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In search of best impact factor and citation indexed journals towards achieving the goals of universities

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Abstract

This paper provides an introduction to the concept and importance of journal impact factor (JIF), citation indexes. The paper takes the form of a short history of JIF, the importance of journal performance indicators, about calculating and determining JIF and the significance of using Citation Indexes. Elements of the factors affecting impact factor namely scientometrics and journalology were also highlighted. A guide to locating the best impact factor journals in various research fields was demonstrated. Despite that JIF is still a dilemma for some fields of research, academic members are still subjected to the Key Performance Index (KPI) criteria compliance for further promotion and excellence service awards on top of the need to generate high impact research publications.

Keywords: Impact factor, Research University, Citation indexes, biochemical journals

Introduction

The inspirational motto, 'With Knowledge We Serve', reflects the full commitment of Universities in developing countries to contribute towards the discovery of knowledge and the exploration of human endeavor as well as the creation of wealth and nation building. Today, we are faced with complex challenges and only those who persevere will survive. In order to face these challenges, the generation of knowledge and life-long learning is crucial and need to be reinforced. Universities must therefore visionalized to actively participate in new adventures of ideas, experiment with innovative methods, and take intellectual initiatives to further discover and expand the frontiers of knowledge

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One of the ways to maintain Research University status is to ensure that all academic staff do research and publish in scholarly journals. Most academic work is published in journal article or book form. In journal publishing, despite some researchers feel that Impact Factor of journals should not be used for evaluating research quality and performance (Seglen 1997; Smith 2006; Hobbs 2007), we have to make sure that the journals are of citation indexed, have a high impact factor and refereed since one of the university requirements is to quantify the number of such journals meet the target of the minimal requirement of a research status. Perhaps, impact factor of a journal is more valid measure of journal quality for specific fields such as medicines and biomedical (Saha et al. 2003). Under such a dilemma, all academic staff, does not matter of the fields of research, have to abide by the Key Performance Index (KPI) which requires that at least a Professor must have three journals a year, two for Associate Professors and one for a lecturer which of Citation Indexed and of High Impact Factor. Most established academic fields have their own journals and other outlets for publication, though many of these academic journals are somewhat interdisciplinary, and publish work from several distinct fields or subfields. The kinds of publications that are accepted as contributions of knowledge or research vary greatly between fields.

The objective of this paper is therefore to give a greater in-sight of what an impact factor journal is and the significance of publishing research papers in high impact factor journals**.** An overview of citation indexed journal is explained with other related factors like Immediacy Index (II) in relation to the need of a researcher to have his or her publications as Open Access (OA).

The need to publish and get accessed o*penly*

Academic publishing describes a system that is necessary in order for academic scholars to peer review the work and make it available for a wider audience or make it opened to a bigger access. The system which is probably disorganized enough not to merit the title, varies widely by field, and is always changing, if often slowly. Meanwhile, 'Open access' (OA) means that a reader of a scientific publication can read it over the Internet, download and even further distribute it for non-commercial purposes without any payments or restrictions. The four most important OA channels are electronic-

refereed-scientific periodicals, research-area-specific archive (e-print) servers (in this paper called subject-specific repositories), institutional repositories of individual universities, and self-posting on authors' home pages (Bjork 2004). Research & Development policy makers around the world such as that of the American Association for the Advancement of Science (AAAS), an international non-profit organization dedicated to advancing science around the world by serving as an educator, leader, spokesperson and professional association that publishes "SCIENCE" have recommended mandating that researchers provide Open Access (OA) to their research articles by self-archiving them free for all on the Web. Another renowned publishing group based in the UK, *Nature. Com* for instance publishes the world's best science and medicine abstracts on your desktop is now firmly on the agenda for funding agencies, universities, libraries and publishers. David's article entitled "the Counting House" that appeared in *Nature* should be an interesting one to be read (Adam 2002). What is needed now is objective, quantitative evidence of the benefits of OA to research authors, their institutions, their funders and to research itself. OA articles have significantly higher citation impact than non-OA articles (Harnad et al. 2004). Brody (2004) was also supported in a web-based analysis of usage and citation patterns. One universally important factor for all authors is impact made by their research papers, typically measured by the number of times a paper is cited. Now the Open Archives (OA) era has revolutionized with new ideas about starting a global database for finding the number of citations received to the OA submissions. Citebase and Citeseer are two such web tools, which serve this partially (Brody 2003). Studies have begun to show that open access increases impact, although more studies and more substantial investigations are needed to confirm the effect. Hitchcock (2004) has given the progress in these directions in the form of a chronological bibliography with some explanation.

The citation analysis in the fields of high-energy physics and astrophysics, indicates that the number of citations to traditional preprints has gradually declined over the past 10 years, and that citations to electronic preprints have nearly doubled every year since 1992 (Youngen 1998a & 1998b). The electronic preprint servers are often the first choice of physicists and astronomers for finding information on current research, breaking scientific discoveries, and keeping up with colleagues (and competitors) at other institutions (Prakasan et al. 2004; Prakasan and Kalyane 2004). In addition to these benefits, electronic preprints allow the free, unrestricted access to scientific information without concern for international, institutional, or political barriers. Recently, Laurence (2001) and Brody *et al*., (2004) have demonstrated that articles which are available on-line at no charge are cited at substantially higher rates than those which are not. Kurtz (2004) has shown that restrictive access policies can cut article downloads to half the free access rate (Kurtz et al. 2004). A new measure that becomes possible with online publication is the number of downloads or 'hits', opening a new line of investigation. Although many authors believe that their work has a greater research impact if it is freely available, studies to demonstrate that impact are few (Antelman 2004). The latest example of such on-line free journals are that of the Canadian Centre for Science & Education (CCSE), World Scientific Engineering Academy and Society (WSEAS) and World Academy for Science, Engineering & Technology (WASET) to name a few. Brody et al. (2004) have been prominent in showing there is a correlation between higher downloads and higher impact, particularly for high impact papers, holding out the promise not just for higher impact resulting from open access but for the ability to predict high impact papers much earlier, not waiting years for those citations to materialize (Brody and Harnad 2004). The effect can be verified with the Correlation Generator. Citation analysis can be used to find emerging fields, to map the time-course and direction of research progress, and to identify synergies between different disciplines (Brody 2004). Citation analysis is being mainly used for measuring the impact made by journal articles. But Rousseau (1997) has attempted to compare the impact made by the 'first and second international conferences on bibliometrics, scientometrics and informetrics' with some top journals in the field. Information scientists are already computing web impact factors (Bjorneborn and Ingwersen 2001).

Definition and history of journal impact factor (JIF)

The analysis of citations is among the means by which policy-makers, scientists, and information professionals seek to achieve a greater understanding of the qualitative forces that affect communications in science (Tomer 1986). Like nuclear energy, the two measures have become a mixed blessing, expected that it would be used constructively while recognizing that in the wrong hands it might be abused (Garfield 1999a). As long as scientists publish articles containing lists of cited references, it will be possible to calculate impact factors (Garfield 2001). Garfield (2004) has also stated that "it has been demonstrated that on line access improves both readership and citation impact". The same impact factor can indicate the 'influence' and 'performance' of e-print archives they make among scientists.

Dr. Garfield, the current Chairman Emeritus of Thomson Scientific, Philadelphia first mentioned the idea of an impact factor in *Science* in 1955. (Garfield 1955). With support from the National Institutes of Health, the experimental *Genetics Citation Index* was published, and that led to the 1961 publication of the *Science Citation Index*. Garfied and Sher (1963) then created the journal impact factor to help select additional source journals. To do this, the author citation index was simply re-sorted into the journal citation index. From this simple exercise, it can be learned that initially a core group of large and highly cited journals needed to be covered in the new *Science Citation Index* (*SCI*). Consider that, in 2004, the *Journal of Biological Chemistry* published 6500 articles, whereas articles from the *Proceedings of the National Academy of Sciences* were cited more than 300 000 times that year. Smaller journals might not be selected if we rely solely on publication count, thus Garfield (1972) created the journal impact factor (JIF).

Tables providing a selective list of journals ranked by impact factor for 2004 or even 2005 can be easily obtained from the web. Such tables also includes the total number of articles published in 2004, the total number of articles published in 2002 plus 2003 (the JIF denominator), the citations to everything published in 2002 plus 2003 (the JIF numerator), and the total citations in 2004 for all articles ever published in a given journal. Sorting by impact factor allows for the inclusion of many small (in terms of total number of articles published) but influential journals. Obviously, sorting by total citations or other provided data would result in a different ranking. The term "impact factor" has gradually evolved to describe both journal and author impact. Journal impact factors generally involve relatively large populations of articles and citations. Individual authors generally produce smaller numbers of articles, although some have published a phenomenal number.

Even before the *Journal Citation Reports* (*JCR*) appeared, Garfield (1972) sampled the 1969 *SCI* to create the first published ranking by impact factor. Today, the *JCR* includes every journal citation in more than 6000 journals about 15 million citations from 1 million source items per year. The precision of impact factors is questionable, but reporting to 3 decimal places reduces the number

of journals with the identical impact rank. However, it matters very little whether, for example, the impact of "Journal of American Medical Association" (JAMA) is quoted as 24.8 rather than 24.831. A journal's impact factor is based on two elements: the numerator, which is the number of citations in the current year to items published in the previous two years, and the denominator, which is the number of substantive articles and reviews published in the same two years. The impact factor could just as easily be based on the previous year's articles alone, which would give even greater weight to rapidly changing fields. An impact factor could also take into account longer periods of citations and sources, but then the measure would be less current.

The significance of journal performance indicators

Many of the discrepancies inherent in JIFs are eliminated altogether in another Thomson Scientific database called Journal Performance Indicators (JPI). Unlike the JCR, the JPI database links each source item to its own unique citations. Therefore, the impact calculations are more precise. Only citations to the substantive items that are in the denominator are included. And it is possible to obtain cumulative impact measures covering longer time spans. For example, the cumulated impact for JAMA articles published in 1999 was 84.5. This was derived by dividing the 31 257 citations received from 1999 to 2004 by the 370 articles published in 1999. That year *JAMA* published 1905 items, of which 680 were letters and 253 were editorials. Citations to these items were not included in the JPI calculation of impact. In addition to helping libraries decide which journals to purchase, JIFs are also used by authors to decide where to submit their articles. As a general rule, the journals with high impact factors include the most prestigious. Some would equate prestige with high impact. The use of JIFs instead of actual article citation counts to evaluate individuals is a highly controversial issue. Granting and other policy agencies often wish to bypass the work involved in obtaining citation counts for individual articles and authors. Allegedly, recently published articles may not have had enough time to be cited, so it is tempting to use the JIF as a surrogate evaluation tool. Presumably, the mere acceptance of the paper for publication by a high-impact journal is an implied indicator of prestige. Typically, when the author's work is examined, the impact factors of the journals involved are substituted for the actual citation count. Thus, the JIF is used to estimate the expected count of individual papers, which is rather dubious considering the known skewness observed for most journals.

Today, so-called Webometrics are increasingly brought into play, though there is little evidence that this approach is any better than traditional citation analysis. Web "citations" may occur a little earlier, but they are not the same as "citations." Thus, one must distinguish between readership or downloading and actual citation in new published papers. But some limited studies indicate that Web citation is a harbinger of future citation. The assumption that the impact of recent articles cannot be evaluated in the *SCI* is not universally correct. While there may be several years' delay for some topics, papers that achieve high impact are usually cited within months of publication and certainly within a year or so. This pattern of immediacy has enabled Thomson Scientific to identify "hot papers" in its bimonthly publication, *Science Watch*. However, full confirmation of high impact is generally obtained 2 years later. The *Scientist* waits up to 2 years to select hot papers for commentary by authors. Most of these papers will eventually go on to become "citation classics." Two recent examples of hot papers published in *JAMA* are those on the benefits and risks of estrogen in postmenopausal women. The first was cited in 132 articles after 6 months, then 776 times in 2003 and 862 times in 2004. The second, more recent, hot paper has already been cited in 300 articles.

Calculation and determination of Impact Factor (IF)

Garfield, probably the world's foremost proponent of citation analysis through two measures: impact factor (IF) and immediacy index (II), first mentioned the ideas in 1955. The analysis of citations is among the means by which policy-makers, scientists, and information professionals seek to achieve a greater understanding of the qualitative forces that affect communications in science (Tomer 1986; Bauer and Bakkalbasi 2005). Like nuclear energy, the two measures have become a mixed blessing, expected that it would be used constructively while recognizing that in the wrong hands it might be abused (Garfield 1999a). As long as scientists publish articles containing lists of cited references, it will be possible to calculate impact factors (Garfield 2001). Garfield (2004) has also stated that "it has been demonstrated that on line access improves both readership and citation impact". The same impact factor can indicate the 'influence' and 'performance' of e-print archives they make among scientists.

According to Institute of Scientific Information (ISI), the 'Impact Factor' and 'Immediacy Index' of a journal are calculated as follows:

$$\text{Impact Factor} = \frac{\text{No. of citations to the previous two years articles in the calculating year}}{\text{No. of articles published in the previous two year citable}}$$

$$\text{Immediacy Factor} = \frac{\text{No. of citations to the articles published in the calculating year}}{\text{No. of citable articles published in the calculating year}}$$

Similarly, the OA (Open Access) Impact Factor (IF) and the OA Immediacy Index (II) can be calculated as follows:

$$\text{OAIF} = \frac{\text{Number of citations received to the previous two years submissions in the calculating year (without self citations)}}{\text{Number of submissions in the previous two years}}$$

$$\text{OAII} = \frac{\text{Number of citations received to the submissions in the calculating year (without self citations)}}{\text{Number of submissions in the same years}}$$

The minimum Impact Factor and Immediacy Index for Open Archives as calculated for journals are usually done by Institute of Scientific Information (ISI) without the first factor x_2. The *Science Citation Index* data is used for computing the Impact Factors and Immediacy Index for Open Archives. Then the Open Archive Classes are compared with the journals included in the *Science Citation Index*. Refining the computation of topic based impact factors can be done through the computation of impact factors for individual research papers (Garfield 1999b). Citation and publication patterns differ between disciplines, so the Impact Factor is only meaningful when it is used to compare journals within a discipline (Testa and McVeigh 2004).

Relationship between high impact and citation index journals

What are citation indexes and why use it?

Citation indexes track references that authors put in the bibliographies of published papers. They provide a way to search for and analyze the literature in a way not possible through simple keyword/topical searching. It also enables users to gather data on the "impact" of individual authors and journals, as well as assessing particular areas of research activity and publication. This latter field is called bibliometrics.

Citation indexing began in the 1950s, and has long been dominated by the Institute for Scientific Information (now Thomson Scientific), the creator and publisher of the three citation indexes available today: Science Citation Index (SCI), Social Sciences Citation Index (SSCI), and Arts & Humanities Citation Index (AHCI). This page focuses on the use of SCI in the "hard" sciences, which have the longest track record in citation studies. SCI covers nearly 6,000 journals across all science and engineering disciplines. All three ISI citation indexes back to 1975 are available online to users via the Web of Science system.

Scientometrics and journalology

Citation analysis has blossomed over the past four decades. The field now has its own International Society of Scientometrics and Informetrics. Lock (1989) aptly named the application of bibliometrics to journals evaluation "journalology." All citation studies should be adjusted to account for variables such as specialty, citation density, and half-life (Pudovkin and Garfield 2004). The citation density is the average number of references cited per source article and is significantly lower for mathematics journals than for molecular biology journals. The half-life (i.e. number of retrospective years required to find 50% of the cited references) is longer for physiology journals than that for physics journals. For some fields, the *JCR*'s 2-year period for calculation of impact factors may or may not provide as complete a picture as would a 5- or 10-year period. Nevertheless, when journals are studied by category, the rankings based on 1-, 7-, or 15-year impact factors do not differ significantly (Garfield 1998a and 1998b). When journals are studied across fields, the ranking for physiology journals improves significantly as the number of year's increases, but the rankings within the category do not significantly change. There are exceptions to these generalities. Critics of the JIF will cite all sorts of anecdotal citation behavior that do not represent average practice. Referencing errors abound, but most are variants that do not affect journal impact, since only variants in cited journal abbreviations matter in calculating impact. These are all unified prior to issuing the *JCR* each year. The impact factors reported by the *JCR* tacitly imply that all editorial items in *BMJ, JAMA, Lancet, New England Journal of Medicine*, etc, can be neatly categorized, but such journals publish large numbers of items that are not substantive in regards to citations. Correspondence, letters, commentaries, perspectives, news stories, obituaries, editorials, interviews, and tributes are not included in the *JCR*'s denominator. However, they may be cited, especially in the current year. For that reason, they do not significantly affect impact calculations. Nevertheless, since the numerator includes later citations to these ephemera, some distortion will result, although only a small group of leading medical journals are affected.

The assignment of publication codes is based on human judgment. A news story might be perceived as a substantive article, and a significant letter might not be. Furthermore, no effort is made to differentiate clinical versus laboratory studies or, for that matter, practice-based versus research-based articles. All these potential variables provide grist for the critical mill of citation aficionados.

Size versus citation density

There is a widespread belief that the size of the scientific community that a journal serves significantly affects impact factor. This assumption overlooks the fact that while more authors produce more citations, these must be shared by a larger number of cited articles. Most articles are not well-cited, but some articles may have unusual cross-disciplinary impact. It is well known that there is a skewed distribution of citations in most fields. The so-called 80/20 phenomenon applies, in that 20% of articles may account for 80% of the citations. The key determinants of impact factor are not the number of authors or articles in the field but, rather, the citation density and the age of the literature cited. The size of a field, however, will increase the number of "super-cited" papers. And while a few classic methodology papers exceed a high threshold of citation, thousands of other methodology and review papers do not. Publishing mediocre review papers will not necessarily boost a journal's impact. Some examples of super-citation classics include the Lowry method, cited 300 000 times (Lowry et al. 1951), and the Southern Blot technique, cited 30 000 times (Southern 1975). Since the roughly 60 papers cited more than 10 000 times are decades old, they do not affect the calculation of the current impact factor. Indeed, of 38 million items cited from 1900-2005, only 0.5% were cited more than 200 times. Half were not cited at all and about one quarter was not substantive articles but rather the editorial ephemera mentioned earlier.

The skewness of citations is well known and repeated as a mantra by critics of the impact factor. If manuscript refereeing or processing is delayed, references to articles that are no longer within the *JCR*'s 2-year impact window will not be counted (Yu et. al. 2005). Alternatively, the appearance of articles on the same subject in the same issue may have an upward effect, as shown by Opthof (1999). For greater precision, it is preferable to conduct item-by-item journal audits so that any differences in impact for different types of editorial items can be taken into account (Garfield 1986). Some editors would calculate impact solely on the basis of their most-cited papers so as to diminish their otherwise low impact factors. Others would like to see rankings by geographic or language group because of the *SCI*'s alleged English-language bias, even though the *SCI* covers European—largely German, French, and Spanish—medical journals. Other objections to impact factors are related to the system used in the *JCR* to categorize journals. The heuristic methods used by Thomson Scientific (formerly Thomson ISI) for categorizing journals are by no means perfect, even though citation analysis informs their decisions. The collective work by Pudovkin and Garfield (2002) was an attempt to group journals objectively. They relied on the 2-way citational relationships between journals to reduce the subjective influence of journal titles such as the *Journal of Experimental Medicine* - one of the top 5 immunology journals (Garfield 1972).

The Importance of using citation indexes

Finding papers that cite earlier papers

Citation indexing is a way to look forward in the literature from the starting point of a particular paper or group of papers. This is a different and complementary approach to ordinary word-based literature searching, which looks backward in the literature from the present time. For example, if you have an excellent paper on a particular topic that was published in 2007, you can use Science Citation Index (via Web of Science) to find papers published after 2007 that cited that paper. Citation implies a direct subject relationship between the papers. So, by searching for later papers citing your known paper, you can find more documents on the same or similar topic without using any keywords or subject terms. Lately, newly established journal publishers encourage their authors to cite their own papers from the publisher's journals to increase the impact factor of their own journals since journal paper publishing nowadays tend to be business oriented.

Procedures of citing papers

You can easily find out how many times your papers have been cited. Citation searching allows you to move forward in time by finding newer papers that cite earlier papers. SCI is part of the Web of Science online system produced by Thomson-ISI. For information on counting your total citations, see the *Counting Your Citations* page.

As an example, for information on searching for citing articles in google scholars (http://scholar.google.com/) can be demonstrated below:

Google Scholar includes a "Cited by" (Fig. 1) count in its display of individual entries. This is calculated from citations appearing in other articles indexed by Google Scholar. Clicking on this link will take you to the list of citing articles. Since it is impossible to determine with any accuracy what publications Google Scholar does or does not index, this is not a reliable figure but it is one of the best open source citation search found in web.

Figure 1: A Sample of citation Impact Factor for Kamaruzaman Jusoff from the Google Scholar (http://scholar.google.com/)

Finding the "Best" journals in your field of expertise

Before I go further discussing about research paper publications in high impact or citation indexes journals, the term Refereed Journal must first be understood. The terms "refereed" and "peer reviewed" mean essentially the same thing. In The Oxford English Dictionary, "peer review" is defined as the process by which a learned journal passes a paper received for publication to outside experts for their comments on its suitability and worth; refereeing. To identify scholarly journals which are refereed, the Ulrich's International Periodicals Directory, available as a Web LUIS database, is a unique, current, comprehensive and continuously updated source of information on selected periodicals and serials published in the United States and throughout the world. The Advanced Search screen allows you to limit Document Type to "Academic/Scholarly Publication" and Special Features to "Refereed". On the other hand, non-refereed materials such as Trade Journals or Magazines use less rigorous standards of screening prior to publication. In some publications, each article may be only screened by the publication's editor. While knowledgeable, no editor can be an authority on all the subject matter printed in a journal. Other non-refereed materials accept almost anything submitted in order to have something to print. Meanwhile, the term "scholarly materials" is often used to describe refereed materials, but this term is not exclusive to refereed material. Non-refereed materials may not by scrutinize as intensely as refereed materials, but they can still be considered scholarly. However, there are cases whereby some researchers get confused between Peer-Reviewed and Scholarly Journals.

Scholarly journals contain articles written by, and addressed to, experts in a discipline. They are concerned with academic study, especially research, and demonstrate the methods and concerns of scholars. The main purpose of a scholarly journal is to report original research or experimentation and to communicate this information to the rest of the scholarly world. The language of scholarly journals reflects the discipline covered, as it assumes some knowledge or background on the part of the reader. Scholarly journals always rigorously cite their sources in the form of footnotes or bibliographies. Many scholarly journals are published by professional organizations. While not all scholarly journals go through the peer-review process, it is usually safe to assume that a peer-reviewed journal is also scholarly.

Some of the databases which allow you to limit your search to referee or peer reviewed journals are:

- EBSCOhost (multidisciplinary)
- InfoTrac (multidisciplinary)
- ProQuest (business and criminal justice)
- CINAHL (nursing & allied health) - select "Peer Reviewed" in the Journal Subset Phrase dropdown box. Other options include "blind peer reviewed", "double blind peer reviewed", "editorial board reviewed" and "expert peer reviewed".

You may find that most or all of the journals included in a particular database are scholarly, refereed journals, so that proper selection of the database may automatically eliminate the less scholarly sources.

- A few examples are:
- JSTOR (multidisciplinary)
- *Science Direct* (multidisciplinary)
- Project MUSE (humanities, social sciences, mathematics)
- PsycINFO (psychology)
- Web of Science (multidisciplinary)
- Cambridge Scientific Abstracts (multidisciplinary)

Publishing your research papers either in Refereed or Non-Refereed journals are still a subject of debate by some scientists and researchers. For instance, there is a significant decrease of Indians and Chinese researchers publishing or reporting their “commercial valued” papers in the American or EU based High Impact Journals for the scare and threats of having their products patented by others outside their countries.

Citations have long been used to rank journals within particular subject areas, usually based on the ISI Impact Factor**.** The impact factor is simply a numerical ratio of the total number of citations a journal receives in ISI Source Journals in one year to the total number of "citable" articles it published in the previous two years. It is a useful way to see how journals perform in relation to others in the same subject area. It is not particularly useful in comparing journals across subject areas, and the number taken out of this context is essentially meaningless.

Citation behavior varies considerably from field to field. Thus, impact factors are only meaningful in context with other journals in the same field. Impact factor can also vary based on the number and types of articles a journal publishes. Review articles tend to be more heavily cited than full papers or communications, so journals and annuals that publish mostly reviews will often have high impact factors. Similarly, journals that publish only a few articles in a given year may have disproportionately high impact factors. Which ever

way you want to rank or count your journal impact factor, I still believe that it is all that "money matters" to some newly established publishers or even the old established ones. Seglan (1997) and Walter (2003) for example discussed in details on the flaws of why the impact factor of journals should not be used for evaluating research articles.

While Impact Factors are useful within certain limits, they are somewhat arbitrary and subject to manipulation by editors and publishers. Despite university requirements to evaluate one of the KPIs of an individual academic staff using Impact Factors alone to make personal performance rating and funding decisions, is still a question mark to me. Impact factors for journals covered by ISI are published annually in an electronic compilation called Journal Citation Reports. JCR also contains data on historical trends, immediacy index, cited half-life, etc…

Conclusion

In my humble opinion, there are many conflicting opinions about impact factors and citation indexing. Both Impact Factor and Citation Indexes is not a perfect tool to measure the quality of articles but there is nothing better and it has the advantage of already being in existence and is, therefore, a good technique for scientific evaluation. Based on my little experience submitting papers to a citation index and/or impact factor journals has shown that in each specialty the best journals are those in which it is most difficult to have an article accepted and/or need to pay a subscription or membership fee, and these are the journals that have a high impact factor. It may not be true since some of these journals existed long before the impact factor was devised. The use of impact factor/citation index as a measure of quality is getting popular and widespread, because it fits well with the opinion we have in each field of the best journals in our specialty.

The author personally feels a bit uncomfortable with the use of journal impacts in evaluating academic staff because it has its inherent dangers. However, we academicians, especially in the specialized fields have to go with it and prove to the university's top management that you can do it as others have done it. In an ideal world, evaluators would read each article and make personal judgments. The recent International Congress on Knowledge Peer Review (KPR) held in Florida, USA last year in 2006, where I was one of the Peer Reviewer Assessor demonstrated the difficulties of reconciling such peer judgments. Most individuals do not have the time to read all the relevant articles in addition to the *personal bias* and conflicts of self-interest of some reviewers. Even if they do, their judgment surely would be tempered by observing the comments of those who have cited the work. Online full-text access has made that practical.

Last but not least, somehow or rather, academicians must adhere strictly to the policy that you must publish (or perish) in open accessed journals as one of the universities requirements. Once the impact and immediacy in citations of subject open archives are compared, you should submit your research documents in the open archive categories with high impact factors and immediacy index. In that case, the continued emphasis on 'Impact Factors' will not be misguided the readers. The readers can make a comparison of sources they want to publish considering impact factors as the criteria; they may slant towards the high impact side.

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