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Scientific publishing in developing countries: Challenges for the future

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"*It is science alone that can solve the problems of hunger, poverty, insanitation and illiteracy. The future belongs to science and those who make friends with science*" Jawaharla Nehru, free India's First Prime Minister (Allahabad University, 1946)

Abstract

In this paper, I first refer to the center-periphery dichotomy in terms of scientific output, placing emphasis upon the relation that exists between science and technology development, on the one hand, and social and economic development, on the other. I then analyze the main problems faced by most peripheral journals and the role nation states play in scientific activities in developing countries. I then address issues such as the world power structures, the social organization of developing countries, growing North/South disparities and the question of collaborative research. The discursive (i.e., language related) and non-discursive problems faced by researchers in periphery countries and the main initiatives that have recently been taken to try to solve the stark disparities that exist in the world of scholarly publishing are also discussed. I finally present a proposal, the aim of which is to suggest ways that could help scientists in periphery countries become fully integrated members of the worldwide network of science and would also contribute to the promotion of scientific multilingualism, a means for science to be truly universal, as it should be. I conclude by arguing that science, technology and publication form a triad which is essential for the survival of developing nations, and that, although the complete elimination of inequities in the world of scholarship is unlikely, progress could be achieved if there were a **universal** will (i.e., a worldwide will at the institutional, governmental and intergovernmental levels) to redress the current North/South imbalance.

Keywords: Linguistic imperialism; Scientific multilingualism; Periphery; NNES scientists; Research; Local/small journals

1. Introduction

When talking about scientific research and publishing, one must refer to a number of different concepts, including: 1) science itself, 2) publishers, 3) the role of nation states, 4) the world power structures, and 5) the researchers themselves. In this paper, I wish to draw attention to the stark disparities and inequities that exist in the world of scholarly publishing and also to the fact that the gulf between rich (developed or center) countries and poor

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(developing or periphery) countries is widening.[1] Indeed, the digital divide contributes not only to the exacerbation of this gap but also to the deprivation suffered by researchers in developing countries. I therefore first of all examine the broad geopolitical context of academic/scientific publishing (numbers 1 to 4 above), and then the more specific problems faced by periphery researchers, i.e., scientists who live in developing countries whom Canagarajah (1996, p. 468) refers to as ''consumers of central scholars' knowledge'', and Ferguson (2007) as those off-networked academics who are isolated from the scholarly conversation of the discipline. I then discuss the main initiatives that have been undertaken lately to try to redress the current world imbalance regarding the world's scientific output, and I present a proposal, the aim of which is to promote scientific multilingualism and suggest ways that could help scientists in periphery countries become fully integrated members of the worldwide network of science.

2. Science: center-periphery dichotomy

A small but important part of the world's inequities manifests itself in the field of scientific publishing, where the bulk of what is published in widely read peer-reviewed scientific journals is authored by writers associated with institutions in industrialized countries.

The scientific world, divided into the 'haves' (the industrialized world) and the 'have-nots' (the developing world), is remarkably unequal in terms of volume and output.[2] But the periphery world is not a homogeneous whole; indeed, even within developing countries (and regions) there is a tremendous disparity in the distribution of science. Moreover, the gap between the 'haves' and the 'have-nots' is not only dramatically evident but also constantly widening (e.g., Arunachalam, 2002; Marusic & Marusic, 2000). In 2001, the United States of America, the European Union (then made up of 15 members only), and Japan, some of the world's wealthiest countries, collectively accounted for 78.3% of the world's published scientific research (European Commission, 2003). Taking citation analysis as an indicator of the global strength of science, King (2004) shows that 31 nations only (out of a total of 191) contribute 98% of the volume of citations to scientific research. In 2003 (when King collected his data), the US ranked first and the UK came second, but the European Union was overall second. Then followed Germany, Japan, Canada, France and Italy. The rest of the world, and this was King's key point, came as a very poor third. Of these 31 nations, only three belong to the developing world (China, India and Iran).

The existing disparity is also highlighted by the fact that 90% of important scientific research is published in 10% of journals, and while developing countries comprise 80% of the world's population, only 2% of indexed scientific publications come from these parts of the world (Abdelrahim, 2004). In a nutshell, then, all the macro bibliometric and scientometric studies, recent and past (e.g., European Commission, 2003; King, 2004; World Bank, 2006), bear out that there is a strong association between scientific research output and national wealth distribution across the world.

Understanding the reasons for the dearth of scientific productivity from developing countries is not only of academic interest, but essential for promoting the economic and social development of these marginal regions of the world for which the 'culture of science' must be one of their prime objectives if they want to have a chance to overcome hunger, poverty, poor sanitation and illiteracy and stop being the victims of exploitation (see Nehru's quote at the beginning of this paper). Indeed, the strong correlation between science and technology development, on the one hand,

[1] What used to be called the 'Third World' is now most frequently referred to as the 'developing,' 'periphery,' 'marginal,' 'non-center' or 'outskirt' world or the South. These terms stand in opposition to the 'industrialized,' or 'developed' world, the North – also called the 'center.' In this paper, I will refer to the former as the 'periphery' or 'developing' world and to the latter as the 'center' or 'industrialized' one. It should be kept in mind, however, that, within the developing world, further distinctions are today made between 'least developed' countries (LDC) or the 'Fourth World' (e.g., Niger) and 'newly industrialized' countries (NIC), such as India, Iran and China, which are nevertheless periphery in terms of international science publishing.

[2] According to Arunachalam (2002, p. 7), in 1998, Malaysia, Philippines, Thailand, Indonesia, Pakistan, Sri Lanka, Bangladesh, Peru, Cuba, Venezuela and virtually every country in Africa (except South Africa) had published less than 1,000 papers each; in many cases, less than 500). The same source indicates that if we look at the number of papers published per unit population, the gap between the developed and the developing countries is even more striking. One should however be careful with such assertions: the Science Citation Index (from which most scientometric/bibliometric data are drawn) indeed covers less than a quarter of peer-reviewed journals worldwide and its preference for English-written journals is well-known (Cronin, 1984; Dong et al., 2005, among many others). A review of the latest Citation Index, for example, cites less than 2% of the journals published in the developing world (ISI citation index, (http://www.isinet.com, accessed October 2006).