

## EDITORIAL

### The impact of publication lists

Scientists in academia are usually judged by their lists of publications. Unlike their counterparts in industry, whose work is assessed by their abilities to translate their work into useful products (and hence, money), the success of academic work seems inevitably pegged to the number of published papers, that emerge from a laboratory. In the academic world, writing thus, becomes a major activity. In the last quarter of a century, the growth of journals has been phenomenal; the present volume of scientific literature is unmanageably large. Every subfield or super-speciality has its own group of core journals. The truly interdisciplinary journals have reached a stage, where apart from the news and general articles on the first few pages, very few of the papers they carry are intelligible to anyone outside a narrow field. The torchbearers of the electronic revolution would have us believe that computers, unlimited internet access and digital libraries, powered with marvellous 'search engines' will allow scientists (among others) to cope with the torrent of information. But, few would argue with the fact that coping with the literature is becoming difficult and in some fields, indeed impossible. An enormous number of papers, published worldwide, therefore remain unread. Their only apparent utility is that they add another title to the lists of publications of the authors.

Why do scientists publish their results? Firstly, of course, there is the great desire to be recognized as having contributed to the solution of a scientific problem. Secondly, there is the more mundane imperative; published papers appear to be the only available yardstick to measure the work done by an academic scientist. Even a freshly minted PhD is unlikely to be considered for a postdoctoral fellowship, unless he or she sports a moderate body of published work. The CSIR, for example, limits the number of candidates being considered for senior research fellowships and research associateships using a quantitative 'publications filter'. Further up the totem pole of the scientific enterprise, publications acquire an even greater importance. Appointments committees and award-giving bodies hun-

grily turn to the lists of publications of the candidates being considered. It is hardly surprising that publishing papers becomes a central activity in academia; sometimes even pushing the actual conduct of research into the background.

How do scientists judge the quality of the lists of publications of their colleagues in the perpetual process of 'peer review'? Since it is almost always impossible to read all the papers and come to an informed judgement, it is critically important to read meaning into the titles of papers and the names of the journals in which they are published. Since judgements are invariably perceived to be subjective (and often, prejudiced), a clear, objective, impersonal criterion would be desirable. Eugene Garfield provided the 'breakthrough' in the area of 'science watching', by introducing the concept of citation counts and impact factors in the 1970s. The early days of citation analysis preceded the modern computer revolution (there was even a printed version of the voluminous *Science Citation Index*); but the methodology was ideally suited to the digital age. Garfield's idea was simple. Why not look through the reference lists in papers and catalog the number of times each paper is cited (and by extension such counts can be carried out for authors and journals). Citation analysis has now spread like wildfire; many analysts untrained in the methodology of science, ignorant of the limitations of the databases they use and intellectually unprepared to look beyond numbers, produce widely-quoted studies of dubious value in India. But the inescapable fact is that there are now clear numbers that can be written next to papers, authors, journals and even institutions; much like the dreaded 'marks cards' of schooldays. We have reached a wonderful stage, where all subjective judgements can be suspended; we do not even have to read a paper, much less understand it. Since counting citations to individual papers is a non-trivial task, assessments are simply based on the 'impact factor' of the journal in which they are published. Journals now flaunt their impact factors (obviously, only when they are high) in advertisements. Many scientists make decisions on the

destination of their papers by scanning lists of impact indices. In committees that decide grants and awards there is an irresistible temptation to abdicate independent judgement at the altar of the impact factor. In the rush to be quantitative and impersonal, 'new parameters' of performance have been invented. There is the 'average impact factor', quite popular in India nowadays, where an individual's (or institution's) net worth is simply summarized by a single number.

The growing emphasis on impact factors signals a new trend. It is no longer important whether a paper has been cited substantially; it is sufficient if it has been published in a journal with a high impact factor. In a provocative experiment some years ago, the Indian Institute of Science carried out an analysis of faculty publications. Beneath the easily interpretable numbers lay some interesting facts. Papers that appeared in 'high impact' journals tended to be cited fewer times than the average for the journal. In contrast, papers that appeared in relatively 'low impact' journals tended to be cited more often than the journal average. The simple-minded interpretation (with a little license, of course) was that papers from India (or more specifically, the institution analysed) tended to lower the 'impact' of the top journals, while they raised the 'impact' of the middle level journals. A corollary conclusion, to which many Indian scientists would subscribe is that many good Indian papers are cited fewer times than similar studies by Western authors.

Why is this so? A possible reason is that many authors pad reference lists with citations to scientists who are likely to act as reviewers. Woe betide the author whose paper ends up on the desk of another scientist in the field, who has not been cited. Human nature being what

it is, most of us are suffused by a warm glow, when we see our names in the reference lists of a paper we are asked to review. Since the likelihood that papers submitted to Western journals will end up in the hands of Indian reviewers is low, there is little need to be careful in citation of Indian work. There is a considerable degree of gamesmanship (and understandably so) in providing citation to the literature. Little clubs of scientists who cite one another but exclude other relevant work, spring up and prosper. Claims of originality can hardly be sustained, even for a brief period, if the author is overly generous in ascribing credit for past or related work. In these competitive times, selective non-citation may be an important weapon in playing down the contributions of rival groups. At the other end of the spectrum, it is sometimes easier to shepherd a paper through the review process at 'high impact' journals, by pandering to the egos of potentially powerful reviewers (and on occasion, editors).

In assessing scientific work, citation counts provide a more reliable indicator of a paper's worth, than the impact factor of the journal in which it was published. There is, of course, no substitute to reading published papers or hearing a scientist describe his or her work and making an informed (and necessarily, subjective) judgement. Since this is well nigh impossible, given the volume of ongoing work in most areas, the bare statistics of the scientometrists provide a seductive solution. But, the next time any influential decision maker states that a specific paper must be important, merely because it has appeared in a glamorous journal we might ask: 'Have you read the paper?'

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