

INTERNATIONAL STUDENT MOBILITY: TRENDS IN FIRST-TIME GRADUATE ENROLLMENT

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ABSTRACT

The academic programs at the graduate level are increasingly interested about the enrollment management challenges in terms of international student mobility. Understanding fundamental enrollment concepts to attract international students provides the essential key to consider the competitive environment concerning university resources, academic program potential, complex cultural dynamics, and workplaces among others. Based on a six-year quantitative and descriptive statistical study, this paper addresses the trends of first-time graduate enrollment and patterns of international student mobility by faculty at the University of Puerto Rico at Mayaguez. Results revealed the sustained trend of graduate enrollment of international students mainly from South America, Central America, and the Caribbean among others. Moreover, the presence of international graduate students adds a dimension of diversity to UPRM between teaching and research undertakings that enhance the Colleges of Engineering, Arts and Sciences, Agricultural Sciences, and Business Administration. The international student mobility has a consistent tendency mainly in the Colleges of Engineering, Arts and Sciences, and Agricultural Sciences. This consistency resembles the quality and reputation recognized by educational institutions and organizational world rankings. In-depth, understanding the trends related to international graduate enrollment and mobility should be considered by institutional leaders and administrators at UPRM to make knowledgeable decisions and to effectively set priorities to recruit highly qualified international students.

INTRODUCTION

In general terms, international student mobility mainly entails students leaving their country of residence for a period of time to acquire a higher education abroad. Student mobility represents one component of the international higher education scene globally. The first group, largely led by the United States, comprises the countries that create knowledge-based technologies; these are the “knowledge producers” (Gürüz 2008). Recent trends and developments on international student mobility show that countries such as United States (US), The United Kingdom (UK) and Australia attract most of the higher education students (Verbik & Lasanowski 2007).

Furthermore, OECD (2011) discovered that the language of instruction was a significant factor

and remarked that the common selected countries exercise one of the more spoken languages (e.g. English, French, German, Spanish or Russian). One major reason for undertaking this study is to provide a general view of international mobility, specifically those who enroll as first-time graduate students at UPRM. This study also explores the international mobility trend by countries of residence and its main inclination by colleges at UPRM.

Institutional Background and Graduate Programs

UPRM was founded in 1911 as the College of Agriculture. The development and diversification of academic programs makes the institution highly recognized as a key institution in higher

education in the Caribbean and Puerto Rico. UPRM was first accredited by the Middle States Commission on Higher Education (MSCHE) in 1946 and the excellence in education has been recognized for its 100 years of existence. Several aspects of the UPRM vision guarantees continuity as a leading institution of higher education in Puerto Rico and in the Western hemisphere in a way to respond to the needs of a modern society (Sharma & Dika 2007). The UPRM's mission encompasses eight strategic goals as a way to develop educated and cultured citizens who can contribute to the cultural, social, technological and economic development of Puerto Rico and collaborate internationally in an environment of solidarity and democracy; perform research and creative activities to serve the local, regional and international needs of society; and provide exemplary service to the local, regional and international community to contribute to a sustainable and balanced development of our society and disseminate knowledge making it available to all those concerned (Sharma & Dika 2007).

The UPRM's high quality programs include Agricultural Sciences, Arts and Sciences, Engineering, and Business Administration. The quality of its students and graduates has been recognized globally by organizations which recruit students for permanent positions and internships in Puerto Rico and the United States. The Office of Graduate Studies (OGS) functions as an autonomous unit under the Dean of Academic Affairs. OGS completely oversees the compliance of certifications and the University of Puerto Rico's bylaws related to graduate studies, as well as the decisions including graduate admissions, approving assistantships, acceptance and approval of all theses and dissertations, proposals, and also certifies completion of each student's degree.

Currently, UPRM offers 38 master degree programs and five doctoral degrees. Moreover, UPRM is the only unit of the Puerto Rican government higher education public system that offers graduate programs in Agricultural Sciences and Engineering. The College of Agricultural Sciences offers nine master's degrees in the fields of Agricultural Economy, Education, Agricultural Extension, Crop and Agroenvironmental Sciences (agronomy, soils, crop protection, and horticulture), Animal Industry, Food, Science and Technology. The College of Arts and Sci-

ences offers 12 masters degrees in the fields of Biology, Chemistry, English Education, Geology, Hispanic Studies, Marine Sciences, Mathematics (Applied Mathematics, Mathematical Statistics, Pure Mathematics, Scientific Computing), Physical Education (Kinesiology), and Physics. The faculty of Arts and Sciences also offers three Ph.D. programs: Marine Sciences, Chemistry, and Computer Information Science and Engineering. The College of Business Administration offers a program leading to both, a Master in Business Administration degree and a MBA with specialization in Human Resources, Industrial Management or Finance. The College of Engineering offers six Masters of Science degrees in Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. The faculty of Engineering also offers three Ph.D. programs: Chemical Engineering, Computer and Information Sciences and Engineering and Civil Engineering Infrastructure and Environmental Options.

REVIEW OF LITERATURE

International student mobility is a significant channel which allows high-skilled immigrants arrive (Suter and Jandl 2006) and it is particularly attractive in view of high integration potential on high skilled students (Chiswick and Miller 2001). The encouragement in higher education policies may affect international student mobility, such as tuition fees, the language of instruction or the quality and reputation of the higher education institutions (De Voretz 2006). Predominantly, the United States (US) receives the highest number of international students in the world, but on a *per capita* basis, its performance is modest, despite the fact that it has many of the best and richest universities in the world (Becker & Locker 2012). Overall, US institutions will likely expect another year of international enrollment growth in 2012 (Choudaha and Chang 2012).

OECD (2011) statistical data from student mobility demonstrate that more than half of the students (53.9%) studying abroad represent six main countries: United States (18%), United Kingdom (9.9%), Australia (7.0%), Germany (7%), France (6.8%) and Canada (5.2%). Furthermore, Russia

(3.7%), Japan (3.6%) and Spain (2.3%) are examples of countries which have begun to attract foreign students in larger numbers in the 21st century. Within the 2009/10 period, there were almost 691,000 international students enrolled in the higher education sector, which corresponds to 3.5% of total student enrollment in higher education (Institute of International Education 2010).

The student's migration decisions almost certainly involve economic incentives as well as the institutional context which is different from migrants whose main objective is finding a job in the labor market (Kahanec & Králiková 2011). Several factors persuade the decision-making of international student's mobility. The quality of education, involving the reputation of higher education institutions and recognition of the degree at the home or international labor market, can also affect inward student mobility (Bourke 1997; Park 2009; OECD 2011). Other factors which are also important for students include multiculturalism, safety, weather and the friendliness of those who live in the country (Bourke 1997; Park 2009).

Becker and Folster (2012) discovered other factors of a country which serves as a study destination are the following:

1. Mutual recognition of degrees/qualifications (by the host country and the domestic country),
2. Costs of higher education and living in a country (tuition fee, availability of financial aid, travel expenses, living costs),
3. Governance of higher education institutions (public vs. private),
4. Internationalization of a country (number of foreign students, availability and diversity of international programmers, stringency of immigration policies),
5. The living, study and work environment of a country (climate, research facilities, ambiance, employment and immigration opportunities/regulations during and after study, demographic growth/decline), and

6. Social and geographical linkages (friends/relatives living or studying in same country, geographical proximity).

Improvements to Admission Proceedings

The increasing competition in the higher education market and changes in mobility patterns was the main concern at UPRM to consider several strategic proceedings for international recruitment. Large numbers of prospective students are reached using Web-based admission application to obtain a successful recruitment, admission processes and enrollment management (Whiteside and Mentz, 2003). The Web-based admission application encourages the UPRM international student mobility. Sharma and Figueroa (2008) highlight the significance of the acquisition of the improved program *Apply Yourself* (AY) at the UPRM. Admission processes transform paper basis application to Web-based admission for graduates and enrollment management of graduate students at UPRM. While the application itself is managed online, it integrates: letters of recommendation, supporting documents, department evaluation, follow-up of missing documents, admission application status for applicant's, notifications of admission decisions to applicants and e-mail notifications during the entire admission process.

The Web-based admission application provided the opportunity to transform higher education. Immigrants arrive with social capital, which may serve as a vehicle for cross-border exchange of new ideas and knowledge and also facilitate international trade or foreign investment (Bonin 2008). Most of the international graduate students come from Latin American countries, mainly Colombia, Peru, and Dominican Republic. During the last six academic years, the Office of Graduate Studies has received international students for first-time enrollment from Argentina, Bolivia, Brazil, Chile, China, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Haiti, India (Bangladesh), Honduras, Italy, Mexico, Nicaragua, Nigeria, Syria, Spain, Ukraine (Russia), Venezuela and Western Germany. Furthermore, the demographic change in terms of gender at UPRM is noticed in the slight decrease in the total graduate enrollment of incoming students during the last 2010-11 academic year.

During the second semester of the 2010-11 academic year, the total enrollment distribution of incoming graduate students by gender was 59% (47) males vs. 41% (33) females (Office of Graduate Studies Admission Report, 2011). During the 2005-06 academic year, the total enrollment of incoming graduate students by gender was 52% (80) males and 48% (75) females (Office of Graduate Studies Admission Report, 2006).

The trends in enrollment demographics will continue as the world's development and reform continues. The *UNESCO Advocacy Brief in Gender Issues on Higher Education* requests a greater participation of women in technical and science education (Ramachandran, 2010). In 2008, the *Organization for Economic Cooperation and Development* identified two relevant demographic trends for the year 2030 (UPRM-OIIP, 2004). Demographic trends mentioned in this report imply that women will be represented mainly in the student populations and their participation will expand everywhere. Also, the student population will become more varied, for example, a greater number in international students, older students, part-time students, among others. After reviewing these aspects, the study addressed the following questions:

1. What international student mobility trends can be identified in the different Colleges at UPRM?
2. What are the main determining factors influencing student mobility choices at UPRM?

METHODOLOGY

The design of the study is quantitative and descriptive. The country of residence from the international students enrolled is categorized as an indicator of this study for the analysis of trends in the student mobility of first-time graduate students at UPRM.

The Organization of Economic Cooperation and Development (OECD) highlights the relevance of international trends in gender inequalities in higher education and can be determined by examining the changes in the composition of student population in higher education.

The population of this study is first-time graduate students at UPRM during the last six academic years (2005-2011). The data samples are those students admitted to graduate studies that enrolled in the August and January sessions of each academic year. Because this study depended on the use of secondary data, a critical concern for the researchers was the identification of reliable statistical sources and other information. This report displays data, by tables or graphs showing totals, percentages, and ratios on the basis of the evolution of international student mobility gaps in graduate admission and enrollment management processes over the last six-year period

FINDINGS

Table I shows the international mobility of first-time graduate enrollment for the last six academic years (2005-2011) for each of the four Colleges at UPRM. Colombia is the main country of residence from international students who enrolled for the first-time at the graduate level in the Colleges of Arts and Sciences (n = 90, 67.2%), Engineering (n = 90, 53.2%), and Agricultural Sciences (n = 17, 47.2%) at UPRM. Peru prevails as the second country where international students enroll as first-time graduate students in the Colleges of Arts and Sciences (n = 32, 18.3%), Engineering (n = 26, 15.3%), and Agricultural Sciences (n = 1, 2.77%) at UPRM. Furthermore, Dominican Republic is the third country where international students enroll for the first-time at the graduate level in the Colleges of Engineering (n = 28, 16.6%), Agricultural Sciences (n = 8, 22.2%), and Arts and Sciences (n = 2, 1.49%) at UPRM. Therefore, international mobility for first-time graduate students at UPRM mainly comes from five continents: South America, North America (Central America, Caribbean), Africa, Asia, and Europe. The main factors influencing the mobility to study at UPRM are the following:

1. Recognition, prestige and global ratings from the Colleges of UPRM.
2. Quality of teaching and research contributions of the professors.
3. Diversity of international alliances and programs

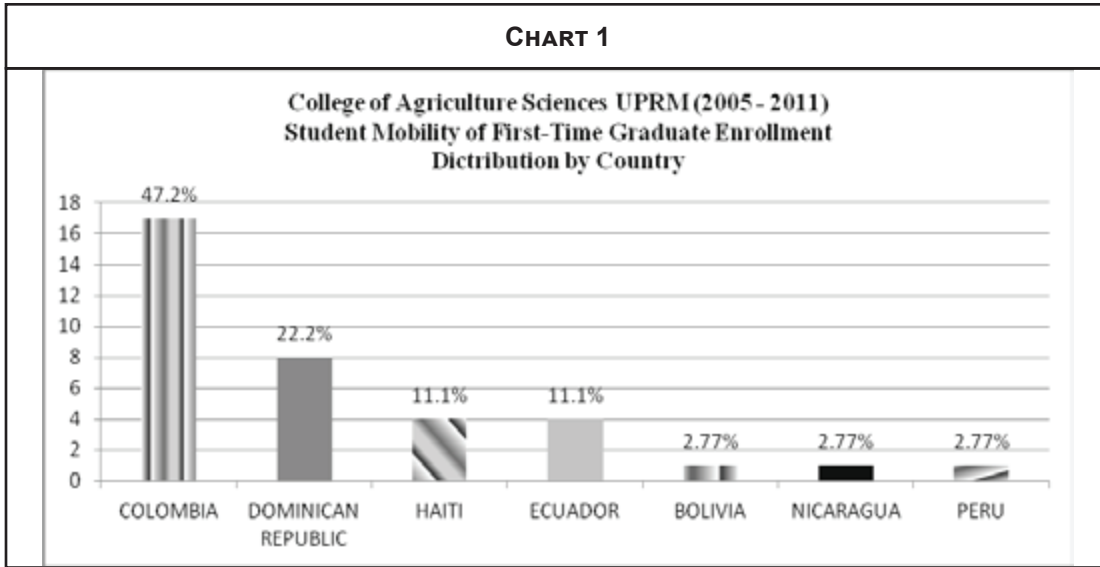
4. Costs of higher education

Chart 1 demonstrates the international student mobility predilection for the College of Agricultural Sciences. The main countries are Colombia (n = 17, 47.2%), Dominican Republic (n = 8, 22.2%), and tied are Haiti and Ecuador (n = 4, 11.1% each). Furthermore, the College of Agricultural Sciences shows a similar trend of international student mobility for first-time enrollment to graduate studies at UPRM from countries such as Bolivia (n = 1, 2.77%), Nicaragua (n = 1, 2.77%) and Peru (n = 1, 2.77%). The

recognition and the availability for field experience offered by the College of Agricultural Sciences explains this trend of international student mobility from countries with agriculture base economy in continents such as South America and North America (Central America and Caribbean). The College of Agriculture Sciences professors have been recognized by their achievements in research such as crop protection area. Also, the Agricultural Experimental Station receives an award for the establishment of the first

TABLE 1
INTERNATIONAL STUDENT MOBILITY OF FIRST-TIME GRADUATE ENROLLMENT
UNIVERSITY OF PUERTO RICO AT MAYAGÜEZ (2005-2011)

Country	n	%	College of Agriculture Sciences n = 36 %		College of Arts and Sciences n = 134 %		College of Engineering n = 169 %		College of Business Administration n = 5 %	
Argentina	6	1.74	-	-	-	-	6	3.55	-	-
Bangladesh (India)	1	0.29	-	-	-	-	1	0.59	-	-
Bolivia	2	0.58	1	2.77	-	-	1	0.59	-	-
Brazil	1	0.29	-	-	-	-	1	0.59	-	-
Chile	1	0.29	-	-	1	0.74	-	-	-	-
China	3	0.87	-	-	-	-	3	1.77	-	-
Colombia	197	57.3	17	47.2	90	67.2	90	53.2	-	-
Costa Rica	2	0.58	-	-	-	-	1	0.59	1	20
Cuba	1	0.29	-	-	1	0.74	-	-	-	-
Dominican Republic	38	11.0	8	22.2	2	1.49	28	16.6	-	-
Ecuador	1	0.29	1	2.77	-	-	-	-	-	-
France	1	0.29	-	-	1	0.74	-	-	-	-
Germany	1	0.29	-	-	-	-	-	-	1	20
Haiti	5	1.45	4	11.1	-	-	1	0.59	-	20
Honduras	1	0.29	-	-	1	0.74	-	-	-	-
Israel	1	0.29	-	-	-	-	-	-	1	20
Italy	1	0.29	-	-	1	0.74	-	-	-	-
Mexico	5	1.45	-	-	-	-	4	2.37	1	20
Nicaragua	1	0.29	1	2.77	-	-	-	-	-	-
Nigeria	2	0.58	-	-	1	0.74	1	0.59	-	-
Peru	59	17.1	1	2.77	32	18.9	26	15.3	-	-
Russia	1	0.29	-	-	1	0.74	-	-	-	-
Syria	1	0.29	-	-	-	-	1	0.59	-	-
Spain	1	0.29	-	-	1	0.74	-	-	-	-
Uruguay	1	0.29	-	-	1	0.74	-	-	-	-
Venezuela	1	0.29	-	-	-	-	1	0.59	-	-



biorefinery in Puerto Rico. The alliances with private organizations

Chart 2 shows evidence of the preferred international student mobility for the College of Arts and Sciences. The main countries are Colombia (n = 90, 67.2%), Peru (n = 32, 18.9%), and Dominican Republic (n = 2, 1.49%). The College of Arts and Sciences also receives international students for first-time enrollment to graduate studies at UPRM from countries such as Chile (n = 1, .74%), Cuba (n = 1, .74%), France (n = 1, .74%), Guatemala (n = 1, .74%), Honduras (n = 1, .74%), Italy (n = 1, .74%), Nigeria (n = 1,

.74%), Russia (n = 1, .74%), Spain (n = 1, .74%), and Uruguay (n = 1, .74%).

Chart 3 reveals the predominant international student mobility for the College of Engineering. Similar to other Colleges, the main countries are Colombia (n = 90, 67.2%), Dominican Republic (n = 38, 16.6%), and Peru (n = 26, 15.3%). This trend demonstrates the College of Engineering's tendency from the countries mentioned above in promoting their students to pursue graduate studies (master's and doctoral degrees) at UPRM. The upward trend validates the international student's mobility mainly from South America and

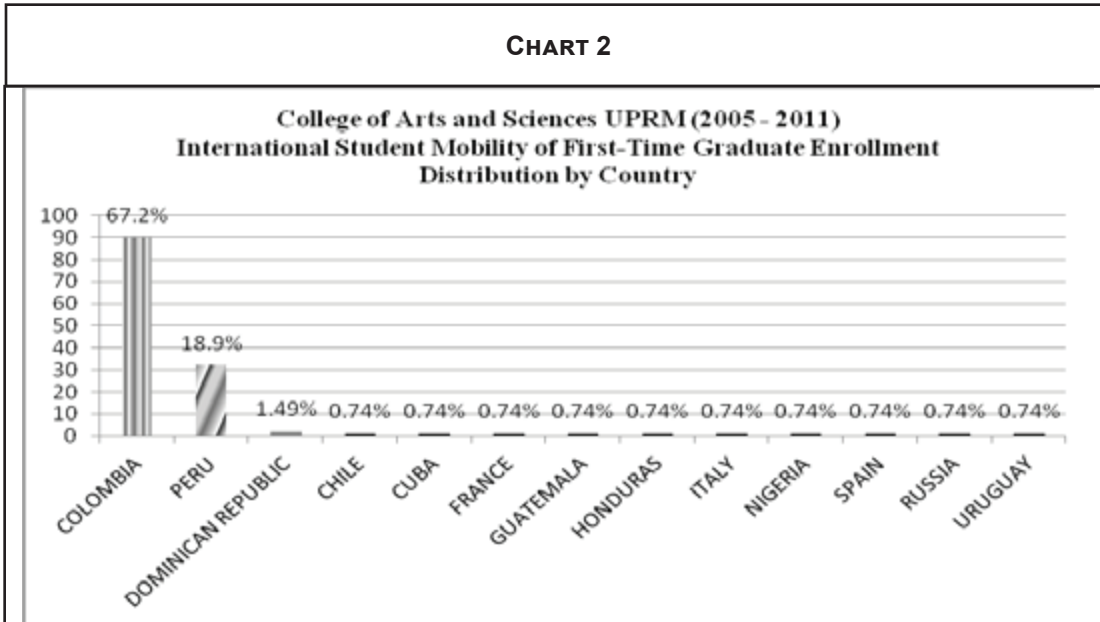
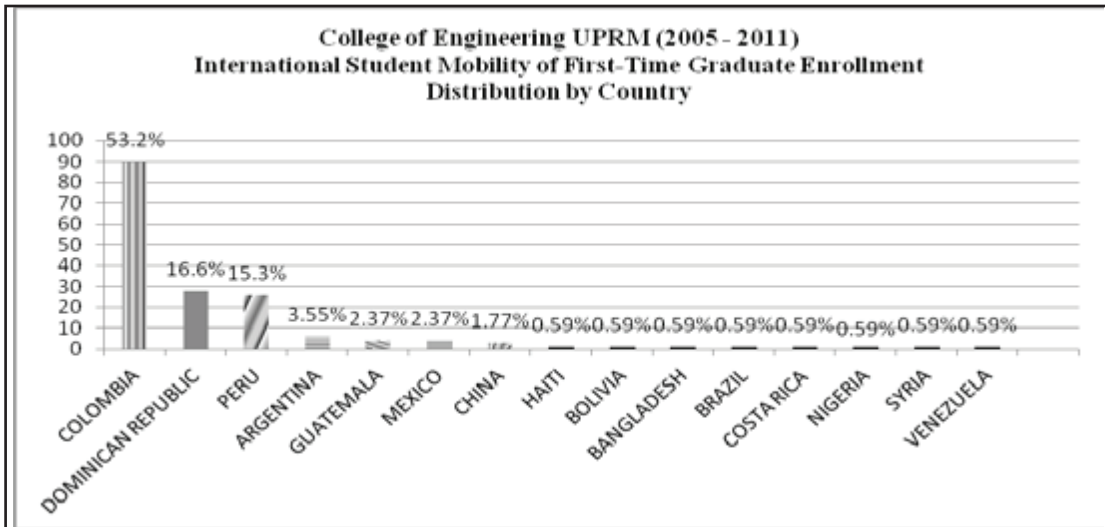


CHART 3



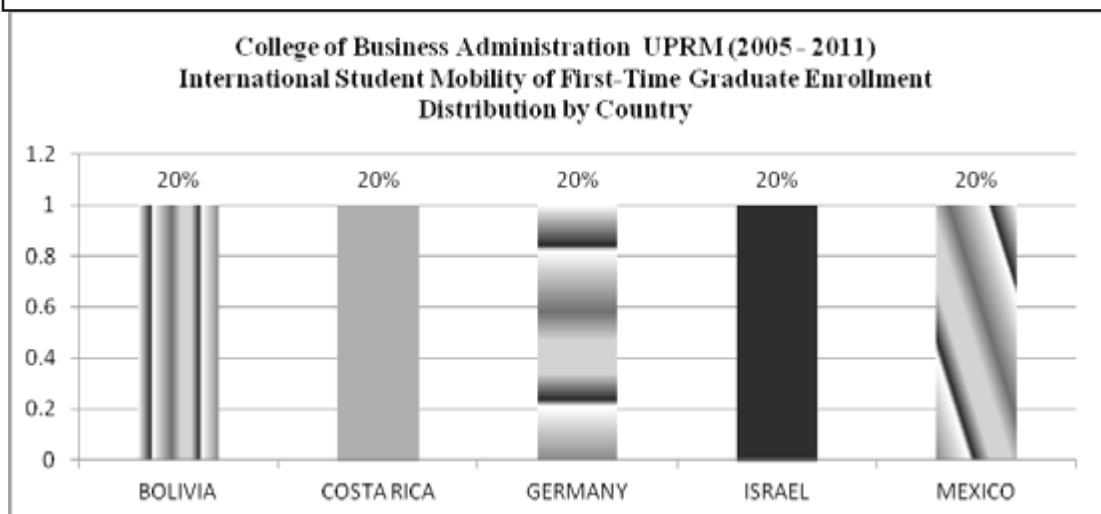
the Caribbean supporting the UPRM alliances for the movement of professors and students among the different Schools of Engineering globally. Also, the College of Engineering has been recognized for several efforts toward university-industry partnerships as an important cornerstone for Puerto Rico’s biotechnology cluster development.

Moreover, the international student mobility from countries such as Argentina (n = 6, 3.55%), Guatemala (n = 4, 2.37%), Mexico (n = 4, 2.37%), China (n = 3, 1.77%), Costa Rica (n = 1, 0.59%), Syria (n = 1, 0.59%), and Venezuela (n = 1, 0.59%) were also included as the main

preference in the selection of the College of Engineering at UPRM. The College of Engineering obtained a similar mobility tendency from international students for first-time enrollment to graduate studies at UPRM from countries such as Bangladesh, India (n = 1, 0.59%), Bolivia (n = 1, 0.59%), Brazil (n = 1, 0.59%), Costa Rica (n = 1, 0.59%), Haiti (n = 1, 0.59%), Nigeria (n = 1, 0.59%), Syria (n = 1, 0.59%).

Chart 4 demonstrates the similar trend of international student mobility by country from the College of Business Administration at UPRM. Mostly, the international student mobility represents countries such as Bolivia (n = 1,

CHART 4



20.0%), Costa Rica (n =1, 20.0%), Germany (n =1, 20.0%), Israel (n =1, 20.0%), and Mexico (n =1, 20.0%) during the six academic years (2005 – 2011). Typically, the Graduate School of Business Administration at UPRM reveals the minimum numbers in graduate enrollment of incoming international students compared with other faculties at UPRM during the six-year period of this study. However, the international student mobility at the College of Business Administration shows evidence of acquiring international students from continents such as South America, North America, Europe, and Asia. In an effort to promote the international student mobility, the College of Business Administration is going through the process of AACSB accreditation.

DISCUSSION AND CONCLUSIONS

Certainly, the international student mobility is changing the global higher education environment due to the increasing number of students moving abroad from their countries of residence for tertiary studies. Predominately, the international student mobility trend at UPRM shows evidence of the Colleges of Engineering, Agricultural Sciences, Arts and Sciences similar to world rankings on higher education. Also, the research recognition to UPRM, the alliances with public and private organizations, the availability of internships and cooperative education programs, the uniqueness of each faculty, the assistantship opportunities among others offers an attractive alternative to international students. Moreover, UPRM as a public university offers low-cost tuition fees comparable with abroad higher education institutions globally.

The Economic theory mainly suggests that high-skilled immigration generally has positive effects on the receiving economy. It may well facilitate the international exchange of ideas, knowledge, goods and services, and capital to a greater extent than low-skilled immigration (Chiswick 2011). The Colleges at UPRM has a unique scenario to promote the enhancement of the regional economy considering the competitive advantage to promote the international student mobility trends. Upon examining the existing evidence on international student mobility at UPRM , it shows a relevant guide to establish higher education policies at the Colleges at UPRM as a

tool to attract international students to increase first-time graduate enrollment and maintain the diversification of graduate programs. UPRM should seek innovative strategies to diversify the graduate student population. Also, the Colleges at UPRM should consider the arrival and integration of abroad students through several areas such as increasing its efforts to recruit and promoting graduate programs, increasing research initiatives and alliances between universities, and increasing the role in the decision-making process, among others.

REFERENCES

- Becker, R., R. Kolster (2012). *International student recruitment: policies and development in selected countries*. Netherlands organization in higher education.
- Bonin, H., W. Eichhorst, C. Florman, M. O. Hansen, L. Skiöld, J. Stuhler, K. Tatsiramos, H. Thomassen and K. F. Zimmerman (2008). “Geographic Mobility in the European Union: Optimising its Economic and Social Benefits”, *IZA Research Report* no. 19, Institute for the Study of Labor, Bonn.
- Bourke, A. (1997). “The Internasionalisation of Higher Education: The Case of Medical Education”, *Higher Education Quarterly* 51(4), 325-46.
- Chiswick, C. U., B. R. Chiswick and G. Karras (1992). “The Impact of Immigrants on the Macroeconomy”, *Carnegie-Rochester Conference on Public Policy*, 37(1), 279-316.
- Chiswick, B. R. and P.W. Miller (2011). “Educational Mismatch: Are High-Skilled Immigrants Really Working in High-Skilled Jobs, and What Price Do They Pay If They Are Not?” in B. R. Chiswick, *High-Skilled Immigration in a Globalized Labor Market*, Washington DC: American Enterprise Institute, 111-154.
- Choudaha, R. & L. Chang (2012). *Trends in International Student Mobility*, Research Report—Research & Advisory Services—World Education Services.
- DeVoretz, D.J. (2006). *The Education, Immigration and Emigration of Canada’s Highly Skilled Workers in the 21st Century*, George-

- town Institute for the Study of International Migration, Washington DC.
- Gürüz, K. (2008). *Higher Education and International Student Mobility in the Global Knowledge Economy*, State University of New York: Albany. Institute of International Education (2010). Press release: international student enrollments rose modestly in 2009/2010, led by strong increase in students from China. URL: <http://www.iie.org/en?who-We-Are/News-and-Events/Press-Center/Press-Releases/2010/2010-11-15-Open-Doors-International-Students-In-The-US>.
- Kahanec, M. and R. Králiková (2011). *Pulls of International Student Mobility*. Institute for the Study of Labor, IZA Discussion Paper No. 6233. Retrieved from <http://ftp.iza.org/dp6233.pdf>
- OECD (2011). *Education at a Glance 2011: OECD Indicators*, OECD Publishing. <http://dx.doi.org/10.1787/eag-2011-en>.
- Park, E. L. (2009). "Analysis of Korean Students' International Mobility by 2-D Model: Driving Force Factor and Directional Factor", *Higher Education* 57(6), 741-755.
- Ramachandran, V. (2010). Gender Issues in Higher Education – Advocacy Brief. *UNESCO Asia and Pacific Regional Bureau of Education*. Bangkok, Thailand.
- Sharma, A.D. & Dika, S.L. "Experiences in Implementing a Quality Culture at the University of Puerto Rico – Mayagüez", Paper presented at the 8th International Conference on Information Technology Based Higher Education & Training (ITHET 2007), Kumamoto, Japan, July 2007.
- Sharma, A.D, & Figueroa, C. "Enhancing Enrollment & Management of Graduate(Postgraduate) Students at the University of Puerto Rico, Mayaguez". Paper presented at the International Conference on Engineering Education- New Challenges in Engineering Education and Research in the 21st Century"-(ICEE 2008), PECS-Budapest, Hungary, July 2008.
- Suter, B. and M. Jandl (2006). *Comparative Study on Policies towards Foreign Graduate: Study on Admission and Retention Policies towards Foreign Students in Industrialised Countries*, Vienna, International Centre for Migration Policy Development.
- UPRM Office of Graduate Studies Statistics– Admission Report Second Semester 2010-2011. <http://grad.uprm.edu>, January 2011. <http://grad.uprm.edu/oeg/RecursosDocumentos/PDF/infadme11.pdf>
- UPRM Office of Graduate Studies – Admission Report Second Semester 2006-2007. <http://grad.uprm.edu/infoadmene07.pdf>.
- UPRM Office of Institutional Research & Planning (UPRM-OIIP), "Strategic Plan: University of Puerto Rico at Mayagüez", Mayagüez, PR, 2004.
- Verbik, & L. V. Lasanowski (2007). "International Student Mobility: Patterns and Trends", *World Education News & Reviews*, 20(10). World Education Services. Retrieved from <http://www.wes.org/ewenr/07oct/feature.htm>.
- Whiteside, R. & Ments, G.S. (2003). "Online Admissions and Internet Recruiting: An Anatomy of Search Engine Placement". *Education Quarterly*; 4, 63-66.