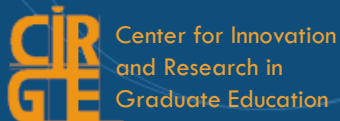



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Developing the Next Generation of Researchers: A Coordinated Effort at Many Levels



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Overview

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1. **Who are we talking about?**
 2. **The changed context: globalization**
 3. **More is asked from the next generation**
 4. **Conceptual approaches for the development of researchers**
 5. **It takes a “global village” – efforts of many levels to develop researchers**
 6. **Example of innovative national doctoral programs with efforts of many level involving many competencies**
 7. **Tensions in times of innovation: are we preparing for intellectual risk taking?**

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Early Career Researchers (ECR)

- **Doctoral (students) candidates**
- **Postdoctoral fellows**
- **Assistant professors (tenure track)**
- **Researchers in industry, business, government, non-profits**
- **Assistant research professors (non-tenure track)**

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

**What do we know about the
education and career path of
researchers?**

And why is it important to know?

**competencies needed in current
and future research jobs**

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Few PhD career path studies

CIRGE conducts career path and retrospective analysis of program quality

Three U.S. National Surveys of PhDs
10+ and 5+ Years Later

1. *PhDs—Ten Years Later* (surveyed 1997)
2. *PhDs in Art History – Over a Decade Later* (surveyed in 2002)
3. *Social Science PhDs- Five+ Years Out* (surveyed 2005/06)

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Postdoctoral Appointments

Major Field	%Doing Postdoc	Mean Years
Biochemistry	86	3.8
Computer Sc.	7	1.6
Elec. Eng.	9	1.6
English	8	2.0
Mathematics	31	2.5
Political Sc.	9	1.5

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

The Globalization Context


Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Effects of Globalization on Doctoral Education

1. Increase in PhD production: more women, more international students, more part-time /older students – **more diverse researchers**
2. A change in the mode of research production – **mode 2 (research triangles)**
3. Increase in the importance of transferable/ professional and translational skills- **more skills**
4. Increase in standardization of doctoral education – **allows for mobility**

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Effects of Globalization on Doctoral Education

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5. Quest for greater accountability- **project management skill**
 6. Increased global communication and creation of global networks – **scholarly, global networks**
 7. Higher education is responding to market forces faster than before –**competition**
 8. Higher education has become commercial and generates revenue- the degree has become a commodity that has value beyond pure knowledge production-**competition for PhD students**

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

National Policies Respond to Globalization

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- Establishment of national governmental research training schemes, research quality frameworks
Australia, EU, Canada, Denmark, Japan, Mexico (Conacyt), New Zealand, Norway, South Africa, UK, US
 - Industrial representation on national PhD program evaluation: **Denmark, Norway**
 - Establishment of “sandwich doctoral programs” and exchange programs of both professors and students: **Brazil, Malaysia, Mexico, Iceland, India**
 - Innovative, interdisciplinary, theme-oriented doctoral programs: **Germany, US, Australia, Netherlands**

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Selected Challenges

- **English** is becoming the means of doctoral seminar instructions thus further distancing science from the local population

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Force and Forms of Change in Doctoral Education Worldwide

CIRGE: International Network

3 Research synthesis workshops

2005 Seattle US; 2007 Melbourne, Australia; 2009 Kassel, Germany

Participants: : 6 continents, 16 countries.

Graduate Deans, national funding agencies (i.e. NSF, NIH), researchers of doctoral education, University provosts for research, early career researchers (ECR)

Outcomes:

- Books University of Washington Press (2008) *Towards a Global PhD?*
- Research agendas setting
- Policy recommendations (see CIRGE website, www.cirge.washington.edu)

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Common Definition of a Research Doctorate

1. Need to contribute to knowledge through original research
2. Expect to have a substantial knowledge in the area of study
3. Training need to include the development of professional/ transferable, translational competencies

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

More is Asked from the Next Generation of Researchers

1. Academic research skills

Skills developed in completing the PhD (critical thinking, research design + methods, data analysis/synthesis, writing, publishing), Working in multi-disciplinary teams
Research ethics –responsible conduct in research

2. Professional competencies

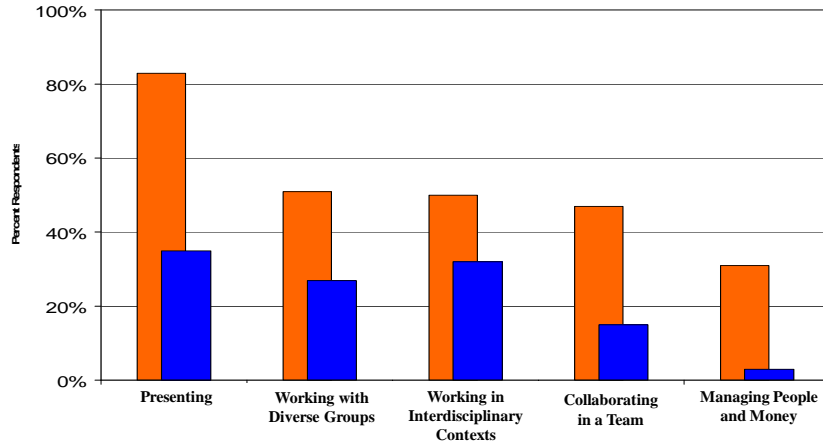
Team work, presenting, grant writing, managing people and budgets, Working in multi-disciplinary teams

3. Multi-cultural competencies

Working with international researchers and in international settings

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Importance of Skill at Current Job versus Excellent Quality of Training in this Skill During PhD Studies



Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Conceptual Approaches to the Education of Researchers

1. Apprenticeship model- **does it still fit?**
2. Professional socialization- **top down?**
3. Community of practice (situated learning) – **widens the perspective**
4. Mentoring – **a panacea for everything?**
5. It takes a global village - **a coordinated effort of many levels of the university and beyond**

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

The Global Village Approach

continuing



1. Main professor/supervisor – and PhD candidate and postdoc: **apprenticeship approach** → **traditional academic research skills**, seminars, lab work, advising, from a “knowledge consumer to a knowledge producer,” novice to junior colleague
→→→**IDEALLY mentoring of all competencies**
2. Department level and laboratory: **transparent disciplinary socialization and community of practice approach** → **disciplinary professional competencies** structured program and disciplinary professional development activities, social community building

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

The Global Village Approach

continuing



3. Graduate School (US type): **professional socialization in multiple learning contexts +community of practice approach** → **professional competencies, multicultural competencies**
 1. Career development (career center),
 2. Learning of Teaching (CIDR)
 3. Professional skills workshops by major fields
 4. Creating and fostering postdoctoral association
4. Beyond the university - National Research Funding Agencies: **strategic funding strategies that require approaches at many levels** →→→**academic + professional + international competencies**
sponsoring innovative, interdisciplinary, international, theme-oriented doctoral programs that also include postdocs in the pedagogical design

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Example of National Innovation Funding

Strategy in Doctoral and Postdoc Education (US-IGERT Programs; German-GK)



Characteristics of these programs

1. Theme based
2. Student funding is tied to the program NOT to the professor
3. Trans- or interdisciplinary and team-based
4. Access to professionals in the field
5. Professional skill development
6. Emphasis on the learning environment
7. Foster diversity of students
8. International component
9. Become a catalyst for change on campus

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Current Tensions!



- Are we fostering **socially relevant research** and also creating room for basic research?
- Do our structures (funding schemes and efficiency measures) allow for **intellectual risk taking**?

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Intellectual Risk Taking

1. Why are we concerned?
2. What is risk? What do we mean by encouraging risk taking?
3. What are the implications for training ECRs?
4. Can funding play a role?
5. Can the university as an institution help?
6. What pedagogical innovations can spur it?

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Intellectual Risk-Taking Policy Recommendations

1. Graduate students/candidates be selected, trained, and rewarded for innovation and risk-taking;
2. Graduate programs develop procedures for doctoral students to learn about and from risk-taking early in their program;
3. Universities develop programs to explicitly train doctoral supervisors in the recognition and management of risk for their students;
4. Universities, departments, and programs develop a research culture that values and rewards innovation and creativity;
5. Every doctoral curriculum train students to be aware of the limits and strengths of their disciplines by exposing them to other disciplines through team-building opportunities.

Source: CIRGE, University of Washington, INORMS 2010, 4-2010



“PhD programs that prepare students only for research and writing as lonely scholars in purely disciplinary context are providing inadequate preparation for many research careers.”

**Highlight report, *Social Science PhDs – Five Years Out: A National Survey of PhDs*
Nerad et al. (2008)**

Source: CIRGE, University of Washington, INORMS 2010, 4-2010

Thank you!



Center for Innovation and Research
in Graduate Education



CIRGE website

<http://www.cirge.washington.edu>