are presented in Table 4.9.

Table 4.9 Informants opinion on disadvantages of research collaboration and policy remedies

Category of informants	Disadvantages of collaboration	Remedies	Number of informants
Regional university/ staff	Loss of independence. Difficulties in organising people in different places. Differences in institutional culture. Administrative structures between institutions and organisations may differ. The funding agencies dictate the terms of collaboration. The collaborative funds have to be shared between the partners. The likelihood of losing highly qualified staff if no funding is available. The management of the project could cause complications. Managing staff of a project without direct authority is difficult The tyranny of distance travelling to attend meetings / conferences can be very expensive for the collaborators.	Comprehensive policy to safeguard the interest of all stakeholders	(N=30)

Category of informants	Disadvantages of collaboration	Remedies	Number of informants
Research collaborators	Administrative structures between institutions and organisations may differ. The management of the project could cause complications.	Comprehensive policy to safeguard the interest of all stakeholders	(N=6)
Research beneficiaries	Fear of public and legal retribution Reaction from community if research outcomes applied are not accepted.	Comprehensive policy to safeguard the interest of all stakeholders	(N=6)

Source: Analysis of field data

The informants identified one of the disadvantages associated with research collaboration as being the difficulty in organising people in different places. They further pointed out that there were differences in institutional/organisational culture, and that there were diverse administrative legal structures among institutions and organisations. This opinion was supported with statements, ‘universities are the next level of bureaucracy after government institutions’. The other challenges cited were the tendency of funding agencies to dictate the terms of collaboration. The collaborative funds have to be shared among the institutions/organisations in a partnership; this may result in reduction of staff pay and hence high attrition. There is a likelihood of losing highly qualified staff if no funding is available. The management of the project could cause complications because the managing of staff of a project without direct authority is difficult. In addition, due to the tyranny of distance, travelling to attend meetings/conferences could turn out to be very expensive for the collaborators. As observed by an informant, ‘I have experienced an inability for individuals and institutions as a whole to engage in and expand on the opportunities of collaboration. I find this frustrating’.

From a research beneficiary’s perspective the main concern expressed was a fear of public and legal retribution for the public for application of research outcomes which may not be acceptable to the community.

In this subsection the triangulated research findings were analysed along with advantages and disadvantages of collaboration. The following section presents a conclusion of this chapter.

4.8 Conclusion

The analysis of empirical data using the qualitative method has revealed the opinions that lie behind the data provided by the individual informants. The analysis was presented in the form of quotations, tables and figures to indicate how the findings and the extent to which they interrelate. The quotations were used to substantiate the findings.

In analysing the data the researcher aimed to achieve triangulation through open-ended interviews with collaborating institutions/organisations and research beneficiaries. The interviews were allotted a time of 15–20 minutes as most of the informants were extremely busy in their respective responsibilities. However, the average time it took for each of the interviews was 45–60 minutes, to the surprise of the researcher and informants. The informants indicated that the area of collaborative research was ‘important’ and of ‘value’ to them, they were happy to continue providing as much information as they could despite their time constraints. The informants supported their views with confidential documents provided to the researcher on condition of non-disclosure of the source. As one informant observed, ‘the concept, process and capacity embracing the policy on collaboration needs endorsement, enforcement and provision of adequate resources’.

In this chapter the background of the case study and the profile of case study participants were examined. The latter sections discussed the patterns of data for Research Questions One, Two, Three, Four and Five. The informants were drawn from a regional university, research partnering institutions/organisations and research beneficiaries. All informants sought confidentiality and anonymity.

Having analysed the data, the next chapter, Chapter 5, presents and discusses the conclusions and implications.

Chapter 5 Conclusions and implications

5.1 Introduction

The purpose of this study is to investigate the research issue posed in Sections 1.2., 2.5., and 3.2.:

The potential for collaboration as a policy strategy to attract external sources of funding for business research.

What are the policy issues possibly affecting research collaboration at a regional university?

Chapter 1 presented the background to the research(1.1.), the research issue and the five research questions (1.2.), the justification for the research (1.3.), the methodology (1.4.), the outline of the thesis (1.5.), definitions (1.6.), delimitations of scope (1.7.), and conclusions (1.8).

Chapter 2 reviewed the literature on collaborative institutional supply chain management and provided an overview of the following: rationale and background to the study (2.2.), supply chain management (2.3.) and collaborative institutional supply chain management (2.4.). In the final section the research framework adopted for the thesis was portrayed (2.5.). The literature review was instrumental in enabling the researcher identify the research gap and formulate the research issue and five research questions. This formed the basis for the doctoral research.

Chapter 3 outlined definitions of research strategies in social sciences and business research methods (3.2.), the justification of the interpretive paradigm (3.3.), the research design including model building from this research (3.4.), criteria for judging quality of case study design (3.5.), criteria for selecting single case study (3.6.), the research

execution including data collection for case study (3.7.) and case analysis procedure (3.8.). In the last two sections, limitations of case study research (3.9.), and ethical considerations (3.10.) were portrayed.

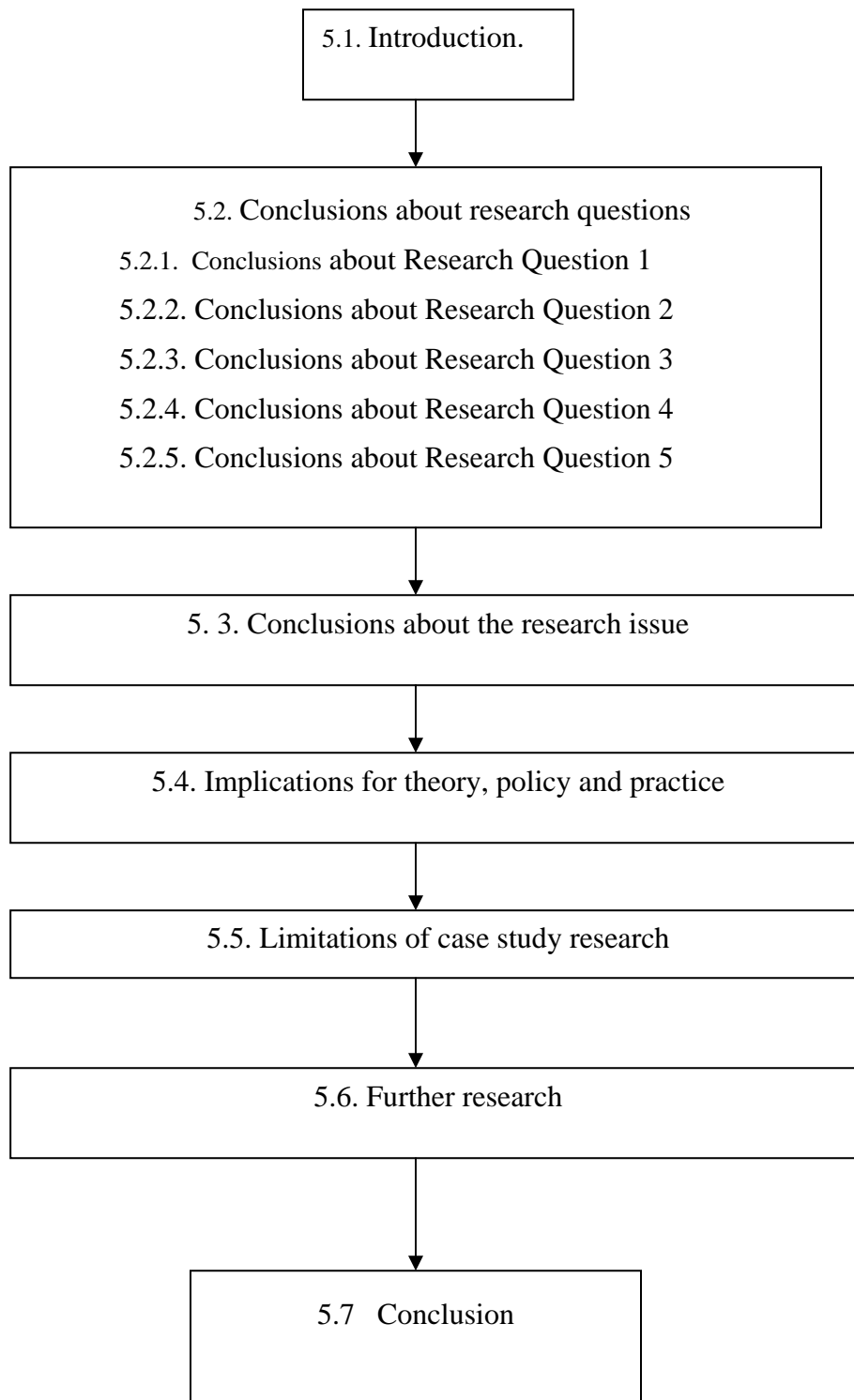
Chapter 4 described the background of the institutional case study (4.2), and presented the patterns of data for Research Question 1 (4.3), Research Question 2 (4.4), Research Question 3 (4.5) Research Question 4 (4.6), and Research Question 5 (4.7). The field data collected from in-depth interviews was analysed and depicted in the form of quotations, descriptions, figures and tables. There was extensive and frequent use of quotations from informants to compare, contrast and substantiate the findings.

The purpose of the final chapter is to draw conclusions about the five research questions and propose a model whereby regional and other universities will be able to respond to the changing public sector research funding to universities in Australia.

Chapter 5 has seven sections. The first section introduces Chapter 5. The second section discusses the conclusions about the five research questions. The third section presents conclusions about the research issue. The fourth section unveils implications for theory, policy and practise. Section Five presents the limitations of this case study research. Section Six discusses suggested areas of further research. The final section, Section Seven presents a conclusion.

The structure of Chapter 5 is graphically presented in Figure 5.1.

Figure 5.1 Structure of Chapter 5.



Source: Developed for this research

5.2 Conclusions about research questions

This section examines the conclusions reached about the five research questions in comparison with the literature review discussed in Chapter 2 of this study. The research questions are discussed separately in the five sub-sections (5.21–5.25) and begin with a brief discussion of the findings in the literature and analysis of the data. The similarities and differences between the findings and the literature are portrayed. There is limited use of quotations from participating informants in Chapter 5 as they were used extensively in Chapter 4 to highlight the findings

The review of the literature on collaboration as a strategy to attract external funding for business research identified policy as one of the key variables for successful partnerships (Blackstone & Cox 2004; Howard Partners 2003). As observed by an informant, ‘in the last two decades collaboration in most institutions was an exception rather than the rule; in the current environment collaboration is the norm’. The other key variables necessary for successful collaboration identified by various scholars are legal environment, corporate and taxation laws, Resources infrastructure, Information knowledge and expertise transfer through university business interaction, Institutional culture, capacity to adapt to external environment (Bradshaw 2001; Burton Jones 1999; Caenegem 2006; Etzkowitz, Webster & Healy 1998; Howard Partners 2003; Johnson, Scholes & Whittington 2005; Lambert 2003; Schein 2004; Yip 2003).

The emerging empirical evidence suggests that regional universities need to have an institutional comprehensive policy on research collaboration in their endeavour to:

- Overcome their regional location limitations
- Align their research to regional requirements
- Attract funding for research from the regional state bodies and the business community
- Conduct research that is regionally relevant and globally significant
- Convince the top Australia Stock Exchange (ASX) companies that business research is of value to them

- Undertake cutting edge research which businesses would find attractive and would be willing to fund
- Commercialise research outcomes
- Engage the community in identifying their needs and propose solutions

The survey of the literature on research collaboration at a regional university did not reveal any qualitative or quantitative studies having been carried out and published. The absence of research on collaboration coupled with the researcher's own interest in bridging the gap between academia, government agencies, businesses and the community was a compelling drive to pursue a doctoral research. The researcher was persuaded that through collaboration all the partners would benefit.

The limited literature on research collaboration was reviewed in Section 2.5. The gap in the literature was also identified. In the absence of a theoretical framework this research required a distinctive approach. This line of thought adopted a theory-building inductive approach rather than theory-testing or deductive approach (Guba & Lincoln 1994; Miles & Huberman 1994; Perry & Coote 1994; Punch, K.F 1998; Yin 1994).

The following five subsections (5.2.1 – 5.2.5) will present each research question and discuss the findings in the literature and analysis of the empirical data.

5.2.1 Conclusions about Research Question 1

<p style="text-align: center;">Research Question 1:</p>
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<p style="text-align: center;">How is the regional university policy on collaboration developed?</p>

There is a scarcity of academic research on collaboration in the context of universities, government agencies and businesses as stated in Section 2.5 and 5.2. In the absence of a theoretical framework, the researcher has adopted a theory-building, inductive approach. The literature surveyed in Sections 2.4 and 2.5 has revealed the importance that academic scholars give to research collaboration, not only as a source of additional funding but also

as a way of bridging the gap between academia and the community (Bradshaw 2001; Nickless 2006; Yves & Gary 1998).

The analysis of field data, as presented in Section 4.3, unveiled the major findings which are summarised and depicted in Table 5.1.

Table 5.1 Research Question 1: Research findings

Research findings	Significance	Contribution
1. All the informants would appreciate being involved with research collaboration	Major	New to the literature on research collaboration at a regional university
2. Informants expressed the desire to have a policy on research collaboration	Major	New to the literature on research collaboration at a regional university
3. Informants would appreciate an opportunity to provide input into policy development	Major	New to the literature on research collaboration at a regional university
4. Informants indicated the need for a policy which would be made available to all	Major	New to the literature on research collaboration at a regional university
5. The informants contend that the policy should help in identifying staff dealing with research collaboration	Major	New to the literature on research collaboration at a regional university

Research findings	Significance	Contribution
6. The informants contend that the policy should identify clear lines of authority	Major	New to the literature on research collaboration at a regional university.
7. Informants indicated that a sunset clause should be incorporated in the policy with input from those charged with responsibility for research collaboration	Major	New to the literature on research collaboration at a regional university.

Source: Developed for this research

This study has confirmed that all informants in one way or another would appreciate being involved with research collaboration at the University. The significance of this opinion was expounded in Section 4.3. and exhibited in Table 4.3. This finding is supported by statements from informants such as ‘research collaboration is a pathway to career development’, ‘through research collaboration the University is able to raise its profile within the community’ and ‘research collaboration would provide an additional income stream for the University’. The importance of research collaboration is supported by academics and practitioners. They contend that this would be one of the ways of dealing with declining funding to regional universities in Australia (Baverstock 2005; Kemp 1999; Yoffie & Kwak 2006). This position is amplified by a report from the OECD which stated that among the OECD countries Australia stands out as one of the few members where the proportion of Gross Domestic Product (GDP) spent on research and development has declined as the economy has grown (Morris 2006, 2006a; Noonan 2007). The mechanism of involving researchers in the development of collaboration policy would certainly require further investigation as proposed in Section 5.6. This significant finding is *new* to the literature on research collaboration. It is believed that the work will contribute to the body knowledge.

The second part of the finding to the first question is that all informants expressed the desire to be made aware of the policy on collaboration. The finding was supported by statements from the informants: ‘a proactive policy on research collaboration would be useful for all categories of researchers at the regional university’, ‘the policy should be made readily available to all research, administrative and legal staff’. In line with the first finding the issue of having a policy merits further research as proposed in Section 5.6. The second significant finding is *new* to the research on collaboration at a regional university. The outcome of this work would contribute to the body of knowledge.

The third part of the finding is that the informants should be accorded the opportunity to contribute towards the development of the research policy on collaboration. As depicted in Table 4.3. all the informants were unanimous in this approach. The finding is supported by statements, such as ‘implementing the policy would be much easier where researchers have had an input in its development’ and ‘researchers would be able to communicate more effectively with collaborators in firming up contracts’. The involvement of staff in policy development deserves further research as proposed in Section 5.6. This third significant finding is *new* to the literature on research collaboration at a regional university and merits further research. It is anticipated that the work will contribute to the body of knowledge.

The fourth finding related to the first question is that a comprehensive policy on research collaboration should be available to all research staff at the University. The finding was supported by statements, ‘the entire policy should be made available to all to research staff’, ‘those responsible for policy development should organise workshops to explain key aspects of the policy on research collaboration’, and ‘early career researchers should be encouraged to familiarise themselves with the policy on research collaboration’. Yves & Gary (1998) point out that institutions need to be proactive in preparation for research collaboration. The cascading of the research policy to staff needs further investigation as proposed in Section 5.6. This fourth significant finding is *new* to the literature on research collaboration at a regional university and merits further research. This work will contribute to the body of knowledge.

The fifth finding related to the first question is that the policy on research collaboration at a regional university should identify persons dealing with research collaboration. The finding was supported with the statements, ‘the policy should facilitate networking both internally and externally’, ‘external partners should be able link up easily with researchers in their respective areas of expertise’, and ‘the researchers charged with the responsibility for collaboration should be readily accessible’. The process of identifying researchers involved with research collaboration requires further investigation as proposed in Section 5.6. The fifth significant finding is *new* to the literature on research collaboration at a regional university and may require further study. This work will contribute to the body of knowledge.

The sixth finding to the first question is that the policy on research collaboration at a regional university should identify clear lines of authority. The finding was supported with statements, ‘as a researcher I am not sure who to report to’, ‘we are part of a research team, lines of authority are not clear when dealing with external partners’, and ‘decisions take time to make as no one wants to take responsibility’. The incorporation of lines of authority in the policy merits further research as proposed in Section 5.6. The sixth significant finding is *new* to the literature on research collaboration at a regional university and may require further investigation. This work will contribute to the body of knowledge.

The seventh finding to the first question is that a sunset clause should be incorporated in the policy. The finding was supported with statements, ‘a sunset clause would provide an opportunity for policy review’, ‘a sunset clause is the universal practice in policy formulation and the University should be no exception’, and ‘the period of review should be in line with the University strategic plan’. The incorporation of a sunset clause in the policy merits further research as proposed in Section 5.6. The seventh significant finding is *new* to the literature on research collaboration at a regional university and may require further study. This work will contribute to the body of knowledge.

The eighth finding to the first question is that staff would appreciate an opportunity to provide input into a review of the policy on collaboration. This conclusion was supported with statements, ‘staff input in policy review would result in consistency and continuity’, ‘researchers feel as part of a process when their views are sought’, and ‘input in policy review ensures ownership’. The regular review of the policy on research collaboration with staff input merits further investigation as proposed in Section 5.6. The eighth significant finding is *new* to the literature on research collaboration at a regional university and may require further study. This work will contribute to the body of knowledge.

The conclusion to the first question has established that the informants are in principle ready to participate in research collaboration at the University. They would be willing to contribute towards the development a comprehensive policy on research collaboration. The involvement of informants in research collaboration and policy development *should* facilitate the process of collaboration.

In this sub-section the findings and conclusion on Research Question 1, the development of the University policy on collaboration were presented. In the following sub-section the conclusions about findings on Research Question 2 are presented.

5.2.2 Conclusions about Research Question 2

In the previous sub-section the findings and conclusions on Research Question 1, were presented. This section presents the findings and conclusions about Research Question 2, on funding of the university policy on collaboration..

<p style="text-align: center;">Research Question 2:</p>
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<p>How is the regional university policy on collaboration funded?</p>
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In order to ensure that collaboration is successful there is a need to provide for adequate funding for the process. Through collaboration, universities can draw on a wider range of private funding. Similarly, industry can harness additional financial resources from public

sources to use in research thereby spreading costs ((Bradshaw 2001; Johnson, Scholes & Whittington 2005; Lambert 2003; Nickless 2006). According to Mentzer (2001) while adequate funding is a pre-requisite in a collaborative arrangement, the parties must be prepared to share the benefits. The analysis of field data, as presented in Section 4.4., disclosed the major and minor findings which are summarised in Table 5.2.

Table 5.2 Research Question 2: Findings

Research findings	Significance	Contribution
1. The informants were unanimous that adequate funding for research collaboration is important	Major	Consistent with the literature on research collaboration at a regional university.
2. While funds are readily accessible there was concern about the block amount apportioned to administration costs by the Regional university which is 20% of the research collaborative grant.	Major	New to the literature on research collaboration at a regional university.
3. A clear mechanism has not been put in place to encourage funding from stakeholders.	Major	Inconsistent with the literature on research collaboration at a regional university.
4. Staff are clear about their tasks which are incorporated in the contract	Minor	Consistent with the literature on research collaboration at a regional university.
5. The staff are appreciative and would like to participate more in collaborative research.	Major	New to the literature on research collaboration at a regional university.
6. Staff are of the opinion that sharing of information within and among partners would lead to synergies and opportunities for further funding.	Major	New to the literature on research collaboration at a regional university.
5. The staff are appreciative and would like to participate more in collaborative research	Major	New to the literature on research collaboration at a regional university.
6. Staff are of the opinion that sharing of information within and among partners would lead to synergies and opportunities for further funding	Major	New to the literature on research collaboration at a regional university.

Source: developed for this research

The first finding related to the second question is that provision of adequate funding for collaboration is vital. This view was expounded in Section 4.4. and exhibited in Table 4.4. The finding was supported with statements such as ‘there is a need for seed capital to support infrastructure for collaborative research projects’, and ‘our efforts to seek partners for collaboration are hampered by lack of funds’. As pointed out in Section 2.5. and Section 5.2.1, among the OECD countries Australia stands out as one of the members where the proportion of Gross Domestic Product (GDP) spent on research and development has declined as the economy has grown (Morris 2006; Morris 2006a). In light of this there is need for consistent efforts to secure other sources of funds for business research. This first significant finding related to the second research question is consistent with the literature on research collaboration.

The second finding related to the second question is that funds allocated for collaborative research are readily accessible within the regional university. However, the regional university’s proportion of 20% of the research collaborative grant as administrative fees was not fully understood or appreciated by researchers. The view was supported with strong statements, ‘the 20% of grants charged by the university as administrative overheads is high for donor agencies to offset, most proposals that reflect this provision are never approved by the external partners’, ‘researchers who obtain external funding are disappointed at the slice of funding that goes to central administration’. This second significant finding related to the second research question is *new* to the literature on research collaboration. The researcher anticipates that this work will contribute to the body of knowledge.

The third finding related to the second question is that a clear mechanism has not been put in place to encourage funding from stakeholders. This finding was supported with statements such as ‘in this institution there is a closed culture which forbids staff understand the value of collaboration which would lead to sourcing of additional funding’. This third significant finding is *inconsistent* to the literature on research collaboration. The researcher anticipates that this work will contribute to the body of knowledge.

The fourth finding related to the second question is that staff are clear about their tasks which are incorporated in the research contract. Mentzer (2001) states that partners in collaboration must have clear expectations of their roles. This finding was supported with a statement, 'the contracts drawn out for researchers clearly spell out their obligations and expectations'. This fourth minor finding is consistent with the literature on research collaboration.

The fifth finding to the second question is that the staff are appreciative and would like to participate more in collaborative research. According to Hiam (2003) the purpose of collaboration is for researchers to value the benefit of working together to achieve common goals. This conclusion was supported with statements such as 'research collaboration is a path to career growth', and 'I appreciate participating in research collaboration as I get the opportunity to network with colleagues'. This fifth major finding is *new* to the literature on research collaboration. The researcher anticipates that this work will contribute to the body of knowledge.

The sixth finding related to the third question is that staff are of the opinion that sharing of information within and among partners would lead to synergies and opportunities for further funding. Information sharing provides the basis for concerted actions and is useful step towards fulfilment of common objectives (Simatupang & Sridharan 2004a; Whipple et al. 2002). The finding was supported with the statement, 'sharing information is the lifeline for researchers'. This sixth major finding is *new* to the literature on research collaboration. The researcher anticipates that this work will contribute to the body of knowledge.

In conclusion, Research Question 2 determined that University staff are clear about their tasks which are incorporated in the contracts. In addition, sharing of information within and among partners *should* lead to synergies and opportunities for additional funding.

In this subsection the conclusions about Research Question 2, on the policy on the funding of the university research collaboration were presented. In the following subsection the conclusions on the findings about Research Question 3, are presented.

5.2.3 Conclusions about Research Question 3

In the previous subsection the conclusions about Research Question 2, were presented. In this subsection the conclusions on the findings about Research Question 3 on the regional university policy on collaboration reflection in relations with external institutions are presented.

Research Question 3:
How is the regional university policy on collaboration reflected in relations with external institutions?

The purpose of Research Question 3 was to ascertain how the University policy on collaboration is reflected in relations with external institutions. In the absence of an empirically tested model the researcher was compelled to conduct a qualitative, inductive, theory-building study rather than a quantitative, deductive theory-testing study. The analysis of field data, as presented in Section 4.5, disclosed the major findings which are summarised in Table 5.3.

Table 5.3. Research Question 3: Findings

Research findings	Significance	Contribution
1. The informants were unanimous that the guidelines are clear on relations with external partners.	Major	Consistent with the literature on research collaboration at a regional university.
2. Staff were of the view that the joint conduct of relevant research with stakeholders is encouraged.	Major	Consistent with the literature on research collaboration at a regional university.
3. Staff were unanimous the guidelines identify the university as a regionally, nationally and internationally recognised research institution	Major	Consistent with the literature on research collaboration at a regional university.

Source: developed for this research

The first finding related to the third question is that informants were unanimous that the guidelines are clear on relations with external partners, as was stated in Section 4.5 and depicted in Table 4.5. Baverstock (2005) states that changes in funding to universities have prompted consultations among like-minded institutions to establish a framework for collaboration. This view was further supported with statements such as, ‘as researchers we have benefited by collaborating with other people especially where the project is multi-disciplinary’, and ‘through collaborative research one is able to have a better understanding of other institutions’. This major finding is *consistent* with the literature on research collaboration at a regional university.

Second, this study has revealed that the researchers at the University are encouraged to conduct joint research with stakeholders. According to the Southern Cross University (2005–2010), strategic plan, one of the key objectives is to increase the non-government revenue stream through involvement in commercial activities with an acceptable return

on investment. This major finding is *consistent* with the literature on research collaboration at a regional university

Third, this research has unveiled the fact that staff were in agreement that the policy guidelines identify the University as a regionally, nationally and internationally recognised research institution. This major finding is consistent with the literature on research collaboration at the regional university.

In concluding the third research question this study has established that the University policy on collaboration reflection in external relations *should* help in recognising the institution as a regionally, nationally and internationally recognised research university.

In this subsection the findings and conclusions about Research Question 3, on how the University policy on collaboration was reflected in relations with external institutions were presented. The following subsection presents the findings and conclusions about Research Question 4.

5.2.4 Conclusions about Research Question 4

In the previous section the findings and conclusions about Research Question 3, were presented. In this section the findings and conclusions about Research Question 4 on how the University policy on collaboration impacts on the institution's research focus are presented.

Research Question 4:
How does the regional university policy on collaboration impact on the university's research focus?

The underlying purpose of Research Question 4 was to assess how the University policy on collaboration impacts on the University’s research focus. The analysis of field data as presented in Section 4.6. unveiled the major findings which are summarised in Table 5.4.

Table 5.4. Research question 4: Findings

Research findings	Significance	Contribution
1. The informants were unanimous that the guidelines are clear on the reflection of regional research.	Major	Consistent with the literature on research collaboration at a regional university.
2. Slightly over half the informants were of the view that internationally significant research is encouraged.	Major	New to the literature on research collaboration at a regional university.
3. Staff were unanimous the guidelines do not promote the university’s research strength.	Major	Inconsistent with the literature on research collaboration at a regional university.
4. The guidelines do not identify the institution as a research intensive university.	Major	Inconsistent with the literature on research collaboration at a regional university.

Source: developed for this research

First, the study has disclosed that the informants are aware that the policy guidelines are clear on the issue of regional research. The finding is validated with quotes, such as ‘the university being regional by geographic location must be seen to address regional research needs’ and ‘the establishment of the Office of Regional Engagement (ORE) under the Graduate Research College is a clear testimony of the universities importance to regional research’. This major finding is *consistent* with the literature on research collaboration at the regional university.

Second, this research highlights the divergent views among researchers at the University with regard to encouragement of internationally significant research. The majority supported the notion that this is encouraged while the remainder of the informants were

not certain. The empirical evidence was supported by the statement, ‘a regional university should maintain an international focus while expanding its regional identity, regional by geographic location but international by focus’. This major finding is *new* to the literature on research collaboration. The researcher anticipates that this work will contribute to the body of knowledge.

Third, this research has shown that the policy guidelines do not promote the University’s research strength. The position is augmented by the statement: ‘there is a disconnection between the research activities carried out and the institutional research strength’. This third major finding is *inconsistent* with the literature on research collaboration at the regional university. The anticipation of the researcher is that this work will contribute to the body of knowledge.

Fourth, this study has revealed that the policy guidelines do not identify the institution as a research-intensive university. The finding was validated by the statement: ‘I believe because we cannot fully grasp collaboration, its context and concept, we lose the sense of the university identity as a research-intensive institution’. This fourth major finding is *inconsistent* to the literature on research collaboration at the regional university. It is believed that this work will contribute to the body of knowledge.

In concluding the fourth question the study has established that the impact on University research focus *should* be comprehensively addressed in the policy on research collaboration.

In this subsection the findings and conclusions about Research Question 4, related to how the University policy on collaboration impacts on the institution’s research focus were presented. In the next subsection the conclusions about Research Question 5, are presented.

5.2.5 Conclusions about Research Question 5

In the previous subsection the findings and conclusions about Research Question 4, were presented. In this subsection the findings and conclusions about Research Question 5, on the operational strategies of the regional university policy on collaboration are presented.

Research Question 5:
What are the operational strategies of the regional university policy on collaboration?

The fifth research question aimed at ascertaining the operational strategies of the University policy on collaboration. The analysis of field data, as presented in Section 4.7. unveiled the major findings which are summarised in Table 5.5.

Table 5.5. Research Question 5: Findings

Research findings	Significance	Contribution
1. The informants were unanimous that the vision is reflected in the policy guidelines.	Major	Consistent with the literature on research collaboration at a regional university.
2. The informants contend that the mission is reflected and strongly feel that this should be incorporated in future policy.	Major	Consistent with the literature on research collaboration at a regional university.
3. Staff were unanimous the guidelines do not have specific objectives.	Major	Inconsistent to the literature on research collaboration at a regional university
4. The guidelines do not contain measurable outcomes.	Major	New to the literature on research collaboration at a regional university
5. The university guidelines on collaboration incorporate intellectual property agreements.	Major	Consistent with the literature on research collaboration at a regional university.
6. Staff were unanimous that the guidelines provide for flexibility and would appreciate that they be strengthened in future policy.	Major	Consistent with the literature on research collaboration at a regional university.

Source: developed for this research

5.2.6 Summary

This research has revealed that the vision of the University is reflected in the policy guidelines on research collaboration. The conclusion is validated by the University vision as stated in Section 2.4.5. This major finding is *consistent* with the literature on research collaboration at a regional university.

Second, this study has disclosed that the informants contend that the mission is reflected in the policy guidelines on research collaboration. The conclusion is endorsed by the University mission as stated in Section 2.4.5. This major finding is consistent with the literature on research collaboration at a regional university.

Third, the research has unveiled that the guidelines do not include specific objectives. The opinion was supported by the statements ‘while there are appropriate policy statements the implementation of policy is wanting’ **and** ‘we have a lot words and very little action’. This major finding is *inconsistent* with the literature on research collaboration at the regional university. The researcher anticipates that this work will contribute to the body of knowledge.

Fourth, the study has highlighted that the guidelines do not contain measurable outcomes. The view was endorsed by the statement ‘as a researcher we need a mechanism of assessing our performance’. This major finding is *new* to the literature on research collaboration at the regional university. The anticipation of the researcher is that this work will contribute to the body of knowledge.

Fifth, the research has established that the University guidelines on collaboration incorporate intellectual property arrangements. Caenegem (2006) has stressed the importance of intellectual property agreements in collaboration. The opinion was supported by the statements, ‘we feel that our interests as researchers and those of the university are safeguarded when contracts are drawn’, ‘I can publish papers from outcomes of jointly conducted research’, and ‘I am comfortable conducting joint research with partners under the current arrangements’. This major finding is *consistent* with the literature on research collaboration at the regional university.

In concluding the findings and conclusions relating to the fifth question this study has confirmed that guidelines provide for flexibility. However, they could be strengthened in future policies. In order for the policy to become operationally feasible the guidelines *should* have specific objectives with measurable outcomes.

In this section the findings and conclusions relating to each of the five research questions were discussed and presented. The empirical findings show an inconsistent pattern which would require further research. The next section will consider the research problem posed

in Chapter 1, which underpinned the entire processes of data collection and data analysis for this research.

5.3 Conclusions about research problem

In Section 5.2 above, the findings and conclusions to the five research questions were discussed. In this section the research problem presented in Chapter 1, which underpinned the process of data collection and data analysis of this study will be considered. The research issue and problem have been highlighted throughout the research. However, the answer to the research problem has been a cumulative process.

The potential for collaboration as a policy strategy to attract external funding for business research.

What are the policy issues possibly affecting collaboration at a regional university?

In order to address this question, the study first addressed the literature to determine whether there were existing theories. The process was challenging due to the scarcity of literature. However, the survey of the literature on collaboration research revealed that this was the domain of larger metropolitan universities as opposed to regional universities. The problem was exacerbated by the lack of academic research being undertaken and published upon the role of research collaboration from a regional perspective. Academic researchers have reiterated that research collaboration is a viable option to raise additional funding. The researcher defined the research problem and five research questions in an attempt to address the policy issues likely to affect research collaboration at a regional university in Australia.

This research has revealed, from the sample chosen, that the informants would appreciate:

- being involved with research collaboration
- having a policy on research collaboration
- providing input into the development of the regional university policy on collaboration
- having a policy on research collaboration available to all
- a policy that clearly identifies lines of authority
- a policy with a sunset clause with input from those charged with the responsibility for research collaboration.

The informants were unanimous that their involvement in research collaboration and policy development **should** facilitate the process of collaboration.

Second, the University researchers were emphatic in stating that adequate funding for research collaboration should be provided. While funds for collaborative research are readily accessible, there is need to;

- review the 20% block amount of research collaborative grant apportioned to administration costs by the University
- put in place a clear mechanism for encouraging funding from stakeholders.

The University staff were clear about their tasks which are incorporated in the contracts. They would appreciate participating in collaborative research and believe that sharing of information within and among partners **should** lead to synergies and opportunities for additional funding.

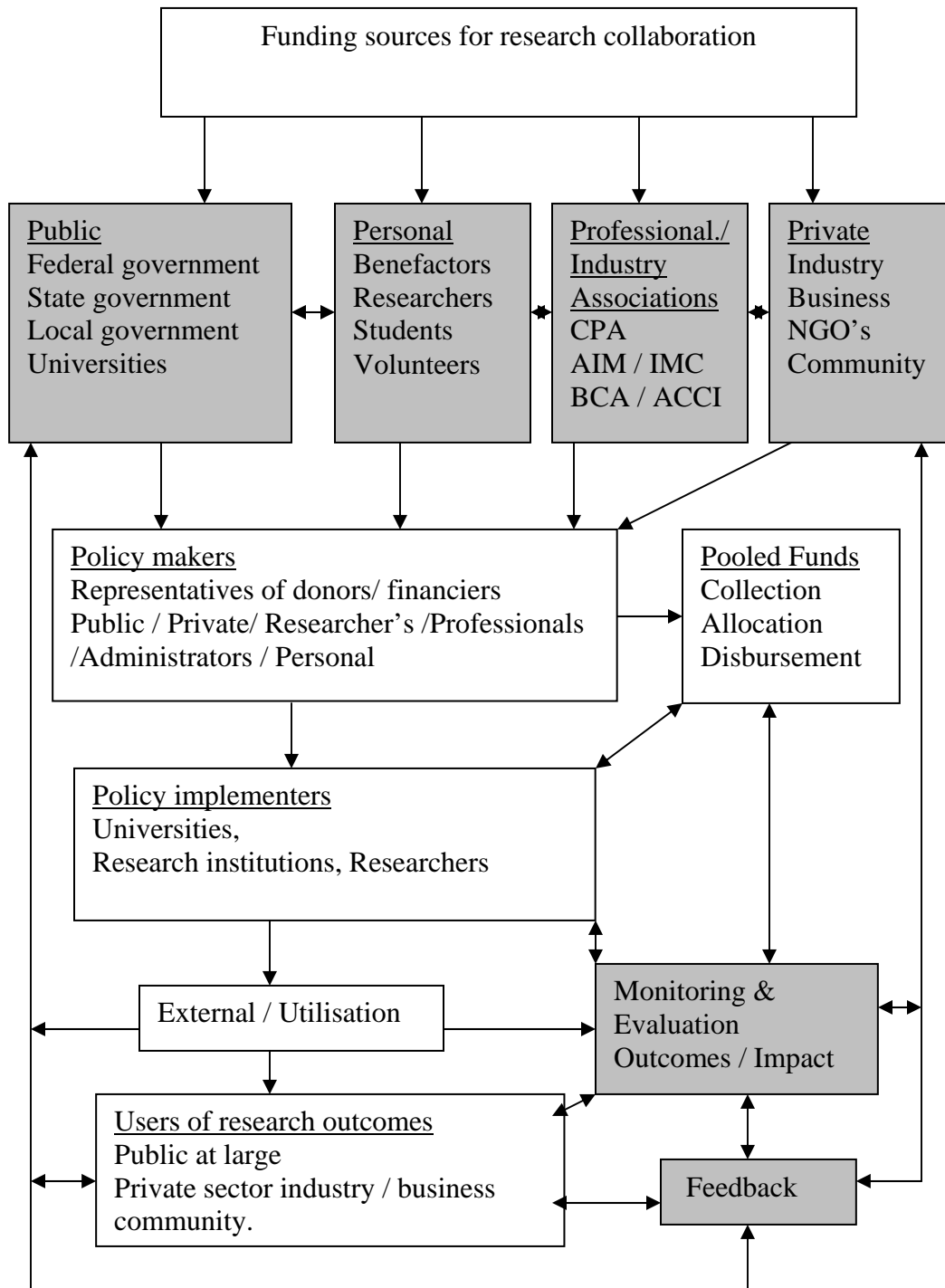
Third, the University policy on collaboration is reflected in relations with external institutions. Informants pointed out that there is encouragement for the conduct of joint research with stakeholders. There was consensus that the reflection of the University policy on collaboration in its external relations **should** help in recognising the institution as a regionally, nationally and internationally recognised research university.

Fourth, the University policy on collaboration impacts on the University's research focus. There was particular reference to an emphasis on regional research where the University has a cutting edge. There were divergent views in regard to encouraging internationally significant research. The majority of informants were in support while the rest were not certain. There were unanimous views that the guidelines do not promote the University's research strength and neither do they identify the institution as a research-intensive university. The impact on university research focus **should** be comprehensively addressed in the policy on research collaboration.

Finally, the operational strategies of the regional university policy on collaboration are reflected in the vision and mission of the University (Section 2.4.5). However, informants pointed out that the guidelines do not have specific objectives or measurable outcomes. On a positive note the guidelines incorporate intellectual property agreements and provide for flexibility. In order for the policy to become operationally feasible the guidelines **should** have specific objectives with measurable outcomes.

As a result of this study based on the extant literature (Chapter 2), the analysis of field data (Chapter 4), and the researcher's understanding of the capacity, importance and relevance of collaboration as a strategy to attract external funding for business research, the following conceptual framework has emerged. The proposed institutional collaborative supply chain funding model is exhibited in Figure 5.2.

Figure 5.2: Institutional Collaborative Supply Chain Funding Model



Source: Developed for this research

The institutional collaborative supply chain funding model in Figure 5.2 illustrates the role to be played by the major stakeholders funding research collaboration. The funds for research are sourced from the federal, state and local governments. The other major donors are from industry, the business community and professional associations, non-governmental organisations (NGOs), research students and volunteers who primarily contribute their time. The professional and industry associations would include the Certified Public Accountants(CPA), Australia Institute of Management(AIM),Institute of Management Consultants (IMC), Business Council of Australia (BCA) and the Australia Chamber of Commerce and Industry (ACCI).

The donor representatives would necessarily be part of policy formulation. It would be important for the donors to assert a major influence in safeguarding their monetary interests. The implementation of the policy on research collaboration is the responsibility of the universities and research institutes who have the necessary resources and infrastructure, particularly the human skills and information technology.

When the research is in progress there are certain outcomes that could be of use within the research institutions for teaching and further research. The outcomes could also be used externally among the stakeholders for application in projects where the research is relevant.

In order to ensure sustainability, value for money and continued support for business research, the utilisation of funds would be monitored and evaluated by an independent authority and/or body which would provide regular reports to the stakeholders with recommendations on ways of improvement.

The end users of the institutional collaborative supply chain research outcomes are the public at large, federal, state and local governments, universities, the private sector comprising industry and the business community, professional associations and personal

contributors who initially were the prime movers as the donors and financiers of research collaboration.

There could also be opportunities for exploring the possibilities of commercialising research outcomes. This would require meaningful tax assistance as development phase of research is both high-risk and cash-intensive and is of critical importance to the development of the knowledge and regional economy (AIC 2007).

To complete the institutional collaborative supply chain funding model, the stakeholders would have an opportunity to receive regular feedback on the relevance and impact of research outcomes. The research institutions and researchers could also use the research outcomes to conduct further research with the support of donors and financiers.

Based upon the model in Figure 5.2 this constitutes a useful starting point for further research.

5.4 Implications for theory, policy and practice

In the previous sections the research findings were presented in the context of the research problem and five research questions. In later sections the conclusions to the research problem were presented. In the next two subsections, the implications for theory, (5.4.1.) in addition to policy and practice (5.4.2) are portrayed.

5.4.1 Implications for theory

In Chapter 2, the literature review established that collaboration is the way forward for institutions in a rapidly changing competitive global environment (Bradshaw 2001; Frost & Sullivan 2006; Goddard 2000; Harryson 2005; Lambert 2003; Nickless 2006; Yves & Gary 1998).

The absence of an established theoretical framework, along with a scarcity of empirical research being conducted and documented on the importance of collaboration as a strategy to attract external funding for business research, have prompted the researcher to

pursue a theory-building, as opposed to deductive, theory-testing Approach. Academic scholars and researchers have emphasised that collaboration should play a major role in seeking alternative sources of funding for business research (Johnson, Scholes & Whittington 2005; Simatupang & Sridharan 2004a). Collaboration between and among institutions and businesses has been variously described and recommended as the way forward and should be adopted as a strategy especially for research-oriented institutions (Barratt & Olivera 2001; Baverstock 2006; Billington, Cordon & Vollmann 2006; Coyle, Bardi & Langley 2003; Fawcett, Ellram & Ogden 2007; Lambert 2003; Mentzer 2001) .

The literature review enabled the researcher to identify the research issues and objective. Upon this the research questions were formulated as expounded in Chapter 2 and depicted in Figure 2.8. The research issue was put to test through detailed interviews with a sample of informants for data followed by analysis. The outcome of the research constitutes the model proposed and exhibited in Figure 5.2. The model will require further testing by means of extended research. This is expounded and elaborated in Section 5.6.

This study has emphasised the importance of addressing policy issues likely to affect collaboration. The scholars and researchers who were key informants have argued a strong case regarding the value and importance of collaboration. The conclusions arising from this research may not be confined to the literature on collaboration per se, but may have the potential to be applied to other related areas. For instance, these may include the other modern supply chain techniques such as partnerships, strategic alliances, joint ventures, networks, engagement and institutional development in general.

In concluding the discussion of the implications for theory, the methodological implications of this research should be pointed out. The study has demonstrated that a case study methodology in the context of a realism paradigm is a viable alternative to a deductive approach. The primary data was collected by means of in-depth interviews with researchers and staff at SCU, as well as staff from research partnering and research benefiting institutions/organisations. The data analysis provided a rich understanding and

appreciation of the importance of collaboration from a regional institutional perspective.
The research reaffirms the usefulness of case study methodology.

5.4.2 Implications for policy and practice

The previous sub-section discussed the implications of this research for related theories. This sub-section examines the implications for policy and practice.

The literature on collaboration has revealed that institutions that collaborate are better placed to deal with the challenges of the 21st century. Further, collaboration between universities, government and the regional communities provides knowledge-based economic development between universities and their communities (Bradshaw 2001; Garlick 2001). Socially robust knowledge can be produced in a variety of settings through networks where membership is open and flexible, thereby acting as a catalyst for collaboration (Gibbons 2005). The regional universities, due to their geographic location, have been disadvantaged in attracting funding from the Australian Stock Exchange (ASX) listed companies, hence the need to review their strategies for funding within and beyond their regional environment. This in itself is a challenge if the policies in place are not supportive of such an endeavour. As observed in this study, ‘in relation to the policy on collaboration that affects members’ rights and obligations at the University, the policy must be approved by one who is properly delegated at the University’. The way forward is to link the policy on collaboration with the regional needs as part of value-added management processes (Goddard 2000). The failure to appreciate collaboration could be attributed to the inability to cascade the policy to all researchers within the regional university. The institutions that are collaborative-ready should be innovative, creative and focused on core competencies (Frost & Sullivan 2006; Yves & Gary 1998).

This research has produced a model that should enable the regional university management and staff to initiate the process of active collaboration with stakeholders. Among the key components in the model is that the regional university ought to identify with the key stakeholders who would provide funding for business research. Once in

place, a comprehensive framework incorporating stakeholder views should be initiated.

In this regard, collaboration:

- should result in increased funding for business research
- should open opportunities for researchers
- should help in identifying relevant research for the region
- should ensure closer working relationship with stakeholders
- should ensure sustained funding for business research
- should equip staff to overcome fear of change
- should help create employment opportunities
- should deliver solutions to regional issues
- should drive the process of networking
- should ensure that all stakeholder interests are taken care of.

The study has revealed that collaboration would be a useful management tool in bringing about cultural change within the regional university to help embrace the process openness and sharing of information.

The findings of this research are based upon researchers' and staff perceptions. The issues should have great applicability in institutional management planning and decision taking processes. As part of institutional change SCU management has designated all schools and research institutes as cost centres which are required to be financially self sustaining. The model proposed could be adopted by the University's schools and research institutes as one of the ways of addressing their management and financial requirements.

5.5 Limitations

In Section 1 the explicit limitations of this research were outlined. Section 3.9 described limitations embedded in the case study research methodology. In this section one additional limitation which emerged during the course of the research is identified.

This research examined the policy issues likely to affect research collaboration at a regional university in Australia. The findings arising out of this research are confined to a single case of a regional university in Australia. The findings may not necessarily apply to the other regional universities as each of them is unique, having been set up with specific purposes by their respective state and territory governments. Consequently, the findings may not apply to all the other Australian universities. Further research will need to be conducted in other regional and metropolitan universities in Australia, or indeed universities in other countries, to authenticate these findings.

The informants for this study were restricted to staff with varying collaborative research experience and staff who offered specialised legal and administrative support. The research staff were recommended based on their involvement or likely involvement in collaborative research at the University. The researcher interviewed 42 participants, 30 from the University and 12 from the research partners and beneficiary institutions/organisations. The researcher had no influence on the selection of participants.

5.6 Further research

This research examined the policy issues likely to affect collaboration as a strategy to attract external funding for business research. The conclusions and recommendations provide a basis for further research. To gain a deeper understanding of the issues involved it would be imperative to conduct further research using one of the following approaches:

- extend the research
- adopt the methodology and quantify the results
- further explore the model proposed
- besides policy, examine other key variables necessary for collaboration:
intellectual property (IP), commercialisation and corporation taxation laws, resources/infrastructure, information knowledge and expertise transfer through university business interaction, institutional culture, capacity to adapt to the external environment

The findings of this theory-building study relied primarily upon a qualitative methodology involving a single case study research and in-depth interviewing.

First, there exists an opportunity to replicate this research to other regional or metropolitan universities to help determine whether the findings are relevant and applicable. There are several possible ways to do this. One, this research was confined to a single case of a regional university in Australia. This poses the question as to whether the policy issues affecting collaboration may be institutional. In this regard, qualitative research should be conducted in other regional and metropolitan universities in Australia to test the findings from this research. Two, the themes, methodology and interview protocol could be adopted for similar studies for universities/institutions abroad that aspire to collaborate or enter into partnerships with Australian universities. In the event that the themes prove to be able to be applied in other environments there may be additional evidence to the effect that some of the themes could be developed into theory.

Two, the findings of this **theory-building research** relied upon a qualitative methodology involving case study research and in-depth interviewing. These findings would be given further credibility by conducting a positivist research involving several cases of a similar nature within Australia with a larger and broader sample.

Third, this thesis eventuated the proposed institutional collaboration supply chain funding model exhibited in Figure 5.2. Testing the model could provide the foundation for further in-depth research.

Fourth, this research will provide an opportunity to explore the importance of other key variables necessary for collaboration besides policy. They include;

- intellectual property (IP)
- commercialisation and corporation taxation laws
- resources/infrastructure
- information knowledge and expertise transfer through university business interaction, Institutional culture
- capacity to adapt to the external environment.

There are several ways in which further research may be undertaken. The immediate option would be to replicate this study in other universities both in Australia and abroad to ascertain how applicable the findings area.

In conclusion this research has examined the policy issues likely to affect collaboration. The research resulted in a number of major and minor findings. A theoretical model was proposed which could provide the basis for further research.

5.7 Conclusion

Collaboration is identified within the supply chain management discipline as a strategy that helps to link inter-institutional business research operations in order to achieve a shared market opportunity. Through collaboration, institutions should aim at maintaining a competitive advantage in their core areas of operation.

Researchers have begun to appreciate that through collaboration they are able to achieve combined synergies through effective use of available yet at times scarce resources particularly for research. In the Australian universities research sector collaboration has assumed greater importance in light of the changing public sector funding environment which is similar to the changes taking place in other parts of the world.

The absence of a comprehensive operational policy on research collaboration in regional universities in Australia would most likely hinder their capacity to attract funding from external sources for their business research functions. The strategy of collaboration, although highly advocated, has not been the focus of any formal published studies in the context of the Australian regional university sector prior to this research.

This thesis set out to fill this perceived gap in the literature by examining the policy issues likely to affect research collaboration at regional universities. For this purpose a research objective and five research questions were identified and defined. The research adopted a qualitative, inductive, theory-building exploratory approach with case study being the main research methodology. The researcher opted for a single case study of a regional university in Australia, where 30 in-depth interviews and an additional 12 representing research partner and beneficiary institutions were conducted.

Upon data collection and data analysis, the following findings emerged:

- One, researchers were keen to be involved in the development of the policy to facilitate the process of collaboration.
- Two, adequate funding is essential for collaboration to achieve the desired results.

- Three, the regional university policy on collaboration is reflected in relations with external institutions, there is encouragement for the conduct of joint research with stakeholders.
- Four, the policy on collaboration impacts on the University's research focus, and should be comprehensively addressed.
- Five, for the policy on collaboration to become operationally feasible the guidelines should have specific objectives with measurable outcomes.

Further to these findings, it has been concluded that: (1) a comprehensive policy addressing the concerns of all stakeholders should facilitate the process of collaboration, (2) that sharing of information within and among partners should lead to synergies and opportunities for additional funding (3) the university policy on how collaboration is reflected in external relations *should* help in recognising the institution as a regionally, nationally and internationally recognised research university, (4) the University's impact on research focus should be comprehensively addressed in the policy on research collaboration, and (5) for the policy to become operationally feasible the guidelines *should* have specific objectives with measurable outcomes.

Based upon the surveyed literature (Chapter 2), the analysis of field data (Chapter 4), the researcher's understanding of the capacity, importance and relevance of collaboration as a strategy to attract external funding for business research, a conceptual model has emerged. The model enables the researcher to shed light on the research issue and the policy issues likely to affect collaboration at a regional university. The empirical research findings derived from this research have further implications for theory, policy and practice. Finally, the conclusions and implications provide a valid foundation for further research. This research will be imperative to obtain a deeper understanding of the underlying issues.

Appendix 1



Southern Cross University

INFORMATION SHEET

NAME OF PROJECT

The potential for collaboration as a policy strategy to attract external sources of funding for business research. A case study of a regional university focusing on policy issues likely to affect research collaboration.

Dear [User name] [User second name]

You are invited to participate in a study that seeks to examine the potential for collaboration among Regional Distance Intensive Universities Australia (RDIUA), as a policy strategy to attract external funding for business research, a case study of a regional university. This research forms part of the requirements for the Doctor of Business Administration (DBA) degree program being conducted by Njau Gitu and supervised by Dr. Philip Neck, Adjunct Professor of International Management and Development.

Please take a moment and read the following which summarises the notion of collaboration in an institutional context. Collaboration involves the harnessing of resources within and between institutions in order to achieve mutually set goals. Collaboration has assumed importance in view of the fact that the cost of business research has been rising. The current trend calls for institutions and researchers alike, to develop mechanisms that would assist in attracting and sharing the available resources. *Best Practices* of effective collaboration can enable institutions and researchers to work together on joint research projects even though they may be physically

apart. Through collaboration institutions are able to share and utilise key human, financial and technical resources.

Procedures to be followed

The interview should take approximately 20 minutes in total. In the first few minutes a brief background and rationale to the study will be provided by the researcher. Background information will be collected, this will consist of your academic qualifications, the number of years of research experience at the current and previous university/institution. and your research field/discipline. No other personal information will be collected by the researcher. You will be asked to give your opinion on five research questions related to policy issues affecting collaboration at a regional university, and be free to provide further information on your experience with regional university research policy on collaboration.

Participation is purely voluntary and no financial remuneration or incentive will be offered for taking part in this research. There are no travel expenses, nor are there any costs associated with participation in this research. There is no cost to you apart from your time.

Possible discomforts and risks

There are no foreseeable risks involved by participating in this study.

Responsibilities of the researcher

It is our duty to make sure that any information given by you is protected. Your name and other identifying information will not be attached to data collected. Any identifying information will be destroyed after your participation in the study.

It is essential that you sign a consent form before you participate in this survey. Due to this necessity, a procedure has been set in place to ensure that your personal details can at no time be matched, identified or tracked back to the data collected on the information provide in this project.

All signed consent forms will be held in safe storage at the University for a period of five years before being destroyed. The information will be presented as overall data. The research findings may be submitted for publication.

Responsibilities of the participant

If there is anything that might impact upon your information provided you are asked not to participate. You may leave the interview voluntarily without explanation of such factors. If you feel there are any safety concerns also let us know.

Freedom of Consent

If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time. However, we would appreciate you letting us know your decision.

Inquiries

This form is yours to keep for future reference. If you have any questions, we expect you to ask us. If you have any additional questions at any time please ask:

Njau Gitu

DBA Candidate / Researcher

Graduate college of Management

Southern Cross University

PO Box 42

Tweed Heads NSW 2485

Email: ngitu@scu.edu.au

Phone: 0412647287

Dr. Philip A. Neck

Supervisor

Graduate college of Management

Southern Cross University

PO Box 42

Tweed Heads NSW 2485

Email: philip.neck@scu.edu.au

Phone: (07) 55993125

The ethical aspects of this study have been approved by the Southern Cross University Human Research Ethics Committee. The Approval Number is ECN-07-147. If you have any complaints

or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Ethics Complaints Officer:

Ms Sue Kelly
Ethics Complaints Officer and Secretary
HREC
Southern Cross University
PO Box 157
Lismore, NSW, 2480
Telephone (02) 6626-9139 or fax (02) 6626-9145
Email: sue.kelly@scu.edu.au

All complaints, in the first instance, should be in writing to the above address. All complaints are investigated fully and according to due process under the National Statement and this University. Any complaint you make will be treated in confidence and you will be informed of the outcome.

"I agree to participate in this research,"

Signed participant

Date _____

Appendix 2



Southern Cross University

Informed Consent to Participate in the following research project

This consent form is based on Guidelines from the National Statement on Ethical Conduct Involving Human Participants as issued by the NHMRC.

Name of Project: The potential for collaboration among Regional Distance Intensive Universities Australia (RDIUA) as a policy strategy to attract external funding for business research. A case study of a regional university focusing on policy issues likely to affect research collaboration.

Researchers:

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I have been provided with information at my level of comprehension about the purpose, methods, demands, risks, inconveniences, and possible outcomes of this research (including any likelihood and form of publication of results).

I agree to participate in the above research project. I have read and understand the details contained in the Information Sheet. I have had the opportunity to ask questions about the study and I am satisfied with the answers received.

I agree to an interview and to my interview being recorded on audiotape.

OR

I do not agree to my interview being audio-taped and prefer the researcher to take hand written notes.

I understand that if I withdraw from participation in this research, that any tapes or handwritten notes about my contribution will be destroyed.

OR

I understand that neither my name nor any identifying information will be disclosed or published, except with my permission.

OR

I understand that all information gathered in this research is confidential. It is kept securely and confidentially for 5 years, at the University.

I understand that I am free to discontinue participation at any time. I have been informed that prior to data analysis, any data that has been gathered before withdrawal of this consent will be destroyed.

I am aware that I can contact the Supervisor or other researchers at any time with further inquiries, if necessary.

- The ethical aspects of this study have been approved by the Southern Cross University Human Research Ethics Committee (HREC). The Approval Number is ECN-07-147.

If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Ethics Complaints Officer:

Ms Sue Kelly
Ethics Complaints Officer and Secretary
HREC
Southern Cross University
PO Box 157
Lismore, NSW, 2480
Telephone (02) 6626-9139 or fax (02) 6626-9145
Email: sue.kelly@scu.edu.au

All complaints, in the first instance, should be in writing to the above address. All complaints are investigated fully and according to due process under the National Statement on Ethical Conduct in Research Involving Humans and this University. Any complaint you make will be treated in confidence and you will be informed of the outcome.

- I understand that I will be given a copy of this consent form for my records. The researcher will also keep a copy in safe storage at the University.

I have read the information above and agree to participate in this study. I am over the age of 18 years.

Name of Participant:

Signature of Participant:

Date:

I certify that the terms of the Consent Form have been verbally explained to the participant and that the participant appears to understand the terms prior to signing the form. Proper arrangements have been made for an interpreter where English is not the participant's first language.

Name & Contact Detail of Witness:.....

.....

Signature of Witness:.....

Date:

NOTE:

The witness should be independent of the research, where possible. If this is not possible at the place of consent, please inform the researcher and state a reason below.

Reason:.....

.....

.....

Name and signature of the researcher:.....

.....

Date:.....

Appendix 3



Southern Cross University

Interview protocol guide

Title of research: **The potential for collaboration as a policy strategy to attract external funding for business research. A case study of a regional university in Australia.**

Research question: What are the policy issues likely to affect research collaboration at a regional university in Australia?

Thank you for accepting to participate in this research, the study is being undertaken to seek the opinion of persons involved with research on the policy issues likely to affect research collaboration at a regional university in Australia.

Collaboration involves the mutual setting of goals combined with provision of knowledge in an open environment which facilitates interaction between academia and business.

Interview guide into policy issues likely to affect research collaboration at a regional university in Australia

The first part of this guide seeks informants background information, the latter part consists of five different sections: (1) Policy on collaboration development (2) Resources and impact on collaboration (3) Institutional relations and collaboration (4) Research focus and collaboration (5) Collaboration policy operational strategies.

Background information.

A. Academic qualifications.

Undergraduate _____ Masters _____ PhD/DBA _____

Other please specify _____

B. Years of involvement in research at previous and current

institutions _____

C. Research field /discipline

Collaboration involves the mutual setting of goals combined with provision of knowledge in an open environment which facilitates interaction between academia and external funding sources.

Section 1: Policy on collaboration development

This section and sub-section seeks to understand the role of persons involved with collaboration, the second part seeks opinion in relation to the development and implementation of the policy on collaboration at a regional university.

1. In your current or past role have you or are you likely to be involved with research collaboration with other institutions while at a regional university.

Yes / No

If the answer to question one is No. The interview will not proceed and the interviewee will be thanked for taking time to participate in the study. If the answer is Yes the interview will proceed.

The interviewee's preference/ opinion will be sought and to each statement and the response recorded by circling/ticking the appropriate number on the likert scale.

1	2	3	4	5	6	7
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree

Strongly disagree

Strongly agree

2.	Through your involvement with collaboration at a regional university you are fully aware of the university's policy on collaboration.	1	2	3	4	5	6	7
----	---	---	---	---	---	---	---	---

If the informants indicate that they are not fully aware of the research collaboration policy at a regional university, the interview will not proceed, the interviewee will be thanked for taking time to attend to participate in this study. If they indicate that

they are aware of the University policy on collaboration the interview will proceed with the remaining sections.

This sub-section seeks opinion in relation to the development of the policy on collaboration. The informant's preference/ opinion to each statement is recorded by circling/ticking the appropriate number on the likert scale.

1	2	3	4	5	6	7
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree

The regional university policy on collaboration:

3.	was developed by persons charged with responsibility for collaboration at the regional university.	1	2	3	4	5	6	7
4.	is readily available to the persons involved with collaboration at the regional university.	1	2	3	4	5	6	7
5.	identifies persons involved with collaboration at the regional university.	1	2	3	4	5	6	7
6.	clearly outlines levels of authority for those responsible for collaboration.	1	2	3	4	5	6	7

7.	has a sunset clause for review.	1	2	3	4	5	6	7
8.	is regularly reviewed with input from persons involved in collaboration.	1	2	3	4	5	6	7

The views of the informant's are sought on their possible involvement with respect to the development of a regional university policy on collaboration.

Section 2: Funding and impact of a regional university policy on collaboration

In this section the informant's opinion is sought with regard to finances and their impact on a regional university policy on collaboration. The informant's preference/opinion to each statement is recorded by circling/ticking the appropriate number on the likert scale.

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

The regional university policy on collaboration:

9.	provides adequate funds for collaboration.	1	2	3	4	5	6	7
10.	ensures funds provided for collaboration are easily accessible.	1	2	3	4	5	6	7
11.	encourages sourcing of funds from different stakeholders government, national, state, local, industry partners, professional bodies, individual donors, benefactors and societies	1	2	3	4	5	6	7
12.	has a mechanism of assessing individual members contribution to a collaborative task .	1	2	3	4	5	6	7
13.	emphasises the importance and value of collaborative research.	1	2	3	4	5	6	7
14.	encourages the sharing of information within the regional university and among the partners.	1	2	3	4	5	6	7

The views of the informant are further sought on the funding arrangements and how they impact on the regional university policy on collaboration.

Section 3: External institutional relations and regional university policy on collaboration

In this section opinion on the policy on collaboration is sought with reference to policy guidance on dealing with external institutions. The informant’s preference/ opinion to each statement is recorded by circling/ticking the appropriate number on the likert scale.

1	2	3	4	5	6	7
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree

The regional university policy on collaboration:

15.	offers guidance on relations with external partners.	1	2	3	4	5	6	7
16.	encourages the joint conduct of relevant research with stakeholders.	1	2	3	4	5	6	7
17.	identifies the university as a regional, national and internationally recognised research institution.	1	2	3	4	5	6	7

The views of the informant are further sought on how the regional university policy on collaboration reflects in relations with external institutions.

Section 4: Regional university research focus

This section seeks opinion on the policy on collaboration with regard to regional university research focus. The informant’s preference/ opinion to each statement is recorded by circling/ticking the appropriate number on the likert scale.

1	2	3	4	5	6	7
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree

The regional university policy on collaboration

18.	reflects the importance of regional research.	1	2	3	4	5	6	7
19.	encourages internationally significant/topical research.	1	2	3	4	5	6	7
20.	helps promote the regional university’s research strengths.	1	2	3	4	5	6	7
21.	identifies the regional university as a research intensive University.	1	2	3	4	5	6	7

The views of the informant are sought on how the regional university policy on collaboration impacts on the regional university's research focus.

Section 5: Strategy and operation of the regional university policy on collaboration

In this section opinion is sought with respect to regional university collaboration and the operational framework. The informant's preference/ opinion to each statement is recorded by circling/ticking the appropriate number on the likert scale.

1	2	3	4	5	6	7
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree

The regional university policy on collaboration:

22.	is reflected in the vision of the regional university.	1	2	3	4	5	6	7
23.	is entrenched in the mission statement of the regional university.	1	2	3	4	5	6	7
24.	has specific objectives.	1	2	3	4	5	6	7
25.	has measurable outcomes.	1	2	3	4	5	6	7
26.	incorporates flexible intellectual property arrangements.	1	2	3	4	5	6	7
27.	allows flexibility in negotiations with partners and stakeholders.	1	2	3	4	5	6	7

The views of the informant are sought on the operational strategies of the regional university policy on collaboration.

Additional information on research collaboration

Please state any specific benefits or problems you may have experienced in the operation of the regional university policy on collaboration.

Based on your experience provide any immediate suggestions/proposals you may have regarding the development of a regional university policy on collaboration.

--

In your opinion how does the perspective of researchers compare with those of the makers of the university policy on collaboration.

The researcher will thank the informant for sparing their valuable time to participate in this study.

Appendix 4

University groupings in Australia

There are four main groupings of Australian Universities. The groups are primarily formed to promote the unique mutual objectives of the member universities, These include marketing advantages, practical benefits of **collaboration**, and the increased lobbying power that comes from being part of a group. The four main groupings currently active are:

- **Group of Eight (Go8)**
- **Australian Technology Network (ATN)**
- **Innovative Research Universities Australia (IRUA)**
- **New Generation Universities (NGU)**

Group of Eight (Go8)

The Group of Eight (Go8) promotes itself as the group of 'Australia's Oldest Universities'. The claim to this is supported by reference to statistics relating to variables such as research outputs, industry links, graduate outcomes, and the competency of their academic staff. The member grouping is depicted in the following table.

Group of Eight (Go8) Universities

Name	State
The University of Adelaide	South Australia
The Australian National University	Australian Capital Territory
The University of Melbourne	Victoria
Monash University	Victoria
The University of New South Wales	New South Wales
The University of Queensland	Queensland
The University of Sydney	New South Wales
The University of Western Australia	Western Australia

Source: Go8 (2006)

Each of these member universities is well regarded in a number of different areas and together they form a powerful bloc among the universities in Australia (Go8 2006)

Australian Technology Network (ATN)

The Australian Technology Network (ATN) is constituted of an influential alliance of five distinctive and prominent Australian universities located in each mainland State, the members are depicted in the following table

Australian Technology Network (ATN) of Universities

Name	State
Curtin University of Technology	Western Australia
University of South Australia	South Australia
RMIT University	Victoria
University of Technology Sydney	New South Wales
Queensland University of Technology	Queensland

Source: ATN (2006)

The ATN's aim is to help secure Australia's reputation as the clever and skilled country, contributing to its social and economic wealth by building strategic partnerships and undertaking solution based research which is relevant to the expectations of industry and the community. The member group champions the key principles of access and equity to ensure its members are the universities of first choice for more students.

The network claims they have a special strength in the way each of the member universities is focused on producing practical outcomes through their academic activity. The result is graduates and research that is closely aligned to the needs of industry and the wider society.

These universities share a common background in the way they distinguished themselves as technical colleges before becoming accredited universities. It is from this background that the universities have been able to develop a framework of flexibility and innovation that continues to deliver practical results (ATN 2006).

Innovative Research Universities Australia (IRUA)

The background, to research performance and innovation are key characteristics of the six universities that comprise a national alliance with the title Innovative Research Universities Australia (IRUA).The members are depicted in the following table.

Innovative Research Universities Australia (IRUA)

Name	State
Flinders University	Victoria
Griffith University	Queensland
La Trobe University	Victoria
Macquarie University	New South Wales
Murdoch University	Western Australia
University of New Castle	New South Wales

Source: IRUA (2006)

The universities are drawn from five states and were all founded during the period of higher education expansion in the 1960s/1970s. The six were established as research-based universities with comprehensive disciplinary coverage and a strong commitment to innovation and an inter-disciplinary focus. Innovative Research Universities Australia (IRUA) share a common mode of operation and believe that by coming together they will be better able to deliver value to their stakeholders. Most importantly, the group believes that they will be able to establish research concentrations and investment across the universities. There will also be opportunities to benchmark against each other along with collaborating in professional development initiatives, e-learning and new information and communications technology, income generation, and industrial issues.

These six universities share a common background having been founded in the 1960s and 1970s as research universities and it is estimated that collectively they have about 15

percent of total university enrolments in Australia. Each of the universities has developed highly regarded areas of specialisation and the formation of the group will result in all the member universities becoming stronger (IRUA 2006).

New Generation Universities (NGU)

The New Generation Universities (NGU) grouping is limited to institutions that have received university accreditation since 1970. However, NGU members also share a number of features including a flexible and dynamic program offering and an ability to operate in response to and in close cooperation with community, business and government. The members are depicted in the table below.

New Generation Universities (NGU)

Name	State
Australian Catholic University	Victoria
Central Queensland University	Queensland
Edith Cowan University	Western Australia
Southern Cross University	New South Wales
Victoria University	Victoria
University of Ballarat	Victoria
University of Canberra	Australian Capital Territory
University of Southern Queensland	Queensland
University of the Sunshine Coast	Queensland
University of Western Sydney	New South Wales

Source:NGU (2006)

The NGU members have a distinctive approach to university operations in the way that is based on the interactions of learning, teaching, research, and community engagement (NGU 2006).

The common denominators in the formation of these University groupings was that they were formed by the need to jointly combine efforts and resources to resolve the issues facing them.. The partnerships and alliances among them have enabled them to harness skills designed to achieve goals for their mutual benefit. As groups they are in a strategic position to take advantage of emerging opportunities. According to the chairwoman of the NGU's the most significant item for NGU's in the 2006 federal budget is the increase in capital development funding (Garnett 2006) . This would provide an opportunity for NGU's to compete on equitable basis with other universities for these funds.

The membership to any of these groups does not in itself necessarily signify anything special about the member universities. There are universities that are not part of any of these groupings that have their own set of strengths and foci. Other Australian universities have international connections that might be more important to them than any domestic groupings. However, the groupings do represent universities that have a similar style and focus and the formation of these groups will most likely accentuate these similarities. The University groups lobby for special consideration for accessing additional **funding** from the Commonwealth Government (Sheehan 2006).

Regional Universities in Australia (RUA)

The Regional Universities Australia (RUA) are a grouping of universities established in the last twenty years, with their main campuses located in regional Australia. (Operational definition developed for this research).

Regional universities are important because they are the major drivers of regional economies through;

- students knowledge and skills enhancement
- employment academic and support staff
- and procurement of goods and services.

The universities have in addition a strategic impact on regional economies by aligning teaching and research to the needs of the region, they are also the key drivers to intellectual, social cultural and environment development (Blackadder 2005) .

The following five institutions would qualify to be members as per the definition of RUA. The members are graphically depicted in the following table.

Regional University Australia (RUA) composition

Name	City, State
Southern Cross University	Lismore, New South Wales
University of Southern Queensland	Toowoomba, Queensland
University of Sunshine Coast	Sippy Downs, Queensland
Central Queensland University	Rockhampton, Queensland
University of Ballarat	Mt. Helen, Victoria

Source: developed for this research

Southern Cross University

Southern Cross University was established on 1st January 1994. The university is located in the North Coast Region of New South Wales. Its specific mandate as an academically integrated institution, was to incorporate the University of New England(UNE) network centres at Northern Rivers, Lismore and Coffs Harbour.

The university has three campuses at Lismore, Coffs Harbour and Tweed Heads Gold Coast. The university has centres in Australia and overseas. SCU provides students with the capacity and flexibility to tailor courses to suit their career aspirations. It has a vibrant business faculty, offering different management courses relevant to industry (Southern Cross University 2006).

University of Southern Queensland

The University of Southern Queensland (USQ) was established on 1st January 1992 at Toowoomba in southern Queensland. It has campuses at Wide Bay, Greater Springfield near Brisbane and a European study centre in Bretten, Germany.

The university offers professional degree courses in:

- Business studies
- Education
- Science
- Engineering

The university is a major contributor to the regional economy of Southern Queensland (USQ 2006).

University of Sunshine Coast

The University of Sunshine Coast was established on February 26, 1996 at Sippy Downs. It was Queensland's seventh public university. The aim of the university was to serve the needs of the Sunshine Community one of the fastest growing regions of Australia.

The university has had a major impact on the regional economy in terms of educational opportunities and employment direct through provision of goods and services (USC 2006).

Central Queensland University

University of Central Queensland was established in January 1992, at Rockhampton. It officially changed its corporate identity and name to Central Queensland University on May 20, 1994.

The university has regional campuses at Rockhampton, Mackay, Gladstone, Bundaberg, Emerald, and Noosa. The university has four Australian campuses in Brisbane, Gold Coast, Sydney and Melbourne are all located in the heart of the respective cities. Internationally has a campus in Suva, Fiji, and also conducts teaching programs in Hong Kong, Singapore and Chengdu.

The University has five community Faculties:

- Business and law
- Arts, Health and Sciences
- Education and Creative Arts
- James Goldston Engineering and Physical Systems
- Informatics and Communication (CQU 2006)

University of Ballarat

The university of Ballarat was established in 1994. Its mandate was to serve the regions of Central and Western Victoria, in particular it was maintain and develop a strategic link to the needs of the regions educational and economic activity mining.

The university is based at Mt. Helen with five other campuses at SMB and Camp Street Campuses in Ballarat , Horsham, Stawell and Ararat.

The university has a track record in business innovation and entrepreneurship. The institution maintains close links to industry by facilitating and promoting new technology in products and services through scientific and industrial research (UB 2006).

Appendix 5

Collaborative research position at Southern Cross University.

The Graduate Research College (GRC) at Southern Cross University (SCU) opines that the University is keen to conduct research in collaboration with outside organisations. The University therefore has in place a flexible approach to Intellectual Property arrangements. SCU is a "Registered Research Agency " (RRA) with the Commonwealth Government in Australia, the implication is that any funds expended for research through the University, are eligible for the Research and Development (R&D) tax concession, which according to the (GRC) may in certain circumstances be as high as 175% (Southern Cross University 2006)

Collaboration research centres between SCU and other Universities

Southern Cross University (SCU) University of New South Wales(UNSW) –Coffs Harbour City Council(CHCC). The Aged Services Learning and Research Collaboration (ASLaRC).

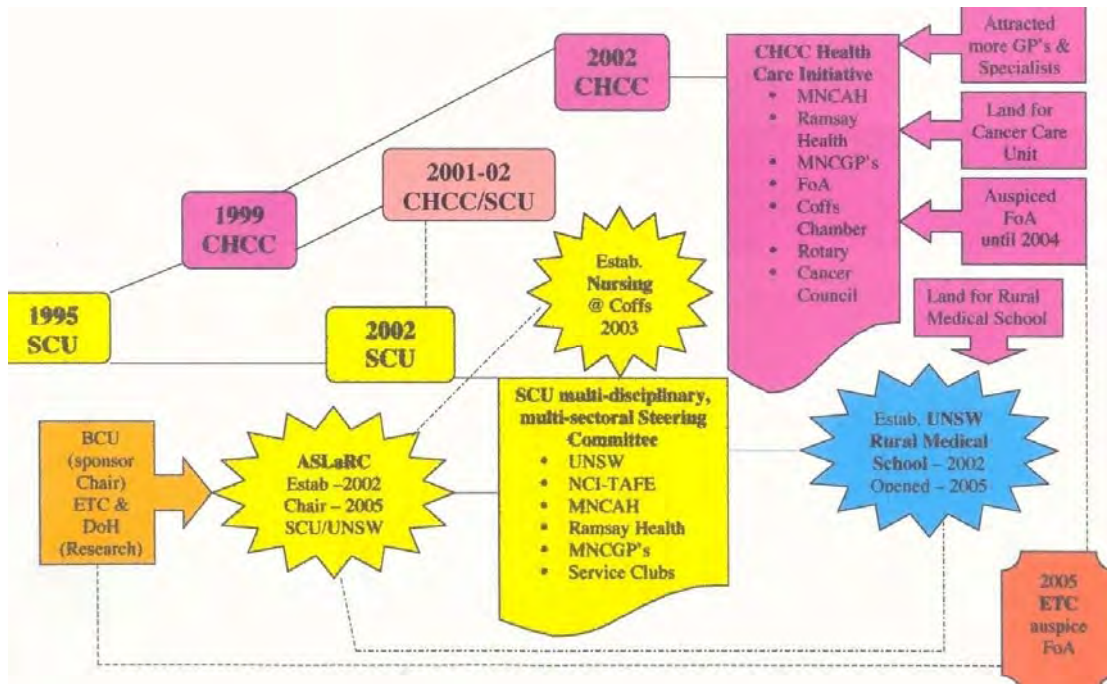
SCU has in place collaboration arrangements with University of New South Wales (UNSW), Coffs Harbour City Council (CHCC) and key public and private health sector providers. The result of this is a significant health and aged services initiatives in Coffs Harbour. The relationship has seen the establishment of the **Aged Services Learning and Research Collaboration(ASLaRC)** to spearhead regional community activities. ASLaRC undertakes research in the following areas depicted in

- Advance care planning
- Ageing in indigenous communities
- Community development and planning
- Effectiveness of the non-governmental sector
- End- of –life-decision-making

- Family carers
- Workforce issues in aged care
- Workforce issues of an ageing population (ASLaRC. 2006)

The collaborative arrangement between SCU, UNSW, CHCC and key public and private health sector providers is depicted in following figure.

Collaboration experience at SCU



Source: Sothern Cross University (2006) Office of Regional Engagement (ORE)

The collaboration between SCU, CHCC and the UNSW and the key public and public health sector was initiated in the year 2000. The CHCC identified several key sectors that underpinned the regional economy to include education, health and aged care.

To facilitate the social and economic development of the Coffs coast representatives from CHCC and SCU met in year 2001-2003 to identify and support opportunities that were mutually beneficial to each organization and to the community.

During this period CHCC through its Health Care Initiative (HCI) and the Future of Ageing Project (FAP) was working with Mid North Coast Area Health, Coffs Harbour Health Campus (CHHC), Ramsay Health (Baringa Private Hospital) and the Mid-North Coast General Practitioners (MNCGP). The initiative identified three health sector needs:

- A shortage of doctors both general practitioner and specialist.
- The need for local nursing training.
- The need for research with a particular focus on better understanding of aged services needs and requirements.

Southern Cross University supported the establishment of the UNSW rural medical school in Coffs Harbour by providing office space prior to the construction of the specialist medical training facility. The facility located adjacent the CHHC was opened in 2005 on land provided by CHCC.

SCU commenced the undergraduate nursing program in 2003 at Coffs Harbour and has worked closely with the North Coast Institute (NCI) of Tertiary and Further Education (TAFE) on the delivery of nursing, aged care nursing and pathway programmes.

The ASlaRC was established in the 2004 and includes an ongoing relationship with UNSW. Among the research projects undertaken by ASlaRC is one on affordable housing options for Department of Housing (DH) and the Enterprise and Training Company (ETC) of Coffs Harbour limited which was completed in 2006 (Southern Cross University 2006)

Southern Cross University – University of New England
The National Marine Science Centre (NMSC)

The National Marine Science Centre (NMSC) is part of Australia's Oceans Policy and was constructed with a grant from the Commonwealth Government's **Centenary of Federation Fund (CF F)**. This is a major development in the study and research of marine and coastal science and management in Australia. The centre was opened in 2002 and is a joint venture of Southern Cross University and the University of New England. The partnership between the Universities was strengthened by the fact that both of them have a history of innovation in natural resource management and marine science that they bring to the NMSC.

The NMSC is an exceptionally well equipped coastal institute based at Coffs Harbour on the East Australian seaboard. The Centre is located adjacent to the Solitary Islands Marine Park (SIMP) which enables students, academic and professional researchers to excel in the study of marine science and management.

The backing of two highly respected universities, SCU and UNE, and expertise from other scientific, environmental and industry groups, enables researchers and students to be part of a developing institute and achieve internationally recognised qualifications in marine science and management (NMSC 2006).

Collaborative research arrangements at SCU

1. Southern Cross University Collaborative Research Grants Scheme

This scheme is self-funded by Southern Cross University. The University will provide matching cash funds with a Partner Organization of up to \$15,000 pa; the Partner Organization is expected to commit to an ARC-Linkage application in the next round.

2. Australian Research Council (ARC) Grants - Collaborative (The "Arc-Linkage Scheme")

There are projects which qualify for an ARC Collaborative Research Grant. The scheme, has a provision in which the ARC provides funding that matches dollar for dollar the cash and in-kind contribution of the Partner Organization. The schemes

3. Cooperative Research Centers (CRC's)

The CRC programme was established in 1990 with the objective:

To enhance Australia's industrial, commercial and economic growth through the development of sustained, user driven, cooperative public-private research centres that achieve high levels of outcomes in adoption and commercialisation.. (CRC 2006)

The programme's responsibility lies with the Minister for Education, Science and Training who appoints an advisory committee to advise and advise the on the selection and evaluation of the centres and on the conditions to apply to the provision of funds administered under the programme.

The CRC has been instrumental in enabling regional universities establish research capability and in the process develop specialisations in research areas. The programme has assisted universities in securing the leadership roles in regional economic development (Howard Partners 2003).

The programme links researchers and research users and focuses on research and development efforts towards:

- **Utilisation,**
- **Commercialisation**
- **Technology transfer.**

At SCU the programme is run at the following centres

- **Sustainable Tourism**
- **Contamination Assessment and Remediation of the Environment**
- **Desert Knowledge**
- **Forestry CRC**
- **Grain Foods CRC**
- **Molecular Plant Breeding**
- **National Plant Bio security**
- **Sugar industry innovation through Biotechnology**

The CRC programme focuses on the following sectors of the economy for research funding;

- **Manufacturing Technology**
- **Information and Communication Technology**
- **Mining and Energy**
- **Agriculture and Rural Based Manufacturing**
- **Environment**
- **Medical Science and Technology**

The CRC programme does not cover the business sector other than tourism which is closely linked to environmental and sustainability issues (Southern Cross University 2006; CRC 2006).

4. Australian Research Council Grants - Postgraduate Scholarships - ("The Arc-Linkage Scheme ")

The scheme is a sub-component of the "Australian Research Council Grants - Collaborative ", where the ARC funds the scholarship for a PhD student at around \$24,000 pa for three years. The partner is required to contribute in cash a inject cash a minimum only \$5,000 pa, being the "consumables" component of the project. In addition there is a requirement for co-supervision by the partner organization.

5. Contract research

The arrangement between SCU and the partner is that they pay the full cost of the research and then the intellectual property generated is owned by the partner.

6. Equity research

This occurs in a situation where SCU and the partner negotiate for a reduced fee and SCU takes an equity or joint ownership in the intellectual property.

7. Shared Intellectual Property (IP)

The University could reduce the costs where a certain percentage of inflows of IP are shared by the two parties.

Collaborative research: potential growth centres at SCU

The previous section outlined the different research arrangements at SCU the following section highlights the potential growth collaborative centres at Southern Cross University.

The Research and Research Training Management Plan (RRTMP), at SCU points out that as a relatively new and regional institution the University does not have the resources to invest in research across the entire spectrum of its activities. The University should ideally would focus and provide support research in Designated Areas of Research Strength (DOARS)(Baverstock, P 2006).

The Research and Research Training Management Plan (RRTMP) at SCU indicates that there are a number of research activities that have demonstrated good potential for expansion and should receive support to develop. The centres are:

- I. Centre for Economic Development and Research (CEDAR)**
- II. Aged Services Learning and Research Centre(ASLaRC)**
- III. Department of Psychology**
- IV. Centre for indigenous Research (CIRCLE)**
- V. Centre for Cultural Diversity and Social Justice(CDSJ)**

1. Centre for Economic Development and Research (CEDAR)

The establishment of Center for Enterprise Development and Research (CEDAR) headquartered at the SCUs newest campus at Tweed Gold Coast provides the university with an opportunity to build on the university culture of collaboration with business and industry. The region is dominated by SMEs in business and tourism. The report acknowledges that CEDARs would require substantial funding to exploit its full potential.

11. Aged Services Learning and Research Centre(ASLaRC)

The Aged Care Services Learning And Research Collaboration (ASLaRC) is headquartered at the SCU Coffs Harbour Campus. The centre has enormous potential to become a focus for aged services research at SCU and possibly at the regional and national level.

111. Department of Psychology

The Department of Psychology at the SCU Coffs Harbour campus is building capacity for staff with a strong research culture. The staff are at the Early Career Researcher (ECR) stage and indications are they have show great potential.

IV. Centre for Indigenous Research (CIRCLE)

SCU through the College of Indigenous Australian Peoples (CIAP) Gnibi has established the Collaborative Indigenous Research Centre for learning and Education (CIRCLE). Through the indigenous centre the university has an opportunity to make a contribution in addressing the issues of violence trauma and recovery, community capacity governance and healing. The vision of CIRCLE is to use the CRC model by encouraging key players to join the centre and establish a nationally and internationally significant centre for the activities outlined.

V. Centre for Cultural Diversity and Social Justice (CDSJ)

The Centre for Cultural Diversity and social Justice (CDSJ) has attracted support for its work on social justice issues. The centre has potential which is yet to be fully exploited.

The research centres at SCU are categorised in two the CRC programme and the DAORS depicted in the table below.

Research centres at SCU

Cooperative Research Centres (CRC's)	DAORS (Designated Areas of Research Strength)
<ul style="list-style-type: none"> • Sustainable Tourism 	<ul style="list-style-type: none"> • Centre for Economic Development and Research (CEDAR)
<ul style="list-style-type: none"> • Contamination Assessment and Remediation of the Environment 	<ul style="list-style-type: none"> • Aged Services Learning and Research Centre(ASLaRC)
<ul style="list-style-type: none"> • Desert Knowledge 	<ul style="list-style-type: none"> • Department of Psychology
<ul style="list-style-type: none"> • Forestry CRC 	<ul style="list-style-type: none"> • Centre for indigenous Research (CIRCLE)
<ul style="list-style-type: none"> • Grain Foods CRC 	<ul style="list-style-type: none"> • Centre for Cultural Diversity and Social Justice(CDSJ)
Molecular Plant Breeding	
National Plant Bio security	
Sugar industry innovation through Biotechnology	

Source: Southern Cross University (2007)

The RRTMP plan concludes that SCU has established a strong track record for successfully bidding for the Cooperative Research Centre (CRC) funding from the Commonwealth Government. There are indications that this funding will continue and SCU should capitalise on its track record. The Research and Research Training Strategy (RRT) at SCU is to focus attention towards “applied research” where there the University has a strong base and track record in leveraging funds from industry the CRC and ARC linkages (Baverstock 2006).

The EAG to RQF recommends that employed university academics undertake research with external collaborators (EAG(b)RQF 2005). The RUA have no formal structure and are only bound by their regional locations and orientation, the reason for lack of formal structures could be attributed to the fact that they have been in existence for less than twenty years.

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