Determining Research Productivity of Education Academics

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The critical question for universities is what should be expected of them in relation to research in the 1990s, and more importantly, how should research performance be assessed. (Grigg & Sheehan,1989, p2)

The issue of quality has become a major concern for Australia's universites in recent years (Bourke, 1986; Grigg & Sheehan,1989; Hattie, 1990; AVCC, 1988; Performance Indicators Research Group,1991; Hattie, Tognolini, Adams, & Curtis,1991;Grigg & Stokes,1993; CQAHE,1993; Hattie, Print & Krakowski, 1994), especially where institutions have linked performance directly to funding in an attempt to improve quality. In most cases the issue of quality has been translated into research performance, rather than teaching performance, administrative performance or community performance. Substantial agreement exists amongst DEET, the Higher Education Council of NBEET and universities that the bulk of institutional operational funding, at least for teaching, should be a function of student load and profile with no direct output performance indicators involved in the calculation of the funding formula (PIRG,1991). Given DEET's

allocation of funding, some 70 % of university budgets are therefore notionallly unaffected by this quality movement.

* This paper represents research in progress

Nevertheless, nearly a third of university budgets is notionally research-targetted, a considerable amount particularly for the larger universites with budgets in the hundreds of millions of dollars. This has led many universities to tie, or to plan to link, research performance directly to a component of faculty funding as a means of encouraging those with high research performance to perform even better and as an incentive, or perhaps a disincentive, for those considered to be under-performing. Consequently research productivity has become a significant issue in Australian universities with an impact on funding and status which is growing in significance.

Australian universities have also witnessed a rapid transformation of the concept of accountability in recent years as governments have demanded specific measures for determining quality performance (PIRG,1991). Within this context of general accountability, driven by DEET, recent changes in jargon and emphasis from the Federal Government have sought to promote quality assurance amongst Australian universities. As quality assurance has become of critical concern to the funding, performance and evaluation of universities and departments within universities, it could be expected that an extensive information database, accessible and agreed upon, exists on which to base decisions about quality. Such is not the case. Therefore a major problem facing universites is how to measure research productivity effectively.

The most powerful manifestation of this demand for accountability and quality 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 initially as rewards and incentives for enhancing quality or performance, the Committee has searched for appropriate ways to determine and measure high performance within Australian universities, as indicated in the guidelines for higher education institutions (CQAHE,1993) and correspondence from the Committee to Vice-Chancellors. The Committee addressed three principal areas of university activity - teaching, research and community service (CQAHE, 1993) but considering universities' traditional 'charter' it is fair to expect that research productivity will continue to feature prominently in the Quality Committee's considerations.

Given its widespread brief, the Quality Committee has the potential to significantly impact upon Australia's higher education system. Through its proposal of tying incentive grants to annual performance assessments, the Committee's operations, it has been suggested, will almost certainly give rise to a new binary system - those who receive grants and those who don't (Twist & Carruthers, 1993). Indeed the Minister at that time stated that he expected up to half Australia's universities would not receive anything out of the

first round of allocations (CQAHE, 1993). This did not eventuate and a more likely eventuality is the creation of at least three performance and assessment bands - top band institutions receiving substantial reward grants, second band insitutions receiving incentive grants to improve performance, and the others. Given the powerful influence of research on determining general quality, the last group is likely to become known as 'teaching universities'. With such considerable amounts of funding involved, and the status stakes clearly evident, the need for valid and reliable research performance indicators within Australian universities is all the more pressing.

The question then, as Grigg & Sheehan (1989) stated, is - what is the most appropriate form of determining research productivity amongst and within universities? To address this question this paper will take faculties and departments of education within Australian universities as a basis for research and discussion. This task is all the more difficult as little consensus exists amongst educators and in the literature as to what constitutes a valid basis for determining performance (Griggs & Sheehan,1989; Hattie, et.al., 1991; PIRG, 1991; Grigg & Stokes, 1993; Hattie, Print & Krakowski,1994). Nevertheless, given the demands of Canberra, university administrations, and predictable comparisons with similar professional faculties and departments, some form of performance indicator index is a likely outcome.

Furthermore, more recent research (Grigg & Stokes,1993) suggests that, despite the associated problems, academics can agree to a set of appropriate measures of research productivity. "... whatever group is surveyed about general indicators of research productivity, consensus can be reached on a set of measures that any reasonable person would agree should apply to research performance in a university." (Grigg & Stokes, 1993, p. x)

This paper addresses how faculties and departments of education* in Australian universities may address issues associated with determining research productivity through an understanding of what educational academics perceive as useful and appropriate. To gain a perspective, the case of education faculties must first be considered within the context of performance and research productivity more generally within universities.

Determining Performance in Universities

Theoretically performance and quality in universities could be determined in many categories and through numerous criteria. We can consider teaching, community involvement, student outcomes, administration and, of course, research. What we haven't seen in Australian universities, with the possible exception of the Quality Committee's deliberations, is any significant attempt or procedure to link quality with any measure apart from research. Where are the examples of universities, or departments and faculties within

universities, being rewarded for anything other than research?

* (in this context the term faculty refers to a single discipline grouping such as an engineering faculty or a law faculty).

We could examine graduation rates, employment rates and student satisfaction as indicators of university performance and other forms of performance indicator. Data for most of those possible indicators are currently collected and are readily available (PIRG,1991), though many are problematic as indicators of performance. In a detailed analysis of possible indicators, Linke and a DEET funded research group (1991) classified performance indicators as institutional context indicators (such as academic staff provision; student demand; financial resource distribution), teaching and learning (such as quality of teaching; student achievement; graduate employment), research and professional services (such as research grants; average publication rate; professional service activity) and participation and social equity indicators (such as academic staff gender ratio; academic program diversity; student gender ratio).

However most are perceived more as marginal factors in accounting for the effectiveness of universities. Some are also cost-inefficient to collect and represent only outcome factors of universities. For example, administrative performance is a province of internal concerns and as it attracts little funding per se its appropriateness in this context is minimal. Yet the quality and effectiveness of a university is clearly a factor of its administration as well as its research and teaching. In more complex, comprehensive models of accountability these variables may well be included (PIRG,1991).

However, teaching performance is a useful indicator to consider though one notoriously unreliable to determine. Professional educators have addressed indicators of teaching effectiveness for many decades, but without consensual success. Mostly teacher educators, for example, revert to accepted / conventional wisdom when determining teaching effectiveness amongst their student teachers, despite the research available. Staff in other professional faculties, such as medicine, enginering, social work, architecture and law, follow similar procedures. Nevertheless DEET, as part of its concern over university quality, has provided funds to enhance quality teaching. The (CAUT) grants have implied understanding of what should be quality university teaching, though whether this is accurate is highly problematic.

Alternatively universities could be reviewed by an expert group

and comparisons made between them. At first glance this seems a feasible proposition, yet none of the previous discipline reviews has been considered a major success and DEET plans to drop this approach. The meta-evaluation of the Science and Maths Review indicated that the original Review exerted minimal impact upon university practices in teaching and research in this area. Indeed, despite a traumatic past few years, one could be led to believe that nothing new or innovative

had happened in the preparation of maths and science teachers. The first stage of the Quality Review, where ratings and rankings of universities did occur, has produced considerable outcry, especially from those ranked lowly.

Two powerful indicators of university quality, already utilised albeit haphazardly, are reputations and research productivity.

Reputations are central to any university. Those that have high reputations are keen to maintain them and those that don't, seek them eagerly. Nowhere is this more evident than with the jostling within the Unified National System (UNS) between the established universities and the so called 'Dawkins' universities. But how are decisions made based upon reputations? Criteria are used by those making judgements about reputations, often in a haphazard, idiosyncratic manner.

That such judgements are made there is no doubt : undergraduate students use reputations as a basis for university selection, graduate students make decisions on the basis of quality, research grant providers take reputation into account when assigning grants, and the community at large has its own interpretation of university reputations. All of these can be affected by the beliefs of individuals about what is construed as normal performance within a university and how these norms relate to other universities. But the making of these judgements is inherently problematic.

In the US, for example, a somewhat systematic approach to reputation analysis is undertaken as this concept has become so powerful a factor in student selection of universities at both undergraduate and postgraduate levels. The US News and World Report surveys the opinions of the leaders of over 1300 US colleges and universities to ascertain those institutions with the highest reputations. While the sample may be statistically large, if biased, the resulting analyses are fundamentally flawed. The survey is based upon opinion, simply that, and as such is subject to many forms of vagaries such as excessive subjectivity. Furthermore, as Hattie (1990) notes, reputational studies often concentrate upon the personal histories of raters in prestige universities, they are norm referenced rather than criterion referenced, they are significantly affected by a few individuals, and they tend to be influenced by input variables such as research money rather than outputs. Over time, reputational data are significantly influenced for individual departments and faculties by the historical effect (what the department or faculty was like) and the halo effect (what the university as a whole is like).

Finally, citation indices have high face validity as performance indicators. They are linked to both status and research in that they reflect what people are saying about each other's work, and usually that means their research. Many find this very acceptable (Bourke,1986;1993) though others do not (PIRG,1991; Hattie, et al,1991; Grigg & Stokes,1993) but as Australian-based citation indexes are difficult to find, the task is somewhat pointless. Citation indices also have other problems in determining performance which substantially reduces their effectiveness. Collecting a large database for citations is an extremely expensive operation (Grigg & Stokes,1993), with one

unfortunate result usually being the listing of only the first-mentioned author. Citation indexes can also be criticised through citing eminent authors thereby producing a halo effect, citations of poor quality papers as instances of incorrectness, the relative quality of different journals and the issue of self-citation (Grigg &

Sheehan,1989). Although citation indicators have value, they are likely to be considered less appropriate, at least for disciplines such as education, for the time being as found in the DEET study. The PIRG study (1991) did not even include citation analysis in their study of performance indicators in higher education. Similarly citation impact, a variation of citation counting, while favoured by some (Grigg & Stokes,1993) has limited application to the field of education in universities.

Research Productivity

A useful way of addressing the issue of judgement-making about universities is to examine the role of research productivity. The quality of departments and faculties within universities can also be assessed on the basis of research productivity. These outcomes can then become the basis of evaluative judgements and any subsequent reward / punishment system that might be attached.

The push within and between university departments and faculties for a place on the granting /government research hierarchy has become increasingly important in recent years. Consequently academics wishing to promote the quality of research productivity of both their own departments and their discipline are searching for reliable information on research productivity However, as there are no single measures of these qualities and no simple procedures to follow, a series of measures needs to be used to form judgements. More specifically, what is need is a measure of research productivity that is both valid and reliable within a field, such as education, and which is based upon appropriate and accessable data.

We can define research productivity as the totality of research performed by academics within universities and related contexts. Research performance indicators can then be devised to measure that performance and to provide a basis for making judgements about research quality. Indeed we should not forget that the process of making quality judgements is essentailly the same as the process of evaluation and effective evaluation is based upon the use of evaluative criteria and collecting data upon performance (Print, 1993).

Performance indicators have been defined variously by Bourke (1986), Cave, Hanney, Kogan & Trevett (1988), Taylor (1988), Grigg & Sheehan (1989), Linke (1984), PIRG (1991) and Hattie, et. al. (1991) in terms of higher education institutions. Although definitions naturally vary somewhat, and no single, authoritative definition exists (Cave, et. al,1988), consensus exists both that performance indicators can measure performance in some legitimate way and scond that they can be

formulated for higher education institutions.

Cuenin (1987) defined performance indicators as "... numerical values which provide a measurement for assessing the qualtitative or qualitative performance of a system and which can be derived in many ways." For Cave et. al. (1988), performance indicators can be considered as authoritative measures, usually expressed quantitatively, of an attribute of higher education institutional activity, while Franklin gets more to the nub of the matter by stating that " Performance indicators are comparative measures which allow you to say that a certain level of activity is more or less (better or worse) than another" (1988, p44). Within the context of higher education institutions, we define performance indicators as statistically valid information about educational activities which can be used for comparison purposes. Comparison may be over time within a department or between departments within a university as well as inter-university comparisons. We now have the basis upon which to consider research performance indicators in the context of Australia's universities with specific application to departments and faculties of education.

More recently, Grigg & Stokes (1993) sought to determine the rank order of indicators preferred by ARC grant applicants. They found a not surprising set of indicators, the rank order of which was : publications of research results in refereed journals, research results published as commercial books reviewed by peers, invitations to deliver keynote addresses or present refereed papers and other refereed presentations at major conferences related to one's profession, ability to attract competitive and peer reviewed grants from ARC and similar government agencies, publication of research results in refereed conference proceedings, post-graduate research degrees supervised to completion, research results published as chapters in commercial books reviewed by peers, and invitations to act as editor or on an editorial board of a recognised journal. Most of these indicators are employed our method as they are highly supported within our discipline (Grigg & Sheehan, 1989; Hattie,1990; Hattie, et al, 1991; Grigg & Stokes,1993).

Table 1 Highest ranked performance indicators

AcrossDisciplines	Education
Articles in refereed journals	1
	1
Commercially published peer reviewed books	2
	2
Major refereed conference presentations	3
	3
Papers in refereed conference proceedings	4

5
Articles weighted by journal citation impact 5
-
Chapters in commercially published peer 6
6
reviewed books
Competitive, peer reviewed grants 7
4
Postgraduate research degrees supervised
to completion 8
7
Editor / editorial board of recognized journals 9
8

Source : Grigg & Stokes,1993

RESEARCH METHOD

This paper reports on research in progress which, in turn, is part of a larger study to determine appropriate measures of research productivity within Australian universities. The first part created numerous research profiles, based upon the literature and our experience with educational researchers, and the responses to those profiles by a sample of Australian educational academics. The next stage will be to evaluate the results in the context of recent initiatives by DEET and the implications of weightings to individual academics, departments and faculties of education. If this is successful we will investigate the wider applicability to other faculties and departments.

Much of the literature has argued that performance indicators are essentially comparable between disciplines, though naturally with different emphasis and weightings. Grigg & Sheehan (1989), and the AVCC (Taylor 1988) for example, found that the main

discipline groupings - biological sciences, health sciences, humanities, physical sciences & engineering , social sciences (including education) all had similar rank ordering of the eight research performance indicators. All five groupings placed journal publications first, research grants ranked second or third, keynote addresses third / fourth, and so forth (Grigg & Sheehan,1989). Books were ranked highly by humanities and social sciences, but less so by sciences. Grigg & Stokes (1993) found the order was - publications refereed journals, commercial books reviewed by peers, invitations to deliver keynote addresses (major conferences), competitive and peer reviewed grants (such as ARC & CCG), refereed conference proceedings, post-graduate research degrees supervised to completion, chapters in commercial books reviewed by peers, and invitations to act as editor or on an editorial board of a recognised journal. We were concerned that the concept of research productivity was defined and consequently

measured too narrowly such that it did not adequately reflect the research endeavours of educational academics. The literature demonstrates an emphasis on a narrow range of indicators and ignores such potentially useful indicators as curriculum works, text books, and creative works. In taking this position we asked :

1. Did existing accepted performance indicators adequately reflect the research productivity of education academics?
2. What other indicators would be acceptable amongst this group?
3. Given the first two questions, what weighting of indicators would be defensible to present to colleagues in other faculties?

We created 35 profiles of educational academics and their research productivity in three major categories - research grants, research students and, most significantly, publications. The categories and the 14 indicators within them reqire some explanation.

Research grants

Research grants are clearly a major part of what we are about. They indicate, where refereed, what researchers believe is important in the discipline in terms of concepts, methodology, et design and so forth. They also reflect the quality of the researcher and consequently deserve enhanced consideration. Research grant applications to CCG schemes are extremely demanding, have low success rates (frequently less than 20% for ARC Large in social sciences, similar for small ARC grants) and are subject to extensive peer review. The amount of time needed to prepare a Large ARC application is likened to that needed for a journal article. Certainly the prestige of ARC grants is substantial given their high competitiveness. Educators ranked research grants fourth most important research performance indicator and across disciplines it was ranked seventh (Table1).

For some, the difference between ARC Large and Institutional (Small) grants is substantial. If such is the case, then Institutional ARC grants are not being utilised appropriately. The ARC believes that the grants represent two ends of a continuum, where differentiation occurs mainly due to the size of the study (ARC, 1993). Procedures for awarding both grants are the same in many universities (competitive, peer reviewed, research panels) and the success rates are not dissimilar. At the University of Sydney, for example, Institutional ARC grants are processed in exactly the same way as large ARC grants and the success rate in social sciences is not significantly different. However, universities are given the option of creating their own procedures for awarding Institutional ARC grants as long as the procedure does not debase the ARC standards (ARC,1993).

University-based research grants are highly valued, competitive, and often peer reviewed, though less prestigious than ARC and other forms of CCG. What is most prized in research grants appears

to be the degree to which they are competitive. All research grants are

competitive to some degree and therefore require acknowledgement.

Only the number of research grants should be counted as the value is a reflection of the size of the research, not necessarily its significance. High value research grants may also include expensive equipment henve boosting its monetray value. Difficulties occur with the interpretation of both number and value (Grigg & Sheehan,1989; PIRG,1991; Hattie et al,1991) though they are less problematic in education.

Research students

Consensus exists in the literature that postgraduate research students are an important component of our research activity (Grigg & Sheehan,1989; Hattie, et al,1991; PIRG, 1991; Grigg & Stokes,1993). The number of doctorates awarded each year, for example, represents an efficient indication of the amount of research being conducted by research students (Grigg & Stokes, 1993). This is applicable across disciplines as it is to education (see Table 1). While some argue that the number of research students negatively affects research productivity (Cave et al,1988), education academics are increasingly following their colleagues in other faculties and integrating their research students with their own research. This is logical and sensible given that supervisors are selected for their ability to research an area as well as to relate to research students. We certainly have some way to go if we compare our procedures with our colleagues in the US or with the high research student faculties like science and engineering.

Of greater concern is exactly what to count and what value should be attributed. Most research on performance indicators suggests that completed research degrees only should be counted as this reflects research productivity, is easily calculatable, avoids contentious issues of retention rates and variable time for study. The problem for education is that the great majority of research students work in the part-time mode and hence spread their study over many years. Education has not been able to attract large numbers of full-time research students such as science and engineering. For example, a major provider of postgraduate students such as the Faculty of Education at the University of Sydney, with some 600 + postgraduate students and 100+ in doctoral degrees, has less than 20% of doctoral students in the full-time mode. Consequently we believe a more valid performance indicator may be the number of research students currently being supervised. This indicator reflects the involvement of staff in research matters, it reflects some status, it also accounts for time spent in this area as compared with time spent on research directly and it more accurately reflects the context of graduate education in Australia.

Publications

Publications are conceded to be the most valid, fair and direct measure of research performance amongst academics (Grigg & Sheehan,1989; PIRG,1991; Hattie et al ,1991; Grigg& Stokes,1993; Hattie, Print &

Krakowski,1994). But which publications should be included?

Within education consensus is high that at least journal articles, books, conference presentations and chapters of books are very highly valued indicators of research performance. Table 1 shows that education academics ranked refereed articles first, commercially published peer reviewed books as second, major refereed conference presentations third, and chapters in commercially published peer reviewed books as sixth. We believe these indicators require refinement to better reflect the nature of educational research and to be more resonsive to the diversity of educational researchers.

All books are not of the same research value and hence would not be expected to receive the same score. Highly scholarly books which make a major conribution to the field should not be accorded equal status as a school textbook. We argue that at least three categories of books are reasonable and that data can be easily collected on them. Scholarly books, like Dunkin and Biddle's The Study of Teaching, should be very highly valued and should be weighted accordingly.

A university level book, written more for use as a reference or text, is a good measure of research productivity, though its original contribution to the field id undoubtedly less that a scholarly book. Accordingly it would not receive as heavy a weighting. Both categories of books should be published commercially and employ a peer review process like a refereed journal. Research monographs, while clearly at the forefront of research, tend not to be refreed, are smaller is size and are rarely published commercially. As in-house publications they tend to suffer from a lack of critical comment.

Chapters of books are important to education academics (Grigg & Stokes, 1993) and they are usually related in size to journal articles. Given their baseline role in calculating research productivity, journal articles should not be divided into excessive numbers of categories. Nevertheless at least two distinct groupings are evident - refereed major journals of high reputation such as the Australian Journal of Education and Review of Educational Research along with significant refereed journals such as Curriculum Perspectives; and unrefereed journals such as History Teacher.

Conference presentations are more problematic for educators in Australia. Even the most prestigious educational research conference, the AARE annual meeting, has great difficulty in undertaking peer reviews of conference papers. The American Educational Research Association does peer review a summary of the conference paper and in many of its divisions acceptance rates are in the low 30%s, a similar success rate to many refereed journals. But Australian conference papers are generally not reviewed, and most are happy simply to attract sufficient numbers to make the conference viable. Consequently we expect relatively low value to be attributed to this indicators. Educators have ranked major refereed conference proceedings very highly (Grigg & Stokes, 1993) but this might equate to keynote addresses only.

Creative works in education are more problematic as research performance indicators, yet they are clearly a major factor of the workload for a group of education academics. They are generally considered (PIRG,1991; Grigg & Stokes,1993) as 'other original work' and are linked with computer software, inventions, patents, exhibitions and the like, where they are valued lowly. Faculties and departments of education involved in teacher education have numerous staff responsible for drama education, music education, art education, industrial arts, home economics and the like. Some of these academics particpate in the more recognised research activites such as research grants and journal articles. Other are more involved in the subject matter of their area, perhaps as composers, dramatists, performers, and so forth. The Performance Indicators Research Group (1991) noted the detailed activities these staff might participate in under the headings of public broadcasts and recordings and other original works. Support for inclusion of these activities within research productivity is high but attributed value is low as they are perceived as more marginal forms of educational research.

We in education are also involved in many other forms of publications which also need to be taken into account in an analysis of research productivity. We need to consider at least curriculum materials, educational reports and educationally related creative works. Many education academics devote time to the preparation of curriculum materials as distinct from the more traditional forms of research activity. As an indicator curriculum materials are largely overlooked in the literature, largely because they are perceived to have limited research impact. In the discipline of education, curriculum materials may be taken to be curriculum packages for universities and schools, curriculum documents for courses, computer materials, resources to facilitate teaching, audio-visual productions designed to faciltate learning, and so forth.

Many education academics are called upon to display their research skills and expertise through the preparation of research-related reports. More like monographs than books or journal articles, reports have very high value and status. To be invited to participate in an evaluation, review or report group is recognition of expertise and research strength. A major national report such as Performance Indicators in Higher Education (PIRG, 1991) usually involves a research team, though a state-wide report (Print,1990) may also involve extensive research support. Major reports are extremely time-consuming, demanding and involve extensive peer participation, if not review, and hence need to be considered as a reseach publication.

Research shows that mean annual publications for members of education faculties varies from 0.85 journal articles, 0.15 books, 0.3 chapters in books, 0.16 conference papers, and 0.17 reports (Grigg & Sheehan,1989) to 2.21 articles, 0.59 books, 1.39 chapters, 0.21 conference papers, 1.02 monographs / reports (Hattie,1990). This range of research productivity compares very favourably with other academics

in related humanities and social science disciplines (PIRG,1991; Hattie, Print & Krakowski, 1994). English academics averaged .27 books, .43 journals and .41 conference proceedings; psychology averaged .11, 1.10, .18 respectively while economics averaged .19, .72, and .32. This project will provide us with some data with which we can compare these earlier productivity scores.

The 35 profiles gave an opportunity to create numerous combinations of education academics and the degree of their research productivity as measured by the 14 indicators within the three categories. The profiles ranged from virtual non-producers to extremely highly productive academics, some emphasising books, others research grants, others journal articles and yet others are more balanced among several indicators.

It is unrealistic to judge research performance of individual academics over the vagaries of a single year so we presented the profiles over a three year period. Participants were also given the opportunity to nominate their own productivity over this period (the last three years).

The instrument was sent to all 34 Australian universities with faculties, schools or departments of education. The person most associated with research in that faculty, the chair of the research committee, perhaps an associate dean for research, was asked to identify four staff members to participate. The initial response rate was extremely pleasing (86 responses or 63%) and we decided not to pursue non-respondents. We also received many unsolicited comments, mostly positive or clarificatory though some participants were apprehensive as to possible applications of the results.

The Lens Modelling technique was employed because it provided an opportunity to focus on an object, in this case the decisions of education academics as to what constitutes research productivity. More specifically, lens modelling allows researchers to investigate the way judges or decision makers focus on certain pieces of information when making their decisions and second, the accuracy of that judgemental process. We were concerned with what information educational academics focussed upon when making decisions about research productivity as well as the accuracy of that decision-making process.

Results

In summary, interim results indicate :

1. A strong preference for refereed journal articles. This is remarkably consistent with other research and conservative as well.
2. Books was the next significant indicator, which also correlated extremely highly with other research results.
3. This was followed by major research grants, consistent with other research on education academics but less so with other academics.
4. More surprising was the lack of support for major reports, research monographs book chapters and creative works.

5. The most surprising lack of support for indicators was for doctoral students, minor research grants, university textbooks, confernce papers and masters research students.
6. As anticipated, little support for major curriculum works and non-refereed journal articles was evident.

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