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Factors Associated with Research Management in Australian Commerce and Business Faculties

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Measurable research outputs have become part of the overall research management structure within Australian universities has over the past ten years. As such, policy makers and administrators alike have come to regard effective management structures and mechanisms as fundamental components of a research environment capable of generating desired quantities of quality outcomes. This paper is based on empirical research carried out over the past year that surveyed academics from commerce and business faculties in Australian universities. The data shows that factors such as gender, discipline and academic level appear to impinge on the relative importance of components that make up research management.

Introduction

University academics have always worked under the dual role of educator and researcher. Over the past two decades, the academics' role as a researcher has become more and more important, both as an indicator of how well the overall institution is perceived (Foldesi 1996, Breslin & Klagholz 1980, Sutton & Bergerson 2001) and how well the individual academic is compensated (Lewis 1996, Fairweather 1993, Prewit et al 1991).

A number of studies in the US, Europe and, more recently, Australia (Benjamin 1998, Marchant & Newman 1994, Taylor et al 1991, Rix et al 2004), have suggested the increasing emphasis on research as and individual and institutional indicator is a product of the reduction of the amount and control of funds to the university sector and while numbers of students has grown, governments are increasingly demanding that universities spend public funds wisely and effectively and demonstrate their ability to attract significant

external, non-government financial support for their activities, especially research (for growth in numbers of students in Australian universities, see AVCC 2003).

In line with trends in the rest of the world, research management within Australian universities has over the past ten years become a priority for both policy makers and university administrators. Measurable research outputs increasingly determine the amount of public research funding received by institutions. Accordingly, policy makers and administrators alike have come to regard effective management structures and mechanisms as fundamental components of a research environment capable of generating desired quantities of quality outcomes. Studies in Australian universities have shown that in the past decade in particular, while growth in higher education has been matched by government demands for performance and quality, it has not been matched with any growth in government funding. Indeed, studies by Welsh & Metcalfe (2003) and Rix et al (2004) have shown that the number of DEST-recognised publications produced by an institution's academic staff members in a year is an important factor in determining the amount of government research funding both the individual, the faculty and the institution will receive in the following year (DEST is the Commonwealth Department of Education, Science and Training).

For academic staff in areas of high teaching (commerce, business and technology) this 'blanket' publication/funding equation adds additional pressure.

Research management procedures, processes and performance criteria have been put in place in most, if not all Australian universities. An examination of these procedures

(Welsh & Metcalfe 2003, Wood & Meek 2002) shows that like the government DEST model, most are applied across all faculties with little regard for varying teaching volumes and commitments. Not only do many of these procedures fail to acknowledge individual faculty differences, but overall there has been little rigorous examination as to how effective these procedures, processes and criteria are, either in terms of attracting external funding or improving performance (Jangbloed & Vorstensteyn 2001) nor has there been any studies examining the suitability of research management strategies to the staff who must work within them.

The motivation for this study was to examine the importance of factors that make up research management policies for academics in traditionally high volume teaching areas. As such, this paper begins by briefly examining the role of research management policies. The paper then examines changes in government policies in Australian universities and their effects on institutions and individuals. Finally, the paper provides some findings of a study of factors associated with research management carried out on 101 academics working within Commerce or Business faculties in Australian universities.

The Role of Research Management Policies

The aim of any research policy is to enhance the future standing of both the institution as well as the individual academic. As such, Hearn (1999) suggests that policy needs to be discussed and supported before implementation. It must include decisions and procedures on how to react to the external marketplace, whether and what type of salary

compensations are attached to the policy, who the stakeholders are in the policy realization and how to address conflict that might arise between those stakeholders.

A number of authors (Diamond 1993, Hearn 1999, Sutton & Bergerson 2001) have suggested the following minimum criteria for the development of any research policy:

- The policies and procedures must fit within the mission statement of the institution (Diamond 1993). For this alignment to occur, Sutton and Bergerson (2001) suggest that it require the re-examination of the mission statement such that it is realistically aligned to the characteristics and strengths of the individual institution.

- The policies and procedures must be sensitive to differences in disciplines within the institution. Sutton & Bergerson (2001) note that for some disciplines teaching, consultation or public service may take a greater role, while for others research is a primary concern and focus.

- Any policy or procedure must account for differences between individual academics and must utilize strengths of individuals.

- Policy development must be mindful of accreditation demands placed on certain disciplines by either professional organizations or government bodies.

- All policies and procedures must have in-built assessments of all staff. These must be seen as fair and workable and must include mechanisms for the differences noted above.

- All policies and procedures must have self assessment policies built into their structure such that policies are continually examined to determine whether they are adequate and suitable to both the institution as well as the individual

The Australian Situation

In 2000, there were a total of 695,485 students enrolled in Australian universities, 37,158 of these doing higher research degrees. Australian universities employed nearly 30,000 academic staff. The 37 public universities in the unified national system had a combined income of $A9 billion, $5 billion of this revenue coming from Commonwealth operating grants (Wood and Meek 2002: 10). As Wood and Meek point out, however, funds from non-government sources have been growing as a proportion of total university revenues since the early 1990s (33% in 1999). They note that this 'is in line with government expectations regarding diversification of funding sources and 'user pays' regarding tertiary enrolments (Wood and Meek 2002: 10).' These reforms to higher education have had some intended, positive outcomes, including greater responsiveness of the sector to the needs of industry and the community, substantial increase in students both domestic and international, impressive increase in the number of graduates, and a dramatic decline in dependence on Commonwealth funding. However, there have also been some far-reaching, negative consequences: 'the high level of institutional competition has decreased the diversity of the system and stifled innovation; the corporate-style institutional management encouraged by market-like competition tends to substantially alienate staff; and the decline in Commonwealth financial support threatens the quality of teaching and research in many institutions (Wood and Meek 2002: 22; see also Bellamy *et al* 2003, Lloyd 2004).

In the ten years to 2003, the reforms to Australia's higher education sector outlined above had also brought about significant changes in research funding policy, forcing universities to identify and develop further their research strengths (DEST 1999). One of the consequences of these changes has been the growth in numbers of university research 'centres of excellence'. The existence of such a centre is thought to provide compelling evidence of research strength in a particular field. (Zajkowski 2003: 203) However, this was not the only significant change in the external environment affecting research funding and direction. Other important changes include:

- Increased competition for research funding from ARC funding grant schemes and discretionary incomes such as the Research Training Scheme and Institutional Grants Scheme, and for research degree scholarships funded by the Commonwealth

- Intensified competition for high quality national and international research students

- Initiatives such as the Australian Government's 'Backing Australia's Ability' review which seek to develop home-grown capacities to generate ideas and undertake productive research, facilitate any commercial applications of these ideas, and encourage the development and retention of skilled researchers

- An emphasis on moving from individual scholarship to institutional research activities in the arts, humanities and social sciences (UoW 2004: 5-6)

Thomas (2000) suggests that these changes have had an effect both on the institution as well as the individual. At an institutional level, Thomas suggested that:

Over the last two decades many institutions of higher education have undertaken a fundamental review of their internal resource allocation mechanisms in response to environmental pressure. This has invariably involved two elements: an increasingly formulaic basis to resource allocation, often reflecting the methodology adopted by the national funding agency and

enhanced devolution of budgetary responsibility to a departmental, school or faculty level. (Thomas 2000 pp127)

Thomas also noted that many of the steps taken included

new appointments at senior level (e.g. pro-vice-chancellor or deputy director) with a specific research brief; establishment of research committees as critical bodies within the institutional structure, reporting directly to the senate or academic board and determining the research agenda; devolution of financial responsibility to departments as an incentive for income generation; strategic allocation of pump-priming tools sometimes in the form of scholarships, to stimulate research; a requirement for annual reports on research activity; monitoring of output against faculty plans; establishment of research databases; targeting of refereed journals for publications; and the active search for research collaboration with partners already possessing a research reputation. (Thomas 2001 pp175)

At the individual level, Bellamy et al (2003) found that despite the major reason given by academics to remain within the university system being flexibility and autonomy of employment, many research management policies

encouraged homogeneity across the university sector, rather than diversity as the government would have us believe. Additionally, academics at the local level may be able to isolate themselves to some extent from the mega-structural and political changes occurring at more senior levels in the system. Perhaps this finding supports the notion of a gap between policy development at the

'university centre' and policy implementation at the local level. (Bellamy,

Morley and Watty 2003 pp27)

A number of studies (Pratt et al 1999, Bland & Ruffin 1992, Rix et al 2004) have attempted

to examine the factors that, at an individual level, affect research. A composite set is shown

in Table 1.

Table 1
Factors Affecting Research

1. Effectiveness of the Faculty Research Management Structure
2. Whether it is linked to workloads models
3. Whether it nurtures new researchers
4. Whether it facilitates research
5. Whether it is transparent
6. How effective research communication mechanisms are within the faculty
7. Whether the faculty encourages interdisciplinary research
8. Whether the faculty encourages external research collaboration
9. Whether the current DEST indicators are relevant to an individual's own research
10. Whether the current DEST indicators direct individual research pursuits
11. To what extent does the Faculty foster research mentoring among staff
12. To what extent are research students included in Faculty research activities
13. How effective are Quality Assurance mechanisms
14. How clearly articulated are the Faculty's research priority areas
15. Do research concentrations within your Faculty emerge naturally
16. Overall opinion of the research environment

Methodology

A survey instrument was developed to collect data about the factors affecting research.

Respondents were asked to rate each of the 16 factors (in Table 1) across a 4 point Likert

scale (very ineffective, ineffective, effective, very effective). The survey also contained

questions used to build a profile of the respondents, including the gender, the academic

level (Dean, Head of School/Discipline, Professor /Associate Professor, Lecturer B/C,

Associate Lecturer) and the Discipline.

Surveys were administered by telephone. A total of 101 academics were randomly

chosen and interviewed.

Results and Findings

All academics contacted by phone agreed to take part in the survey. The responses formed

the basis for a statistical analysis carried out using SPSS. An inspection of the frequencies

indicated that the full range of response scales were utilised by the respondents. The aim of

the statistical analysis was to establish the correlation (if any) between the factors affecting research. Prior to this the scales of measurement for the 16 factors was tested using a Cronbach Alpha reliability test. Cronbach's Alpha was .7801 indicating a high level of reliability. An initial correlation matrix was produced (see Table 2). The correlation matrix indicated several 'clusters' of questions or factors were in evidence.

Table 2
Correlation Matrix of Factors Affecting Research

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
Q2	.167														
Q3	.207*	.220*													
Q4	**.375**	.044	.283**												
Q5	**.392**	.173	.299**	**.473**											
Q6	**.445**	.106	.219*	**.455**	**.567**										
Q7	**.319**	.124	.116	.261**	.292**	**.329**									
Q8	**.439**	.068	.158	**.339**	**.397**	**.384**	**.481**								
Q9	.102	.302**	.230*	-.013	.173	.130	-.036	.044							
Q10	.111	.285**	.192	.032	.076	.144	.025	.101	**.834**						
Q11	.234*	.072	**.313**	**.573**	**.327**	**.320**	**.344**	.279**	.055	.086					
Q12	.004	-.065	.064	.199*	.192	.138	.214*	.134	-.097	-.116	.290**				
Q13	-.036	.178	.337	**.350**	.284**	.113	**.320**	.169	.131	.135	**.502**	.355			
Q14	.160	.029	.171	.305**	.119	.105	.200*	.068	-.022	.024	.280**	.231*	.176		
Q15	-.043	.054	-.054	-.071	.017	-.268**	.168	-.016	.058	.028	.070	.090	.048	.219*	
Q16	**.474**	.238*	**.398**	**.521**	**.524**	**.508**	**.435**	**.435**	-.025	.050	**.473**	.172	**.326**	.295**	-.012

The findings suggested the use of Factor Analysis to investigate any separate underlying factors and to reduce redundancy of certain questions indicated in the correlation matrix. The results of the Kaiser-Meyer-Olkin MSA (.761) and Bartlett's Test of Sphericity (χ^2 =584, p=.000) indicated that the data set satisfied the assumptions of factorability. Principle Component Analysis was chosen as the method of extraction in order to account for the maximum variance in the data using the minimum number of factors. A four factor solution was extracted (see Table 3) with Eigenvalues of 4.530, 2.084, 1.605 and 1.199. This was supported by an inspection of the Scree Plots. These four factors accounted for 58.865% of the total variance. The four factors have been nominally termed research management, research nurturing, research indicators and research priorities.

Table 3
Total variance Explained

Component	Eigenvalue	% of Variance	Cumulative %
research management	4.530	28.315	28.315
research nurturing	2.084	13.026	41.340
research indicators	1.605	10.034	51.374
research priorities	1.199	7.491	58.865

The four resulting components were rotated using a Varimax procedure and a simple

structure was achieved as shown in the Rotated Component matrix in Table 4.

Table 4
Rotated Component Matrix

	Research management	**Research nurturing**	**Research indicators**	**Research priorities**
Q1	**.785**	-.009	.117	.004
Q2	.162	.004	**.538**	.010
Q3	.203	**.487**	.345	-.192
Q4	**.537**	**.532**	-.004	-.118
Q5	**.634**	.315	.148	-.009
Q6	**.728**	.175	.009	-.313
Q7	**.565**	.207	.002	.451
Q8	**.714**	.004	.003	.152
Q9	-.008	.007	**.917**	-.003
Q10	.003	.005	**.895**	-.002
Q11	.325	**.696**	.005	.008
Q12	.002	**.589**	-.219	.192
Q13	.001	**.803**	-.175	.007
Q14	.151	.399	-.003	**.426**
Q15	-.106	.002	.010	**.852**
Q16	**.699**	.406	.004	.004

Seven factors (Questions 1, 4, 5, 6, 7, 8 & 16) loaded highly on the first component

(Research management), five factors (Questions 3, 4, 11, 12 & 13) loaded on the second

component (Research nurturing), 3 factors (Questions 2, 9 & 10) loaded on the third

component (research indicators) and 2 factors (Questions 14 & 15) loaded on the fourth

component (Research priorities). The four factors are independent and uncorrelated, as an orthogonal procedure was used. It is interesting to note that Question 4 loaded onto components 1 and 2 (Research management and Research nurturing) although the loading was slightly higher for research management.

The data was then separately subdivided by gender, academic level and discipline. For each set of subdivisions correlation matrices were produced and a similar set of factor analyses was performed (these are available from the authors). The resultant eigenvalues and % of variance provides an indicator of the relative importance of each of the factors to the sample subgroups. Tables 5 – 7 show the relative levels of importance of the four factors for the subgroups. It should be noted that the tables do not add to 100%as the ratings by some respondents may be loaded onto more than one factor.

Table 5
Importance of each of the Research factors by Gender

Importance	Male	Female
Research management	30.608%	14.195%
Research nurturing	8.298%	28.398%
Research indicators	10.669%	9.253%
Research priorities	15.580%	8.559%

Table 6
Importance of each of the Research factors by Level

Importance	Executive	Head of Dept. or School	Junior Lecturer (Lecturer A)	Senior Lecturer (Lecturer B/C)	Prof/Assoc. Prof
Research management	45.166%	38.233%	14.378%	28.013%	28.193%
Research nurturing	6.671%	16.321%	26.410%	14.015%	9.084%
Research indicators	20.555%	15.360%	17.318%	11.324%	22.864%
Research priorities	14.238%	10.251%	10.595%	7.745%	14.674%

Table 7
Importance of each of the Research factors by Discipline

Importance	Accountancy	Economics	Information Systems	Law	Marketing	Management
Research management	31.238%	27.007%	40.167%	45.406%[*]	10.164%	11.991%
Research nurturing	8.564%	15.203%	6.822%		29.889%	32.050%
Research indicators	21.667%	22.361%	22.624%	23.867%	20.408%	12.931%
Research priorities	8.170%	10.062%	10.203%	7.576%	10.146%	8.391%

* Law respondents considered Research management and Research nurturing to be one component

Discussion

The results of this study are an important first step in consolidating our understanding of factors affecting research in Australian universities. The correlations and subsequent factor analyses indicate that factors can be grouped into four main themes - research management, research nurturing, research indicators and research priorities. An examination of Table 4 shows that research management includes facilitation of research, transparency of research management, communication of policy and collaboration. Research nurturing includes facilitation of research, mentoring, encouragement of research

students and quality assurance of research supervision. The factor <u>research indicators</u> includes workloads models and <u>research priorities</u> includes details of how concentrations of research are arrived at.

An examination of Table 3 shows that for the entire respondent population, the strongest research factor is research management, accounting for 28.315% of the variance in responses. Indeed, this factor is more than twice as important as any of the other factor.

As indicated, the data was separately subdivided by gender, academic level, and discipline. These will now be considered separately.

Table 5 shows the respondent data subdivided by gender. An examination of the data in Table 5 shows that the most important factor for male respondents appears to be research management. 30.608% of the variance found in the factor analysis for males was attributable to research management. By comparison, the largest variance for females was research nurturing. Clearly, then, there are distinct gender differences in the relative importance of research factors.

Table 6 presents the respondent data subdivided by level within the university. An examination of Table 6 shows that with the exception of Lecturer A respondents, all levels considered research management to be the single most important factor. Lecturer A's considered the need for research nurturing to be more important. It is interesting to note

that at the highest levels, Executive and Professor/Associate Professor, the second most important research factor was research indicators.

Table 7 presents the respondent data subdivided by discipline. An examination of the data in Table 7 shows that three disciplines, Accountancy, Economics and Information Systems considered research management to be the most important factor, with research indicators being the second most important. By comparison, Management and Marketing considered research nurturing to be far more important than research management. Of particular interest are the responses from the Law discipline that considered research nurturing to be part of research management.

The results of this study are significant both for government and university administrations that are promoting research within their campuses. Firstly, the basic model reduces fragmentation from having a large number of factors concerned with research. It also provides a more concise understanding of research and research factor because 16 factors can be grouped into four factors. This is powerful explanatory tool because research factors can now be explained in terms of research management, research nurturing, research indicators and research priorities.

The study is also important because it shows that a number of underlying considerations are 'at work' in the discussion of research factors. These include gender, academic level and discipline. This is an important finding for government and university administrators.

Clearly, the results suggest that any attempt to promote research needs to be mindful of these underlying considerations.

This study was carried out with 101 academics. Clearly further similar studies need to be undertaken before any generisable findings are possible.

Limitations

It should be noted that the study presented here has several limitations. Firstly, the number of respondents was only 101, making any attempt to generalise the findings problematic. Secondly, the choice of variables may change over time or through alterations to government policy, thus altering the alignment of these to the four factors. Finally, a far more in-depth qualitative analysis needs to be undertaken to determine how the four factors impact on research and why certain subgroups of the university population rate various factors differently to other subgroups.

Conclusion

The higher education policies of the Commonwealth government have been enormously influential in shaping the research environment within Australian universities. As university administrators have sought to integrate research planning at the faculty level with planning at the institutional level, so have government policies had a direct and often severe impact on the working lives of Australian academics. These developments have put considerable pressure on individual academics to lift their own 'research game'. These pressures appear to have been greatest in commerce and business faculties that have experienced the combined effects of higher teaching volumes and detailed, micro management and measurement of research performance.

Accordingly, research management within these faculties has to be undertaken with great care to ensure that it does in fact encourage research and improve research performance in an environment not always conducive to research. It is hardly surprising that commerce and business faculty staff rate research management factors as the factor having the greatest impact on their research. However, as the research reported in this paper has demonstrated, the effectiveness of research management in commerce and business faculties was rated quite differently across the demographic categories identified.

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