



Delft University of Technology

How to create a new generation of talent ? An industry-academia view

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How to Create a New Generation of Talent ?

An Industry-Academia View

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Discussion Points

- A View from Academia (TU Delft): Internationalization and Industry Involvement
- Recent Developments in Enrolment and Graduation
- A View from Industry (Schlumberger): Internationalization and Female Participation

Interests of the Main Players

- **Student:** Acquire skills that make him/her marketable in a field of his/her own interest; find a good job in an attractive company
- **Industry:** Recruit skilled but still malleable graduates at times of need
- **University:** Produce a steady stream of good graduates that help develop networks with industry and government

Divergences

- Industry wants to hire **when needed**, university wants to have **\pm constant influx of students and outflow of graduates**
- Student wants to have **diploma and good grades**, university and industry wants **good skills**
- Upon entering university, student does not know market situation at time of graduation - often there is a **phase shift**

The University Market Place

European Developments

- Bologna Convention: B.Sc. and M.Sc. programs
- Erasmus Program: International Exchange
- European Science Foundation, EUROCORES
- Less national funding

Ô Collaboration AND Competition !

Ô Identify Opportunities

Ô Develop Vision, Identity and Image

The University Challenge: How to Adapt and Grow?

- Internationalization and competitive programmes
- Sponsorships
- Strategic alliances (U/U; U/I)

Internationalization: The Great Challenge

- M.Sc. program implies some degree of repetition with earlier curriculum, cross-disciplinary flow of students, courses in English, etc.
- Can universities become more international AND raise the standards?
- Recruiting hint: Those who can are the top universities

Internationalization



At the TU Delft more than 40% of the MSc students are international. The program is in English

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Competitive Programmes

180 (all) Dutch

130 (60% Dutch, 40 % foreign)

85 (80% foreign)

<p>BSc "Toegepaste Aardweten- schappen" (Applied Earth Sciences)</p> <p>Broad program In Dutch</p>	<p>MSc Applied Geophysics Jointly with ETH and RWTH</p>		<p>PhD Program</p> <p>Research School</p> <p>Center for Technical Geosciences (CTG)</p>
	<p>MSc Geoscience and Petroleum Engineering</p>	<p>Reservoir Geology</p>	
		<p>Petroleum Engineering</p>	
	<p>MSc Geo Engineering Jointly with Civil Engineering</p>		
<p>MSc Resource Engineering EMC (Helsinki, RWTH, Exeter)</p>			

< 5% leaves

95% leaves to industry, 5% to PhD

80% to industry

Types of Sponsorships

- Endowments, donations (USA)
- Research grants
- Sponsoring chairs
- Scholarships for M.Sc. students
- Internships

M.Sc. Student Scholarships

- Establish link university - industry
- Bind student to sponsor
- Usually target student
- But recruiting does not always follow

M.Sc. level shortens “product cycle” to 2 years

Sponsorship: A Case Study

- NIOC sponsors 45 students to get M.Sc. in Petroleum Engineering in Europe
- Deal: Student completes study, gets job at NIOC
- Costs: ~40,000 Euros per student
- Selection within Iran from large number of applicants
- Distribute to three universities: Trondheim University, Imperial College London, Delft University of Technology
- Attrition rate \pm zero; some students chose to pursue Ph.D.
- Motivated students, good results
- **NIOC and universities achieved objectives**

Strategic Alliances

- Goal: Establish strong link with one or more partners who share mutual or complementary interests
- Long term! Attract broad cross-section of students!
- *Form 1:* University Alliances (e.g. IDEA League, **FEMP**)
- *Form 2:* Industry-University Alliances (e.g. Schlumberger Ambassador Program, UTP etc)
- Need clear definitions of roles and responsibilities
- Can potentially reduce cyclic variations and uncertainties

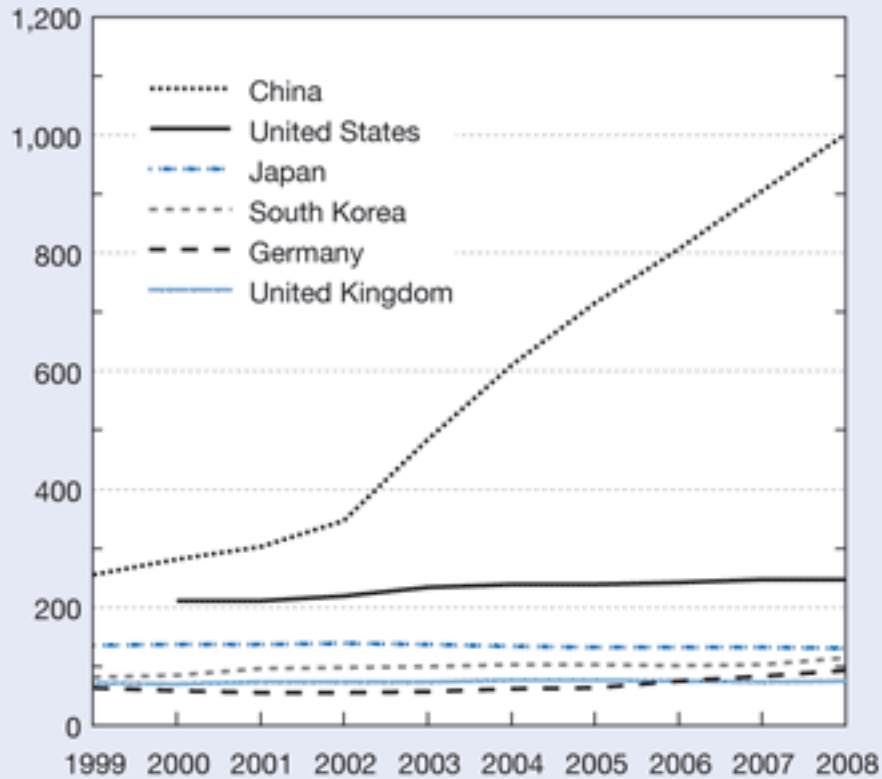
FEMP

- Federation of European Mining Programs, an association of universities that do not have the critical mass for running such a program on their own; industry-cosponsored (Rio Tinto, Corus...) and EU supported
- **Mining Engineering**: Aachen, Exeter, Delft, Helsinki
- **Mineral Engineering**: Aachen, Exeter, Delft, Helsinki
- **Geotechnical and Environmental Engineering**: Berlin, Freiberg, Miskolc, Kosice, Wroclaw
- **Worldwide unique and attractive; students cycle through universities, acquire international view and network, logistically demanding**
- *www.femp.org*

Recent Graduation Comparisons

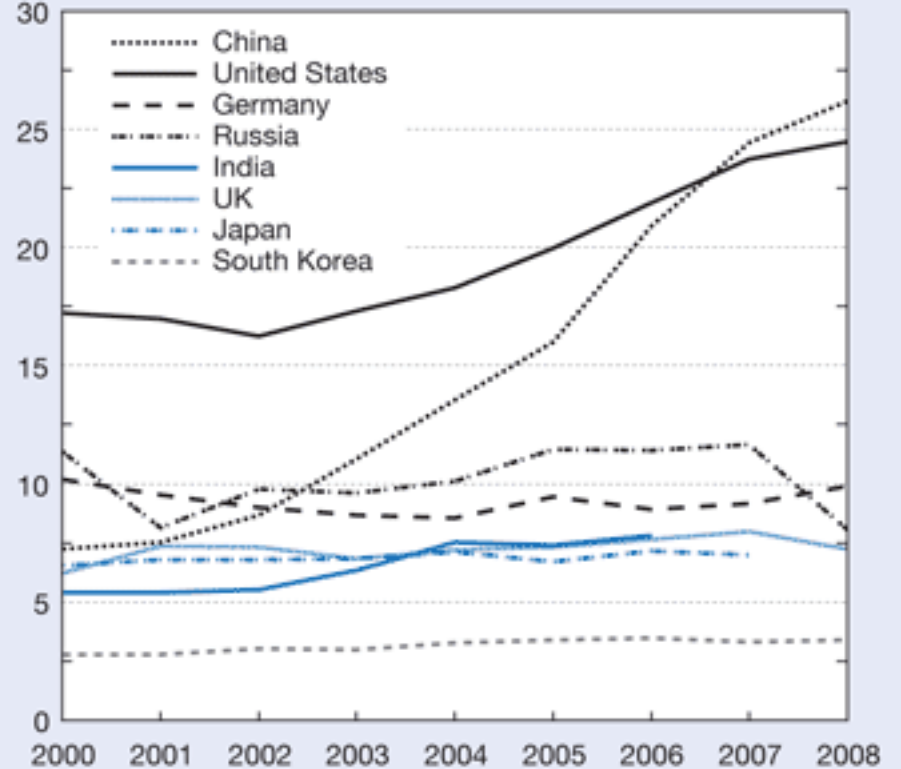
First university natural sciences and engineering degrees, by selected countries: 1999–2008

Thousands



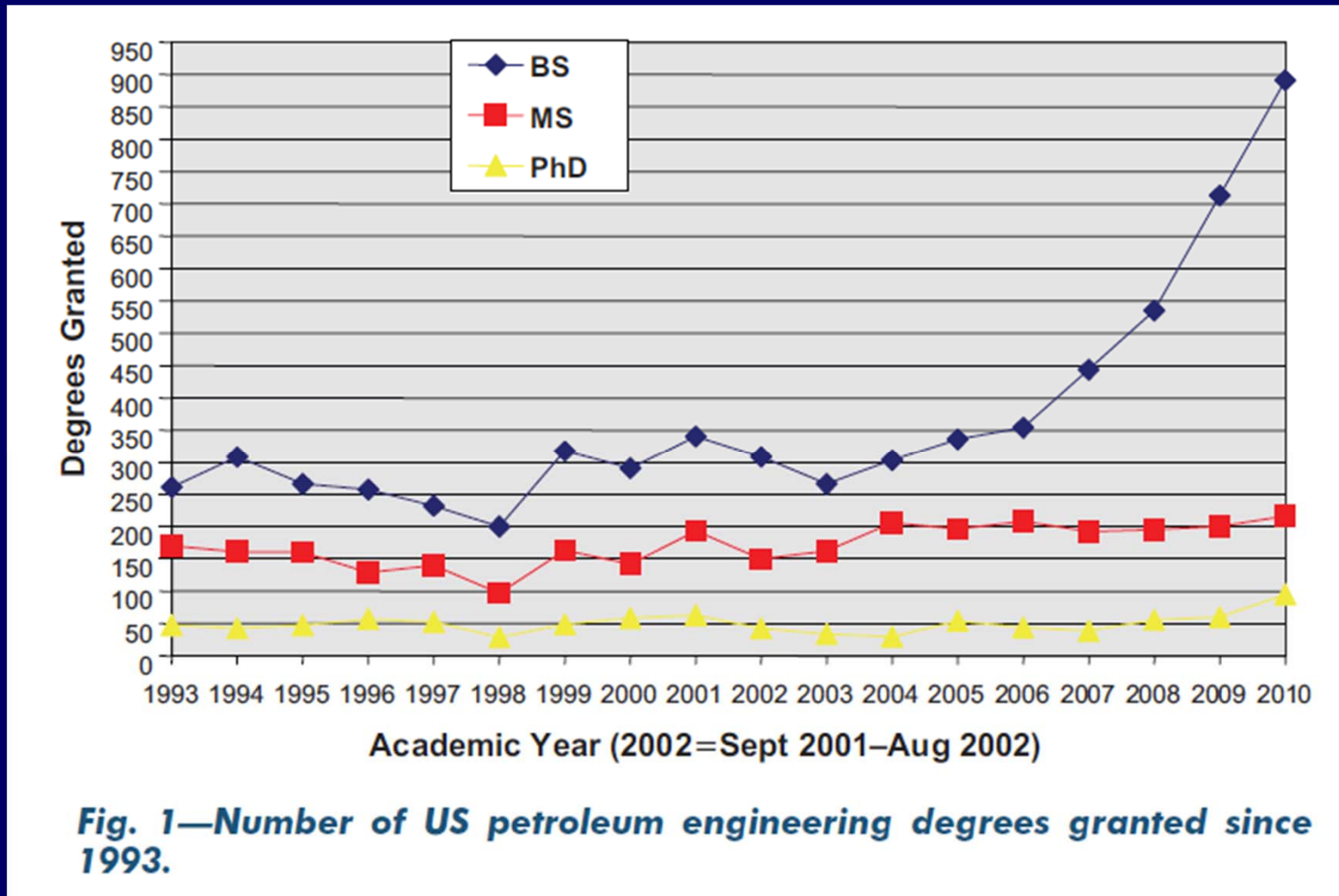
Natural sciences and engineering doctoral degrees, by selected country: 2000–08

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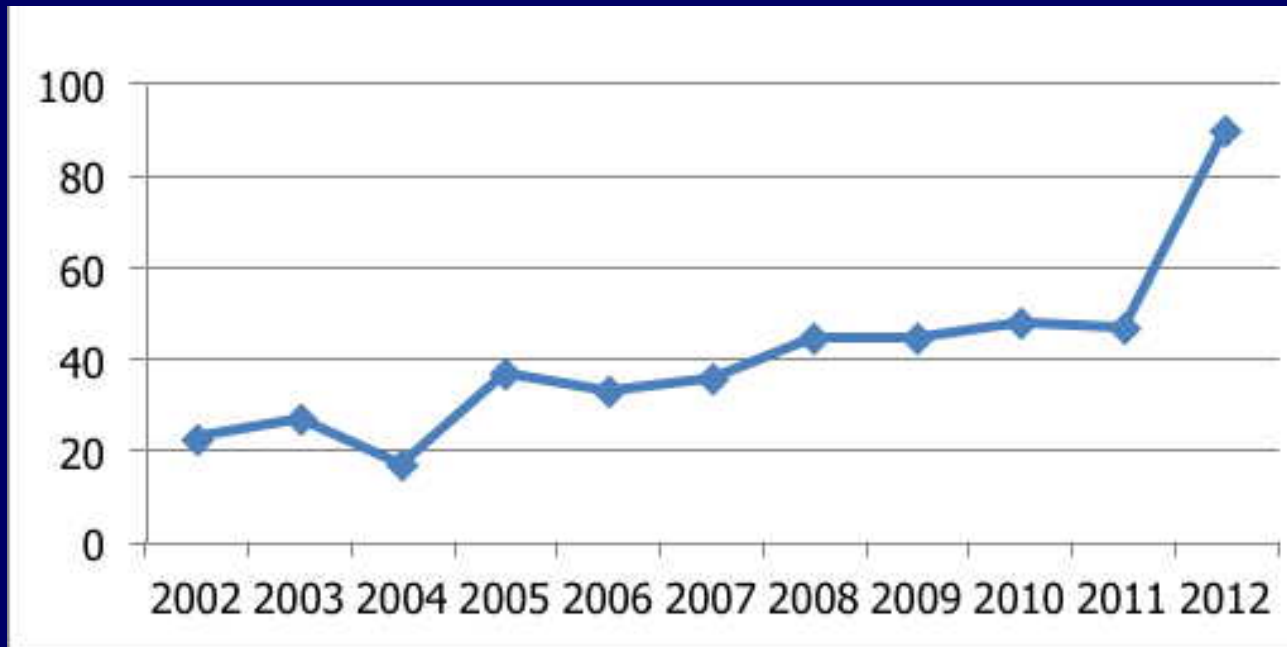
Science and Engineering Indicators 2012

Petroleum Engineering Degrees, USA



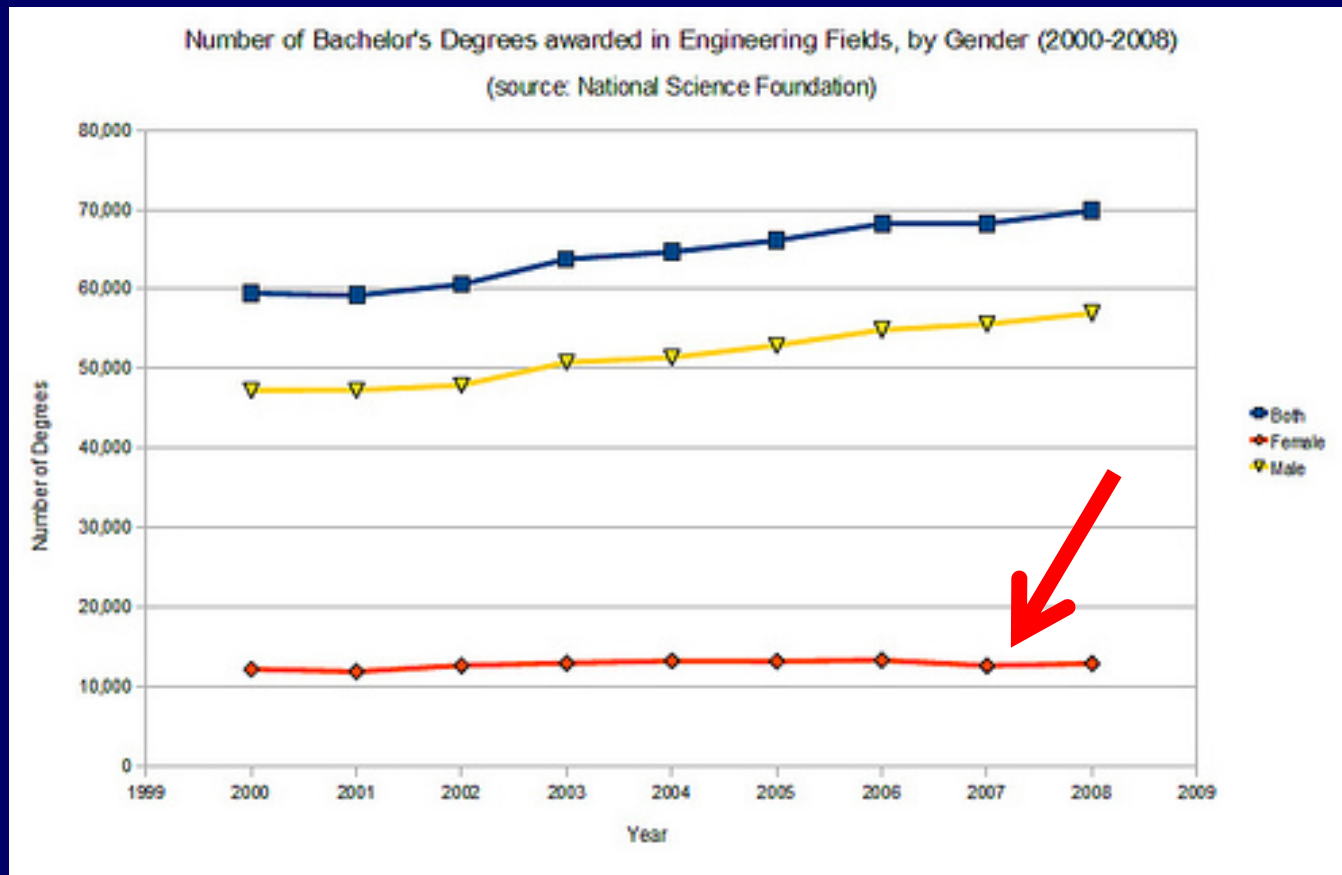
JPT/Steve Holditch

First Year Enrollment Applied Earth Science, TU Delft



Projected for 2013: 120
Female Percentage is 25% on Average

BSc Engineering Degrees, USA



Schlumberger's Internationalization

- Schlumberger started in the 1980's to become a truly **international company**, hiring people from throughout the world ("company match")
- This required a serious **change in the company culture** as a much more diverse workforce required different ethics standards, mutual understanding, tolerance and respect.
- 30 years later Schlumberger has a workforce of **120,000+ from over 100 countries**

Schlumberger's Internationalization



Schlumberger's Next Initiative

- More recently Schlumberger has actively pursued to increase the **percentage of women** in the company at all levels and in all fields
- Today the head of Wireline is a woman and until recently the head of DCS as well

Schlumberger's Next Initiative



A female SLB wireline engineer on OMV's well Spannberg-29 (2007)

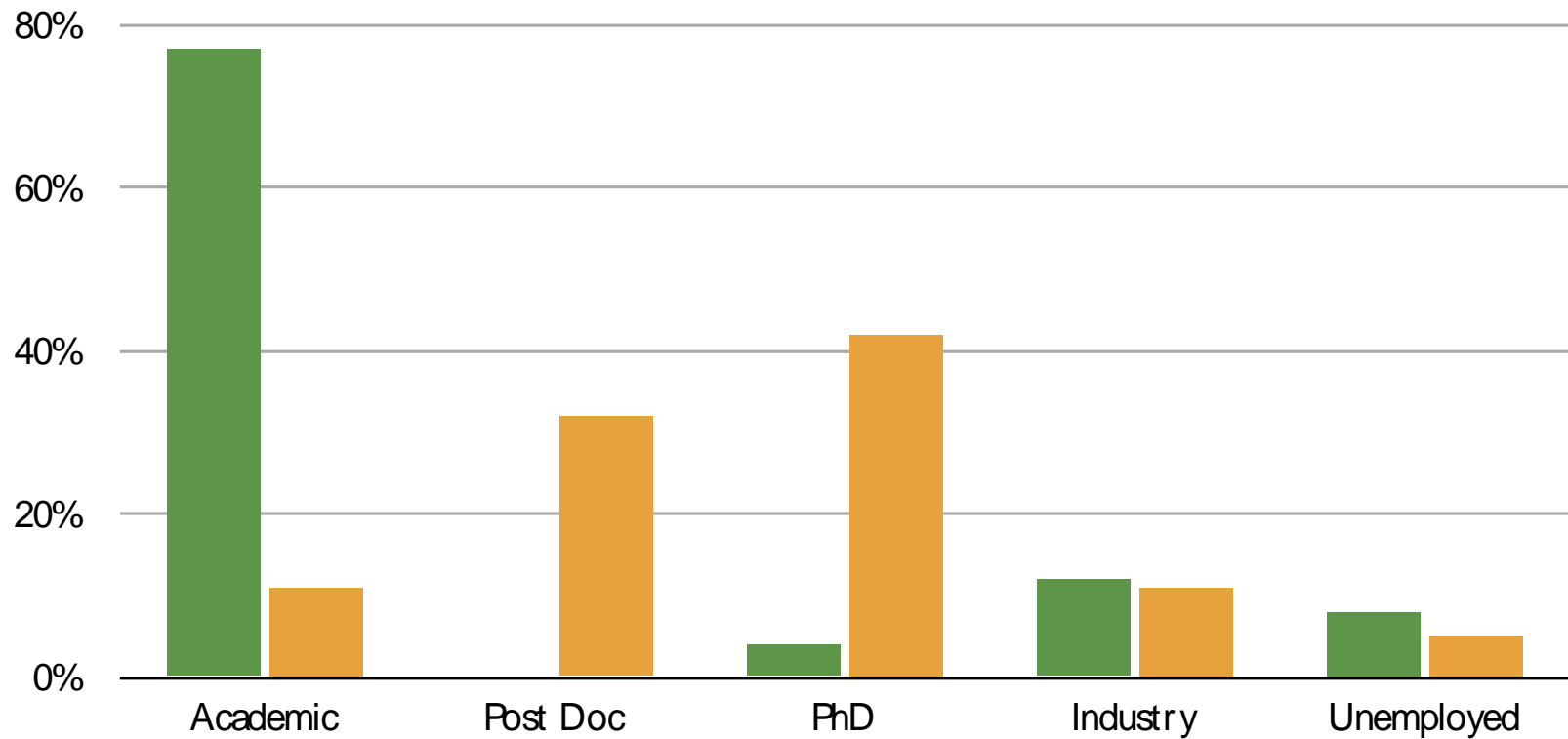
Schlumberger's Next Initiative

- Schlumberger in 2004 has taken the next step with the **Schlumberger Foundation Faculty for the Future (FFTF)**
- This program provides funding to women from **emerging countries** to pursue an advanced graduate study abroad in science, engineering and technology.
- The long-term goal of the Faculty for the Future program is to generate conditions that result in **more women pursuing scientific and engineering disciplines**, and helping their societies implement change leading to increased prosperity and economic development.

Schlumberger's Next Initiative

- For the **academic year 2013-2014 67 women** have received a scholarship from the FFTF programme
- Most of them are from Asian and African countries

The FFTF's Success Rate is Monitored



Current employment status of former fellows

Not at home
At home