be paid, or supplemented, by research agencies or special funding schemes outside of university control. Competitive research funding, largely from public agencies, became the rule. Graduate programs may charge fees, and in fact many specialization and master's programs are self-sustained. Diversity of funding at the graduate unit level brought increased autonomy vis-à-vis the central administration, with more flexible contract arrangements and workplace rules. Thus, graduate education became a safer niche for research-oriented, full-time faculty than in the past within the professionally dominated public university. The downside is that often this niche is quite isolated from the rest of university life, except for the market-driven specialization courses.

Last, but not least, the growth of graduate education is associated with increased differentiation within the professoriate in terms of academic status, career orientation, and academic values. While in the past an academically oriented professoriate consisted mostly of a small group of foreign-trained and internationally oriented scholars with a tenuous status within the public university, it has now become a major (although by no means predominant) segment of locally trained faculty, more often than not associated within graduate education.

Doctoral programs are largely concentrated in public universities and almost entirely supported through public funding allocated to education and/or scientific research.

Conclusion

Although research and advanced training are certainly the most internationally oriented segments of higher education in Latin America, as elsewhere, the risks of parochialism and inbreeding are not to be dismissed when academic communities are still relatively small, a sizable proportion of researchers are locally trained, and mobility is restricted by the small number of research-oriented universities that often favor their own doctoral graduates in recruiting new faculty. The reliance upon domestic publication in Spanish or Portuguese, particularly but not solely in the social sciences and the humanities, is a mixed blessing in this regard. Given the decreasing number of foreign-trained researchers in the region, a number of alternatives are actively explored by funding agencies, research universities, and the academic community to counteract the risks of development. International coauthorship has increased markedly in some countries and disciplines. Collaborative efforts in quality assurance involving international counterparts, often supported by international agencies, are numerous and productive. A number of research and advanced training collaborative efforts are run with the support of electronic media, supplementing the expensive academic exchange programs. Sandwich fellowships for doctoral students to spend time in overseas laboratories and institutes to complete their theses have become very common. Internationalization is thus a priority on the agenda, yet it has to compete with many other factors for domestic funding at a time when international donor agencies do not find compelling reasons to target their efforts on Latin American countries. ■

New Developments in International Research Collaboration

Sachi Hatakenaka

Sachi Hatakenaka is an independent consultant and researcher on higher education policy and management. E-mail: sachi@alum.mit.edu.

International research collaboration has always helped scientists to keep abreast of international science and to share expertise and resources. Today, one-fifth of the world's scientific papers are coauthored internationally—a result of increasingly easy communication and cross-border travel. However, a new character of international collaboration is emerging, as scientific research has become an integral part of economic and innovation policy and international collaboration has become a key element in globalization strategy.

The Background of Such Changes

The perception of a "knowledge economy" matured. Knowledge economy has become a key term not only in developed countries but increasingly in developing countries. Excellence in science is a prerequisite for future economic success, and international collaboration is seen as a key mechanism for international scientific competitiveness.

Some emerging economies, such as China and India, are changing the meaning of international collaboration. Today global networks are known to have contributed significantly to the success of Silicon Valley. It is possible for the old economies to benefit directly from the information technology boom in India or from high-tech electronics in China, by being connected. Moreover, the success of these countries does not derive just from cheap labor. China and India are attracting global R&D activities—something that old economies in North America and Europe have been trying to do for decades. The old economies are keen to establish connections to these new powerhouse economies—not only in downstream industries but also in upstream science.

The world is increasingly united on the need for research and innovation to tackle global challenges such as poverty and

climate change. The growing international concerns regarding greenhouse gases, crises in Africa, or diseases in developing countries are leading to new hopes about international research collaboration to address these issues.

Steps Taken to Encourage International Collaboration

The United States was one of the first nations to establish an approach to attract the "best and the brightest" in the world to their institutions. This policy placed the United States at the heart of international research collaboration, with US researchers coauthoring with researchers from over 170 countries. The unique US position was based, first, on the openness of financial aid and fellowships supported any deserving graduate student. This system grew partly through generous federal research funding but also by means of institutional competition to attract the best graduate students. Second, the tradition of openness in hiring academics dated back to World War II, during which many prominent European scientists moved to the United States. Third, the US labor market has been open to immigrants—particularly for highly skilled ones who could get companies to sponsor them.

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Today, more countries are taking comparable approaches to attract the "best and the brightest" through similar policies to open up. The stepped-up competition for international students undertaken by other countries—most notably Australia, the United Kingdom, and Japan—and the tightening of US immigration and security rules following September 11, 2001, led to the first period when the number of international students declined in the United States for several years. The trend has since been reversed, owing in part to some steps already taken to facilitate visa processing. Other immigration measures, particularly to attract highly skilled international workers, are under discussion. Thus, competition will continue.

Since the late 1980s, Japan is a country that has been actively investing to become a viable destination for international students. Japan's strategy has been complemented by another approach to promote international research collaboration through well-targeted programs, often based on bilateral agreements with collaborating countries. These activities cover joint research grants, research fellowships, and joint workshops and seminars—particularly in Asia. Today, their regular work with Asian peers shows that the Japanese researchers have become key players in the emerging Asian research hub.

Europe is going a step further. In its Seventh Framework Programme, which just started this year, the European Union (EU) announced its intention to "mainstream" international collaboration across the range of its programs. In many ways, this policy is a natural extension of the EU's principle role—to encourage cross-border collaboration. However, the key change is that the EU is now ready to invest in such work, particularly with researchers in emerging and developing countries, by supporting them to a greater extent than in the past.

The EU has also been strengthening its bilateral ties with key emerging economies, most significantly China and India but also Latin American countries as well as its neighbors—such as Turkey. China was its first Asian partner for science and technology (S&T) bilateral agreements a decade ago. This year, the EU and China are jointly hosting a dozen or so events across Europe and China to promote China-Europe S&T collaboration. These special partnerships are being used to identify specific research themes for targeting funding.

Another approach to international collaboration is to invest in world-class research centers of excellence. Japan has been stepping up its effort to create true hubs in global scientific networks through several programs, including the World Premier International Research Center Initiative. Singapore's approach has been much more aggressive; it was one of the first countries to use public money for attracting world-class institutions. Singapore has been at work for a decade to become a major Asian education and research center, by creating high-profile international partnerships (with the Massachusetts Institute of Technology [MIT], Stanford, Berkeley, and Wharton—to name but a few), inviting world-class foreign universities to open campuses (e.g., INSEAD, University of Chicago Business School, and Waseda), and by its ambitious biomedical science park, Biopolis. However, not all of these ventures have worked. A partnership with Johns Hopkins University was terminated, and the University of New South Wales closed its brand-new campus.

Singapore is not alone in funding institution-level partnerships with an emphasis on research. The United Kingdom provided its support for an MIT-Cambridge partnership, which covered not only education but also research. Scotland followed suit with the Stanford-Edinburgh link, which gives a greater focus on thematic research and commercialization. In the Middle East, many oil-rich nations have been investing in international educational partnerships. Recently, one unusual announcement came from Abu Dhabi on an energy-research initiative called MASDER, which is to be based on multiple international research partnerships. There is also a California-Canada partnership with an emphasis on research, though there is no promise of new public money. Portugal has also recently announced collaborative partnerships with MIT, Carnegie Mellon, and the University of Texas, Austin.

The Implications for Developing Countries

For developing countries, these steps are likely to lead to increases in scholarship and research collaboration opportunities. Indeed, there is a specific focus on research for develop-

ing countries. US foundations led the way in supporting private-public partnerships on key research and innovations—particularly to tackle infectious diseases in developing countries. The need for action on climate change is also leading to new dialogues to support research and innovation in developing countries. The Department for International Development in the United Kingdom was one of the first official donors to articulate a policy to emphasize the funding need for research and innovation in international development.

International research collaboration has entered an era in which networking has a direct economic significance. Some governments are already beginning to pay a premium to become hubs in global excellence networks. The question is whether these developments will produce significant changes in the world's research capacity. Will these reforms yield new centers of excellence? Will one approach be more successful than others in creating effective networks? Finally, will these trends create capacity building for research in developing countries or just more research relevant to developing countries? Only time will tell us the true answers to these questions, but it is worth paying attention to these emerging trends. ■

International Student Mobility and the United States: The 2007 *Open Doors* Survey

Patricia Chow and Rachel Marcus

Patricia Chow is Research Manager and Rachel Marcus is Research Officer, Institute of International Education. E-mail: iieresearch@iie.org. More information about the Open Doors survey can be found at: http://opendoors.iietnetwork.org.

In 2005, more than 2.7 million students were pursuing transnational higher education—a 47 percent increase over the 2000 figure of 1.7 million students. A concurrent increase has occurred in the number of students seeking an international education in nontraditional destinations in Asia, Africa, and Latin America. Several countries in these regions have positioned themselves as key actors in the global economy, attracting more students to their shores. Despite these developments, the United States continues to be the top host country for students seeking higher education abroad. In 2006, the United States attracted 30 percent of internationally mobile students among the leading eight host countries (Australia, Canada, China, France, Germany, Japan, and the United Kingdom).

This article draws upon key findings from the International Student Census of the recent *Open Doors 2007: Report on International Educational Exchange* to describe the current international student population in the United States and to examine the future trends in international enrollment. The Institute of International Education (IIE) has collected data on international student enrollment in the United States since 1919 and in the form of the *Open Doors* survey since 1954. Annually, *Open Doors* surveys approximately 3,000 regionally accredited US higher education institutions on aspects of international educational exchange. The 2007 survey reported 582,984 international students studying in the United States during the 2006/07 academic year—a 3 percent increase over the previous year and the first significant increase in total international student enrollment since 2001/02. In addition, the number of *new* international students—those enrolling at a US higher education institution for the first time—increased by 10 percent, building upon the 8 percent increase seen in 2005/06.

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Origins

Asia remains the largest sending region, accounting for 59 percent of total US international enrollments. The number of students from Asia increased by 5 percent this year, driven by increases from the top two sending places: India (10% increase) and China (8% increase). For the seventh consecutive year, India remained the leading place of origin of international students in the United States, with 83,833 students. China remained in second place, with 67,723 students and the Republic of Korea in third place, with 62,392 students.

Turning to other regions, in 2006/07 we saw a 25 percent increase in the number of students from the Middle East (to 22,321 students), largely due to the 129 percent increase in student numbers from Saudi Arabia (to 7,886 students)—the result of a large Saudi Arabian government scholarship program launched in 2005. Enrollments from Latin America remained steady in 2006/07, with Mexico sending the most students from the region (13,826). Kenya, with 6,349 students, was the only African country in the top 20 places of origin this year. The number of international students from Europe and Oceania declined in 2006/07, to 82,731 and 4,300, respectively. Europe and Oceania are the only two world regions where the number of US students studying abroad in the region exceeds the number of students from the region studying in the United States.