

Preparing Students for the Global Workplace



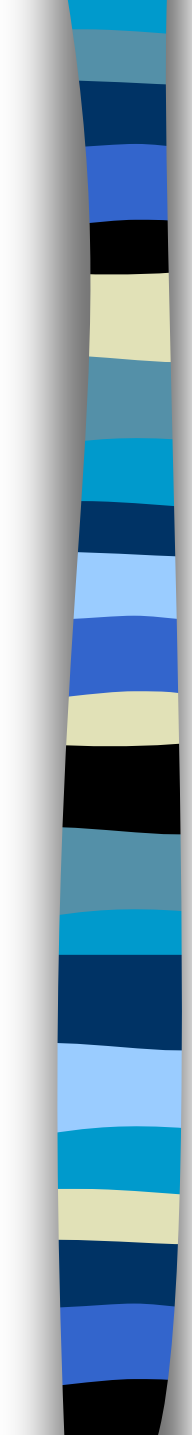
**The Spanish International
Engineering Program**
at the University of Rhode Island



Presenter

- **Roberto C. Manteiga**

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*9th Annual Colloquium
on International Engineering
Education*

November 2-5, 2006

The Hotel Viking

Newport, RI

The International Engineering Program in Spanish



3-year grant from the U.S.
Department of Education's

**Fund for the Improvement of
Postsecondary Education (FIPSE)**

The International Engineering Program



1987-2006

- 5-year Dual Degree
- B.S. in an engineering discipline
- B.A. Spanish
- Six-month paid internship abroad
- Semester study abroad



Five Year Dual-Degree Program

- Bachelor of Science

- Engineering Field

- Biochemical
 - Biomedical
 - Chemical
 - Civil
 - Computer
 - Electrical
 - Industrial
 - Mechanical
 - Ocean

- Bachelor of Arts

- Spanish



The Original Goals and Objectives of the Program

- Provide Students with technical and language skills to be competitive in today's workplace
 - Fluent in oral and written Spanish
 - Familiar with at least one Hispanic culture
- Attract high caliber students to the College of Engineering
- **Recruit Students from underrepresented groups, particularly Hispanics**



Goals and Objectives

- **Increase retention rates of Hispanics in Engineering**
- Develop ties between URI and universities and companies in Latin America & Spain
- Set up internships and exchanges
- Strengthen ties with local businesses
- Develop a program that can be replicated
- Secure support for continuation of program beyond grant period



PROBLEMS

- When the Spanish IEP was established in 1996, it was evident that Hispanics were underrepresented in Engineering
(In 1999 only 3.7% of engineering graduates in US were Hispanic)
- Retention rates of Hispanics in engineering nationwide were poor
(In 1999 only 33% of URI Hispanic students graduated with a degree in Engineering...the rate was 75% for the general student population)



ADDITIONAL STATISTICS

- According to the US Census Bureau, the Hispanic population in the US increased 6 times faster than the overall population from 1982-1992.
- In RI the Hispanic population was expected to increase 10% between 1999 and 2010.
- When our program began, about 50% of the students in the Providence school system are Hispanic (today that figure remains about the same).



ADDITIONAL STATISTICS

- In 1999, the US Census Bureau reported that Hispanic-owned businesses composed the largest minority business group growing at a rate of 12%...a 76% increase over the figure reported in 1987.
- In that same year CAHSEE reported that 9% of the US population was Hispanic, and that Hispanic's represented about 7% of the workforce (today the percentage of Hispanics in the US is over 10%).
- In that same year African Americans, Hispanics, and Native Americans combined earned only 12.5% of all bachelor degrees conferred in science and engineering.



PROBLEMS

- In 1996 (when the SIEP was launched) only 16% of the students in the College of Engineering were women.
- Nationwide only 6% of engineers were women (article published in Communications of the ACM, vol. 13, no. 11).



ADDITIONAL STATISTICS

- US Labor Statistics reported in Jobs 2000 that nearly 75% of tomorrow's jobs will require computer proficiency. Fewer than 33% of those enrolled in computer classes at the time were girls.
- According to a National Science Foundation study (#94-331), 34% of high school girls were advised NOT to take senior math.
- Michael Brodie reported in "Advancing Women Through Engineering," vol. 4, no. 6, June, 1996, that women leave science and engineering careers twice as frequently as men.
- Carol Hollenshead, in The Equity Agenda (Ann Arbor, 1995) reported that women's salaries in science and engineering lagged behind men's by 12-15%.



RESOURCES FOR WOMEN AND MINORITIES

- Brown University List
- MIT online publication, WMSE, Women and Minorities in Science and Engineering
- Organization for Women in Science, Technology, Engineering (STEM) published by Southern Illinois University.



SOME PROMINENT ORGANIZATIONS

- NACME (National Action Council for Minorities in Engineering)
- SHPE (The Society of Hispanic Professional Engineers)
- NSBE (The National Society of Black Engineers)
- Dept. of Veteran's Affairs, CAHSEE (Center for the Advancement of Hispanics in Science and Engineering Education)
- AWSEM (Advocates for Women in Science, Engineering, and Mathematics)
- The Society of Women Engineers
- The Online Ethics Center
- National Resource Council's Committee on Women in Science and Engineering



WHAT OTHER UNIVERSITIES ARE DOING

- Cal Tech
 - Minority undergraduate research fellowships
 - The Cal Tech Women's Center
- Iowa State
 - WISE (Women in Science and Engineering)
- University of Arizona
 - Multicultural Engineering Program
- Purdue
 - Boasts one of the highest percentages of women in tenured track positions in Engineering
- University of Colorado at Boulder
 - Minority Engineering Program
 - Women in Engineering Program



Seeking Diversity: Diversity Initiatives at URI

- First Diversity Committee, 1994
- Diversity 2000 Committee, 1998
- URI Bridge Programs (outreach)
 - Women in Engineering Summer Bridge Program
 - Minorities in Engineering Bridge Program
- **SMILE** (Science & Math in an Investigative Learning Experience)
- Spanish International Engineering Program



Our Students

■ College of Engineering

	Total # Students	Hispanics	Women
1999	760	35 (4.6%)	(16%)
2000	853	46 (5.4%)	(16.7%)
2006	973	63 (6.4%)	(16%)



Enrollment Figures

■ Spanish IEP

	Total # Students	Hispanics	Women
1999	15	11 (71%)	4 (27%)
2000	20	13 (65%)	4 (26%)
2006	45	*15 (33%)	*23 (51%)

First Intern: Carlos Ramirez

- Spring 2000
- Burgos, Spain
- Ansa Lemforder



“My internship in Spain gave me real-life exposure to the engineering world and the opportunity to learn about myself. Although I knew their language, I did not know their customs. While there, I learned about an exciting new culture and more about the world. I loved everything about my experience and came back a better person for it!”



RECIPROCAL EXCHANGES

Mexico

- ITESM - Campus Toluca
- ITESM – Campus Monterrey

Spain

- Centro Politecnico Superior, Universidad de Zaragoza
- Escuela Superior de Ingenieros Industriales, Universidad de Navarra
- Universidad de Valladolid
- Universidad de Cantabria



National Resource Center for International Engineering Education

[Http://www.uri.edu/iep](http://www.uri.edu/iep)