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Geographical impact of scientific journals (doi:10.4136/ambi-agua.29)

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ABSTRACT

One important quality measure of a scientific journal is its scope, not just the scientific coverage, but also the geographical impact. In fact, the primary classification system, used to evaluate and grade scientific journals' quality in Brazil, known as Qualis CAPES, when classifying a journal attributes a quality grade A, B or C, and also adds an indication of the journal's geographical impact: Local, National or International. This classification system is used by several other institutions, especially by research funding agencies, for instance, CNPq, whose thematic committees use Qualis CAPES classification to quantify the researchers' and Research Groups' productivity. This article discusses several possibilities for geographical impact evaluation and presents the mechanism used by Ambiente e Água - An Interdisciplinary Journal of Applied Science (Ambi-Água) to monitor the extent of its spatial impact.

Keywords: Ambi-Água; Qualis CAPES; Google Analytics; academic journals indexing; Environment and Water.

INTRODUCTION

Until recently the evaluation of the geographical impact of a scientific journal was limited to the analysis of the authors' or experimental sites' origin and to citation indices for instance, the "Science Citation Index (SCI®)" or the Journal Citation Reports (JCR®), maintained since 1975 by Thomson Scientific (2007).

Dewitt et al. (1980), analyzing several systems recognized the importance of the citations indices but, advised that it should be used with great caution in order to ascertain the quality of an article or a scientific journal, especially, due to self citations or many authors' articles. Buchanan (2007) called attention to another deficiency of those citations indices when the editorial procedure of a journal doesn't identify clearly when a citation begins and when it finishes. Gupta et al. (2005) discussed mathematically how citations develop with time in the academia community and mentioned that most publications are not referenced after five years, except, few relevant articles. Szklo (2006) indicated the need for quality evaluation of articles after they have been published and concluded that citation indices should not be used and mentioned several flaws of those indices based on Walter et al. (2003) study. These authors indicated that the "Impact Factor" (IF), defined as the number of citations divided by the number of articles published in the two previous years is conceptually and technically flawed due to the following reasons:

- “the quality of published material cannot be constrained by time – the two-year period set by the ISI for citations is arbitrary;

- the number of journals in the ISI's database is a minute proportion of those published;
- reviews are cited more frequently than original research, thus favouring journals that opt for these articles as part of a publishing strategy;
- the IF does not take into account self-citations, which amount to a third of all citations;
- errors are common in reference lists (occurring in up to a quarter of references), inevitably affecting IF accuracy; and
- the assumption of a positive link between citations and quality is ill-founded, in that we cite articles for diverse reasons, including to refer to research judged suspect or poor."

Walter et al. (2003), in addition, related the following criteria as quality indicators:

- "adds consequentially to the field through original, innovative research findings;
- expands or challenges current knowledge;
- opens additional areas for new research activity;
- opens a pathway to advance knowledge;
- integrates discoveries obtained by different approaches and/ or disciplines through creative synthesis, thus bringing new insights to bear on original research; and
- reflects critically on research findings to guide the direction of further research."

Of course those recommendations by Walter et al. (2003) for post publication analysis of an article can be included in the editorial procedure before the publication depending on the editorial policy of the journal.

Brazilian system for quality evaluation of scientific journals – the Qualis CAPES system

The Brazilian government agency, CAPES, is responsible for the classification of journals associated with accredited graduate degree programs. The journals are classified according to their circulation as Local, National, or International and to their quality as A-high, B-average, and C-low, by several evaluation committees within CAPES sub-areas. CAPES uses the Qualis system to evaluate the Graduate Schools National System. The system is based on information annually supplied by the graduate programs: the so-called "Coleta de Dados" package. This is a computerized system that collects information about registered graduate degree programs in the National System of Masters, Doctorate and Professional Master's Degrees.

The classification is implemented by the specific Evaluation Area using an application called WebQualis. A journal can have, in different areas, different classifications. Areas have their own criteria, previously defined after following guidelines established by the CAPES Technical Scientific Council. Annually the system is updated with new journals. For a journal to be inserted in the Qualis list it must have been previously listed in the Annual Report sent to CAPES ("Coleta de Dados"), with an indication that professors, students or researchers have published scientific articles in that journal. Later on, that journal undergoes a standard check to confirm the validity of the ISSN code and of the journal's title. Additionally, it has to be indicated by the Evaluation Area as relevant to be published in Qualis of each specific

area. Another possibility of a journal to be listed is by direct indication from the Area Representative.

Reclassification implies in the modification of a previously classified journal. This is accomplished in the first year of each three-year cycle remaining the same during that period, except in special cases when the area requests the correction or adjustment of the previous classification.

The circulation impact classification criteria (that classifies as Local, National or International) vary among the several thematic areas of CAPES. In general all areas analyze the indigenusness of the articles taking into account the authors' origin and the article impact in citation indices such as JCR (Thomson Scientific, 2007) or its acceptance by SciELO – Scientific Electronic Library Online (<http://www.scielo.org>). Thus, it is possible to have a national journal classified as international if it had a significant value in JCR.

Geographical impact of Ambiente e Água - An Interdisciplinary Journal of Applied Science (Ambi-Água)

The Ambiente e Água Journal exercises the “golden open access” policy and search quality standard based on a large, highly qualified, peer review panel. The open access is powered by the OAI-PMH communication protocol (Batista, 2007). Figure 1 shows the countries that have frequently accessed Ambi-Água.



Figure 1. Countries from where Ambi-Água has been more frequently accessed in a period of 2.5 months (October 1st to December 15, 2007). Total of 3,630 visits from 73 countries/territories.

Source: Google Analytics (2007).

Table 1 shows the number of visits from countries where Ambi-Água has been most frequently accessed. A total of 3,630 visits produces an average of 3.34 pages per visit and a medium time of 2:13 minutes per visit.

Figure 2 shows the distribution of the cities from where the most frequent accesses came from. The 3,630 visits, in the same period, originated from 493 different cities.

Table 2 shows the cities from where the 10 most frequent accesses came from, the number of pages visited, and the average duration time of each visit.

Table 1. Frequency of access from the 10 countries from where Ambi-Água has been mostly accessed in the period of 2.5 months (October 1st to December 15, 2007).

| Order of frequency | Country/territory | Visits | Pages/visit | Average time in site |
|--------------------|-------------------|--------|-------------|----------------------|
| 1 | Brazil | 2,895 | 3.35 | 00:02:14 |
| 2 | Portugal | 123 | 2.17 | 00:00:56 |
| 3 | United States | 99 | 3.00 | 00:01:02 |
| 4 | Mexico | 56 | 5.11 | 00:04:29 |
| 5 | Spain | 55 | 2.89 | 00:01:11 |
| 6 | Germany | 30 | 5.27 | 00:02:42 |
| 7 | United Kingdom | 29 | 4.24 | 00:00:53 |
| 8 | Turkey | 22 | 2.14 | 00:00:25 |
| 9 | China | 21 | 1.71 | 00:02:07 |
| 10 | Japan | 20 | 6.60 | 00:08:52 |



Figure 2. Cities from where Ambi-Água has been mostly frequently accessed in the period of 2.5 months (October 1st to December 15, 2007).

Source: Google Analytics (2007).

It can be observed that visits originated in different countries or cities have different characteristics. The interpretation of those characteristics is still premature due to the short monitoring time, only 2.5 months. It is important to emphasize the functionality of this monitoring tool (Google Analytics, 2007). That system allows the analyzes of visitors' flow and it supplies a detailed report on the entrance and exit pages, and it identifies which content was more explored, at no charge. That is important for a scientific journal, because it allows, for instance, knowing which articles are being more accessed. That system also informs how the readers found the journal and how they navigated throughout its content.

Table 2. Cities from where Ambi-Água has been mostly accessed in a period of 2.5 months (October 1st to December 15, 2007).

| Order of frequency | City | Visits | Pages/visit | Average Time in site |
|--------------------|---------------------|--------|-------------|----------------------|
| 1 | São Paulo | 330 | 3.25 | 00:01:55 |
| 2 | Rio de Janeiro | 250 | 1.86 | 00:01:24 |
| 3 | Sao José dos Campos | 198 | 10.48 | 00:08:37 |
| 4 | Belo Horizonte | 181 | 1.97 | 00:01:14 |
| 5 | Brasília | 170 | 2.63 | 00:01:31 |
| 6 | ("not set") | 165 | 3.18 | 00:01:38 |
| 7 | Goiânia | 89 | 2.17 | 00:01:41 |
| 8 | Florianópolis | 80 | 3.00 | 00:02:01 |
| 9 | Curitiba | 77 | 1.66 | 00:00:31 |
| 10 | Porto Alegre | 74 | 2.82 | 00:01:26 |

Another important way of evaluating the geographical impact of a scientific journal is to analyze the regional origin of the published articles, the members of the editorial board and the peer review panel. Batista (2007b) presents the ad hoc peer review panel members of the Ambi-Água, as of April, 2007, organized by State and region. The Expedient Section of this edition (Volume 2, Number 3) presents a list of current Ad Hoc Peer Reviewers of Ambi-Água. Table 3 presents the origin of all primary authors that already published in Ambi-Água, organized by State/Country, and the institution of the first author.

Table 3. Origin of first authors that already published in Ambi-Água (Volumes 1 (2006) and 2 (2007)).

| | State/Country | Institution | Nº Articles |
|----|---------------|-------------------------------------|-------------|
| 1 | SP | UNITAU | 9 |
| 2 | SP | INPE | 8 |
| 3 | SP | CSA/CTA | 1 |
| 4 | SP | UNESP/FEG | 1 |
| 5 | SP | UNESP/Sorocaba | 1 |
| 6 | SP | IG/SMA | 1 |
| 7 | SP | UFSCarlos | 1 |
| 8 | SP | UNICAMP | 1 |
| 9 | DF | UnB | 2 |
| 10 | MG | UFUberlândia | 1 |
| 11 | MG | UFV | 1 |
| 12 | PA | SIVAM | 1 |
| 13 | PA | UFPA | 1 |
| 14 | PB | UFPB | 2 |
| 15 | PR | UFPR | 1 |
| 16 | RS | UFPelotas | 1 |
| 17 | Cuba | Centro de Investigaciones Pesqueras | 1 |
| 18 | MD/EUA | U. of Maryland | 1 |

The indexation of a scientific journal in several international directories (Data Harvesters) increases its visibility and circulation. In addition, the publication in several languages and the presentation of an English version of all published abstracts and keywords is expected to enhance the geographic impact of a journal. Table 4 shows the directories that list Ambi-Água. As Ambi-Água is indexed by the Open Archives Initiative, any Service

Providers registered in the OAI-PMH can index Ambi-Água automatically, therefore, increasing the visibility of its published articles.

Table 4. Directories that list the journal Ambi-Água as of December of 2007.

| Directories of Scientific Journals | Link to Find Ambi-Água |
|---|---|
|  | OALster : The University of Illinois OAI-PMH Data Provider Registry: http://gita.grainger.uiuc.edu/registry/details.asp?id=2190 |
|  | Open Journal Systems: http://www.openarchives.org/Register/ListFriends http://www.agro.unitau.br/seer/index.php/index/oai |
|  | The Public Knowledge Project is a federally funded research initiative at the University of British Columbia and Simon Fraser University on the west coast of Canada. |
|  | http://livre.cnen.gov.br/ConsultaPorLetra.asp?Letra=A |
|  | http://www.doaj.org/doaj?func=findJournals&hybrid=&query=Ambiente |
|  | http://www.latindex.unam.mx/revista.php?opcion=1 |
|  | http://dgb.unam.mx/periodica.html |
|  | http://www.socolar.com/vn.aspx?id=6545 |

FINAL CONSIDERATIONS

It is quite evident that there is no single form to evaluate quality or geographical impact of a scientific article or journal. Perhaps, the best practice is to use several indicators and cautiously interpret them. Although restrictions do exist about the use of hit counting of access to the most popular articles of an electronic journal as indicator of the academic merit of those articles, the use of sophisticated and efficient systems such as the Google Analytics can be a tool of great value for the evaluation of on-line journals.

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