EDITORIAL

When Eugene Garfield made his seminal contributions to quantitative studies of scholarly journal publication (*Citation Indexing – Its Theory and Applications in Science, Technology and Humanities,* New York; Wiley, 1979), I am sure he did not anticipate the dominant influence it will have on the publication process. His concept of the journal impact factor (IF), published by the Institute for Scientific Information (ISI) and published in the Journal Citation Reports (JCR) is commonly used to evaluate journal status as well as the productivity of researchers. More recently even non-bibliometric scholarly journals have discussed the use, misuse, disuse as well as possible abuse of the numerical values of the IF. At first glance IF appears to be a perfectly objective numerical tool to judge both the quality and quantity of research output regardless of the discipline. As has been shown with abundant evidence this is not indeed true, namely, the short term (two years) IF does not necessarily reflect the quality of publication correctly. The interested reader may wish to refer to the extensive, scholarly literature on this subject. A selection of relevant references is posted on the website www.geocities.com/AS_Mujumdar.

In my earlier series of Editorials, I have pointed out the weaknesses of the IF on simplistic terms without the benefit of any major statistical studies. In particular, I have pointed out the fallacy of comparing IF values for different types of journals, e.g., science cannot be compared with technology in terms of the IF alone. There are major differences in the nature of authorship, readership as well as the citedness of these different classes of journals. Science journals typically have papers with very large listing of references, often requiring elimination of paper titles and even use of a finer font to save space. Engineering and technology journals, on the other hand, typically have a smaller citedness number (i.e., fewer references cited) and demand full reference citation including the title for the benefit of the reader. This can influence the citation frequency for the journal, for the author and also result in a lower impact factor. For those who are not familiar with the impact factor definition, here it is. *The IF of a journal in year T is the number of citations in year T to documents published in that journal in years T-1 and T-2* (Garfield, 1979). If a journal reaches its maximum citation in the third or subsequent year it has a lower IF than one that reaches the peak in the second or first year after publication. The so-called citation half-life does not correctly remedy this situation as been demonstrated by several published studies.

Finally, a new or corrected journal impact factor is needed. One such attempt, which appeals to me as being reasonable, is that of Moed et al. (Scientometrics, Vol. 46, No. 3, 1999, pp. 575-589). He proposes a normalized impact factor depending on the subject category of the journal. In fact a single journal can be placed in two or more sub-fields as defined by ISI. A normalized impact factor ratio of one implies that the impact of the journal is "as expected," given the average in the sub-field to which it belongs. In a given sub-field, citation characteristics and types of articles may be expected to be similar. Thus apples are compared with apples and not with oranges or pineapples! Thus a scientific journal with IF of 30 may be compared with journals of the same class. Its normalized IF may drop to just 3 if the average IF of the sub-field is 10. In another sub-field the same journal may have a different normalized IF for this reason.

Finally, I wish to invite readers to write to me about their own thoughts and perhaps even suggestions for new and improved quantitative measures that could be used to evaluate the quality of research publications as well as the research results that are published. It is clear that new criteria are needed especially for engineering and technology oriented journals.

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