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International Collaborative Writing: One Solution for Science Writing and Publishing – Focus on Central and South America

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ABSTRACT

The Central and South American continents do not have any native English speaking countries, and apart from Brazil, where Portuguese is spoken, all other countries have Spanish as their first language. For Central and South American scientists it is extremely difficult to compete with native English-speaking scientists when trying to publish work in top English language-based peer reviewed journals. For them, language- and writing skill-based difficulties are the top two challenges when writing scientific manuscripts for submission to peer-reviewed journals and are, without a doubt, after the scientific core of an experiment, the most essential skills for success in science publishing. This paper explores some perspectives from plant scientists in Central and South America and provides their opinions on how international writing collaboration can serve as one simple but effective solution that could result in scientific publishing success without ethical hurdles provided that strict rules and values are adhered to. Increased competitiveness in a global scientific sphere can be achieved through international writing collaboration as one sub-set of research collaboration that will ensure the competitive advantage that Central and South American scientists will require to publish, advance their careers and move the advancement of science forward.

Keywords: English and science writing skills, partnerships in science writing, science writing collaboration

THE QUESTION OF AUTHORSHIP

Authorship in research papers is in essence decided upon by researchers. Cunha and Cavalcanti (2008) classify three types of authors: 1) The author that is responsible for the content; 2) The author that creates the scientific, literary or artistic manuscript; 3) The author that permits and makes alterations to the content.

However, the American Psychological Association (APA 2007) indicates that not only is the person that writes the text legible to be an author, but authorship should include all those who have made a substantial contribution to the study or research topic.

Each researcher or research group defines their own criteria for authorship and according to that importance, the order of authors in the paper is subsequently determined. Among the criteria used for authorship are the following contributions: supervision, execution and analysis of the experiments, and writing and editing the paper. However, one point of major value and that has recently lost influence on the definition of an author, is the complex thought that an initial idea serves as the original seed for the research and subsequently, the scientific paper. The initial and original idea of research is one of the major intellectual contributions that an author can have and which would lead to a research experiment(s), since this is the origin of all scientific process, and that results in the development and draft of the paper. A original idea can have several intellectual origins: 1) From reading literature in books and journals connect or not to a problem that needs to be solved; 2) From the adaptation of methodologies and applied techniques used for different species, using as reference other articles already published; 3) From ideas not necessary obtained, but based on scientific methods that can result in a paper.

Although this opinion appears at first glance to be simple, the definition of an author of an original idea is much more complex that often involves searching for common ideas with more than one researcher to solve common problems in research or improve protocols and methodologies. Another problem with the definition of authorship is the piracy of ideas, i.e., unauthorized or illegal intellectual property theft.

Other problems involve ethics in publishing: masking data, publishing the same data in more than one journal; copy-cat research of similar previously published work; conflicts of interest among authors (Witter 2010).

International collaboration and partnerships (Teixeira da Silva 2011a, 2011b, 2011c; The Royal Society 2011; Teixeira da Silva 2012) is one of the most important resources for improving the contribution of research developed in Central and South America. Such international collaboration should be not only improved the writing (language and structure) of scientific papers, but also provide a real scientific contribution, too provided that the ethics and initial concept are respected.

PROBLEMS WITH INTERNATIONAL PAPERS FROM CENTRAL AND SOUTH AMERICA

In South America, the relative number of professionals and researchers that are able to combine scientific language with a high-level of English writing is limited, reducing their international competitiveness and ability to publish in high quality scientific journals. This represents a limit to global potential use of this work, information and tech-

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niques that were developed in South America and reduces the number of citation of its authors. An author who is able to develop the work or technique, combining the scientific quality and English (linguistic and grammatical) level of the paper to the level of an international contribution is a simple but viable alternative for mutual aid to researchers, independent of their geographical origin.

Historical changes in research and development (R&D) in Brazil

In Brazil, the change and consequent increase in value of the national currency (Real) after 1995 was a great step forwards in the social, political and economical development of Brazil. This improved the quantity of resources for R&D in Brazil. The consistently high valued currency and the stability of Brazilian economics after 2003/2004 fortified much more financial resources to universities and research institutes for training professors and researchers in of PhD and post-doc courses in Brazilian universities and other countries. This economic situation improved the financial status of high quality research, too.

R&D resources in 2003 was 1.26% (around U$12 billion) of the Brazilian GPD and in 2008 this increased to 1.44% of GPD (around U$25 billion) (The Royal Society 2011). This improved the quality of research and the number of international papers published in this period of time. Due to this favorable condition, Brazil has held a highly ranked position in science around the world (Oliveira 2010; Petherick 2010; The Royal Society 2011). A parallel improvement in economic conditions and political conditioning for R&D was also observed in China.

Recently, Thomson Reuters statistics showed an improvement in the number of papers published by Brazilian researchers, from 5,212 papers in 1994 to 34,210 papers in 2011, and the main universities that contributes to this number of papers were University of São Paulo (USP) accounting for 22.4%, University of the State of São Paulo (UNESP) and the University of Campinas with 8.5% and 7.2% of total papers published in 2011, respectively. Although Brazil saw an increase in the number of published papers (7.6-fold increase between 1980 and 2006), still numerous problems remain to be solved. In the same period, other developing countries improved much more: Taiwan (31-fold), China (54-fold) and South Korea (133-fold). Other problems including fewer citations of Brazilian papers in international papers (i.e., basically an index of the impact on the world by Brazilian research) and an ill-conceived notion that researchers need patents before their final paper is published, remain some of the negative impacts on Brazilian research (Nicolsky 2011).

In a study conducted by the 'Faculdade de Filosofia, Letras e Ciências Humanas' of 'Universidade de Sao Paulo (USP)' that shows a historical analysis of participation in international papers and authored by Brazilian researchers demonstrated an increase in contributions to scientific articles from the 1980's, caused by increased Brazilian participation in international projects and giving visibility to research carried out in the country. However, the number of citations of articles published by Brazilians, as well as the participation of these researchers as leaders in international projects is still a challenge and needs to improve (Barata 2010; Souza Vanz and Stump 2010). Data from Thomson Reuters showed that the number of papers increased 6.6-fold between 1994 and 2011, but the relative Impact Factor® of the papers remained level (0.64-0.65).

Brazil currently accounts for about 2% of world scientific production and about 45% of all Latin America, and between 1994 and 2003, approximately 84.3% of Brazilian publications were in partnership with international researchers. Some authors showed that currently, this contribution is more than 95% (Souza Vanz and Stump 2010; Meneghini and Packer 2006). However, Thomson Reuters showed that international co-authors in Brazilian papers reduced slightly between 1994 (33%) and 2011 (27%).

Marques (2012) showed large differences between the investments of financial resources for R&D according the different regions of Brazil. São Paulo State alone invested in 2010 around U$1.95 billion in R&D, more than 86% of total of investments of the other 26 states of Brazil together. Coincidentally, or not, the Universities of São Paulo State: USP, UNESP and UNICAMP, published in 2011 more than 38% of total papers from Brazilian research.

In fact, the quality of Brazilian science is assessed and quantified by a new system, the Qualis system (Qualis 2012), developed by Coordination of Improvement of Higher Education Staff (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES) and consists of a classification of scientific journals into 8 ranks, all of which are basically based exclusively on Thomson Reuter's IF (or JCR indexing/ranking):

A1: IF ≥ 4.34

A2: IF ≥ 3.25 and < 4.34

B1: IF ≥ 2.17 and < 3.25

B2: IF ≥ 1.40 and < 2.17

B3: IF ≥ 0.80 and < 1.40

B4: IF ≥ 0.10 and < 0.80 + Scielo listing

B5: IF < 0.1 + Indexed without an IF (only PubMed)

C: Irrelevant journals.

Ironically, there are 22 journals listed as being without an IF and not indexed, but because they are Brazilian journals with an editor board and with peer review, they have been classified as B5. Regrettably, CAPES uses these criteria (Qualis Classification) as part of an evaluation system and classification of undergraduate programs (see Indicators section of CAPES 2012). These criteria are used, as example, to establishment scholarship quotas for undergraduate (MSc and PhD) programs, despite the criticism that exist about the IF and how it has and can be manipulated. In reality, not only CAPES, but also other agencies provide financial support to Brazilian research based on papers published in journals with a high IF. The biggest consequence (and risk) of this system is the permanent dependence of the measurement of "quality" on the IF, a disturbing trend that affects other countries, too (Saha *et al*. 2003; Simons 2008).

Uruguay: Perspectives

There are no official rules by the Ministry of Education which stipulate who can become an author or a co-author in Uruguay. The University (Universidad de la República, which is the only public university and the biggest) has a commission of intellectual property (CSIC 2011) where there are regulations about patents, copyright, royalties, etc. Anyone carrying out research is able to write and submit a paper. In fact, we are encouraged to do so. It is generally assumed that the first author is the person who is responsible for a research project (and is also the corresponding author). Other scientists involved (students for example) are included in alphabetic order. In the case of projects which are the student's thesis, then the student is the first author of a publication and the researcher who orientates him/her is the last author. This is generally the case, but it may vary with different groups, and situations other than this may arise. Authorship position is very important in terms of academic significance, as scientists in Uruguay are periodically evaluated and re-elected for their academic positions, and publishing is one prerequisite of prime importance. Some evaluators only take into account a scientist's contributions as first author. The same applies for grants, or other financial support requested; applications are evaluated in terms

of 'scientific production', which in Uruguay means the number of publications that one has as first author. Regarding statistical analysis, if the author needs help from the statistics department, the person who assists with statistical analysis becomes a co-author. This is a new policy that did not exist as little as one or two years ago (Biometria 2010). This applies to the Agronomy Faculty (Universidad de la República), but might not be a policy that applies to Uruguay as a country. Two of the main difficulties scientists in Uruguay face when submitting a paper pertain to language and writing skills in a foreign language. Financial issues may also be a difficulty, but there are institutional programmes to support the costs of publishing (CSIC 1997). Differences in the style of journals make it impossible to submit a paper that has been rejected to another journal without making thorough changes, which is a time-consuming process. Free access to scientific literature used to be a major problem in Uruguay, but since January 2009, scientists in Uruguay have free on-line access to important data bases such as Springer, Elsevier, Scopus and others through 'Portal Timbó' (Portal Timbó 2011).

Cuba: Perspectives

There is no official data published on the current state of scientific research in Cuba. As has been abundantly mentioned for other countries in Central and South America, the primary difficulty for scientists in Cuba is related to language. This is further worsened by the speed and freedom of access to the Internet, hindering rapid and up-to-date searches. The lack of updated scientific literature is very common, especially since research institutes are often on an extremely tight budget, unable to pay for access to leading journals in that field of research. These journals, in turn, are increasingly stricter with the quality of work submitted, and in plant science, the lack of molecular studies to support other proof is a limiting factor due to a lack of equipment and reagents in most laboratories. Consequently, there is a massive brain drain by Cuban scientists to other countries to complete PhDs and post-docs.

Ecuador: Perspectives

Scientific Research in Ecuador has not been well developed because Higher Education Centers in the country do not support its promotion or it operation. University Research Centers refer almost exclusively to theoretical formation of knowledge, with little or no practice in the theoretical approach of research or development.

A global standardized measure of the level of development and research is the number of professionals who graduate with degrees such as Doctor of Philosophy (Ph.D.). In neighboring countries, this number is very high, approximately 15,000 Venezuela and Colombia with 5,000. However, in Ecuador as at 2007 there are just 100 more than in 2004, according to data from Fundacyt (Foundation for Science and Technology of Ecuador, now SENESCYT).

Most of the documents in indexed journals have been published through the isolated efforts of individuals or institutions to meet specific needs. Generally, an individual who does research abroad, returns to the country only to find there is no manner to promote knowledge for the benefit of the institutions and people of Ecuador. This contributes to the exodus of highly qualified personnel (no data available) and the stagnation of the country's biotechnology development. A new study concerning this was conducted by the Chilean economist and MIT graduate, Andres Solimano, for the United Nations Economic Commission for Latin America and the Caribbean (ECLAC). The study confirmed that the United States continues to attract the majority of Latin American talent, attracting 60% of highly skilled professionals and entrepreneurs from the region.

According to World Bank estimates, 14.3% of college graduates in 2000 Mexicans residing abroad, while the rate in Colombia is 11%, Ecuador 10.9%, Chile 5.3%, Brazil 3.3% and Argentina 2.5%. The highest percentages are in Central America and the Caribbean.

In the last four decades, each of the 73 universities and Technical Institutes in Ecuador produced, on average, only four publications every five years according to an article published in 2009 by Ecuadorinmediato (Newspaper in Ecuador). According to the same article, from 1965 to 2009, educational institutions in Ecuador published 2912 articles, books and scientific reports worldwide. This number is insignificant when compared with Chile, which published 60,570, Venezuela, with 28,580 articles, Colombia, with 15,574, or Peru, with 7085 works in the same period.

Ecuador along with Honduras, Nicaragua and Guatemala, only invest about 0.001% of GDP on science and technology, well below countries like Brazil which invests 15 times that in same category (RICYT 2009).

There is a long-held belief that the high standards and demands to the elite international journals give little opportunity to Ecuadorian researchers to publish with a total lack of research qualifications, the lack of laboratories and libraries, the poor economic support to the production of scientific research and problems with translation from Spanish to English, all of which cause the lack of noteworthy scientific publications and high-impact research.

It is hoped that the new government, Rafael Correa Delgado, elected in January 15, 2007 in terms of science and technology, will promote the growth of scientific publications in indexed journals, create reforms in the system of higher education; and help standardize scientific research in the country. 70% of the country's scientific research is sponsored solely by the government.

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