Journal of Documentation, Vol.44, No.2, pp.166-167 (June 1988)

Letter to the Editor

Citation Counts

One measure by which the central funding agency for universities in the United Kingdom is seeking to assess appropriate levels of support for various disciplines is that of citation counts. The first subject area in which this has been applied is the earth sciences. A questionnaire sent to relevant academic departments included a request for information on citation or 'impact' counts, and forthcoming reviews of chemistry and physics may be expected to do the same. It is therefore appropriate that attention should be drawn to some of the dangers inherent in the use of this form of bibliometrics as a 'research indicator'.

1. The citation counts may be carried out by people with indifferent skills in the use of *Science Citation Index (SCI)*: the results reported by a departmental secretary would not be comparable with those compiled by a trained information officer.
2. The citation count may be based on different ISI products or publications which are not identical in their coverage. Results from a Library holding the 1980-1984 cumulation of *SCI* would be higher than those based on a search of the corresponding annual volumes since the cumulation contains almost 500,000 additional references.
3. The 1980-1984 cumulation contains corrigenda, whereas the annual volumes do not.
4. Errors, introduced through the ISI citation practices can be multiplied through the carelessness of authors and editors. Thus a non-existent author such as M.V.C. Bergmeyer can acquire a string of citations at the expense of the true author, H.U. Bergmeyer. (The erroneous initials may have been derived from 'Mannheim, Verlag Chemie'[1].)
5. Important results may be published, and cited, in journals not widely read outside a particular discipline, and therefore excluded from *SCI* which scans only 3322 periodical titles (1986 figures).
6. University work which is carried out under contract or with an industrial partner may be deemed to be commercially sensitive and remain unpublished. Such work cannot be cited. Paradoxically, applied work of this kind is presently favoured in government circles.
7. Joint authored papers are cited in *SCI* under the first-named authors and so cannot reflect the relative contributions of all the authors whose names may appear alphabetically or according to some other convention (see, for example, reference [2] below where the name of the principal author and patent applicant C.W Chu appears last).
8. papers which contain non-controversial (but useful) results, and work oriented to services and applications, may be rarely cited whereas disputed or erroneous publications attract citations, e.g. H.E.H. Paterson's *Recognition concept of species*, or Rupert Sheldrake's books. Some journals specialise in

the publication of controversial papers, e.g. *Geophysical Research Letters*, which will generate debate, and hence citations, although many of the papers will prove unfounded [3].

9. Methods (or 'recipe') papers tend to be cited particularly often and have spuriously high impact factors.
10. Some forms of publications, e.g. patents, may score less well than regular journal articles. There were only 27,665 citations to patents recorded in SCI in 1986.
11. The use of citation counts in performance assessment may itself influence the way in which citations are made. Malpractices such as multiple publication, the serial publication of minimal pieces of information (the 'least publishable unit'), self-citation and mutual citation by co-workers may all flourish as authors attempt to enhance their citation counts.

The average author now has 8.65 citations; the average paper approximately two citations, so counting errors (which will always be whole numbers) will have a disproportionately large effect, especially on young researchers with few publications to their names. If citation counting is to continue to be used in assessing the research rating of universities these are problems which should concern not only librarians.

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