Editorial

Core journals

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The format of scientific exchange—authoring, peer review, and reading has not changed fundamentally in over a century. The pace and quality of science depends on the willingness to write, the review method, and the amount of edited text pages in a discipline. The two major neurosurgery journals provide approximately 7000 edited amounts of text pages in a discipline. The two major neurosurgery journals provide approximately 7000 edited pages per year. If one article uses 6 pages, then approximately 1200 articles per year are published on a myriad of topics. Since our own discipline contains many fields, the amount of science in each area is limited further. With this model, it is clear that learning can be problematic. Too much information is lost within our literature or not even recorded, and too many findings are forgotten. Most non-classroom teaching is performed from recall according to principles of oral tradition. This paradigm has been in place since the late 1890s when increasing numbers of journals were created.

There are several fundamental challenges at play, and the authors of this report address one of them—identification of where core knowledge may lie. They aim to define a core literature source for neurosurgeons and hope that the information contained within its articles is of particular value. Unfortunately, “value” is determined by citation number and not actual knowledge use. Digging deeper, we could ask what kind of information is found within those articles. Is an article valuable because it is citable for future work, or because of its intrinsic teaching message? What kind of science do we want our journals to provide? With billions of people across the globe and with thousands or millions of people affected with individual diseases, we as authors continue to describe small amounts of data. Commonly, we write articles about 100 aneurysms from one center and 150 from another. Rarely do authors describe 1 million patients with stroke or lumbar disc herniation, despite the fact that each year in the United States, 1 million patients sustain a stroke. The ubiquitous request for “more data” is frustrating and commonly not pursued. Without statistical power, how can we truly affect growth? The current “big data” movement aims to address this. Knowledge should be able to be created quickly, be credible, be meaningful, be found, and be used. This report by Madhugiri et al. addresses how knowledge might efficiently be found. They are to be congratulated for their work, because efforts to understand the scholarly process are of broad importance.

Thomas Kuhn, in his 1962 book, The Structure of Scientific Revolutions, states, “Scientific knowledge, like language, is intrinsically the common property of a group or else nothing at all. To understand it, we shall need to know the special characteristics of the groups that create and use it.” For the last century, the scientific and knowledge communities have created a great infrastructure for scientific knowledge. Unfortunately, that infrastructure has not evolved. The authors tell us that most clinicians update themselves by reading journals on their personal subscription list and rarely (8%) by a literature search. Personally, I pay over $2000 per year for my numerous subscriptions. So what might I, or anyone else, be missing? Most readers glean learning from this old paradigm. The paradigm of authors writing a report, submitting it for review, “hoping” for a positive response, and then providing interaction to a limited readership is fundamentally flawed. Ideally, the report should include information of value to a group, be created and reviewed efficiently, and be placed into an interactive format for use. We use the term “knowledge community” to define a group with an established interest in a specific area and the term “knowledge network” to describe that interaction. After a century of journal-based communication, our community should know what it wants to know. Neurosurgeons know the kind of information that has been valuable to neurosurgeons, neurosurgical trainees, and patients. But where should it be located? In one of the 6 core journals identified in this report, or in some new knowledge environment? Should those outside the 6 work to be included via the old metrics, or should they strive toward a better format?

Tapscott and Williams, in their book Wikinomics: How Mass Collaboration Changes Everything, detail the problems of knowledge use and dissemination. “No doubt these problems are hangovers from the world of physical distribution. The current publishing regime emerged in 17th Century Europe.” They state that, “as a scientific endeavor swells in scale and speed, a growing number of participants in the scientific ecosystem are questioning whether the antiquated journal system is adequate to satisfy their needs. The traditional system is being superseded by peer-to-peer collaboration.” Clearly the world of physical distribution is changing. The authors indeed

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challenge the idea of broad distribution by refocusing readers on where the impactful information may rest.

The traditional journal article is being pressured by many new forces. These can include the opportunity to provide information to large numbers of people through less creditable or evaluated means (the “Wiki” concept). Another force has been to conjoin information with related knowledge (articles with advertisements, articles with statements or commentaries—like this one). Pricing models have forced journals to respond through a change of individual subscriptions to more bundled packages. Indeed, at a recent conference on scholarly publishing, it was said that “the entire field is waiting for a new solution,” and “few are focused on improving content.” The forces involved in the creation and publication of knowledge, often the mandated task of university faculty, must be understood. The quality of our scientific peer review is paramount in an era where rapid access to nonvalidicated information is part of our Internet-supported culture. Indeed, social media, blogs, and wikis have allowed the quick creation of opinion and poorly validated data that can be found rapidly and free of charge. The authors tell us that 15% of articles suitable for a systematic review are not listed in PubMed. So where is this information and how is it distilled? We must ensure credibility through peer review, but it is also clear that the peer-review process can be better. This model must be efficient, allow study and quantification, allow determination of the best reviewers (not just the quickest), and allow an interaction among the author-reviewer-editor-reader that is more direct and meaningful. Journals that facilitate creation and review of an improved article will increase their own value.

The authors’ analysis, replete with assumptions that they describe in their Discussion, uses two metrics to study value, the impact factor and the h index. One assumption is that the literature across a single year would be congruent with another recent year’s output, but this ignores the efforts of editors and reviewers to improve or evolve their journal. Although there are many available metrics, the importance of a scientific journal most frequently has been gauged by its “impact factor;” a calculation based on the number of total citations received by all reports in that journal over a 2-year period. It is highly discipline dependent and can be affected by self-citation or by inclusion of review articles or topics with current high public interest. The impact factor is a measure of the journal and not of the actual report within that journal. The separate measure of one author’s scholarship over time, the h index, is gaining traction. Increasingly there should be more focus on the authors and the reports, rather than the publication site. I hope that publications will evolve and adopt powerful networking methods to empower their content. Those that do will more rapidly join the “6” that represent the specialty core.

The authors conclude that their method helps to determine journal importance via a focus on the original citation sources used to write articles of higher impact. This would help to understand which journals act to keep a reader abreast of important literature that may be cited as well as guide them on where to publish. Of course, a large segment of the readership is just that—readers. Readers commonly are not future authors. And at present, articles that are read, perhaps enjoyed and remembered for some worthwhile message but not highly cited, are devalued. That is also wrong. The good news is that the forces of change are real. Our literature must evolve to meet the 21st-century demands of all those who care about scholarship.

Disclosure

Dr. Kondziolka has been a consultant for Elekta AB (through 10/31/2012) and is a shareholder of SciencEngines, Inc.

References


Response

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We thank Dr. Kondziolka for his balanced and insightful comments on our paper. He has evaluated the paper in the context of the broader milieu of global knowledge sharing and dissemination. Our goal was to establish a valid technique for identifying those journals that are of greatest use to neurosurgeons. This technique applies to the current submission–peer review–publication–citation paradigm of knowledge sharing. As Dr. Kondziolka has mentioned, the movement away from this model toward the evolution of knowledge communities and communities of practice will lead to dramatic shifts in the way we share knowledge.2

There are two ways in which the value of a paper may be assessed. The first is by assessing its value to other authors and researchers in the field. This is easily gauged by the number of citations a paper receives in scientific literature. This is objective and forms the basis of the impact factor and h index as metrics.1 However, these metrics do not consider where a paper is cited. Although a paper may be published in a neurosurgery journal, it may be cited the most by scientists in other disciplines. Such a paper may be of “curiosity value” to neurosurgeons, but the scientific value of such a paper to this group may be limited. To overcome this limitation, we looked at those
papers that were being most cited by other neurosurgeons and then traced the journals that published these papers. Clearly, this would identify those journals that publish papers that are being most cited by other neurosurgeons. The only caveat is that this analysis is feasible only if a specialty has an adequate number of journals to analyze. Thus, in neurosurgery the technique would be of greatest value for general neurosurgery (including all subspecialties, as we have done in this analysis) and possibly vascular neurosurgery and spine surgery. Another way in which the impact of a paper is felt is the extent to which it educates, enlightens, and entertains readers. An additional effect could be a change in clinical practice consequent to the dissemination of the findings published in a paper. Unfortunately, there is no direct or objective technique to assess the impact of a paper across these domains.

The technique employed in the current study assesses papers on the basis of citation metrics but not on the other parameters, which are imponderables. The analysis, therefore, assesses the utility of a journal and the papers it publishes to other authors and scientists. It is, at best, a surrogate marker of the utility of these journals to readers who are not themselves writers and/or scientists.

We had, perforce, to make two assumptions for the purpose of this analysis. The first was that within a short period (2–3 years), the publishing and citation pattern of a journal would not change drastically. We have termed this assumption publication homogeneity. This was necessitated because, although brief, the period included for analysis itself (3 months) yielded 22,850 citations. To analyze and meaningfully interpret all citations over a period of 3 years would have become an intensely mathematical exercise. We felt justified in assuming publication homogeneity because other studies have reached meaningful conclusions after analysis of far fewer citations.3,4 The second assumption was that within the recent past or near future, irrespective of the period of time chosen for analysis, the journals populating Zones 1 and 2 should not change. Although we have defended this assumption, it is possible (as Dr. Kondziolka states) that strenuous and visible efforts by a journal to improve the quality of science it publishes or its peer review process may lead to its inclusion in a higher zone than it was in just a few months previously. The only objective method of testing this would be to actually perform the analysis over a different 3-month period and compare the results with the results of the present analysis. This is something that could be undertaken after a reasonable gap of 2–3 years. If the same paradigms of knowledge dissemination were to be in vogue then as are now, it should be possible to identify the core journals and determine whether they remain the same or not.

Lastly, journals that are not included in the core list are certainly of value to readers. Although these journals may be maximally perused by readers of the country or region where they are published and may not reach a very wide readership, they still do record valuable data and form part of the neurosurgical “memeplex.” In this, we completely agree with Dr. Kondziolka. But given the innumerable demands on a clinician’s time, we believe that identifying the core journals for every discipline helps one decide which journals to spend one’s dollar (or $2000 in the case of Dr. Kondziolka!) on and maximize returns on one’s investment of time and money.

References


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