

In this special edition of *Tecnura Journal*, which is devoted to the Doctorate in Engineering of our university, it is pertinent a reflection on the current state of doctorates in Colombia.

We may initially point out that doctorate programs in the Colombian universities are relatively new. According to the National Ministry of Education, in 1990 there were only six programs of this type, while in 2002 we already had 34. In the last years a considerable rise has been registered, reaching 197 programs in 2013 and 226 in 2014, according to data from the National Accreditation Council. The amount of students that take these doctorates in our country has increased significantly in the last years; while in 2011 were registered 2.920 doctorate students in the whole country, at the end of 2013 the amount of students rose to 3.467.

While these encouraging numbers have been increasing, the current state of the doctorates in Colombia presents particular characteristics that draw attention and that have been analyzed in different aspects, out of which we can mention the following:

Despite the rising number of students, few of them actually culminate the doctorate, since between 1990 and 2012 only 1.250 doctors were graduated from the Colombian universities.

Most graduates come from the same universities where they work at.

Out of the graduates, 51% of the new doctors are working in higher Education, either because they have maintained the labor relationship, or because they linked to universities before ending their studies or after their graduation.

Besides those employed in educational institutions, a big amount states to work as consultant or independent researcher, or they do not have incomes. Only a minimal part works in public administration when they graduate.

Although the designed policies have made room to the increase in the number of doctors, and there are progressively more universities having doctorate programs, a few concentrate most part of those.

The amount of Colombian doctors is still very low compared with most of the countries in the region that hold similar development characteristics with our country.

Currently, 43 Colombian universities have doctorate programs, but six of them group 126 out of the 226 existing. Universidad Nacional has 57, Universidad de Antioquia 24, Universidad de los Andes 15, Universidad del Valle 13, Universidad del Norte 10, and Universidad Javeriana 7 programs. The remaining 37 universities group the other 100 programs.

In terms of the number of graduating doctors every year in the region, during 2011, according to the news site of Universidad Nacional, Brazil registered 12.217 graduates. Followed by Mexico with 4.665, Argentina with 1.680, Cuba with 1.235, and Chile with 514. Colombia registered 245 graduates and only overtook Costa Rica which, according to the report, had 112.

Despite the increase of the doctorate programs offered in the country and the number of students taking them, our indicators are below related to other Latin-American countries; and even lower in respect to other developed countries that register the number of graduate doctors every year per million inhabitants. According to this same source, in 2012 Portugal graduated 152, Spain 173, United States 156, Australia 240 and the United Kingdom 259. It is also mentioned that, in 1930, the number of doctors per million inhabitants in the United States was larger than the current Colombian index with 130 doctors per million inhabitants in total. On this aspect, it is important to remark that this situation is the result of the late entrance of the country in this type of formation, as noted by the same researchers.

The State has admitted that without doctors to create knowledge networks assembled to the different sectors of the economy, it is not possible to achieve a great productive transformation in Colombia; and it is required to double governmental and private sector efforts in order to reach the established objectives. Our country has set as its goal to educate 20.000 doctors by 2034 and create 16 high-standards research centers by that year. According to the National Ministry of Education, with the growth projections for current programs and those in process, it is expected that in 2018 there will be 7.126 teacher-researchers with a doctorate, 12.626 for 2024. The goal for year 2034 is having 26.695 doctors in the country.

Finally, though the results obtained so far in Colombia in terms of doctoral formation are discrete,

and those are barely the beginning of a long road in their policies, for Colombia it is already evident the challenges that bring along to our universities the formation in this level regarding the institutional capacity in matters of equipment, infrastructure and human resources, internationalization, accreditation and sustainability in the mid and long term of doctorate programs. Even so, maybe there is the greater challenge that means the insertion of doctors educated in our universities inside the different economical sectors of the national life.

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