

Factors influencing research performance of university academic staff

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Abstract. The application of performance based criteria in the allocation of resources and the targeting of substantial research funds to topics of national priority are two major features of the new research funding climate in Australian higher education. Successful competition for such funds will depend on universities developing and implementing appropriate research management plans and on the overall research performance of their academic staff. This paper reports the views of academic staff from one Australian university on such issues as the determinants of research performance and the importance of individual autonomy in the selection of research topics. One of the main findings is that research activity is highly variable and influenced by a number of factors including, personal characteristics; differences in research styles, methods and strategies both within and between disciplines; and dependence on funding. The findings show that academics firmly believe in “freedom of inquiry” in the choice of research topic.

Introduction¹

Under the Australian federal government’s reforms of higher education, universities will now have to make a much more explicit case for the funding of their research activities (*Higher Education*, 1988). The success with which they do this will largely depend on (1) their capacity to develop and implement appropriate research management plans; (2) being able to identify and encourage the high research performers on their staff; and, increasingly, (3) the ability of their staff to design projects to compete for funds earmarked for national priorities.

In introducing procedures for the appraisal of overall research performance, universities will need to know more about how research activity and attitudes differ between departments, disciplines and institutions; whether this activity is influenced by such factors as the work or colleague environment, funding arrangements and teaching loads; how young researchers are socialized into the academic profession; whether all academic staff need to engage in research as well as teaching; the degree of autonomy staff should be allowed in the choice of research topics; and how well current research funds are being spent. As part of this process, the problems posed by “restricted economic resources, an aging, highly tenured faculty, and minimal opportunities to hire new personnel with needed forms of expertise and skill” will also have to be

addressed (Baldwin, 1985; see also Reskin, 1977; Bean, 1982). However, despite a variety of studies completed over the past four decades, our detailed knowledge about university based research activity is limited. A major concern of this paper is to identify those factors academic staff consider important in explaining differences in research productivity and to examine these factors in terms of their potential contribution to the development of a research management policy.

Purpose

This paper reports the results of a study carried out at the University of New England (UNE) during late 1987 which sought the opinions of academic staff about various issues concerning research performance. The main aim of the study was to find out how academics from different disciplines carried out and viewed their research.² The following areas were of particular interest to the study and are the focus of this paper: the factors academics considered to be the most important in explaining varying levels of research productivity; the importance of individual autonomy in the selection of research topics; and the ways academics accommodate the different demands of their work. The preliminary findings identify a number of issues which are of potential relevance to university administrators interested in the development of a research policy. From the nature of what was said and the language in which it was expressed it is apparent that some staff are particularly concerned about the changing climate of research appraisal and funding.

Methodology

The University has six faculties covering Arts, Science, Rural Science, Economic Studies and Education. External teaching is a major function of the University, although not all academic staff teach in this mode. An interview schedule containing a number of open-ended questions was designed to collect the required information. 14 departments participated in the study and interviews were carried out over a two month period towards the end of 1987. There is strong support in the professional literature for distinguishing between different subject areas when examining academic research activity (cf. Lodahl and Gordon, 1972; Biglan, 1973a,b; Bresser, 1984, 1985). An attempt was therefore made in the selection of departments for the UNE study to include a variety of different disciplines. To maintain this distinction, departments were grouped into the following four categories for analysis: (1) *Sciences* – Physics, Agronomy, Botany, Ecosystems Management and Geology; (2) *So-*

cial Sciences & Humanities – Sociology, Politics, Econometrics, Economics and Classics; (3) *Performing Arts* – Drama and Music; and (4) *Education* – Continuing Education and Adult Education. The project was directed to those holding the position of lecturer or above. In every department, the “head” or “acting head” participated in the survey. The interviews were taped and later transcribed.

Overall some 53 staff were interviewed on either an individual or group basis with heads of departments organising the actual participants. However, the individual interview provided greater flexibility and control over the interview than the group one. In particular, it removed any hierarchical influences which might have prevented either a contribution to discussion by less senior staff or the giving of confidential information. Responses to the questions were usually located in the context of the situation at UNE but experiences at other institutions either as a PhD student or staff member were provided. Answers to questions regarding “performance” were in the context of assessment of research for appointment, promotion, tenure, and funding purposes.

Results

1. *Factors that affect research performance*

Why some university academic staff produce high quality research year after year while others do not is a genuine puzzle. So too are the differences in research activity between universities, between different disciplines, and sometimes between academics of the same age and rank and holding the same formal qualifications. In the literature, differences in research activity have been explained in terms of individual (e.g. ability, age, sex, ambition); environmental (e.g. calibre of doctoral training, prestige of employing institution, collegueship); reinforcement factors (e.g. the reward structure, access to resources, literature citations); and disciplinary expectations (Fox, 1983; Finkelstein, 1984; Creswell, 1985, 1986b). However, no one perspective has satisfactorily identified the relationship between these factors or the dynamics by which they influence research activity. Methodological problems, limited empirical testing and disagreement about the effects of different variables, have been particular obstacles in developing a unified theory to explain the varying productivity of researchers. No doubt efforts to develop such a theory will take on increasing importance in Australia given the attention that has been focused on the efficiency and effectiveness by which universities carry out their different functions (CTEC, 1986, 1987; ASTEC, 1987; *Higher Education*, 1988).

The findings of the UNE study indicate that apart from personal characteristics, and to some extent the availability of funds and the teaching load, the different *styles, processes* and *techniques* of research *within* and *between* disciplines are the most important factors in explaining variations in research productivity. However, in this context it should also be appreciated that many academics in the survey do not believe that there is necessarily a link between high research productivity and high quality research. This issue has been addressed in more detail in the literature (see for example, Le Grew, 1984; Chan, 1978).

The explanations provided by academics are summarised below.

Personal characteristics

Across disciplines, differences in ability, energy, creativity, motivation, ambition and self-discipline are considered to be important factors in distinguishing between productive and unproductive researchers. However, it is clear from the explanations given by academics that there are different types of productive researchers. For example, one type described by a senior academic in Politics, portrays the productive researcher as one “*who can cope with an extraordinary workload, is intellectually very curious, likes writing and puts time away for research*”. However, a less flattering (although equally prominent) description sees the productive researcher as one who is adept at academic gamesmanship. In particular, this academic is characterised as one who is “hard-nosed” about the time allocated to research, pursuing this activity even though other responsibilities, such as teaching, may suffer. This type of academic is also seen as a strategist in relation to publications. That is, giving priority to producing a lot of short articles which can be published quickly, interspersed occasionally (although not always) with a number of quality papers. Several academics identified the stringency of the university’s requirements for promotion as the main reason for why some academics employ gamesmanship tactics in their approach to research. As suggested by one lecturer in Adult Education “*To conform to the University’s promotion criteria you need to be brutal to do research*”.

A number of academics claim that differences in productivity are also largely a question of focus – that is, some concentrate on research but others see teaching/administration as a legitimate emphasis for their work. Disillusionment with the institutional reward system is also suggested as one reason why some able academics decrease their productivity. A further explanation given by a senior academic in Politics is that the unproductive researcher “*lacks confidence in getting work judged by peers and on occasion there is too much concern for standard and so the work never gets published*”.

Some academics believe that productivity declines with age but little of a

systematic nature was noted. For example, although several scientists commented that the major research in their fields tends to be done early in the academic career, experience was seen to more than compensate for any problems that might develop with age. In Classics it was noted that a very long apprenticeship was required just in reading and mastering the foreign literature before an academic could contribute to the discipline. The most productive phase in this discipline is identified as between 30 to 45 years of age. However, several academics suggested that incentives like promotion, could enhance productivity at different stages and thus mitigate the influence of the age factor.

Depending on discipline, age is also considered to have both negative and positive aspects. For example, it was suggested by a senior academic in Classics that in some cases young academics try to publish too quickly before gaining a proper command of their subject matter. But it was also suggested by a lecturer in Economics that younger academics tend to be better trained in quantitative skills and techniques which allow them to undertake research which is more quantitatively analytical than that undertaken by their older counterparts. In this context it is interesting to note that some authors have identified a trend in research as the academic ages "from highly specific, empirical, and analytical inquiries toward broader, theoretical, synthetic and interdisciplinary research" (Finkelstein, 1984; Parsons and Platt, 1973). These authors also suggest that it takes longer to produce publications in the latter type of research. The validity of such claims should be established if productivity figures are to be interpreted correctly.

Area of research

According to academics in the UNE study, differences in the *styles, processes and techniques of research within and between disciplines* bring different potentials for productivity. Thus variation in research productivity between academics can to some extent be explained by differences in the fields of research and the varying definitions of what constitutes acceptable research output in these fields. In the UNE study, productivity is claimed to vary according to whether the research is, for example, pure/applied; high/low risk; fieldwork/laboratory/desk; established/developing; of local/national/international reputation; experimental/ecological; and shortterm/long-term. The time required to carry out research and the lag time between completion and publication are cited as related factors. Also the expectations of funding bodies and clients are considered to have a strong influence of the type of research produced and the form in which the results are presented. The following comments illustrate how some academics perceive the influence of subject matter on research productivity:

In the soils area longterm projects are quite frequent – it might take 3 years for a soils type project to be completed but you might only get one paper out of it. In field work disciplines you don't produce papers rapidly. There is also more risk with experiments – for example, because of the weather. Those heavily tied up with field work areas are at the lower end of the production game as far as publications go. (Agronomy)

There are differences between experimental and ecological fields. It takes far longer to produce something in the latter field. (Botany)

Productivity depends on the field you work in. In a developing field there is an onus to report on developments. In other fields it is more difficult to publish. There is also the difference between documentation as opposed to problem solving articles. Documentation involves, for example, the publishing of either a new species or currents of a fossil or a discovery of a new mineral which you have come across by chance. It doesn't take an enormous amount of effort to describe these for publication. The problem solving publications, which involve, for example, proving that it is indeed a new mineral, take far more time. (Geology)

Some fields by their nature publish more than others. (Physics)

Some people are engaged in longterm research that doesn't produce many articles but may make a substantial contribution to the discipline through one seminal article or book. Some research is high risk. Some work requires a considerable amount of time to digest the relevant literature. (Sociology)

Some areas you can publish in prolifically, not of course necessarily in the top journals, It is more difficult to get research publications at the theoretical end compared with the empirical end. (Economics)

There is a long gestation period for various types of work. There is a danger that the emphasis on productivity is undercutting longterm research. (Politics)

Competent scholars need to have a good working knowledge of several languages. Also every time you initiate a research project you have to familiarise yourself with the vast amount already written in that area to make sure no one else has written on your topic. It's more difficult to write short articles in Classics which will make any substantial contribution to the ongoing debates in the discipline. (Classics)

Some areas you can produce quick papers but if you want to do something broad it takes you years. (Adult Education)

The UNE findings are consistent with those of similar studies reported in the literature which have examined the relationships between subject matter characteristics, communication structure and productivity (cf. Smith and Fielder, 1971; Whitley and Frost, 1971; Lodahl and Gordon, 1972; Biglan, 1973a, b; Light, Marsden and Corl, 1973; Pelz and Andrews, 1976; Thompson and Brewster, 1978; Grimes, 1980; Haim, 1981; Wanner, Lewis and Gregorio, 1981; Roe, McDonald & Moses, 1984; Bresser, 1985; Wettersten, 1985; Everett and Entrekin, 1987).

Some academics also consider that differences in productivity may occur as a result of the application of a definition of research output appropriate for one field to one where it is not. For example, in the Performing Arts and Education there is a perception that the definition of research activity used by review committees is too restrictive. By using a definition based on the scientific model of research it is claimed that these committees do not take into account the full extent of research activity within the Performing Arts and Education. As one senior academic in Drama commented "*If production is*

excluded from the profile to assess research performance then some [academics] look up the creek”.

The potential for exploiting a topic area is also considered an important factor influencing productivity. For example, by entering a growing field of research during its initial stage of development it is suggested by some that the academic has a greater chance of making a significant contribution. This issue has been addressed in more detail by researchers such as Martin and Irvine, (1982) and Mulkey, (1976). The choice of research area and topicality are also claimed to affect productivity as can be seen from the following comments:

Choosing the right area is important. This can be gamble, but only a very few can change research areas successfully. (Physics)

Some of the prolific publishers get on a publication bandwagon. Some researchers get on to one topic and just continue publishing a series of papers on this theme. (Agronomy)

If you want to establish a reputation you have to publish something that is topical. Articles on new techniques, in contrast, take time to be assimilated as there has to be some demonstrated application of the technique within the physics community. (Physics)

Choice of topic is also very important. If it's fashionable it doesn't matter how badly the article is written it will still be published. A change of research specialty is also very risky. (Sociology)

Pressures to publish for promotional purposes are also claimed by some academics to work against pure research and encourage problem-oriented research.

Funds/equipment/support staff

The importance of these resources as factors explaining productivity differences very much depends on the academic's field of research. For many scientists engaged in theoretical work funds are not considered to be of major importance as long as computer facilities are readily available. However, for the majority in science departments the availability, amount and continuation of funding are very important in facilitating research and many identified serious problems faced by funding restrictions. A particular problem claimed by some scientists is the increasing difficulty in being able to justify some applications in terms of the departmental support (e.g. technical, secretarial or computer) which is expected by some granting bodies to be available for the project. A related concern is not being able to attract and retain high calibre technical and research assistance when the continuity of funding is not assured. Some academics also claim that the choice of research topic is becoming increasingly influenced by the opportunity to attract outside funding, particularly for those working in pure research areas. Similar claims have also been raised in the literature (cf. Liebert, 1977; Packard, 1977; Garner, 1979; Everett and Entekin, 1987; Lowe, 1987). The following comments are illustrative of the above concerns:

A small amount of funds limits you to obsolete equipment and you're always falling behind the latest developments. Modest funds will keep you going but it's not good for your self-image. (Physics)

Funds are lacking and so there is an increasing rejection of good grant applications which have taken a lot of time to prepare. This is demoralising. (Agronomy)

You can't plan programs without security of funding. (Botany)

The availability of funds is important to guarantee relatively longterm projects and to employ assistants. (Ecosystems Management)

Funds will affect the kind of things you can do rather than whether or not you can carry out research. If you're good you can always find someone to fund you. (Geology)

In comparison to the sciences, equipment costs are claimed to be minimal in the social sciences. For example, in Econometrics, Politics and Classics many academics claim not to be dependent on external funding for the support of their research. However, academics do acknowledge that the availability of funds for travel and support staff does influence the scope of the projects which can be undertaken and sociologists are particularly vocal on these issues as can be seen from the following comments:

Academics are frequently subsidising research out of their own pockets because of the lack of financial support. It is also increasingly difficult for young academics at the family stage of the life cycle to fund overseas sabbaticals. (Sociology)

Restricted funds limit you to doing less substantial projects in some areas. (Sociology)

Equipment costs are minimal but money for travel and hiring support staff such as research assistants and interviewers is very important. Such staff assume a major significance when the research can't be carried out locally because of ethical reasons or because of a lack of suitable populations or institutions on which to base the study. (Sociology)

The availability of research teams and research assistants is particularly conducive to productivity. It's humanly impossible for some people to produce what they claim to be producing by themselves. For example, where people have 3 or 4 publications per year it's usually because they have a number of research students or research assistants involved in a project. (Sociology)

Other problems raised include difficulties in securing funds for pure research along with a perceived bias by some funding bodies to support particular types of research which are not necessarily of importance to the development of the discipline (for example, research which endorses rather than criticises government policy). Similar issues were also raised by scientists.

In Music funds are important for offsetting the substantial costs associated with concert performances and in Drama funds enable academics to solve problems with productions by being able to hire actors to present more than one interpretation of an idea. In Education equipment is not a problem in research but funds for travel, accommodation and personnel to do transcriptions of interviews are considered very important.

Colleagues and work environment

A number of investigations have been undertaken to determine the influence of colleagues and the work environment on academics' attitudes to their research (e.g. Braxton, 1983; Creswell, 1985; Stark, Lowther & Hagerty, 1986). However, it is not clear whether "colleagueship patterns cause productivity or productivity creates patterns of collegial interaction" (Finkelstein, 1982). In the current study while academics consider it important to have colleagues who can provide stimulation and challenge, most acknowledge that the influence of colleagueship and the work environment is variable. Academics in the smaller departments indicate, however, that it is generally difficult to have colleagues within the same department who share similar areas of expertise. Some examples of these views are provided below:

The less diversity in the research interests and the more people around you doing the same sort of thing, the more enthusiasm you get. (Physics)

The ability of people to get on is very important, particularly in being able to share a similar perspective in work and to get on and do it. (Agronomy)

We're working within an art form which is a desirable non-essential and can't be justified in terms of utilitarianism. There is a certain amount of creativity which must exist because it is an art form and there is a sense where a university may be a hostile environment to an art form such as drama. Creativity is typically spontaneous, it doesn't work to a schedule or rules and regulations. So you have to work in an environment that requires you to be typically spontaneous, yet at the same time you're working in an environment that looks on an impulsive act as being wrong. (Drama)

However, colleagueship is not seen to be without its limitations. For example, a potential disadvantage identified by a senior lecturer in Botany is that, when the competitive aspects of colleagueship outweigh the cooperative aspects, the traditional ethical safeguards surrounding the appropriation of new ideas presented in, for example, seminars can no longer be taken for granted.

Postgraduate training department and its work environment

It has often been asserted by some authors that the graduate school department is of critical importance as a socialization environment for the academic not only because it develops knowledge, skills and competencies but also because it cultivates norms, values and attitudes concerning the academic profession. (Crane, 1965; Collins, 1971; Reskin, 1979; Cameron and Blackburn, 1981). However, in this study postgraduate training is not considered so determinate that it applies independently of the academics' later continuing work in the discipline. For example, as one Physics lecturer comments "*If someone is trained in a dynamic research environment they are likely to adopt the same sort of attitude but it would last as long as there is compatibility in the attitudes and expectations between the current and the next group the scientist works*

in. It really comes back to personal motivation". It is also suggested that the person who is going to be successful will seek out those departments which have a good research standing and resources. Choice of topic is frequently regarded as more important than the department in which the researcher trained.

Number of PhD students

For scientists in particular having research students is considered an important part of the research process. A frequent claim, particularly in the sciences, is that these students enrich the environment through their enthusiasm and new ideas. Similar claims have also been made in the literature. See, for example Bean, (1982); Ross, (1983); Corcoran and Clark, (1984). There are, however, some negative opinions regarding the benefits of having research students in a department (particularly in the social sciences). These include the inability of some students to carry out independent research. Also some students are criticised because their motivations for pursuing a PhD are unclear. Despite these criticisms, the small number of students continuing with doctoral studies is seen by many of those interviewed as a limitation on the overall intellectual environment within Australian universities.

Teaching and administrative demands

These demands are considered as distractions from the research enterprise but factors which do not necessarily reduce research output in all cases. External teaching, the need for academics in small departments to teach a wide range of topics, the amount of time needed for reorganising or rewriting courses and the demands of courses which require high staff/student contact are all seen as limitations in being able to carry out quality research. Some scientists are concerned about the difficulty in getting sufficient continuity to conduct experimental work because of teaching commitments. In one case a departmental head has changed the emphasis of his research from experimental to more theoretical to accommodate the increasing administrative demands of his work.

Tenure

There is general agreement that tenure influences the scope and type of research activity an academic can undertake. A frequent comment is that lack of tenure places enormous pressure on academics to publish research findings, irrespective of the quality of that research. Lack of tenure is also seen as a discouragement to undertake risky/contentious research. A comment from a

lecturer in Physics which conveys the general feeling about tenure is that *“It’s only when you aren’t looking over your shoulder for the next position that you can sit back and consider the direction of your research”*.

Other explanations

“Hidden productivity”, that is the period between publications where, for example, the academic reformulates ideas, collects additional data or plans for the next project, is considered by a number of those interviewed as an important but discounted aspect of the research process when an academic’s work is being assessed. Similar claims have also been investigated and supported by such authors as Toombs, (1973); Braxton and Toombs, (1982); Le Grew, (1984); Wheeler and Creswell, (1985); Elton, (1986); Everett and Entekin, (1987).

Early experience in publishing and working for academics who served as role models are also identified as possible factors influencing research productivity. For example, as suggested by a lecturer in Agronomy *“For most people when they start off in their careers they are in a vacuum in terms of experience. On reflection, careers are a series of accidents. Therefore it is crucial to work for the right people in developing a research career”*. The extent an academic publishes with students is also considered to influence research productivity. In this context some academics recommend that specific guidelines be developed on who should author such publications. Family commitments are noted by some as a source of competition with research during evenings and on weekends.

Several younger academics explain differences in research productivity in terms of changes in institutional expectations regarding research performance. These academics claim that in examining research performance it should be noted that some older staff were employed at a time when the expectations of research performance were modest whereas these days there is much more pressure to publish and the requirements for appointment, promotion and tenure are more stringent. Similar points have been made in the literature, particularly in the context of staff morale (cf. Everett and Entekin, 1987; Roe, 1988). An additional suggestion made by a senior academic in Classics is that people with established reputations find it easier to get material published than younger researchers as it is rare for journal editors in Classics to remove the author’s name when sending articles out for review. A further explanation given by several academics in the social sciences and Education is that consultancies, while making a significant input to teaching by the provision of material not readily available in published form, are often not counted in assessments of research performance.

In Music several discipline specific factors are also claimed to account for

productivity variations. For example, staff in this department point out that in some cases practitioners wish to refine a performance first rather than publish, whereas with review committees, the focus is on publications. A related claim by one academic is that *“To be playing properly you must be physically fit and acquainted with the instrument. Holding a pen is inimical to playing”* (Music). The cost of travel, the isolation of Armidale and the timelag in getting overseas journals are cited as additional discouragements to research.

Promotion is considered an important incentive for research and a suggestion made by several scientists is that the “high fliers” should be encouraged at all costs. The use of longer time periods for assessing performance is also considered important in order to take into account the times when research is important and the times when teaching and consolidation are given emphasis.

2. Importance of individual autonomy in selecting research topics

Academics in the UNE study generally consider it important to research areas they find intellectually challenging. However, most claim that the final choice of topic is not made solely on this basis. Questions of funding, relevance to government instrumentalities and practitioners in the field, and the overall research thrust of the department are also taken into account. Academics also claim to be responsive to the needs of students, particularly in gaining discipline related work, when initiating new projects.

Federal government concern to encourage more research into areas of “national priority” is generally considered by academics across all disciplines to be a threat to the autonomy currently enjoyed and a move which would in the long run be counterproductive. The principle of “freedom of inquiry” is seen as an essential component of the research function and consequently it is considered a fanciful notion that academics can be directed to work in areas they aren’t interested in and still produce work of some substance. Similar claims have been made in the literature by Barnes and Dolby, (1970); Flämig, (1980); Williams, (1984); Swinnerton-Dyer, (1985). Because of the motivation, commitment and enthusiasm that comes with being involved in an area that the academic finds intellectually challenging it is recommended by several academics that incentives be used to get staff to change the direction of their research if this action were considered appropriate. This recommendation has also been identified by a number of authors as one way of reducing the “widening gap between academic ideals and institutional realities” (cf. Fenker, 1975; Powell, Barrett & Shanker, 1983; Creswell, 1985; Startup, 1985; Everett and Entrekin, 1987).

3. Ways in which demands of teaching, research and administration are accommodated

For the majority of those interviewed, the research function is clearly the main attraction of the academic position. A similar finding has been reported by Bowden and Anwyl (1983) in relation to their work on the attitudes of Australian academics. However, a number of problems are identified by academics in the UNE study in trying to accommodate their research interests with the other demands of their work. In general, teaching and administration, because of their immediacy, take priority and research fits in to whatever time is left over. This frequently means that academics have to work evenings and weekends to get sufficient time for their projects. Some scientists commented that they are moving away from certain experimental projects which require their continuous involvement, to research areas which can more easily fit into their time constraints. A further limitation in carrying out research is the residential schools associated with external teaching. Some academics claim that because these schools are usually carried out in vacation periods it is difficult to use these traditional breaks for research.

In an attempt to provide some continuity in research, several departments try to accommodate staff preferences in the distribution of teaching throughout the year. This initiative is, however, claimed to be more difficult for the smaller departments to undertake or where there is a very strong link between an academic's research and the content, structure and direction of his/her courses.

Overall there are no obvious differences in the ways academics in the different disciplines try to fulfil their work obligations. However, some of the younger staff feel that they have additional pressures because while most have little experience in teaching, they are under pressure to carry substantial teaching loads as well as to establish a reputation in publishing.

Time and resource restraints have been identified in the literature as the major stresses of the academic role (see for example, Gmelch, Lovrich & Wilke, 1984). In particular, excessive teaching demands are seen as being incongruent with the expectations of the disciplines (Light, Marsden & Corl, 1973; Austin and Gamson, 1983; Brookes and German, 1983; Finkelstein, 1984; Sadowski and Backes, 1987). Related to this concern is the ambiguity over the criteria used to assess staff performance in research, teaching and service. Recent research has pointed to the adverse effects of occupational stress on job performance and satisfaction (cf. Gmelch, Lovrich & Wilke, 1984; Roe, McDonald & Moses, 1984; De Rome, Boud & Genn, 1985: 133; Moses, 1986). All of the above concerns were raised by staff in the UNE study and emphasize the importance of both staff and university administrators reappraising "institutional and individual capabilities and limitations" (cf. Gmelch, Lovrich & Wilke, 1984).

Conclusion

The findings of the study show that research activity is highly variable both within and between disciplines and influenced by a variety of factors. The most important of these factors include personal characteristics; the different styles, processes and techniques of research; and funding availability. However, the influence of some of these factors, either singly or in combination, is often seen as variable and also difficult to measure with any degree of accuracy. The perception of academics of the differences between disciplines in the ways research is carried out is also very limited.

In relation to personal characteristics, such factors as ability, creativity, motivation, self-discipline and ambition are claimed to account for some of the variation in research productivity between staff. However, the measurement problems raised above make it difficult for this information to be used by universities in, for example, recruitment and appointment procedures. Nevertheless, personal factors do not exist in isolation and as argued by one author are "strongly affected by the social and organizational context in which they occur" (Fox, 1983). In this context it is interesting to explore claims by some academics interviewed that personal dispositions produce different responses from staff in relation to promotion and publication pressures. For example, from the study it is apparent that apart from inherent ability and the self-discipline to do the job, high research productivity can be accounted for by other personal attributes. These include singlemindedness in the pursuit of research activity to the exclusion of other responsibilities such as teaching. This practice raises both ethical and practical questions for work colleagues in relation to, for example, the distribution of the teaching load. In response to more stringent promotional criteria some academics are also claimed to undertake research which can produce quick results rather than work which will necessarily contribute to the discipline. The validity of such claims should be investigated in more detail if questions of staff morale, as implied in the first case and quality of research as implied in the second, are to be adequately addressed.

The availability of funds is also identified as an important factor influencing research productivity. In particular, the study shows that some academics experience major restrictions in carrying out research due to the inadequacy of funding. These include being forced to undertake simpler, less challenging and more short-term projects; demoralisation because of the need to use outdated equipment; and difficulties in retaining trained support staff. Such findings echo those of a survey carried out in 1983 concerning the adequacy of funding of the Australian Research Grants Scheme (Australian Research Grants Committee, 1984). However, from the study it is apparent that the impact of funds on research depends not only on the academic's discipline but

also on the type of research being undertaken, for example, pure vs applied. Consequently while large amounts of funds are considered important in scientific areas for carrying out quality research, those involved in theoretical work claim to have only modest resource needs. In other areas such as Adult Education, Drama and Sociology the availability of research funds is seen to influence the type of, rather than necessarily the amount or quality of, work which can be undertaken.

A major source of variation in research output is claimed to result from the different styles, processes and techniques of research both within and between disciplines. In focusing more attention on better ways to assess research performance there is clearly a need to learn to recognise and appraise the relative degrees of productivity associated with these different fields. In particular, attention should be directed to identifying the different forms considered appropriate for presenting research findings.

“Hidden productivity” is also suggested by some academics (particularly in the Performing Arts and Education areas) as a reason for explaining differences in research performance. An assessment period which takes such information into account may reduce some of the discrepancies in performance assessment that are claimed to exist under current assessment practices. Some academics also explain low research performance in terms of a lack of institutional rewards rather than lack of ability. Related to this is the claim (particular by some younger academics) that publication pressures and the current requirements for appointment, promotion and tenure are more stringent than those operating in earlier, more economically lenient times.

The findings of the UNE study indicate that academics do not consider that age has any systematic influence on research performance. However, it is possible that a continuation of the current predominantly older age structure will be accompanied by a decrease in the amount of challenging, contentious, controversial and risky research which is often associated with the young academic. Also at a time when young academics are faced with increasingly stringent promotional criteria and heavier teaching loads they are less likely to challenge the prevailing views on research in their disciplines.

Heavy teaching loads are generally seen as a distraction from the research enterprise but not necessarily a pressure which lowers research output in all cases. However, it should be noted that comments by some academics in relation to how they accommodate the different demands of their job, contradict this view. In particular, the teaching load is frequently seen by these academics as a major obstacle in being able to accommodate research and other demands.

The allocation of federal research funds to areas identified as of national importance will undoubtedly influence the choice of topic by those whose work is dependent on outside funding. However, in the UNE study most academics

stress that autonomy in selecting research topics is essential if work of any substance is to result. Also there is a strong resistance by many academics to the idea that researchers can be successfully directed to areas which they do not find intellectually challenging. Positive incentives in redirecting research efforts are considered by some to be one way of overcoming this resistance. Such issues need to be examined in greater depth than was possible in the UNE study if staff morale and motivation in carrying out research are not to be undermined.

The study also shows that some academics experience a number of problems in trying to accommodate the different demands of their job. Teaching responsibilities, particularly for those involved in external studies, are claimed to substantially reduce the amount of time available for research. For some this has resulted in a shift research interests from, for example, experimental areas to more theoretical topics which do not rely on the continuity of the research effort for their success.

The challenge for those responsible for academic staff assessment is to determine how the different definitions and measures of research output can be linked together into some kind of meaningful overall evaluation (cf. Rouban, 1985). This is particularly important if staff performance and morale are to be enhanced (cf. Creswell, 1986a; Everett and Entekin, 1987). A possible first step in this direction would be to place any assessment of research in the context of the many other demands staff have to meet, particularly those of teaching. In relation to this, institutional expectations regarding teaching, research and administration should be clarified, especially as they relate to the reward system. This is a recommendation that is gaining increased support in the professional literature. See, for example, Reskin, 1977; West, Hore & Boon, 1980; Roe, McDonald & Moses, 1984; De Rome, Boud & Genn, 1985; Moses, 1986. Also expectations regarding research performance should be formed with an acknowledgement of the changing climate and conditions under which research is undertaken. In particular, differences in the funding availability between different disciplines and different fields of research should be noted. Related to this is the importance of examining the impact that the increased expectation of research has on staff who see themselves primarily as teachers (cf. Powell, Barrett & Shanker, 1983). Assumptions and limitations of existing measures should also be acknowledged in the effort to produce a better means of assessing research performance. (Romney, Bogen & Micek, 1979; Lindsay, 1982).

The findings of the UNE study indicate that there is a gap between review committees and academics concerning the aims of research and how it is best supported. Greater consultation with academics about such issues and possible ways of setting up a mechanism for gathering and reporting information to do with performance assessment might be one way of reducing this gap. Finally, while the initiative for establishing research profiles has come from

the federal government, universities should nonetheless be very active in making explicit the indicators "most appropriate to their own spread of research activities" (cf. Bourke, 1986; Rouban, 1985; Taylor, 1985; Sizer, 1986). However, in their bid for competitive funding, care should be taken not to overadapt to changing circumstances by compromising commitment to research and teaching. This could change the fundamental role of the university as a "respository of knowledge, tradition and scholarship" (Powell, Barrett & Shanker, 1983; OECD, 1981).

Notes

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2. The issues of measurement of research performance is dealt with in a separate article by the author.

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