

## **OPENING NEW PERSPECTIVES FOR BRAZILIAN YOUNG SCIENTISTS**

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The Brazilian scientific production has grown 10-fold in the last three decades. This output is 5-fold higher than the mean growth of the world and one of the most expressive among all countries, positioning Brazil in the 15<sup>th</sup> place in the world rank in 2006. Such efficiency can be credited to a national plan, designed to establish and support training and development of human resources for strengthening science and technology activities in the country. This plan, named National Post-Graduate Program (PNPG) was initiated four decades ago. This well structured educational system, recognized through out the world, is dedicated to the formation of young researchers at both Master and Ph.D. levels. Today, the PNPG can be viewed as a successful program in terms of achievement and the quality of its general output. During this period, research activity has been institutionalized and more than 23,000 active groups, comprising 65,000 researchers and several thousand Ph.D. and Masters students working in several universities and research centers have been consolidated. Numerous technological advances in many areas have been achieved throughout the country. A most impressive result of this effort was the acceleration and improvement of a more productive and internationally competitive agriculture and animal production; banking and industrial plants automation; space science development and aircraft production; extending knowledge in tropical diseases; scientific development in both research and services attendance in dentistry; medical and biomedical advances in several fields; deep water extraction and exploitation of petroleum; biofuels (ethanol and biodiesel) production; metallurgical, civil and electric engineering including metal-mechanic industry, hydroelectric power plants and paper-cellulose complex exploitation. These advances also stimulated better performance of several other economic fields such as agribusiness. The existence of an effective system based on a group of multi-funding agencies belonging to both the federal (CAPES-MEC; CNPq-MCT and FINEP-MCT) and state (several State Foundations) governments, was an essential additional factor.

In 2007, the entire PNPG covering 47 fields of knowledge accounted for 2,545 Master and 1,309 Ph.D. courses with 160,000 Ph.D. and Masters students; a total of 83,479 Masters and 25,183 Ph.Ds. degrees were granted in the last evaluated triennial (2004-2006) period. The scientific production in the most recognized international journals increased continuously since 1981. The achievements of Brazilian C&T system attained were strictly linked to four components: a) a strong fellowship program named "Initiation in Science" designed for undergraduate students and sponsored by CNPq; b) formation of Research Groups through out the country, organized and monitored by CNPq; c) a carefully planned and recognized process established for watching over the need of increasing growth of PNPG, as well as for its financial support, conducted by CAPES, are both under a most rigid and permanent peer review evaluation of all post-graduate courses; and d) choice of appropriate partners for international cooperation.

Despite of these advances, in the last two decades a group of challenges is hampering our best expectation to sustain the country's perspectives of reaching a better position in the world concerning our scientific output and particularly concerning technological research, development and innovation. Among others, some of these problems are listed bellow:

1. In several institutions the best post-graduate courses are getting old thus requiring a necessary renewal of their scientific staff. This situation, already pointed out in the press, requires a prompt action of the government in order to guarantee the outstanding output of these courses;
2. Up to 2010, not less than one third of the teaching and research staff of the Federal Universities will be renewed and/or amplified. A similar advance process will happen in research centers such as EMBRAPA and many others. Quite often, however, the newly hired young professor or researcher does not correspond to the expected capacity to cover the requirements of the Post-Graduate courses and/or scientific activity in order to unwrap and cope with new and innovative fields of research. It means that some additional process designed for the incorporation of highly qualified young researchers into universities and research centers are required in order to face this problem;
3. Uncoupled growth capacity of the S&T system for granting research fellowships (CNPq's Productivity Fellowships) for young researchers as compared to the PNPG capacity of awarding new Ph.D. degrees. It is well known that a great number of well trained young researchers are presently out of this most important CNPq program designed to assure the scientific and technological development of the Country.

### **Actions and proposals designed to face the challenges**

1. In addition to the 10,000 concourses already made since 2004, another group of 13,000 academic places linked to the REUNI Program of MEC will be open in the Federal Universities before 2011. A National Concourse for filling these positions is under negotiation with ANDIFES in order to assure better regional distribution and research conditions for the hired young Ph.Ds.
2. Aligning doctorate students thesis project with an international "sandwich" fellowship and a post-doctoral program in one single induced pack. This model designed to combine the student project of thesis with job demand of the institutions will be started by CAPES under a agreement with EMBRAPA and can be extended for other organizations .
3. Reestablishing the financial capacity of CNPq's Productivity Fellowship Program. CAPES offered to assume, in three years, all Master's fellowships of CNPq. This project now under negotiations inside the government, will be made with CAPES own budget, starting in 2009, does allowing CNPq to use the equivalent budget to increase in about 80% in this period the number of its Productivity Fellowships as compared to today.
4. Teaching fellowships for young professors at Federal Universities. This new program, similar to the CNPq's Productivity Fellowship is now being established by MEC and will reach most of the newly hired professors in the Federal System. The program will be coupled to PIBID, a new type of fellowship created by CAPES, similar to the PIBIC of CNPq, that will reach about 20,000 undergraduate students in 2009. The young University

professors and undergraduate students awarded PIBID fellowships will develop activities oriented to increase the quality of basic education, now part of the new mission of CAPES.