How productive are we?
An analysis of Australian academics in education

John Hattie The University of Western Australia
Murray Print University of Sydney
Krzysztof Krakowski The University of Western Australia

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This paper aims to provide information about productivity in one discipline, demonstrates the range of data available, presents procedures for assessing quality, and provides baseline information - albeit only for research productivity in one discipline

In the past decade Australian universities have witnessed a rapid transformation of the concept of accountability from a mere catchcry to specific measures for determining quality performance (Linke, 1991; Piper, 1983). While this transformation has occurred separately and uniquely within universities its potentially most powerful manifestation can be seen with the creation of the Commonwealth's Committee for Quality Assurance in Higher Education (Quality Committee). Charged with the responsibility of distributing up to $80 million as rewards and incentives for enhancing quality, the newly formed Committee is searching for appropriate ways to determine and measure high performance within Australian universities.

Such a search requires an understanding of the present status of productivity, and in the discipline of education relatively little is known about the performance of its members, the range of activities, and the nature of the outputs. The basis of this paper is to provide some evidence about the reputation and productivity of Australian academics located within faculties and departments of education in an Australian educational context.

The present study primarily uses an Australian data base to assess the impact of Australian academics in education. Although the local data base is most extensive and exhibits high face validity for the Australian context, there is an obvious trade-off and limitation in that international contributions are excluded. It should be emphasised that this is a limitation and not a damnation, as the aim of this study is to complement the earlier and other studies by focussing upon an Australian context. Further, this paper will demonstrate the power of using

other than USA-based databases to comment on the status of publishing by Australian academics in education within Australia.

Method

The Australian Educational Index (AEI) was chosen because it includes the most comprehensive index available to literature relevant to Australian education. The major sources for the AEI are articles from 207 Australian Journals (about 45% of entries), speeches and meeting papers (17%), books and monographs (12%), reports (12%), and theses (9%). The major subject areas in the AEI are listed in Table 1 (from McGaw, Boud, Poole, Warry & Mckenzie, 1992 - all Tables available from the authors). In the following analyses we excluded from the AEI database references to Library and Information Science (which we estimate to be about 5000 entries). The AEI is available on CD-Rom and we thank, ACER, particularly Phil Mackenzie and Peter Matthews, for providing the CD-Rom and permission to access the raw files.

Every academic in Australian university departments and faculties of education listed in the 1992 Commonwealth Yearbook was used as the pool of staff. In some university's, education staff were located in Centres (e.g., Schonell Centre), departments with curriculum related names (e.g., Department of Mathematics Education), and key centres (e.g., SMEC), though most were found within faculties and departments of education. The Yearbook includes staff designated as lecturer and above, although it was not possible to identify whether a staff member was full or part-time, or occupying an establishment or independently funded position. As well, staff from the Australian Council for Educational Research (ACER) were included as the ACER was deliberately established to play a major role in developing and disseminating educational research in Australia.

There were difficulties in preparing the names of educationalists within each university as we have found that departments of education are not necessarily homogenous. In some university's the curriculum staff are located in the substantive discipline whereas in others, all education staff are found within faculties and departments of education. In some university's the education staff may be located in special centres such as at UWA where there is a rural centre, aboriginal programs, tertiary evaluation studies, and English as a second language. By contrast, at the University of Sydney all educational academics are located within a single faculty.

In all we identified some 2,048 academics in education departments which is close to the 2,569 educationalists (in the universities used in this paper) identified in the DEET National Report on Australia's Higher Education Sector (1993). Each of these academics were then matched to each of the 45,000 records in the AEI and three scores assigned. One score, the total

publication index, was simply a unit weight for every time an academic contributed to an article, book, conference paper or report. The second score was a proportion based on the reciprocal of the number of authors for every time they had contributed to an article. Given that staff have been employed for different lengths of time, the total publication score was divided by the difference between their latest and earliest publication dates to form a third index of average rate of publications per year.

Approximately one-third of the total data base could be matched to the academics found in the universities yearbook. The remainder are primarily attributable to retired and deceased academics, those who have left Australia, teachers, government employers, and librarians.

Further, the citations of the 30 academics with the highest total publication score were determined from the Social Sciences Citation Index (SSCI) between 1986 to December 1992. This index served as an indicator of the representativeness of the AEI as a measure of international impact, an additional indicator of the academics' impact and, as will be seen later, placed the present study into a larger context.

Results

Table 2 presents the three indices for each of the 32 HEI's that have a department or faculty of education and ACER. As might be expected, there is a high correlation between the publication and the weighted publication index and the rate of publication (r's > .80). Thus, except where there are differences, the total publication index is used in subsequent analyses.

Overall there are 10534 references attributable to the 2048 academics; an average of 5.14 publications per academic (sd=8.36). This average, however, is grossly misleading as there is a phenomenal negative skew (see Figure 1). A small minority of academics produce the great majority of the publications: only two per cent of academics produce 50% of all publications.

These data indicate that most of the pre-UNS universities have at least a small core of these staff, whereas departments and faculties that are low producers have very few such academics.

There is also a negative correlation between publications and size (r = -.31). Given that the largest departments are those which amalgamated in the late 1980's, then the highest producing departments are five pre-UNS departments that did not amalgamate with a former CAE.

Table 3 demonstrates the percentage within each institution who have published zero, between 1 and 3, and more than 3 publications across the total database. In the AEI data base, publication refers to an indexed item, which includes conference papers, reports, articles and books. Of the total number of education academics, 33% published nothing, a further 26%

published between one and three, and 42% published more than 3 publications. There is considerable variation across the institutions, from 4% who had more than 3 contributions to 84%. These results, of course, correlate with those departments that were high producers in Table 2.

Similarly, departments and faculties that were lowly ranked on the total and average productivity table have been highly ranked in the zero and 1-3 categories and lowly ranked in the greater than three publications category. For example, Edith Cowan University has the third largest number of academic educators with the second lowest publication ranking (Table 2), has the third largest number of staff with zero publications, and the third lowest number of staff with greater than three publications. By contrast, Murdoch University and the University of Western Australia, two of the other Western Australian universities, are ranked first and second in Table 3.

Table 4 presents comparisons of the ranking's of the 17 pre-1987 institutions using the more internationally based data provided in Hattie (1990) and the present Australian based data. These data show that education academics at some institutions, such as La Trobe, James Cook, Deakin and Wollongong, tend to publish more in Australian journals, whereas Flinders, Melbourne, New South Wales, Newcastle and Macquarie publish more overseas. UWA and Monash have tended to publish as much in both Australian and international outlets, hence their high ranking in both contexts. Comparing the pre-UNS and post UNS data also show that some departments and faculties of education have fared relatively poorly out of amalgamations in terms of their publication productivity. These universities include Newcastle, Sydney, Flinders and Melbourne.

It is worthwhile repeating an important implication discussed in the previous paper, namely that outcome indicators are meaningful only in reference to inputs and processes. The rankings of inputs plus processes derived from the previous study are also presented in the final column Table 4, although many of the institutions have dramatically changed in size, nature and purpose since these data were collected. This issue is raised later when considering directions for furthering research and debate of performance indicators in education, and it also serves as a reminder that such data are critical before internal funding decisions are made based on the AEI database alone.

Table 4 also presents a summary of the rankings of the number of publications, weighted publications, rate, and percentage of staff publishing greater than 3 articles (%>3). The correlations between these indicators are substantial and significant, and a single factor can explain 83% of the variability of the four indicators. The institutions that tend to publish most, also have academics who are the most productive across many years, and have the highest critical mass of productive academics (those who publish > 3 articles). The

correlations of these four indicators with size are small and negative (ave r = -.21), thus favouring the smaller rather than larger departments.

An interesting variable to consider in terms of research productivity was the current level of appointment for each staff member. These levels were coded into 11 categories ranging from tutor to professor. Table 5 presents the three productivity indices by level of appointment, including appointments as research fellow and senior research fellow. The productivity closely follows the patterns of seniority, with major jumps between Professors and Sr Research Fellows, to Directors, Readers and Associate Professor, to the other levels. Indeed, four distinct groupings occur on all three indices - lecturers and below; senior lecturers, research fellows and departmental heads; associate professors, readers and directors; and the most productive group being professors and senior research fellows.

While we would expect that the more senior levels would have higher productivity levels for no other reason than they have been academics longer, most senior positions also have substantial administrative demands of some form. We note that senior staff, for instance, maintain a higher productivity rate of publication despite these demands. Excluding both categories of research fellows, whom it could be argued should be clearly the most productive, senior education academics invariably become involved in multifarious associated activities (faculty and university committees, organisation roles, research assessors, journal advisory boards, and so forth), as well as administration, which makes their productivity all the more commendable. Senior academics also have more collegial networks, are more likely to work in research teams, have a greater knowledge of manuscript acceptance procedures, and have a greater number of graduate students. These data indicate that publication does not stop when the incentive provided by the prospect of promotion is no longer operative. Instead it increases which supports the role of intrinsic rather than extrinsic motives for research involvement.

In terms of level of appointment, the most disappointing performance comes from research fellows, lecturers and to some degree, senior lecturers. Given that research fellows are appointed for that task, we could expect substantially greater publication productivity. Although these positions tend to be short term in nature, an annual publication rate of .65 is half that of an associate professor, most of whom also have substantial teaching and administrative responsibilities. The performance of lecturers is also generally disappointing, given that they are half as productive as senior lecturers and are barely different from senior tutors.

Conclusions

Australian educationalists, as a group, can generally be proud of their level of productivity and the high prestige accorded their work given citations by scholars throughout the world. The picture of the discipline is that Australian educators have made major contributions, are collectively most productive, and have maintained a high rate of productivity over a sustained period. When the picture is cast in terms of individual institutions then the effects of amalgamations, particularly the bringing together of historically different perceptions of research and its place in the academics' role, have had major moderating effects.

More disturbing is the significantly skewed distribution of research productivity caused by 33% of academics in education publishing nothing, and a further 26% publishing between 1-3 publications only. Thus more than half of Australia's education academics have less than three publications.

This study has demonstrated that a few individuals located throughout most Universities in Australia are making major contributions to research productivity and even fewer have had their publications cited by others. These individuals, not surprisingly if the selection processes are working correctly, are the senior members of the profession. But it would be folly to generalise to all senior members; the variances are too large. Nevertheless, 2% of all educational academics publish 50% of all the publications found in the field; probably fewer are well cited; and even fewer have major international reputations. (The comparable figure for all disciplines in Australia is 10% of academics produce half the published work; Ramsden, 1993.) Given that about 33% of education academics publish not at all and ten departments publish 50%, the effects of these productive academics in Australia is undoubtedly greater, particularly as the study has demonstrated that educationalists have an overall better productivity than many other disciplines.

Others have noted the changes in collegiality, particularly given the improvements in technological developments such as email. Bourke & Martin (1992) noted that the influence of the department is less than whether an individual "is part of a group of, say, four to eight scientists in the same subfield rather than whether they happen to be working in a large department. In many departments, the level of interaction between research groups is low. This was particularly the case as a consequence of greater specialisation, fragmented into a set of only weakly interacting subfields" (p. 16). They concluded that departments have become largely irrelevant as research entities and are functional chiefly for management and teaching purposes. It is clear from the analyses in this paper that individual contributions and small teams (probably across institutions) are

more powerful predictors of success than the department. Certainly those small, pre-UNS departments of education that remained intact have, for a variety of reasons, demonstrated clear productive superiority.

The impact of CAE amalgamations on established universities has been uneven. The effect on those universities that incorporated a greater proportion of staff from the CAE sector has been generally negative on productivity (see Melbourne, Sydney, Macquarie and Newcastle). Over time, however, the impact of amalgamation moderates somewhat as evidenced by the productivity of James Cook and Wollongong. The effects on productivity of those institutions that amalgamated only across former CAEs were unpredictable; as evidence by the relatively high performance of Charles Sturt, particularly compared to Edith Cowan.

Given the massive and in some instances traumatic changes in departments and faculties of education around Australia, the present paper has aimed to provide more stable and dependable baseline figures to monitor the changes in educational productivity. Quality assurance needs such dependable baseline information before comments about 'value-added' components can be debated. Indeed it would be foolhardy in the extreme for a single university or a group of universities to conduct any quality assurance activities without devoting appropriate resources to establishing baselines. This paper has sought not only to provide a procedure and baseline data for measuring educational research productivity but also aimed to promote discussion about educational research productivity.

Such discussion is more defensible than historical claims to preserve some mythical 'big Seven Research Universities'. Any demarcation of the 'Big Seven in Education' would not parallel the Big Seven in other disciplines and, given the low correlation between research and teaching, it says nothing about the quality of teaching (see Hattie & Marsh, 1993). The information in this paper furthers highlights the importance of individuals over departments, and departments over institutions in determining productivity among educationalists.

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