

# Is Mexico Sending Mixed Messages About International Skilled Migration And Knowledge Production?

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The competition for international talent, that is, international migrants with graduate degrees or who are highly skilled, has increased considerably in recent years. Many nations have had to change their immigration policies to attract people with a “desirable” profile. For example, Germany introduced the “blue card” in 2012 to make the immigration process more flexible for highly educated individuals. The United States has changed its immigration laws to retain more graduates in the so-called “STEM fields” (science, technology, engineering, and mathematics). Similarly,

Denmark, Japan, and France have made changes to keep highly qualified people from other countries. And Canada also revised its immigration laws in 2013 to facilitate the immigration of highly qualified personnel.

In fact, in most of these countries, attracting highly qualified individuals begins with promoting and competing to attract graduate students and fostering this educational level. Some other countries have taken different measures, like Estonia, which in 2012 decided to offer social security and increased numbers of scholarships to motivate students to pursue doctorates; in 2014, Italy created programs offering scientific independence to young researchers. Other countries that have developed this kind of policies are Russia, Slovenia, New Zealand, Turkey, and England. The Organisa-

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tion for Economic Co-operation and Development (OECD) also mentions Mexico's Professorship Program at the National Council for Science and Technology (Conacyt), just created in 2014, which we will touch on here.<sup>1</sup>

While the countries look for how to attract more international students with publicity programs like "Study in Australia," "Study in Germany," or "Study in Texas," among many others, the competition for international talent goes way beyond this. It implies issues such as, for example, the budget earmarked for science and technology, hiring conditions, and stimuli for pursuing specialized studies, among others. This is why the central questions in this article are what place Mexico occupies in terms of attracting and training talent and producing knowledge, and what its main policies in this field are.

#### NATIONAL SCHOLARSHIPS OR SCHOLARSHIPS TO STUDY ABROAD?

The main policies for training highly skilled personnel in Mexico can be summarized as follows: awarding scholarships for graduate studies in Mexico and abroad (since 1971); the establishment in 1991 of what is known today as the National Program for Quality Graduate Studies (PNCP);<sup>2</sup> national sabbaticals and post-doctoral programs and national sabbaticals and post-doctoral programs abroad; the repatriation of high-level scientists and technicians; retaining high-level researchers; retaining high-level scientists and bachelors in technology; fellowships for scientists and technicians' profes-

sional development abroad and the placement of high-level scientists and bachelors in technology in companies; and the recently created (2014) Conacyt Professorships for Young Researchers. It is worth pointing out that these policies have not been unchanging or established at the same time; practically all of them have changed their original criteria and some have disappeared.

The current Mexican government scholarship strategy for training highly qualified personnel involves a clear bet on strengthening the country's national graduate programs and limited internationalization (it puts a priority on temporary, not permanent, mobility, in master's and doctoral programs and post-doctoral extended stays); awarding scholarships to foreign students in national graduate programs; and beginning to promote young recent graduates being given academic posts.

When the Conacyt scholarship program was created in 1971, 378 were given for students to go abroad (65 percent), and only 202 for graduate programs in Mexico (35 percent). In 2014, 5 205 scholarships were given for graduate studies abroad, compared to 46 109 to study in Mexico. The tendency changed so much that 90 percent of the budget earmarked for graduate scholarships went for studies inside Mexico and only 10 percent for studying abroad. Graph 1 shows the historic trend in Conacyt scholarships.

That is, the emphasis on national graduate programs and not pushing students to go abroad, except in strategic areas, speaks to a conception of how to train highly qualified workers, but also of the role of knowledge and the way it is produced. The same trend can be seen in other scholarship programs

like the Program for Teachers' Professional Development (previously the Program for Teacher Improvement).

#### THE PRODUCTION OF KNOWLEDGE

According to the OECD, countries can be classified as producers of knowledge or passive or technologically disconnected users.<sup>3</sup> When it defines the knowledge-based economy, it refers to knowledge directly linked to industrial and commercial impacts, knowledge that generates value on the market. The quest for innovation has become a kind of mantra repeated in universities, companies, and governments. However, it should be remembered that emphasizing a certain kind of knowledge relegates other equally important kinds that apparently do not generate economic benefits to the back burner.

Although many kinds of knowledge exist, applied and specialized knowledge is what has become more important in recent years.<sup>4</sup> Different authors have written about the new forms of production of this kind of knowledge: from Nowotny, Scott, and Gibbons and others, who have written about "mode 2" production of knowledge (socially distributed, oriented to application, transdisciplinary, and subject to accountability);<sup>5</sup> Etzkowitz and Leydesdorff, who made contributions about the "triple helix" (relations established among the university, industry, and the government);<sup>6</sup> to the work by Slaughter and Leslie and Slaughter and Rhoades about "academic capitalism" (how new regimes in production have been established, emulating economic production, particularly in universities).<sup>7</sup>

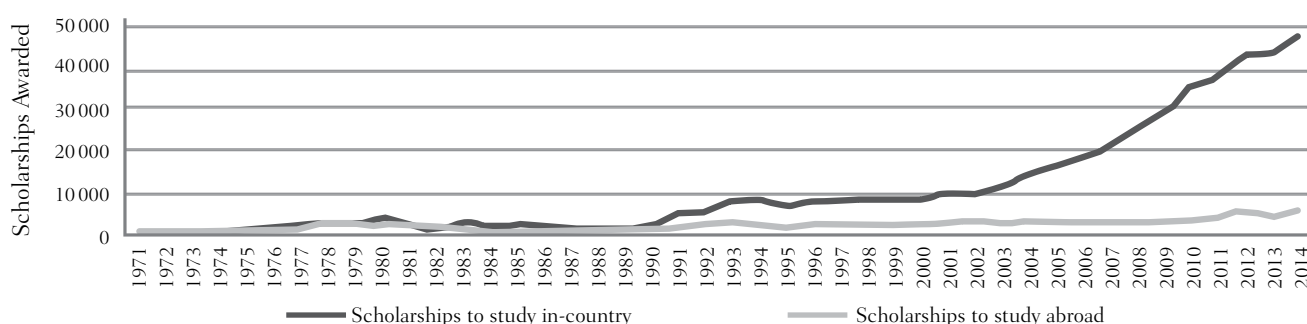
The National Science and Technology Council (Conacyt) eliminated the concept of "scholarship-loan" that forced recipients to return to work with Mexican institutions because the Mexican government is not obligated to offer a job in the country.

In fact, some work now proposes the idea that we find ourselves in "mode 3 of knowledge production" and that the image representing this is a quadruple helix (university, industry, government, and civil society).<sup>8</sup>

But, beyond the different interpretations of how knowledge is produced, the fact is that the process has become more complex, universities have lost their exclusive claim to its production, and international cooperation has been fundamental for the most important achievements of recent years. For that reason, it is appropriate to ask ourselves what the most effective forms are for ensuring the establishment of fruitful collaboration and participating in the world's most important networks for producing knowledge. And, in this context, what is Mexico doing about it?

This article presents only three examples. In the first, the country decided to join forces to strengthen and support the development of national graduate programs, at the cost, perhaps, of not sending some students abroad to study, but supporting short stays outside the country. Despite this, the number of scholarships to study abroad is by no means negligible. The change in policy consists of not forcing students who have scholarships abroad to return to the country; they

GRAPH 1  
THE NATIONAL SCIENCE AND TECHNOLOGY COUNCIL (CONACYT)  
SCHOLARSHIPS FOR GRADUATE WORK IN MEXICO AND ABROAD (1971-2014)



**Source:** Developed by the author using data from Conacyt, *Indicadores de actividades científicas y tecnológicas. Edición de bolsillo*, 2012, <http://www.conacyt.gob.mx/siicyt/index.php/indicadores-cientificos-y-tecnologicos/indicadores-actividades-cientificas-y-tecnologicas>, del *Primer informe de gobierno* (Mexico City: Gobierno de los Estados Unidos Mexicanos, 2013), and from *Segundo informe de gobierno* (Mexico City: Gobierno de los Estados Unidos Mexicanos, 2014).

are only asked to finish their graduate studies. Does this indirectly encourage young people with scholarships for studying abroad to remain there? Would it not be better to vigorously promote their leaving, but also returning home?

In 2004, the Conacyt eliminated the concept of “scholarship-loan” that to a certain extent forced recipients to return home or establish some form of collaboration with Mexican institutions. The policy read, “At the end of the study program, [the student] must show that he/she has returned to Mexico to contribute to national development.”<sup>9</sup> The change occurred not only to make criteria more flexible, but also because the Mexican government is not obligated to offer its former scholarship recipients a job in the country. Considering the fact that not many scholarships are awarded to study abroad and that they are quite expensive for the country, is it really the best idea for the country to free a scholarship recipient from his/her obligation to the country? Is it a good idea for a system to put forward the idea that there will be few students with scholarships abroad, perhaps fewer and fewer with regard to those offered stipends to study in-country, but to consider it okay if they do not return?

In the second example, Conacyt’s support for post-doctoral stays abroad aims mainly “to support high-level human capital desirous of continuing their training, allowing them to place themselves on the cutting-edge of knowledge and innovation to be able to compete in international circuits.”<sup>10</sup> However, we should take into account that people with post-doctoral studies are a fundamental part of the work force in the process of knowledge production in universities worldwide due to their high level of training. Their numbers have increased internationally at the same time that the number of available academic positions has decreased; therefore, they constitute a less expensive work force than academics already working in institutions, who, thanks to these hires, are freed up from activities like supervising other students.<sup>11</sup>

In the United States, the survival of certain fields in mathematics or engineering depends on the participation of international students. That is why it is worth asking, if post-doctoral students carry out important work in the production of knowledge, why Mexico should subsidize their stays in the institutions where they go to work. Is this not actually a subsidy to those universities, most of which are in developed countries? Is it worthwhile to subsidize them in exchange for the students’ acquiring work experience in research? Does the subsidy compensate the benefits received in terms of participation in networks and the hope of future collaboration? No matter how

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complementary the support is, should paid post-doctoral stays entirely sustained by the universities be promoted, as happens with most of the individuals employed in this way?

Third example: the Special Program for Science, Technology, and Innovation underlines the importance of “the social appropriation of science and knowledge in Mexico.” However, it has never been clear what that social appropriation consists of and what it should look like concretely. The Conacyt states that “the knowledge generated by scientific and technological research and innovation must be utilized by Mexican society in its on-going process of transformation and social and economic development.”<sup>12</sup> One recently created program, Conacyt Professorships, states that one justification for its operation is that “the private appropriation of knowledge plays an essential role as the detonator for the country’s economic development, an essential motivator for private investment in research and economic development.”<sup>13</sup> That is, the right of researchers to register the knowledge they produce should be promoted and, if the institution tries to interfere, it should be penalized. What is not clear here is whether the right to individual intellectual property and the importance of social appropriation of knowledge can both fit in a single objective. What is meant concretely by the phrase “social appropriation of knowledge”?

#### FINAL REFLECTIONS

The foregoing examples serve to show some of the problems that arise when defining countries’ policies on science and development. In the case of Mexico, several contradictions come to mind immediately; they are not necessarily negative, but rather should motivate the discussion about what the best, most effective way forward is for discussing how public monies should be spent on science and development in an emerging economy that is primarily a consumer of knowledge like Mexico.

If we support the training of highly-qualified personnel, what should the obligations of the individuals who receive the support be and what would an unrestricted policy with

no conditions look like? Until now, Mexico's strategies around the production of knowledge seem to be based on the premise that increasing national graduate programs will bring us closer to knowledge-producing countries. The biggest proposition today is that this may not require getting a degree abroad, but that it would be sufficient to have a degree from a Mexican institution and spend a short, temporary stay abroad

to become highly specialized and establish international networks. Would that be enough to close the gap with the more advanced countries? If we contrast these policies and their results with the ambitious goals they purport to aim for, like guiding the country "toward a knowledge-based economy,"<sup>14</sup> then, up until now, these strategies would seem to leave us with more questions than answers. ■■

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#### NOTES

<sup>1</sup> OECD, *Science, Technology and Industry Outlook 2014* (Paris: OECD, 2014), pp. 76 and 246-247, [http://dx.doi.org/10.1787/sti\\_outlook-2014-en](http://dx.doi.org/10.1787/sti_outlook-2014-en), accessed January 2, 2015.

<sup>2</sup> This was known from 1991 to 2000 as the Registry of Excellence, and from 2000 to 2006 as the Program for Strengthening National Graduate Programs. [Editor's Note.]

<sup>3</sup> OECD, *The Knowledge-based Economy*, OECD/GD (96) 102 (Paris: OECD, 2006).

<sup>4</sup> Burton Clark, *El sistema de educación superior. Una visión comparativa de la organización académica*, R. Kent, trans. (Mexico City: Nueva Imagen/Universidad Futura/Universidad Autónoma Metropolitana, 1983), p. 36.

<sup>5</sup> Helga Nowotny, Peter Scott, and Michael Gibbons, "Mode 2 Revisited: The New Production of Knowledge," *Minerva* vol. 41, no. 3, pp. 179-194.

<sup>6</sup> Henry Etzkowitz and Loet Leydesdorff, "The Dynamics of Innovation: from National Systems and 'Mode 2' to a Triple Helix of University-Industry-Government Relations," *Research Policy* vol. 29, no. 2 (2000), pp. 109-123.

<sup>7</sup> Sheila Slaughter and Larry Leslie, *Academic Capitalism: Politics, Policies and the Entrepreneurial University* (Baltimore: The Johns Hopkins University Press, 1997), and Sheila Slaughter and Gary Rhoades, *Academic Capitalism and the New Economy* (Baltimore: Johns Hopkins University Press, 2004).

<sup>8</sup> Elias G. Carayannis and David F. J. Campbell, "Mode 3 Knowledge Production in Quadruple Helix Innovation Systems," *SpringerBriefs in Business* vol. 7, 2012, doi: 10.1007/978-1-4614-2063-0\_1.

<sup>9</sup> Conacyt, "Trámite de carta de liberación," <http://www.conacyt.gob.mx/index.php/tramite-de-carta-de-liberacion>, accessed January 2, 2015.

<sup>10</sup> Conacyt "Convocatoria 2014. Estancias posdoctorales al extranjero para la consolidación de grupos de investigación," <http://www.conacyt.gob.mx/index.php/becas-y-posgrados/becas-en-el-extranjero/estancias-posdoctorales-y-sabaticas-en-el-extranjero>, accessed January 2, 2015.

<sup>11</sup> Brendan Cantwell, "Academic In-sourcing: International Postdoctoral Employment and New Modes of Academic Production," *Journal of Higher Education Policy and Management* vol. 33, no. 2, 2011, <http://www.informaworld.com/smpp/title~content=t713431525>, accessed January 31, 2014.

<sup>12</sup> Conacyt, *Programa Especial de Ciencia, Tecnología e Innovación 2014-2018* (Mexico City: Consejo Nacional de Ciencia y Tecnología, 2014).

<sup>13</sup> Conacyt, "Cátedras Conacyt para jóvenes investigadores. Convocatoria para instituciones de adscripción 2014-1," <http://www.conacyt.gob.mx/index.php/el-conacyt/convocatorias-y-resultados-conacyt/convocatoria-catedras/jovenes-2015>, p. 10.

<sup>14</sup> Conacyt, *Programa Especial* . . . op. cit.