

# Knowledge, Skills and Abilities for the Future: Challenges to Doctoral Education

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ReMaT Final Conference  
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## Global Challenges



### Addressing Basic Human Needs

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV / AIDS, malaria
- Ensure environmental sustainability

## Capacity Building



### The Role of Science & Technology

- Energy
- Agriculture
- Water
- Health
- Education that includes S&T
- Democratic governance, rule of law, respect for human rights, and peace and security
- Interdependency between growth, poverty reduction, sustainable development

## Environmental Scan

For academic research faculty

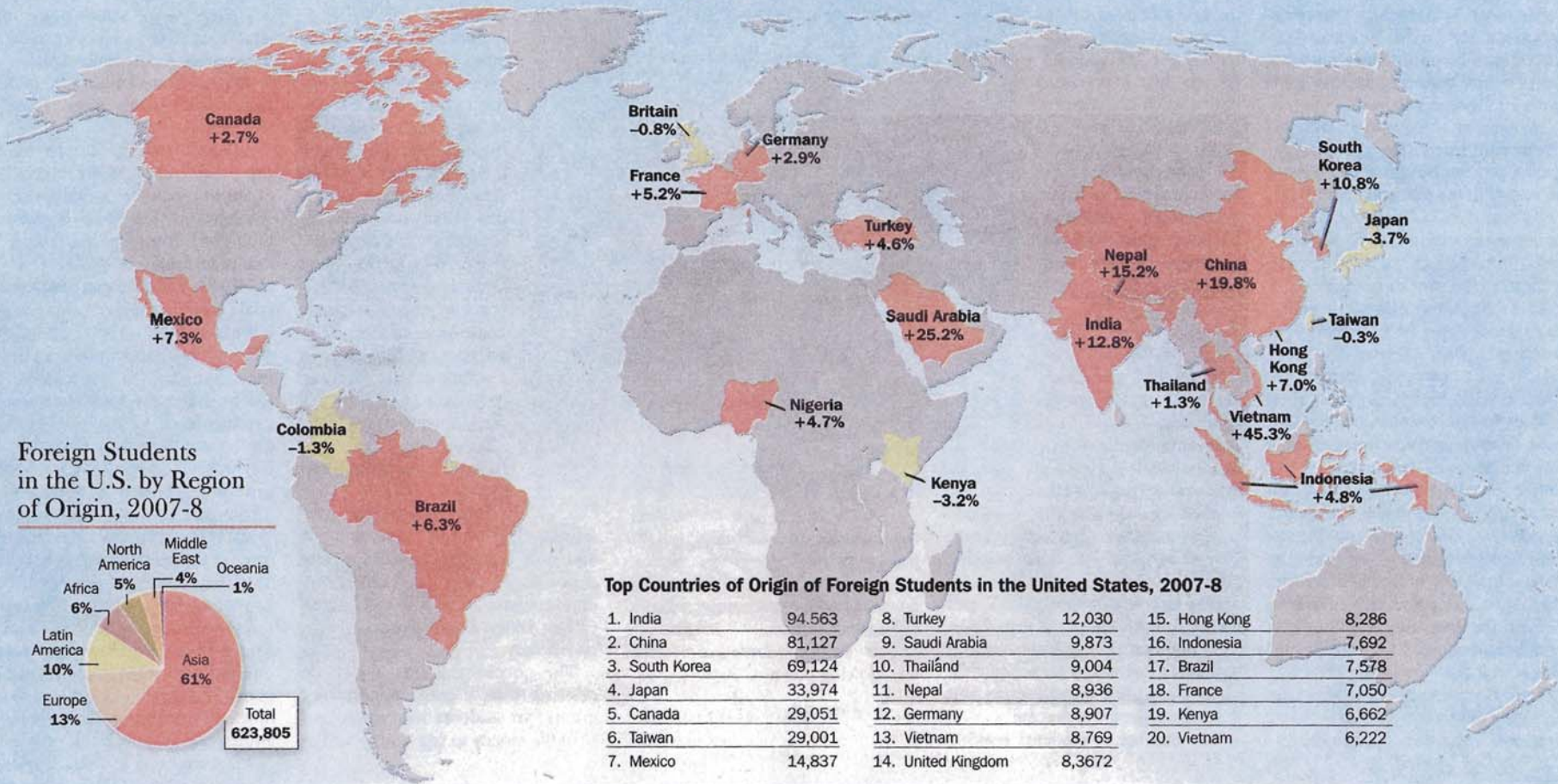
- Changing views of the nature of teaching and learning
- Changing expectations for faculty
- Changing student body

## Top Countries of Origin of Foreign Students in the United States, 2007-8

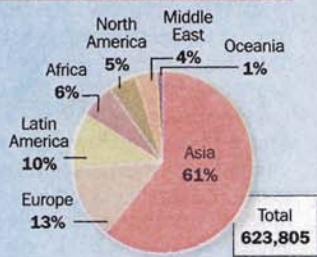
The map highlights the percentage change in students from 2006-7 to 2007-8 for the top 20 countries.

■ 1-year increase  
■ 1-year decrease

<http://opendoors.iienetwork.org/>



Foreign Students in the U.S. by Region of Origin, 2007-8



Top Countries of Origin of Foreign Students in the United States, 2007-8

1. India	94,563	8. Turkey	12,030	15. Hong Kong	8,286
2. China	81,127	9. Saudi Arabia	9,873	16. Indonesia	7,692
3. South Korea	69,124	10. Thailand	9,004	17. Brazil	7,578
4. Japan	33,974	11. Nepal	8,936	18. France	7,050
5. Canada	29,051	12. Germany	8,907	19. Kenya	6,662
6. Taiwan	29,001	13. Vietnam	8,769	20. Vietnam	6,222
7. Mexico	14,837	14. United Kingdom	8,3672		

## Environmental Scan

For all career options

- Growing dissatisfaction with job readiness of new Ph.D.'s (graduates and employers)
- Job markets are rapidly changing
- More competition & more collaboration

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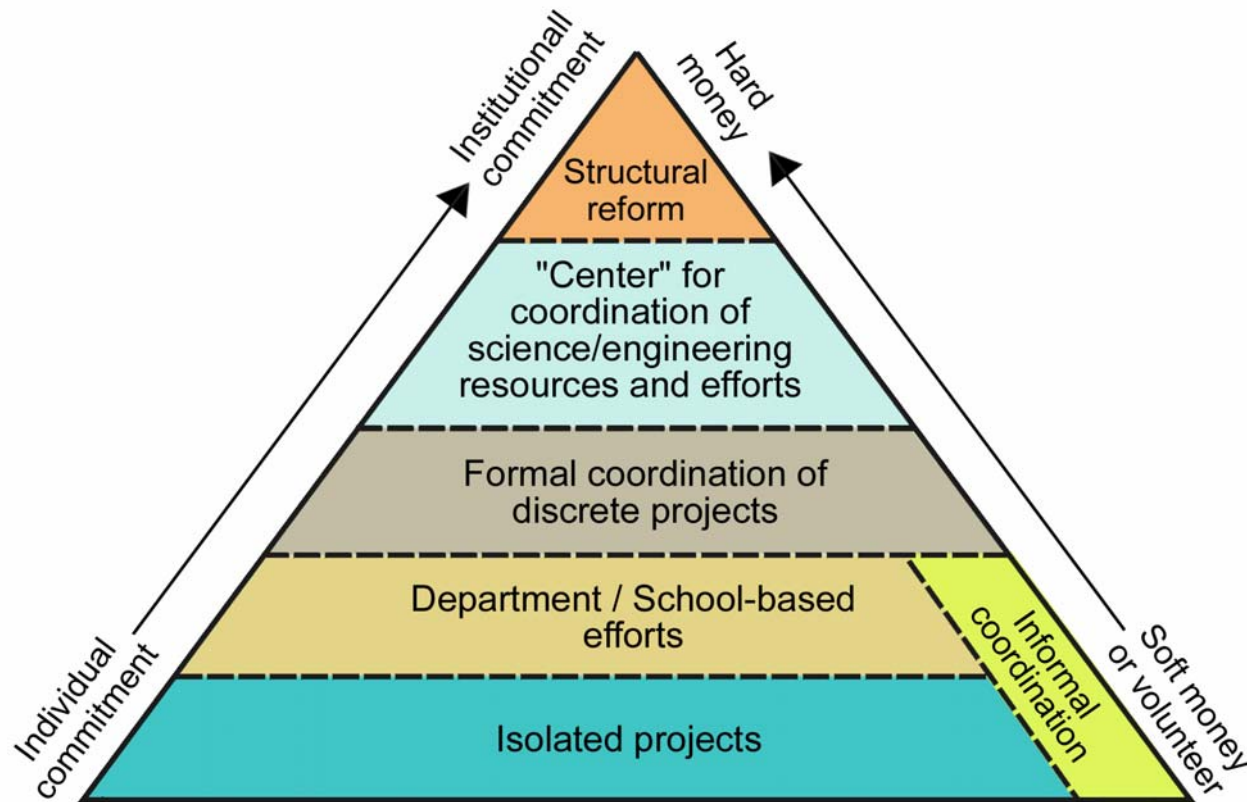
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Source: Partnership for 21<sup>st</sup> Century Skills

## Basic Assumptions

- The Ph.D. is a research degree
- Not all Ph.D. students aspire to faculty / academic research careers
- Not all Ph.D. programs aspire to prepare students for faculty careers or for the full range of career opportunities available to PhD trained scientists





The **Preparing Future Faculty (PFF) program** at Arizona State University is a professional development opportunity for students who are seeking a Doctorate or MFA degree and are interested in pursuing a faculty position upon graduation or those who are giving it considerable thought.

Through the Preparing Future Faculty program, students learn about the many roles faculty members are asked to perform (research/scholarship, teaching, service) and are given an inside look into other aspects of the faculty position from distinguished faculty and administrators at ASU.

Another component of the Preparing Future Faculty program is to provide participants with an overview and comparison of how the roles of faculty may differ depending on the type of institution (large public research, small private religious, etc.). Students who complete the Preparing Future Faculty program are better prepared for the academic job search and are more successful in their first faculty position.

<http://graduate.asu.edu/pff/index.html>





THE UNIVERSITY OF TEXAS AT AUSTIN



**Intellectual Entrepreneurship:** *"Educating Citizen-Scholars"*  
A Cross-Disciplinary Consortium

Intellectual Entrepreneurship (IE) is an inter-collegial Consortium of the Colleges of Communication, Liberal Arts, Fine Arts, Natural Sciences, Engineering, Law, Education, Pharmacy, and the Schools of Information, Public Affairs and Social Work. The mission of IE is to educate "citizen-scholars"--individuals who creatively utilize their intellectual capital as a lever for social good.

<https://webpace.utexas.edu/cherwitz/www/ie/>

The logo for the Professional Science Master's (PSM) program, with 'PSM' in large gold letters and 'PROFESSIONAL SCIENCE MASTER'S' in smaller blue letters below it, separated by horizontal lines.

PSM PROFESSIONAL  
SCIENCE MASTER'S

The Professional Science Master's (PSM) is graduate degree designed to allow students to pursue advanced training in science or mathematics, while simultaneously developing workplace skills highly valued by employers. PSM programs consist of two years of academic training in an emerging or interdisciplinary area, along with a professional component that may include internships and "cross-training" in business and communications. All have been developed in concert with industry and are designed to dovetail into present and future professional career opportunities.

<http://www.sciencemasters.com>

## FAIRER SCIENCE

FairerScience began because researchers and advocates for women in science, technology, engineering and mathematics (STEM) have not been effectively communicating their findings in ways that allow the public including policy makers, educators and parents to understand and evaluate these findings and, where appropriate, make decisions based on them.

FairerScience is committed to changing that both in terms of gender and where gender issues in STEM interact with issues of race/ethnicity and disability.

<http://www.fairerscience.org>

## Communicating Science

tools for scientists and engineers



*Communicating Science: Tools for Scientists and Engineers* online resources include [webinars](#), how-to tips for [media interviews](#), strategies for identifying [public outreach opportunities](#), and more. [Workshops](#) for scientists and engineers interested in learning more about science communication tools and techniques are also available.

<http://communicatingscience.aaas.org/>

## About .....



- Organized in 1848
- The AAAS journal *Science* was founded by Thomas Edison
- *Science* has the largest paid circulation of any peer-reviewed general science journal in the world (total readers = one million)
- More than 130,000 members, 47% are academics
- AAAS serves 260+ affiliated societies and academies of science – reaching 10 million students and scientists!
- Programs in Education, Science Policy, and International Collaboration

Helping today's and tomorrow's scientists forge a successful career is one way we *advance science and serve society.*

## Science Careers

From the journal *Science*



- Jobs
- Career advice
- Funding database
- Discussion forum
- [www.sciencecareers.org](http://www.sciencecareers.org)

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## Science Career Magazine

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Career Advice

### Tooling Up: 15 Minutes to a Better Interview

By David G. Jensen  
November 28, 2008

Even for experienced interviewers, some basic rules of courtesy and etiquette are worth reviewing.

[Whole Story](#) | [Discuss in Forum](#)

### Spotlight

[Tooling Up: 15 Minutes to a Better Interview](#)

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[Young Italian Scientists Take to the Streets](#)

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**Taken for Granted**


Beryl Lief Benderly has been a regular contributor to Science Careers since 2003, writing on postdoc matters and other scientific workforce issues.


  
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[Mastering your Ph.D.](#)

  
[Opportunities](#)

  
[Mind](#)

  
[Taken](#)

  
[Tooling](#)

Issues & Perspectives

**Young Italian Scientists Take to the Streets**

Italian scientists on short-term contracts defend their futures by protesting cuts in research funding and jobs.

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**Analyzing Scientific Investments**

A background in science can be an advantage for analysts charged with determining the value of science-based companies

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Job Market

**Finance's Quant(um) Mechanics**

One of the earliest "alternative" science careers, quantitative finance is now deeply embedded in the world's finance industry.

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Job Market

**Special Feature: Scientists as Financial Analysts**

It may be a terrible time for the finance industry, but it might be a good time for researchers to plan for careers as financial analysts.

[Whole Story](#) | [Discuss in Forum](#)

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## Career Planning and Management

- What will you be doing in 10 years?



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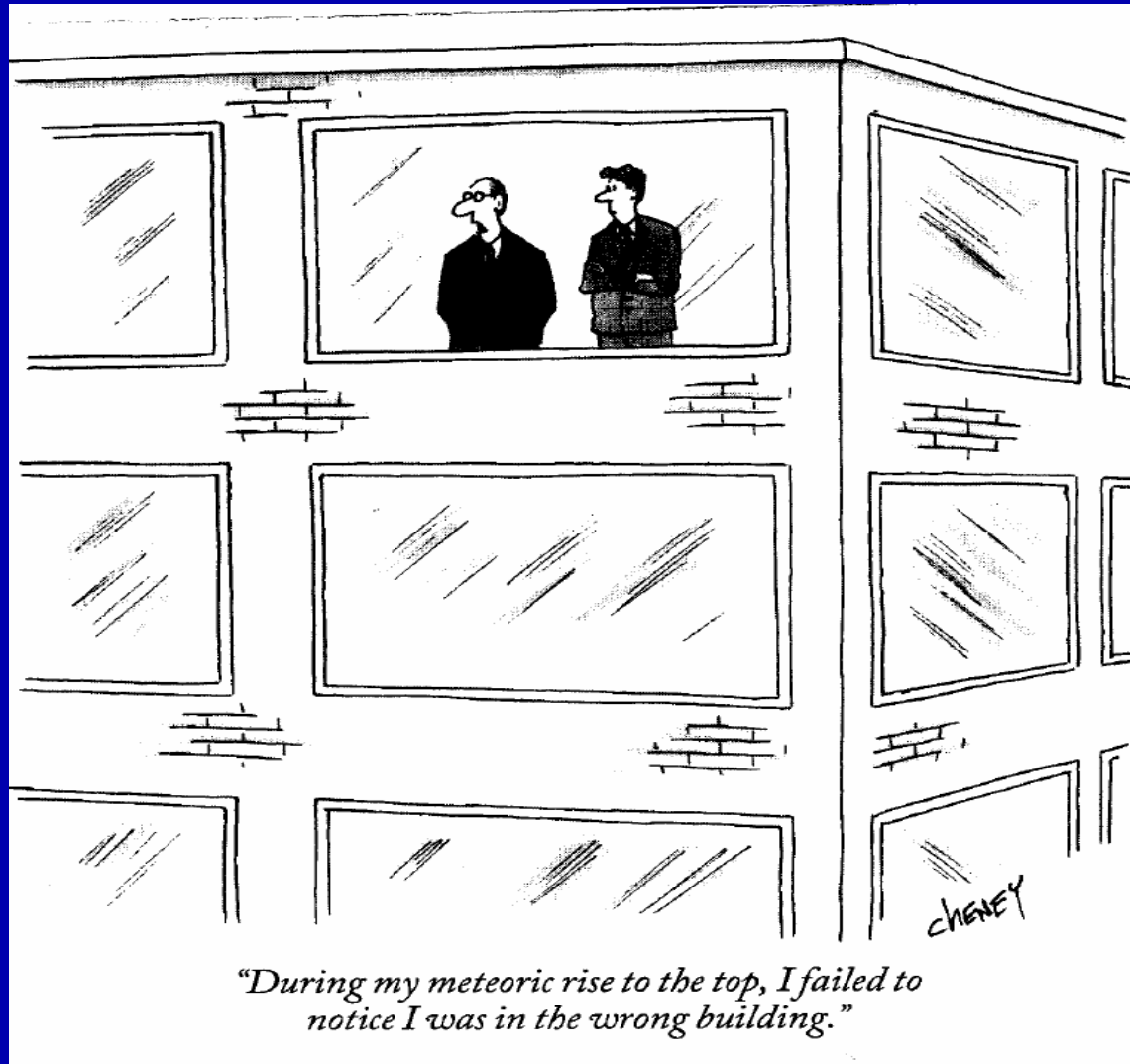
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- What will you be doing in 10 years?
- What do you want to be doing?
- What will you need to know and be able to do in that job?
- What will you wish you had learned / done in graduate school to prepare for that job?



## Danke schön

- Monica Schofield
- Margarete Remmert-Rieper
- Ingeborg Meyer-Gaffke
- TuTech Innovation GmbH

## Questions, Comments, and Ideas Welcome

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