

VIEW POINT

JOURNAL QUALITY AND VISIBILITY: IS THERE A WAY OUT OF THE SCIENTIFIC PERIPHERY?

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Abstract: Scientific journals play an important role in the transfer of scientific information, and international visibility is a prerequisite for fulfilling this role. However, entering international bibliographic databases is a major challenge for the journals from the so-called scientific periphery. These journals have an unfavourable starting position because of the small number of manuscripts received, an insufficient pool of reviewers, the low quality of published articles, and poor international visibility, all of which reduce the pool of potential authors and close a "vicious circle of inadequacy". To break this circle, editors have to make a great effort to improve basic journal publishing standards, especially timeliness; to find a "niche" for their journal; to increase the international diversity of the Editorial Board; and to actively seek for authors and help them to improve the quality of their manuscripts. The example of the *Croatian Medical Journal* (Zagreb, Croatia) shows that it is possible to get out of the scientific periphery if editors have a clear vision and willingness to work really hard.

Key words: periodicals, publishing

In a world of large scientific production and fast global communications, journals have a major role in the transfer and exchange of scientific information [1]. The productivity of scientists, institutions, and countries is measured by the number of published articles. There is a growing number of scientific journals on the world's market [2], and the Internet has greatly increased the searchability and accessibility of journal literature.

However, scientific publishing faces many of the problems which affect society at large. The existing gap between the rich and poor widens. In the field of biomedical research, 80% of published scientific articles originate from only 10 countries [3]. Almost a quarter of the world's scientists live and work in developing countries, but they receive only 5% of the total money allocated to research [4]. Differences between "big" and "small" are present also among scientific journals: 90% of the relevant data is published in 10% of the journals [5]. The most prominent and widely used bibliographic databases, such as Science Citation Index or Current Contents, index only a small part of the world's scientific literature. For example, The National Library of Medicine (NLM) yearly receives over 25,000 journals from all parts of the world, but selects only 4,800 for its MEDLINE database.

It is obvious that market globalization, with all its advantages and disadvantages, has affected the field of scientific publishing. Indeed, science knows no borders any more: people can read and use journals even from the most remote parts of the world, and all authors are equally entitled to publish their articles in those journals. The only condition is that the journal must be indexed in some of the international bibliographic databases. Otherwise it will stay far from the view of the global scientific community, condemned to vegetation in a narrow and obscure nook bounded by national borders.

Before we start to discuss the problems of journals from the so-called scientific periphery [6] and ways to get out of it, we want to point out that international visibility is crucial for scientific, but almost irrelevant for professional journals [7]. National professional journals have an important role in the development of the professions in their countries, but if they want to publish scientific articles, they have to accept international standards, become a part of the world-wide scientific community and participate in a global flow of scientific information.

A vicious circle of inadequacy

It is not easy to become listed in an international bibliographic database, especially for journals from the so-called scientific periphery [6]. These journals are disadvantaged at all levels (Figure 1). Small countries have a small number of scientists, who produce a limited number of scientific articles and try to publish them in indexed (international) journals of higher visibility. Consequently, domestic journals can only count on the leftovers of an already meagre production, which has a negative impact on the number and quality of articles submitted to such journals. Another problem is the small pool of available reviewers. The best experts will not bother to write reviews for unknown and non-indexed journals, and so the authors do not get high-quality comments and critiques which would help them considerably to improve their manuscripts.

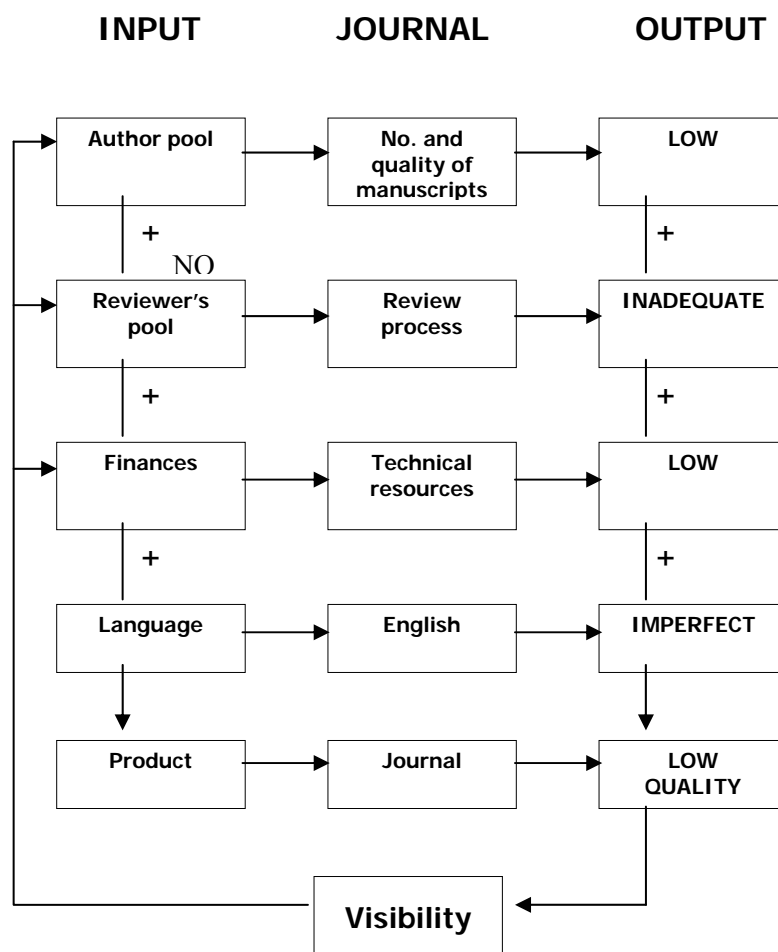


Figure 1 – Vicious circle of inadequacy of scientific journals from small countries
(Reproduced from [6], with permission of the Croatian Medical Journal)

Слика 1 – Магичен круг на неадекватноста на научните списанија од малите земји (репродуцирани од [6], со дозвола на Croatian Medical Journal)

Scientific journals in Macedonia, as well as in other countries of similar socio-economic environment, are financed mainly from the government budget, meaning that the small number of subscribers and low readership does not jeopardize their existence. However, such a situation is hardly sustainable and it seems inevitable that state financial support should be adjusted to the journal's measurable quality [7]. In a pure market environment, present in some countries

of the world, finances become an important part of the "vicious circle" of small scientific journals, because the low quality has a negative impact on the market success, i.e. the number of subscribers and paid advertisements. Reduced financial and technical resources additionally lower the journal's quality, and even threaten its independence. Financial interests can influence editorial decisions and undermine the scientific credibility of the journal.

The choice of language is of the utmost importance for the visibility of a scientific journal. Publishing only in a local language limits the circle of potential authors and readers. Abstracts in English can increase the chances of getting indexed in bibliographic databases, but articles whose full text is not in English are rarely interesting to an international readership [8]. On the other hand, if a journal from a non-English speaking country decides to publish exclusively in English, it has to deal with the problem of the language imperfections of submitted manuscripts. A language editor is needed to overcome this problem, but not many journals from the so-called scientific periphery can afford to pay for professional language editing. Even for journals with enough money, it is difficult to find a person conversant with all the intricacies of scientific English [9].

All these shortcomings, each individually and all of them together, cause a low visibility of small scientific journals. And at that point the "vicious circle" is closed (Figure 1).

Bibliographic databases

The key to breaking out of the "vicious circle" is in increasing the journal's visibility, i.e. entering international bibliographic databases. Databases are defined as organized collections of information on published scientific articles. This information is available in a machine-readable medium; it points to original publications and facilitate their selection and use [10]. Different scientific fields have different bibliographic databases (Table 1). Citation databases have a special significance; they allow inspection of the literature which preceded any given article, and give information about the impact of the article on further research [10]. There are many bibliographic databases, but so far only a single fully functional citation database. The only citation database is the Web of Science (WoS), hosted by Thomson Scientific, formerly known as the Institute for Scientific Information (ISI). WoS includes Science Citation Index (SCI), Social Science Citation Index (SSCI), and Arts and Humanities Citation Index (A&HCI) databases. They are used for the calculation of the impact factor, which shows how many times the "average article" published in a given scholarly journal has been cited in a particular year or period [10]. In spite of many criticisms of the impact factor [11, 12], it is still considered the best

measure of a journal's quality and its impact on the scientific community [13]. Apart from WoS, Thomson Scientific produces the Current Contents (CC), which is the most selective database and indexes about 8,000 journals from all fields of science. CC allows quick access to the most recent scientific literature, but is not used for calculation of impact factor.

Table 1 – Табела 1

Examples of bibliographic databases from different fields of science.

Примери на библиографски бази на податоци од различни научни полиња

Scientific field	Bibliographic database
Medicine	Medline
Biology	BIOSIS Previews (Biological Abstracts)
Physics	INSPEC
Chemistry	Chemical Abstracts (CA Search)
Agriculture	CAB Abstracts
Economy	EconLit
Information/library science	LISA
Psychology	PsychINFO
Sociology	Sociological Abstracts
Philosophy	Philosopher's Index
Languages	Modern Language Abstracts (MLA)

The criteria for entering the citation databases are very strict. For example, SCI indexes about 3,700 journals from 100 scientific disciplines, which represents only 5–7% of all journals published in those disciplines [7]. It is worth noting that among the 3,700 journals indexed in SCI, less than 2% come from developing countries. Is that a sign of SCI's partiality or a low quality of journals from the so-called scientific periphery?

Strict selection of journals

Database owners, such as Thomson Scientific, are guided by commercial logic. According to the ISI founder Eugene Garfield, "a cost-effective index must restrict its coverage, as nearly as possible to only those items that researchers are likely to find useful" [14]. Each year, Thomson Scientific evaluates about 2,000 journal candidates for inclusion in its citation databases, and accepts only 10% of them. However, this does not mean that the quantity of indexed journals constantly increases: an equal number of journals is excluded,

based on the continuous assessment of quality of all journals in the databases. The evaluation is done by Thomson's editors, who are information professionals, librarians, and experts in the literature of their subject area. The journals are selected according to four basic criteria [15]:

1. *Basic publishing standards.* This primarily means timeliness of publication. Many small journals resort to publishing double issues, which are nothing but a sign of an inability to attract and process enough manuscripts. Besides timeliness, technical quality (layout, design, printing, binding) is under scrutiny. Thomson Scientific also notes whether the journal follows international editorial conventions such as informative journal titles, fully descriptive article titles and abstracts, complete bibliographic information for all cited references, and full address information for every author.

2. *Editorial content.* Is there a recognizable editorial policy? What is the journal's purpose, at whom is it aimed? Does the journal regularly publish guidelines for authors, statistics and reports on various aspects of editorial process? Positive answers to these questions would increase the chances of journal inclusion in the citation databases.

3. *International diversity.* The editorial board should include renowned experts from the international scientific community. The journal should be able to attract not only domestic authors, but also those from other countries. This indirectly implies the requirement of publishing in English, especially in the fields of the natural and technical sciences.

4. *Citation analysis.* All cited articles are captured, regardless of their being published in indexed or non-indexed journals. Citation analysis identifies those publications which have proved important, influential and useful. The results of citation analysis can differ significantly from one scientific field to another. For example, in Agricultural Economics and Policy or Andrology there are not many articles published, and so the number of citations is low. On the other hand, Cell Biology, Genetics and Heredity are very propulsive fields with many published articles and citations. Citation growth is rapid in Life Sciences, but relatively slow in Arts and Humanities. For brand new journals, Thomson Scientific examines the publishing record of the journal's authors and editorial board members, noting where their articles have been published and if their work has been cited.

Citation databases, therefore, apply the same set of high standards to journals from rich and developing countries alike. The fact that only a small percentage of journals in citation databases comes from the so-called scientific periphery is more probably the result of a small journal's inadequacy and low quality than systematic discrimination on the part of database evaluators.

Requirements of citation or bibliographic databases, of course, are not the only ones that journals have to face.

What do authors look for? And what about readers?

Scientific journals are not self-serving. They have to serve two main target groups – authors and readers. The problem is that the expectations and demands of these two groups can be considerably different.

The main motivation of authors to publish is their desire to communicate the results of their studies to the scientific community [16]. The second most important inducement for authors is the career benefits that come with publications: professional advancement and grants for further research. Finally, there are reasons such as increase of prestige, patent protection and personal profit [17]. Authors prefer journals of high visibility and impact factor, with a quick and helpful peer review process. Less important for them is the make-up of the editorial board, the technical quality of journal, its price and publication services. On the other hand, readers like journals that are easily accessible and rapidly delivered, interesting, easy to read and in a convenient format. Readers look for authoritative scientific articles, up-to-date information, preferably everything in one place. And all of that for a minimal price, or even better, free of charge.

The polarity is obvious: authors are interested in the journal as a whole, readers in individual articles; authors put a high value on peer review, readers on the simplicity of use; authors would like to publish more, readers to read less.

On top of that, there are the opposing interests of the publisher in profit and the general public in open access [18], so it is clear that the position of a journal is always somewhere in between the hammer and the anvil, between (great) aspirations and (insufficient) capacities. Is there a way out?

A case study: the Croatian Medical Journal

Although the position of a journal from the so-called scientific periphery is seemingly hopeless, it is possible to break out from the "vicious circle", increase visibility and achieve considerable success, provided that each member of the journal's staff works very hard towards that goal. An encouraging example is given by the *Croatian Medical Journal (CMJ)*, founded in 1992, at a time of fierce aggression against Croatia [19]. *CMJ* was conceived ambitiously from the very beginning. It was published exclusively in English, and had a clear purpose and mission: to present the results of biomedical science from Croatia and other small scientific communities to the international scientific arena. *CMJ* was produced in difficult war circumstances and soon profiled itself into a journal that pays special attention to the impact of war and other trauma on the health of individuals and human communities. In that way it started to shape its "niche", i.e. a specific and recognizable content which will make it

different from other general medical journals [20] As the visibility of the journal increased, it began to receive a growing number of manuscripts from abroad, mainly from transitional and newly emerging countries, so the *CMJ* was able to strengthen its position as a bridge between small scientific communities and mainstream science [21].

However, visibility did not increase by itself. Editors had to invest great effort, especially in work with authors. The experience of the *CMJ* was that the authors from small scientific communities lacked not useful data or good ideas, but knowledge of the rules of scientific publishing as well as of writing skills. Therefore the *CMJ* editors began to cooperate actively with authors in order to improve the presentation of their manuscripts [22]. The appointment of a statistical editor in 1996 was another attempt to increase the quality of published articles [23]. Tutoring from the *CMJ* editors showed a long-term positive impact on the authors' academic advancement [24].

To be able to teach others competently, the *CMJ* editors had to keep in touch with the latest developments in the field of scientific writing and publishing. With this purpose they joined professional associations such as the Council of Science Editors (www.councilscienceeditors.org), the European Association of Science Editors (www.ease.org.uk), and the World Association of Medical Editors (www.wame.org). Active participation in the work of these associations was also a valuable opportunity to promote the *CMJ* internationally.

Teaching the authors was just the beginning of a broader educational effort. In 1996, the *CMJ* editors initiated a mandatory undergraduate course, "Principles of Medical Research", at Zagreb University School of Medicine [25] and published a textbook for the course [26]. In 2000, they introduced a continuing medical education course: "How to Plan and Write in Medical Research" [27]. The educational efforts were also directed towards reviewers: the *CMJ* editors wrote a comprehensive guide for reviewing scientific articles, which was published both in English [28] and Croatian [29].

Teaching activities are usually not considered part of an editor's work, but they are the price a small journal has to pay in order to increase the quality of published articles and get closer to the point of breaking the "vicious circle".

An important contribution to the increase of the *CMJ*'s visibility was setting up a web page (www.cmj.hr). The full content of all issues published since 1996 is now freely available on-line.

From the very inception of the *CMJ*, great attention was paid to the technical quality of the journal. Timeliness of publishing was the priority, but efforts were also made to improve the language of the articles [9]. Design and layout were spruced up to the highest degree, which did not go unnoticed: in 2002 the *CMJ* received a special award for design from The Association of Learned and Professional Society Publishers.

After more than 10 years of functioning without much legal regulation (but with a lot of enthusiasm and hard work), the *CMJ* formalized its legal status in 2003 by an agreement which defined the journal's owners, the main participants in making of the journal, as well as their responsibilities and benefits [30].

Diligent work towards the improvement of the journal's quality and visibility led to international recognition: in 1998 the *CMJ* was indexed in MEDLINE/PubMed, and in 1999 it was included in Current Contents and Science Citation Index databases of Thomson Scientific. Today, the *CMJ* is published bimonthly, with a circulation of 500–1000 copies. It receives more than 350 manuscripts yearly, and has an acceptance rate of 35%.

To help oneself by helping others

The example of the *CMJ* shows that journals from the so-called scientific periphery can help themselves by systematically helping others, primarily their present and future authors. Small journals can also help each other through various kinds of exchange. "Exchange of authors" means that editors encourage authors from their scientific communities to submit their manuscripts to partner journals from another country. This can be especially beneficial when both partner journals have a clearly defined profile and do not overlap in their scopes. Editors can also exchange experience during short visits or simply by the use of e-mail. Such communication between editors of scientific journals can be very productive – it enhances mutual understanding and opens new possibilities for cooperation [6].

Although one could expect some assistance from "big" journals [6], experience shows that the best policy is to lean on one's own powers and capacities. And that means hard work, devotion, persistence... and more hard work. For those who follow this path, no circle is so vicious and no periphery so remote that it cannot be escaped from.

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