CHAPTER NINE

Analysis, Summation and Recommendations

Academic leadership in higher education in the 21st century is very different and more multifaceted than it was just a decade ago. Thus, given the multi-layered, dynamic nature of higher education leadership at individual, group and organisational levels, a more nuanced understanding of its role in driving excellent research performance remains paramount. Hence, this study made an exploratory investigation of academic leadership through the lens of research performance. It sought to explore the professional and personal nature of research leadership that enables and stimulates high quality research performance. It explored the research trajectories of research leaders and the experiences and views of their mentees in a South African socio-historical-political context, in an effort to offer an interpretation of the research experiences and academic career pathways traversed by these leaders, and how they lead in order to influence research performance. The study assumed that their research trajectories developed as a result of the interplay of political, social, economic, institutional and individual dynamics across both pre- and post-apartheid phases of the history of South Africa's higher education. Hence, the research leadership experiences are viewed as contextualised and particular.

This final chapter will draw together the findings and early analyses as presented in the previous three chapters in answering the research questions posed for this study. It will also reflect on the research process used as well as the conceptual framework model described in Chapter 3 and the extent to which the findings support this model and suggest new ideas. In addition, the chapter will critically reflect on the ongoing system tensions that emerged for research leadership, as well as recommendations for further study.

9.1. Revisiting the Research Process – case selection

The literature review in Chapter 3 pointed out that leadership is hard to define and effective leadership even harder. In addition, Bolden et al. (2008) suggest that there is still little evidence of the impact of leadership or leadership development on performance and productivity. Given these sobering 'caveats' in relation to leadership, this study's focus on research leadership and its possible influences on research performance certainly position it within a contested space. And as the research methodology shows, the case selection for this study can be viewed as part of an ongoing South African debate about the NRF rating system. In the light of the centrality of the case selection to the study, it is important to revisit this aspect of the research process before arriving at any conclusions about research leadership and its influence on research performance.

As discussed in Chapters 2 and 5, the South African research personnel are relatively small, comprising about 16000 full-time equivalent research staff. Only between 6000-7000 of these are considered as publishing scientists and scholars. The definition of research leadership used in this study consists of a number of variables all associated with successful research staff. The main criterion was scholarly research performance. Thus in the first instance, the sample had to be based on research leaders with demonstrable research performance as a major criterion. An initial method proposed was that of reputation sampling, that is, which individuals in the national research community had the reputation of being research leaders? Reputation in that case cannot be presumed to be based strongly or solely on research performance, but may be influenced by public visibility (through media opinion pieces for example), institutional alliances, or heroic trait leadership characteristics of some larger-than-life individuals. In addition, in a small research community dispersed throughout competitive higher education institutions, this method of sampling was not considered rigorous enough for determining the sample for this study.

The NRF-rating system, as outlined in Chapter 5, was considered to provide a more objective benchmark of research performance through an international peer review process. Hence, the choice was to use only NRF-rated researchers since their ratings provided a standardised, transparent assessment of their research output, independent of this researcher or institutional communities. From that initial criterion for selection, the institutions were then asked to suggest rated researchers whom they considered to be research leaders in their institutions. They were not restricted, in their choice, to certain rating categories. However, the final sample shows that 80% of the researchers suggested by institutions had either A or B NRF–ratings. The final sample of researchers used in this study were thus all NRF-rated researchers who, in addition, were considered as research leaders by their nominating institutions.

This sampling strategy does not in any way imply that unrated researchers are not research leaders who are able to influence research performance in their research contexts. It is not mandatory for scientists and scholars employed in South African public higher education institutions to become NRF-rated. Currently, only about 2144 researchers (out of approximately 16 000) have chosen to become rated by the NRF. There are many researchers of international standing who are not rated by the NRF. In addition, researchers from the social sciences and humanities have been in the rating system for fewer than 10 years. Hence it is recognised that more researchers in the national system are unrated rather than rated. Thus, this study acknowledges that among that group of unrated researchers are research leaders who could also have met the criteria of research leadership used for this study i.e. scholarly publication at the cutting edge of the discipline, extensive quality national and international research networks, personal scholarly recognition and prestige among peers, leadership of quality Master's and doctoral programmes, early researcher mentorship and the ability to garner research funding. However, in the interests of a rigorous sample selection in a doctoral thesis, the unbiased assessment of research output by an independent panel, provided through the rating system, was used as a first criterion for sample selection.

Chapters 6, 7 and 8 provide the details of the career pathways of the research leaders, as well as their roles in intellectual leadership and management of the people in their research contexts, with a focused discussion on mentoring and supervision as a leadership development strategy. This information is helpful in answering the research questions that explore the research career pathways traversed by the research leaders (Question 1) and the attributes and leadership experiences of effective research leaders in the context of the research enterprise (Question 2)

9.2. Exploring research career pathways

The participants in this study were all NRF-rated researchers employed full time in higher education institutions at the time of this study. The selection process outlined ensured that they were all established researchers, with about 80% of them regarded as internationally recognised scientists and scholars (NRF-ratings). They are black and white South African citizens, with three research leaders being permanent residents from other countries. The majority of this sample (60%) obtained their doctoral qualification at overseas universities. Given disciplinary differences, some were late starters to academic life (PhD at approximately 40 years of age). They have held formal leadership positions in higher education for a number of years (all except one) and the data in Chapter 6 shows that the average age of the sample is 52.4 years. Those in their 50s (more than 50%) have almost reached the pinnacle of their research careers and are thinking of exit strategies from current research posts in their institutions. Given this outline of the more general features of the sample of research leaders, the discussion will now highlight the core features found to be common across the research careers and pathways outlined in the preceding chapters.

9.2.1. Research-centeredness

The career trajectories of the research leaders have shown a strong sense of research-centeredness that permeates all stages and phases of career development.

9.2.1.1. Early research orientation

Across the sample all researchers were immersed in research from an early career stage. For this discussion, the entry point to the research career is taken as the doctoral degree, although it is acknowledged that positive master's experiences can motivate towards further postgraduate education. Research leaders in this sample obtained doctoral degrees both in South Africa and from overseas universities. The South African universities where the research leaders obtained their doctoral degrees were (at the time of PhD graduation) and are still all at recognised research intensive universities. None of the research leaders in this sample studied at or were employed at a historically black South African university or technikon, even post 1994. This is in line with the original apartheid conceptualisation of these organisations as teaching and training organisations, as opposed to research institutions. Research leaders who obtained doctoral degrees from international institutions did so at institutions already known for their research strengths.

Although undertaking doctoral studies at an English medium, historically white South African research university, Professor Frankie, acknowledged that supervisory capacity at doctoral level was minimal in her emerging field at the time. However, she was able to obtain discipline based expertise from the international community. It is evident that for researchers in this sample the doctoral experience as the first immersion into research took place in institutions that had research as one of their missions and that gave priority to research. Some who attended international programmes studied under the committee approach as described earlier, and found this exposure to more senior students and established researchers a motivating, but challenging

experience. It is generally recognised that universities with strong research cultures have high research performance, and quality doctoral education forms an important part of that research performance. The emphasis is on research and the entire doctoral experience is preparation for research and scholarship. All the research leaders in the sample had completed their doctoral studies in quality research intensive environments. Given the desire to grow the South African research expertise base, a quality doctoral programme in a research focused environment seems to be a minimum entry requisite.

9.2.1.2. Research role models

It was shown in Chapter 6 that some research leaders (mostly female, both black and white) had not started out with a decision to enter research, and for many of these researchers, the decision to undertake the PhD came after motivation from supervisors or mentors from earlier studies. Resource-intensive research universities generally employ the most talented professors – scientists and scholars who are attracted by the research orientation, by the facilities and often by the favourable working conditions at these institutions (Altbach, 2007). It would appear that early exposure to these research environments increased the chances of being in close proximity to leading researchers. Significant role models in their career trajectories seem to have been influential in shaping the emerging research possibilities. As Professor Nelwa says, "I saw lots of people doing PhDs and it seemed like a logical step to me. I had people who mentored me and I was always looking at people slightly older than me – my professors – here I was being guided by them". This type of mentoring experience is described by almost all research leaders and the feeling is that the focus of the mentors was never just on the immediate project (doctoral research question to be solved), but on the overall development as a researcher. This early experience of the research leaders is reflected by the discussion of their own roles in Chapter 8 where it was found that they too, in return, are now able to provide the image of the scholar for their mentees. This resonates with the work of McCarthy and Frederick (2008) who found that research development of staff required a

focus on strong and visible leadership. Hence positive role models, who are themselves leading scientists and scholars, are essential in shaping the intellectual development and identity of mentees while becoming academics. In a country context where fewer than half of the full-time research staff in the research universities has doctoral qualifications, the image and experience of the research-performing scholar may remain remote and easily idealised as unattainable unless the academic quality and experience of doctoral supervisors is improved in all postgraduate institutions.

9.2.1.3. Accountability for research productivity

Many of the researchers remembered, with pride and joy, seeing their own first research article in print. This emphasis on scientific writing, writing skills and writing for publication seems to have been a mantra throughout the discussions with research leaders and mentees. Hence a focus on publication remains pivotal to the research performance of these research leaders. This notion is discussed in detail in Chapter 8. However, as shown by mentee feedback, there is a keen awareness that the quality of the publication is of paramount importance in motivating excellence in research performance. This is driven through the mentoring process and research culture of the individual research units. According to an early study of research productivity by Ramsden outlined in the literature review, the strongest predictor of individual output is the membership of a highly productive team. The research cultures of the units became evident through the mentees' reports of the general leadership style; supportive but demanding, with a strong commitment to excellence. A perusal of Table 10 (Chapter 6) will show that all research leaders in the natural sciences and engineering became NRF-rated researchers in about five years of graduating with doctoral degrees. This rating is based on research publication records, and hence there is an early sense of accountability for driving research productivity after doctoral studies. They have all maintained their research ratings throughout the career trajectories, that is an indication of self-leadership to drive their own research performance at acceptably high levels of performance (mostly A- and B-rated scientists). The fact that they lead Research Centres of Excellence and

Research Chairs as well means that they are also accountable for ensuring the performance of these research institutions. This direct extrapolation from doctorate to rating cannot be done for the social sciences and humanities, because they have been included in the rating system only since 2002 and hence the longer lag periods in the table between PhD qualification and first NRF-rating.

Because productivity early in one's career usually predicts later success, efforts to secure and foster accomplishments early are important. The early NRF P-ratings for three research leaders in the sample provided early career recognition and reward for excellence in research outputs from the doctoral research. This early success has largely been realised (P-ratings to A-ratings) for those researchers who have remained close to research and not moved into more senior executive management positions. Tensions between maintaining high levels of research productivity while taking on senior leadership positions have been discussed, and generally it has been found that this affects research productivity to some extent. In Figure 10 (Chapter 6) this is shown where some researchers have moved from an A to a B-rating.

Student mentorship is an important part of research performance and, as discussed, many of these researchers have supervised large numbers of post-graduate students, especially in the natural sciences and engineering. Their commitment to creating cultures that are conducive to research through a continued focus on publishing, international conference presentations, quality research infrastructure, early leadership experiences, and so on (discussed throughout Chapter 8) is an indication that they, as leaders, are personally accountable for their own research productivity, that of their mentees, and that of the research centres overall. The reported leadership appears to contain a persistent theme of team –work and connectedness. Enhanced research performance does not happen overnight; it develops over time and with experience, and it helps if a credible leader takes accountability for making that happen at the forefront of the discipline. The complex and comprehensive nature of building intellectual capacity means that this is a

long term and multifaceted process to which institutions and individuals have to commit.

9.2.2. Leading by example

The findings discussed in chapter seven showed how the intellectual leadership provided by the researchers in the sample has been pivotal to both the developments in the disciplinary fields and to the personal scholarship of the individual research leaders. Many of the research groups led by the research leaders in this study were shown to be working at the cutting edge of their disciplines and usually form a core of expertise in and across various institutions. They have made extensive international networks that have been pivotal in the internationalisation of South African higher education. The emphasis has been on the key leadership roles that they have assumed in driving international relationships from the context of the developing world. Taken together, these contributions have led to many of these researchers becoming highly regarded scientists in international communities. This level of performance has also been recognised through numerous awards and international appointments to research bodies. This research performance allows the research leaders to lead from the front. This 'role model' role is supported by previous research on the academic department chair where deans interviewed felt that if chairs expect their academic staff to excel as teachers and researchers, then they think that they should lead by example (Benoit and Graham, 2005). Deans who make a conscious level to lead by example, do not neglect their duty as researchers, but are forced to reprioritise. Research leaders can then make research demands for improved performance, based on the fact that they themselves are performing at the cutting edge of the disciplinary field. Research development in South African institutions has tried to aspire to this principle, as can be seen by the stated personnel requirements of appointments of high level researchers "who can lead by example….the focus of such appointments should be fourfold including: i) establishing and managing a vibrant and productive faculty research group; ii) providing study leadership and mentoring; iii) the performance of one's own research and contribution of accredited research

outputs; and iv) production in knowledge application programmes in the occupation and the community" (Lues and Lategan, 2006:119). However, despite these aspirations, the cohort of high research performing South African researchers who can lead by example still remains limited when compared to the size of the academic population.

The feedback of the mentees illustrated that where they could, they chose research supervisors on the basis of their research reputation. Earlier findings illustrated that the mentees wanted to work in these high-performing teams and they appreciated the connections to these research leaders' networks. Hence, as illustrated by the various discussions, these research leaders are able to lead by the example of their own scholarship and prestige and drive research performance towards increasingly higher levels of achievement. The recommendations to increase the number of doctoral graduates in South Africa imply that we need a cadre of highly regarded scholars to lead these programmes. This research study has shown that quality research leadership by highly regarded scholars is able to influence research performance positively by providing the image of the scholar and a research-centeredness that is essential to attract new junior researchers to the field and to their long-term research career development.

9.2.3. Locally relevant and globally competitive research

Higher education institutions in South Africa have attempted to respond to the transformation agenda by creating environments in which researchers can become internationally recognised (and thus competitive), while also contributing to continental and national development. In the research arena, these efforts are generally seen to have an impact via knowledge production, technology transfer, training and capacity development.

Most of the research leaders in this study are working on problems in a variety of locally relevant areas such as engineering, education, health, energy, environmental and agricultural economics, human rights and forestry. In these research domains they are researching relevant aspects such as

reducing carbon emissions, teacher education, drug development and treatment protocols for HIV/AIDS. The importance and relevance of the research to local industry and policy is also illustrated through local university research units:

As such, the team bears the responsibility for all forest protection issues in South Africa, covering an area of about 1.5 million hectares of plantation (*Prof Bloom's Research Group*)

There are examples of cross-disciplinary research with applications in engineering becoming useful in local health and social sciences issues:

Image processing can also be used to diagnose diseases. An x-ray image of a patient's lung can be scanned and the image processing system can be used to determine if the patient is suffering from pulmonary embolism or a blockage of the lungs. Having taken the leap of turning an engineering application developed for the manufacturing environment to healthcare uses, the research expanded its functionality to diagnose other diseases and injuries, and can even be used to assist with the treatment of patients needing radiation therapy (*Research of Professor Nelwa*)

There are some researchers in the sample who have developed regional pre-eminence. This is illustrated by the work that is led through the extensive continental programmes which include mobility of students and research experts, as well as technological innovations. The larger doctoral programmes across the continent are in the areas of environmental and agricultural economics and international human rights, two issues with high relevance in the South African and African context. Two research leaders in engineering have won prestigious continental awards for research achievements that are deemed to have an impact on the quality of life for Africa and its people.

The international footprints of the research leaders discussed in Chapter 7 showed their competitive ability in the global knowledge markets. Two "special qualities" identified through the work of Hanson and Monsted (2007), and that are required in research leadership in the new knowledge economy, appear to be present in this group, viz: a) to be able to use the external contacts and dissemination of research for access to further research; and b) to create an environment of self management in a collective organised

research group to mobilize young researchers to take their own initiative. The latest work of Prof Liu and her team gives credence to the meaning of 'locally relevant and globally competitive':

Scientists and engineers at the (name of university), have developed a hybrid energy solution, based on the Fischer-Tropsch (FT) chemical process, which could be deployed at municipal rubbish dumps to produce both electricity and transport fuels from fresh garbage. Director Professor Liu tells us that the so-called 'Gate Project' (Garbage-to-Energy Project) has been proved on a laboratory scale, while the main electricity- and fuel-making components are already in commercial operation in Australia, China, Japan and South Africa. The proposed solution aims to combine these components into a modular facility capable of dealing with South Africa's triple challenge of municipal waste disposal, power shortages and unemployment.

The discussion above is intended to show that many of the research leaders are undertaking research that is of excellent quality, locally relevant and globally competitive. In terms of transformation, there has been a stress on the need for "the development of scholars interested in actively pursuing and developing new knowledge about the continent, scholars who realise that Africa desperately needs intellectuals that focus on Africa" (Nkomo et.al 2006: 9). In the South African context of the "brain drain" and/or institutional leeching created by academics on the move, a useful reminder is that the best local academics are employed at research universities which provide them with a home and with the possibility of contributing to science and scholarship without leaving the country (Altbach, 2007).

9.2.4. Personal Dynamics

The effective leadership and research productivity literature and models referred to in this study (Bolden et al., 2008; Bland et al., 2005; Bland and Ruffin, 1992) highlight the role of individual or personal characteristics. These usually relate to the personal qualities, experiences and preferences of individual leaders. This study comprised interviews with ten individual leaders from diverse disciplinary backgrounds, institutions and academic experiences as outlined in Chapters 6 and 7. Given their intellectual leadership roles and professional credibility, these are individuals with high academic capability

and an aspiration to succeed. This is seen through the self-leadership in driving continued research performance at the level of self, team and institute. They display a confidence in their ability to do research, raise funds and lead a team of researchers towards enhanced research performance. Overall, they all displayed a passion for learning and for research and knowledge production that can make a difference. Mentees described many of the leaders as energetic and very hard-working. For many of the research leaders, the roles of manager/administrator versus academic revealed identity tensions at the personal level and this is supported by the findings of the leadership model suggested by Bolden et al. (2008). People leadership is a central role of academic leadership and at the unit of analysis for this study (department/research unit), one of the strongest focuses was on the relationship with the post-graduate students. Naidoo's research study on deans in merged institutions pointed out that "people need to feel appreciated before deans can apply any form of transformational leadership" (2009:138). In general, the interviews with the leaders showed the centrality of the students to the research enterprise. This was confirmed by the mentee feedback on the interpersonal and professional relationships. As discussed in Chapters 7 and 8, the mentee feedback was overwhelmingly positive for this sample of leaders.

Hence the study draws attention to the fact that research leadership is also influenced by the personal characteristics of the leader. With the development of the new generation of research leaders as a core responsibility of research leadership (as discussed in Chapter 8), people centred leadership is an important attribute that arises out of a set of personal values and characteristics of individual leaders.

9.3. Notable differences

Having drawn attention to the more cross-cutting or common themes traversing the individual career trajectories, on further reflection, differences in research leadership across the sample can be traced mainly to differences in disciplines. Gibbs Knapper, and Picciin (2008) are of the opinion that much of

the research literature on leadership in higher education is discipline-blind, mainly because it focuses on senior and central management and not on departments. According to the authors, "disciplinary differences involve differences in activity systems and the way work is organised that have profound implications for the way leadership does, or could operate" (Gibbs et al., 2008:417). This research study focused on research leadership at the departmental and research centre level and hence permitted a level of detail that made visible the activity systems of the particular disciplines involved and the local organisation of the various forms of dispersed leadership. The research questions did not specifically address disciplinary differences, but the differences did emerge from the findings of the study.

Professors Liu and Bloom, coming from the engineering and biological sciences, showed research and leadership similarities in the sense that they were managing centres of excellence, working with large research teams in expensive laboratory environments, raising large budgets through industry partnerships and government funding, and using similar committee approaches to the mentorship of doctoral student. To this end, their research environments and leadership follow the new framework of "entrepreneurial action among researchers" referred to in the literature review. Their research activity systems align with the findings of Hansson and Monstead (2007), namely:

- Funding is tied to collaborative networks of researchers that cross both national borders and boundaries between universities and industry;
- Much stronger emphasis on applied research;
- Consultancy services for technology transfer and the legal and commercial aspects of innovative activities.

The ability to create these networks, play a brokerage role and create and use entrepreneurial opportunities is one of the most important leadership competencies of these research leaders. Personal qualities such as scientific capital and charisma are shown to foster these leadership competencies in

this complex environment. As showed earlier, both researchers used distributed leadership models in the large research teams, with accountability dispersed through various layers of expertise that included students.

This networking and industry collaboration was also found among other research leaders (Marie and Nelwa) but in different degrees. Professor Marie does not run a centre of excellence but has forged the industry relationships and focus through her drug-discovery programme in a move to a new research-intensive university. Professor Nelwa, who has three patents and technological innovations outlined in this and previous chapters, has moved out of the laboratory environment into executive management where he now overseas research development across seven different schools in the faculty. Hence, organisational factors influence research beyond the discipline. This agrees with Shattock (2003) who felt that discussions of leadership style in universities must be qualified by disciplinary cultures as well as by the nature of university organisations.

At least two of the professors from the biological sciences were undertaking fundamental research and hence were working with small student numbers. They relied on government funding through research support agencies.

Research activity systems and leadership differed in the cluster of social sciences and humanities. In this sample, the research leaders in law and economics worked in large teams across national and continental borders, with large injections of funding from international foundations and donor communities. This required leadership of diverse student populations who spent only periods in the home institutions. Education, business management and health leadership in this sample followed the solitary research model more closely, with one on one mentor-mentee relationships most prevalent in the respective departments. The leadership role was confined mostly in the higher education system with health professionals sometimes opting to move into private practice. Given that all study participants, regardless of discipline, are highly regarded research leaders, it is then clear that excellent research

can be fostered through a variety of forms of leadership across-disciplinary boundaries.

9.4. Reflections on the Conceptual Framework

In exploring the professional and personal nature of research leadership and its influence on research productivity, the Bland et al. model was used as a conceptual framework. This model of faculty and departmental research productivity was tested in the environment of a large medical school in the USA, but was found by the authors to be internationally applicable beyond disciplinary borders.

In summary, the research productivity model confirmed that an individual's research productivity is influenced by a combination of individual characteristics and institutional characteristics. The impact of the institution is mediated by the qualities and style of the leader. Thus, given its emphasis on leadership as one of three important factors contributing to research performance, the model was found to be appropriate as a starting framework for this research study. However, it is recognised that a study of leadership characteristics will indirectly include features that are both individual and institutional in nature. The findings of this study are discussed here, using the Bland et al. model framework. Since this research study aimed to explore the leadership elements, characteristics and modes of practice that drive excellence in research performance, the main findings will focus mainly on the four leadership characteristics of the model, namely, highly regarded scholar, research orientation, leadership style and leadership roles.

Figure 10: Components of a productive research environment: the individual, environmental and leadership characteristics.
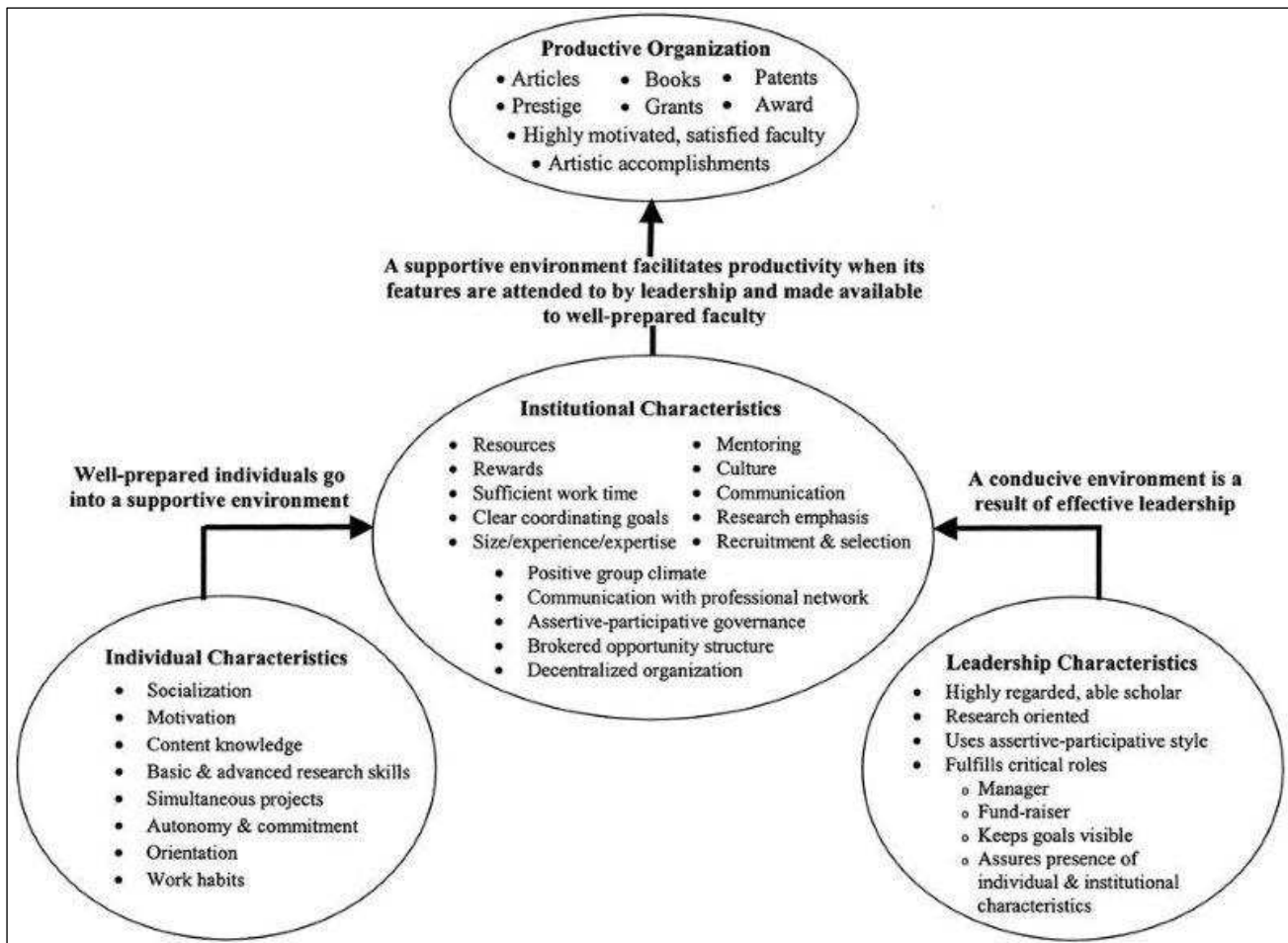
Source: (Bland etal.2005:227)

Highly Regarded Scholar:

The model suggests that the leader should be highly regarded as a scholar. In this research study, this important criterion formed the basis for selection of the participants in the study. Firstly, the original selection was based on the assessment of their research performance records (NRF-rating system). Their NRF-ratings gave assurance that they were all established, productive scientists, with at least 80% of the sample having been identified as leading international scholars or international scholars of note in their field. In addition to their NRF-ratings, each participant was recommended by their research institutions as a person who was considered to be a research leader.

Secondly, Chapter 7 illustrated how, because of their excellent research work, their personal intellectual scholarship was, in many cases, moving boundaries in their discipline fields. Thirdly, their curriculums vitae indicated that their peers had recognised them as leaders through national and international awards, appointment to international committees, professional associations, academies and panels and invitations to world congresses, joint collaborations or visiting fellowships. The internationalisation at this level has been significant since many of the roles have been able to influence how the international community views and collaborates with the developing world. All these areas ensured that the research leaders in the study are highly regarded scholars in their fields of specialisation.

Another important emphasis of the model is that the highly regarded scholar serves as a peer model and mentor for other group members. The qualitative data of Chapter 8 showed that a large portion of the mentees indicated that their choice of supervisor had been based on the research reputation and track record of the professor. It was also shown how having a highly regarded scholar as a supervisor provided the mentees with a close-up 'image of a productive scholar' that is so necessary to early socialisation into an academic research culture. Various mentee responses described how they valued this opportunity to work with good role models and mentors who lead by example. Hence, the findings of this research study support the Bland et al. emphasis on the need for the leader to be a highly regarded scholar who serves as a peer model and mentor.

Research-oriented:

The second leadership characteristic of the Bland et al. model is that the leader should be research-oriented. This characteristic has been identified as being common to the research career trajectories of all research leaders and is discussed fully earlier in this chapter. Given the detailed discussion of this factor in this chapter, there will be no further elaboration except a comment that the findings of this study illustrate the importance of research-centeredness to effective research leadership.

Leadership style:

The model found that leaders who facilitate research performance use an assertive, participative style. As discussed in Chapters 7 and 8, research leaders and mentees in this study emphasised a collective team approach, with a shared responsibility for maintaining excellent research performance and the reputation of the research unit. Leadership was found to be dispersed in a collegiate way among the members of the research teams. Communication was found to be a key feature of the professional and inter-personal relationships between leaders and mentees. Large teams were seen to be working in a distributed leadership mode, where junior and senior researchers worked together in committee style. The cultures supported excellence in all areas. This created supportive work environments and set expectations for all research team members. Mentee responses reported in earlier chapters illustrate mostly positive experiences of research leadership in doctoral programme. Hence this research supports the characteristic of participative leadership for effective research performance.

Leadership roles:

The Bland et al. model highlights the necessity of leaders to engage in the critical roles of manager, fund raiser and facilitator of research cultures and productivity. The findings discussed in Chapters 6 through 8 illustrate that all the identified leadership roles were performed by the research leaders in this sample. Their leadership style was generally described in mentee feedback as empowering and consultative. They played strong mentorship roles in a distributed leadership framework by preparing young researchers for academia. Many leaders were found to be transformative in their leadership roles, working at supporting mentees in areas that required social and emotional support outside of academia.

Their roles in obtaining funding was found to be instrumental to the research success of the team, with the research experience and reputation of the individual and the centre/institute playing a significant role in the ability to raise funds from a variety of sources. The research leaders were group advocates for the research team and individual mentees, taking on the

institutions on matters of student funding, laboratory safety standards, parking and safety and security. They appeared to be generally comfortable with the role of academic as fundraiser and entrepreneur. The emphasis on publication in quality journals and completing doctoral studies in allocated time frames meant that the mentees were oriented towards a group mission with a focus on excellence. This was emphasised in Chapters 7 and 8 that describe how the research leaders were instrumental in facilitating the overall research productivity of research teams.

The four main leadership features of the Bland et al. model are found to be present in the research leaders in this research study. It is thus concluded that the sample of research leaders chosen for this research study have leadership characteristics that are in common with effective research leadership in the international research community. As 80% of the participants are research leaders in research-intensive universities, the expectation is that these leadership features correlate highly with the institutional factors as well. It must be noted, however, that this study did not investigate the institutional characteristics in great depth, except through the contextualisation of the South African research environment and the participants' own narratives of their career trajectories. The research did not explore all the individual characteristics of the mentee's, except as they were exposed through their experience of the research process and research leadership provided.

9.4.1. Challenges in the use of the conceptual framework

Research is also about adding value to the individual, the community and broader society. The South African context has been uniquely characterised by a strong drive to redress deeply inherited systemic inequalities which have their roots in the pathologies and social relations of race, class and gender. In this context then, research leadership can be viewed as an agent of and for higher education transformation. Hence, effective research leadership in the South African context must, of necessity, include a responsibility to address the transformation imperatives of the system.). The policy framework of the

South African Government's 1997 White Paper placed key conditions on the transformation of the system including:

- Increased and broadened participation;
- Responsiveness to societal interests and needs;
- Co-operation and partnership in governance.

Transformational leadership shows itself through concern for the "development and well-being of others, in the ability to unite different groups of stakeholders in articulating a joint vision, and in a delegation of a kind that empowers and develops potential, coupled with the encouragement of questioning and of thinking which is critical as well as strategic" (Metcalfe and Metcalfe, 2005: 32).

The Bland et al. model allowed this research study to clearly illuminate the intellectual leadership role of the ten research leaders in driving research excellence. However, it does not allow as equal an elucidation of the transformational leadership required to change the research system. It does not seem to locate the research production in a framework that accounts for socio-political contexts and hence transformation imperatives. A research leader who has satisfied all the criteria for effective leadership according to the Bland et al. model i.e. highly regarded able scholar who is research oriented, uses a participative leadership style and fulfils a range of critical functional and management roles but failed to use this leadership to drive the research transformation needs of higher education in South Africa, could hardly be termed fully effective in making the country globally competitive. Anecdotal evidence suggests that a major argument against the late apartheid era and early post-apartheid system was that while senior rated researchers were internationally renowned scientists, they were not necessarily training South African black post-graduate students (in any significant numbers) in the national higher education system. Highly regarded researchers were supported to focus on research, with limited imperatives to train quality post-graduate students in quantities that would impact on the

research performance of the system. National funding systems like the NRF then introduced funding criteria that were more directly linked to transformation imperatives in order to drive systemic change. These were not always successful in accomplishing change at the levels required, especially when the grant size and rating categories were no longer linked. Highly-regarded researchers who obtained money external to the national system (e.g. from foundations or industry) were not compelled to meet the transformation imperatives of the country.

When these contextual influences are considered, it seems as if the Bland et. al. model could be strengthened for broader application to transforming education systems in certain ways. These include the following:

a) Foregrounding the entire model in a contextual milieu that recognises that research productivity is affected by the social, political and cultural context in which institutions, individuals and leaders find themselves. This then links more directly to some features of the Bolden et al. (2008) model of academic leadership discussed in Chapter 3. In that model the contextual dimension refers to the external social, political and cultural environment, as well as to the internal organisational culture, history and priorities. The research context outlined in Chapter 2 shows how the apartheid system differentiated the system along deep race and narrowly conceived knowledge production lines. The findings of this study reveal that the research trajectories and hence pathways to research leadership were affected by cultural, institutional, political and social factors. "Establishing the existence of research excellence cannot be reduced to numbers without losing contextual information that is essential for interpretation of findings" (Tjissen, 2005:100). Chapters 2 and 3 have shown that in South Africa, the historical higher education institutional legacy, its effects on research development and research careers of individuals and the slow development of strong intellectual leadership are all embedded within a social context. The absence of the contextual dimension in the current Bland et al model gives the impression that the three groupings that

influence research i.e. institution, individual and leadership are independent of social context

b) Adding a fifth characteristic to the leadership characteristics listed in the model, i.e. *Advocate/Agent for social change*. This characteristic would link research leadership and research performance to the transformation and societal needs of the higher education context in a more visible way. It would draw attention to the need for highly regarded scholars to be instrumental in leading for broader social justice (research leadership as an agent of transformation and for transformation). In a study of deans of academic departments referred to previously (Benoit and Graham, 2005) being a *Visionary* is described as a necessary leadership characteristic/role. This is recognised with the understanding that a visionary is a transformational leader, a change agent capable of creating a space for change and generating consensus among staff. Leaders accepted the role with the understanding that making changes would be an exciting challenge. A visionary moves out in front of the pack. Although the term might be applicable to research leaders who achieve broader roles, further reading of that study found that the term 'visionary' seemed to be more closely related to the research itself rather than to leadership roles that are truly transformative. If the term is eventually chosen to capture this broad role of research leadership, it should be used to encourage greater accountability and make 'leading by example' a truly lived value at this level.

9.5. Answering the research question

Chapters 6, 7 and 8 outline detailed findings that provide answers to research question 1 *What are the career experiences and pathways traversed?* and question 2 *What are the characteristics and leadership experiences?* These main findings are summarised, with common themes and differences highlighted in this final chapter. However, at this stage research question 3, *Why are some research leaders more effective than others in influencing and stimulating research performance?* remains unanswered.

This question opens up further questions about measurement and baselines for comparison in order to decide 'what is effective', and then 'what is more effective'. Research leadership in this qualitative study was broadly defined by the research hallmarks of excellence in scholarly publication at the cutting edge of the discipline, extensive quality national and international research networks, personal scholarly recognition and prestige among peers, leadership of quality master's and doctoral programmes, early researcher mentorship and the ability to garner research funding. In the sample used in this study, all researchers were rated and hence considered to be established researchers. Although they were all effective researchers, it became clear that not all research leaders in the sample were able to influence and stimulate research performance to the same level in their research contexts. Based on the qualitative data collected through this study, it is suggested that those research leaders in the sample who were able to influence and stimulate research performance, had the following sets of personal and environmental features in common:

- **Academic experience**

Firstly, they had been in the research environment for an extensive period of time (more than ten years). They had also held varying senior research leadership positions for a number of years. They had built an academic reputation over an extended period of time, based mainly on demonstrated intellectual capacity through personal scholarship. This has implications for the local academic sector which has, at times, been characterised by the appointment or promotion of individuals to positions of leadership without the necessary academic experience; "privileging race in these senior positions is extremely dangerous unless it is backed by broad consensus that the eligible candidate is in fact a leading scholar and a competent manager" (Jansen 2004:12).

- **Personal characteristics**

Secondly, they loved what they were doing. They loved their jobs. They had a passion for research, worked long hours, and showed maternal and paternal

attachments to the research students and their research units. Their leadership style was people centred. They were generally described as charismatic and dynamic by mentees. In at least one case the research leader was seemingly regarded by mentees almost as heroic, mostly in terms of what had been achieved in the research world. A case study of research development at a South African university of technology found that "the establishment of intellectual capacity amongst the existing population of researchers appears to demand more personal strategies" (Lues and Lategan, 2006:119).

- **Institutional support**

Thirdly, these research leaders generally had a positive relationship with their institutions. They were still very vocal in their institutions about things they did not like or were dissatisfied with, but they seemed to get the support from their institutional leadership to move beyond the everyday administrative annoyances. As illustrated in an earlier chapter, these leaders were left to do their own research thing. Their research performance, through rewards and accolades, added to the research reputation of the institution, and hence they were supported to continue to perform.

- **Leadership roles**

Fourthly, they embraced the leadership role with confidence, whether at the administrative/management or the strategic level. They managed to face the ongoing tensions in such a way as to ensure that daily operations continued while strategic and intellectual leadership were simultaneously achieved. They were able to assert both personal and professional authority which appeared to emanate from the self confidence in their intellectual scholarship and the drive to enhance research. They stayed close to the research field and the latest, cutting edge developments. Part of embracing that leadership role was seen as bringing in the right people to get the work done.

- **Culture of learning**

Lastly, but not of least importance, is the fact that mentees of the effective leaders reported research programmes as exciting and innovative, with the encouragement of some risk taking, especially in the conceptualisation of ideas. Open enquiry environments were described, where any question was allowed to be put forward without fear of discrimination or rebuke. Ambitious research targets were set and mentees were competitive in realising these targets for personal and departmental recognition. Hence it seems that the research leadership at this level is able to create a stimulating research culture of mentoring and learning.

These five features seem to be common to those leaders in this sample who were able to occupy senior leadership positions, train large teams of students, raise considerable amounts of funding and play leading national and international roles in research contexts and networks and hence effectively drive enhanced research performance. In the higher education context as outlined in Chapter 2, there has been a critical need for "the production of intellectuals who can make a contribution to the transformation project in South Africa" (Nkomo et.al. 2006). However, the findings discussed illustrate that research leadership characterised by intellectual scholarship and academic excellence is still struggling to drive an equally successful transformation agenda within the South African higher education context. The challenges that exist are outlined below.

9.6. Challenges for research leadership

This research has shown that leadership does matter and that research leadership that has professional credibility through personal scholarship and prestige is able to influence research performance positively. The research indicators discussed in Chapter 2 show that the South African higher education system is characterised by pockets of scientific excellence in certain disciplinary fields. A transformed system that supports the economy in being truly competitive and that improves the quality of life of all its citizens will require a focused effort to increase the quality of personal scholarship and

intellectual leadership of the majority of academics in higher education. In addressing this systemic gap in academic leadership, the research reveals a number of challenges that remain for research leadership in the South African context. These include:

- **Individualism and competition**

The South African system is relatively small when it is defined by the number of FTE researchers (approximately 16 0000). Most higher education institutions in South Africa aspire to be world-class research institutions, despite efforts to work towards a differentiated system of establishing some teaching and some research universities. Highly regarded scholars are still in the minority across disciplines and hence there is a 'market' culture that exists, where universities with resources can attract the best-qualified researchers. This is illustrated in the discussion on career moves (Chapter 6). As well qualified individuals seek out more and better paying job opportunities it becomes increasingly commonplace for better resourced departments to "raid" skills to meet their own research skill shortages or meet their staff equity targets. The practice lends itself to situations where the focus is on a few individual researchers as they reach iconic status in the system and where competition between departments and institutions is increased.

- **Equity and excellence**

Excellence is the 'gold standard' in research performance and a culture of excellence is part of the research cultures in the research environments created by these research leaders. However, the basic education system of South Africa is still not providing education that is of a high enough quality to ensure entry to university level courses. There is still limited university access for students from working class, rural, and poor social origins. Many schools attended by black students, especially from rural areas, do not meet minimum standards for quality education. Thus universities are increasingly required to fill the proficiency gaps (ASSAF, 2010). Research leaders should be mindful of the imperatives to fill these gaps and drive active research cultures and programmes that will address this ongoing system tension. To date, as

revealed in discussions with research leaders, there is competition for a limited number of black students who may meet the required standard of excellence.

- **Race and gender**

Despite the changes in higher education outlined earlier in this thesis, there has been very limited change "with respect to the challenges of decolonising, de-racialising and de-gendering of inherited intellectual spaces. The social composition of academic staff remains largely white." (Badat, 2009:465). Research leaders and mentees in this study discussed how the complexities of gender affected their research pathways. In Chapter 5 it was pointed out that the initial list of recommended research leaders supplied by institutions in the sample did not include a single black woman. Upon request, universities were able to offer at least one or two "possibilities". Hall and Burns (2009:56) point out that "while acquiring research skills may appear to be a neutral process, skills associated with being a researcher reflect what a research community values, and those values can be used in powerful ways to promote, marginalise or exclude". Research leadership has to be committed to the transformation needs and should be at the forefront of drives to change institutional cultures dominated by historical traditions that make it difficult for women and people of colour to become highly regarded scholars.

- **Research career exit and entry**

More than 50% of research leaders in this sample are thinking about possible retirement from their current research posts in the next five to eight years or less. Two researchers in this sample in the 40-year age category were adamant that they were working towards more senior research management posts in higher education. As a result, besides natural attrition, the system has to cater for the attrition of younger researchers into more executive academic or corporate posts. If effective leaders develop over time through academic experience, responsibility through a variety of leadership roles, personal characteristics and institutional support, then the system should already have a cohort of emergent leaders-in-waiting. Where will these new

research scholars emerge from? One concern noted earlier is that the mentee 'super stars' have been identified by research leaders and are the next leaders-in-waiting (Cross, et al. 2011). This makes addressing all of the challenges mentioned above more difficult. The imperative of building a new, more democratic process of knowledge production and a new, diverse, high-calibre research cohort is a pivotal role of research leaders. It is in this light that the changes have been suggested to the Bland et al. model.

At this point, reflections on the research model and the summary of the answers to the main research questions helps to clarify what contributions to knowledge have been achieved through this research study.

Firstly, there is a dearth of studies on higher education leadership in South Africa, so this exploratory investigation of research leadership and its influence on research productivity will add to the limited literature in this field. This research differs in that it has used the 'positive sample' i.e. research leaders who are already known to be high research performers and explored their pathways to this position of leadership. The focus of the leadership study has moved away from the role of the vice chancellor or other senior university leaders more commonly identified in leadership research. Instead the unit of analysis for this study has been at the departmental or research centre/centre of excellence level. At this level the leadership is still close enough to the disciplinary research context while also including management and administration roles. In exploring the contribution through the personal scholarship of individual leaders, the research has been able to provide a view of the developmental roles played by individual researchers in different research domains. Gibbs et al. (2008) point out that there is a limited number of studies that address leadership at the discipline level, so this exploration of research leadership at the disciplinary level will add to research in this area.

The findings from the study suggest that the Bland et al. model may be more reflective of transitioning higher education systems like South Africa if it positions the social-environmental context more visibly. The research findings show how research trajectories and hence research leadership pathways

have been affected by both race and gender and international politics, for example, the ban on international research collaborations or conference attendance with South African researchers during the apartheid era. Hence, in addition to the existing leadership characteristics that were all found to be important and positive in the research leaders of the study, the Bland et al. model of faculty and department research productivity should highlight their role as transformative leaders, as agents of change. This role has been found to be a central requirement of all research leaders in the transforming research context, although, admittedly, a role executed with seemingly less success than intellectual leadership. Although they have been identified in this research, future explorations of research leadership should perhaps look more closely at the role of research leaders in driving transformation agendas at varying levels of curriculum, new knowledge production and research culture and mentorship. This would test the feasibility and viability of suggested changes for the developing, transitional context.

9.7. Directions for Future Research

Given the limited research on leadership in higher education, especially in the context of South Africa and the developing world, this study could provide the basis of further developments in this field. This study used the NRF rating as a mandatory criterion for sample selection and the reasons for this choice have been explained. However, future research should explore the research trajectories of a sample of unrated research leaders across-disciplinary fields. This could provide a basis for comparison where the issue of rating scientists in a small science system is continually under discussion.

This sample of research leaders for this study had all been trained (doctoral degrees) at research-intensive universities and most occupied research leadership positions at research-intensive universities. This is not reflective of the entire higher education history of South Africa, where there is a legacy of researchers who attended and were trained through doctoral programmes in less research-intensive institutions. Many of these graduates possibly lead research capacity development in universities of technology or

comprehensive universities. An exploration of their research pathways may reveal a different path to the position of a highly regarded scholar and it would be important that their research story be told alongside the research pathways of this sample.

A common criticism of leadership research is that it is a tale of self-report by the leaders themselves. Hence this research study included the views of mentees who had worked with or were supervised by the research leader, generally at the post-graduate level. This has extended the research in the leadership domain. Most of the feedback from mentees on their experience of research leadership was positive. A criticism of that additional source of data may be that research leaders and mentees/students exist in power relationships that might have provoked the positive feedback. Future leadership research should continue to include mentees, but could also include the feedback of fellow established researchers in the research teams. These would provide the additional voice of the research peers.

Finally, a longitudinal study is suggested that might provide useful information for the South African scholar/leader debate raised in the rationale of this thesis. A number of the research leaders in this sample indicated that they would consider a move into executive research management if this was a possibility. If they did, a research study could explore what role their intellectual leadership plays in considerations of their appointment as well as how they lead from the position of a highly regarded scholar. This would be along the lines of the work by Goodall (2006; 2007) who suggested that leading universities are led by leading researchers.

A response from a mentee in this study seems an appropriate way to conclude this exploratory study on research leadership. . This is chosen for two reasons, namely to avoid the criticism of self report in general leadership studies, and because the response encapsulates the essential features of effective research leadership that have been highlighted in this study. The mentee described the impact of a research leader's mentorship on his/her research career in the following way:

The impact is immeasurable…

(Prof) helped me to develop with regard to fundamental research skills (thinking, research design, writing, etc.)…

(Prof) guided me into a network of wonderful and successful diversity scholars…

Perhaps as importantly (Prof) has been a role model with regard to being an overall scholar of the first rate.