Defining and Measuring Successful Career Outcomes

,
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Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Overview

1. The context of my remarks
2. Common incorrect assumptions about doctoral education
3. Current criticisms of US doctoral education
4. Research findings on current doctoral education from doctoral students and PhD recipients' viewpoint
5. Are we preparing for the future?
6. Characteristics of doctoral education for the 21st century
7. Criteria for measuring program effectiveness

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

The context: CIRGE research

1. **Research on outcome measures of doctoral education outcomes: 3 national career path studies of PhDs**
2. **Action/evaluation research of innovative and international doctoral programs: NSF IGERTs/ German Graduiertenkolleges**
3. **Research/monitor international trends in doctoral education: biannual international CIRGE conference, development of pilot programs on "international" leadership workshops for doctoral students**

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common *(incorrect)* US Assumptions about US PhDs

1. All PhD students want to become academics.
2. The “best” PhD students do become academics.
3. Science PhDs who pursue an academic career path reach this career goal at a relatively young age

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common *(incorrect)* Assumptions about US PhDs

4. PhD recipients' career paths are linear and smooth.
5. Everybody can take the best job offered.
6. Children detract women from the pursuit of an academic career.
7. Academics enjoy the highest job satisfaction.

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Empirical Findings from Three US *PhDs –10+ and 5 Years Later* Studies

1. **PhDs—Ten Years Later** ***(surveyed 1997)*** **MELLON FOUNDATION AND NSF FUNDED**

   61 US universities, 6 disciplines

   Survey population: 5,864 response rate: 66%

   - **Biochemistry**
   - **Computer Science**
   - **Electrical Engin.**
   - **English**
   - **Mathematics**
   - **Political Science**

2. **PhDs in Art History – Over a Decade Later** ***(surveyed in 2002)*** **GETTY GRANT FOUNDATION FUNDED**

   54 US universities, all art history PhD programs

   survey population: 725 response rate: 70%

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

3. Social Science PhDs – 6+ Years Out

(surveyed 2005/2006) FORD FOUNDATION FUNDED

64 universities, 6 disciplines, 50% response rate (2,702)

- Anthropology
- Communications
- Geography
- History
- Political Science
- Sociology

Survey instrument:

- Career goals at start and end of PhD education
- Career paths and salary
- Job search and job satisfaction
- Evaluation of doctoral education
- Usefulness of doctoral education
- Family and Career

Source: CIRGE, University of Washington, COE Future Committee, January 20, 2005

(peer and national comparison upon request)

Common Assumption 1

All students who you pursue a PhD want to become professors.

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Career Goal at PhD Completion and Tenured 10-14 Years Later

	(1) % Wanted to Be Professor		(2) % Tenured of (1)		(3) % Tenured of All PhDs	
Bio-Chemistry						
Computer Sc.						
Electrical Engin.						
English						
Mathematics						
Political Sc.						

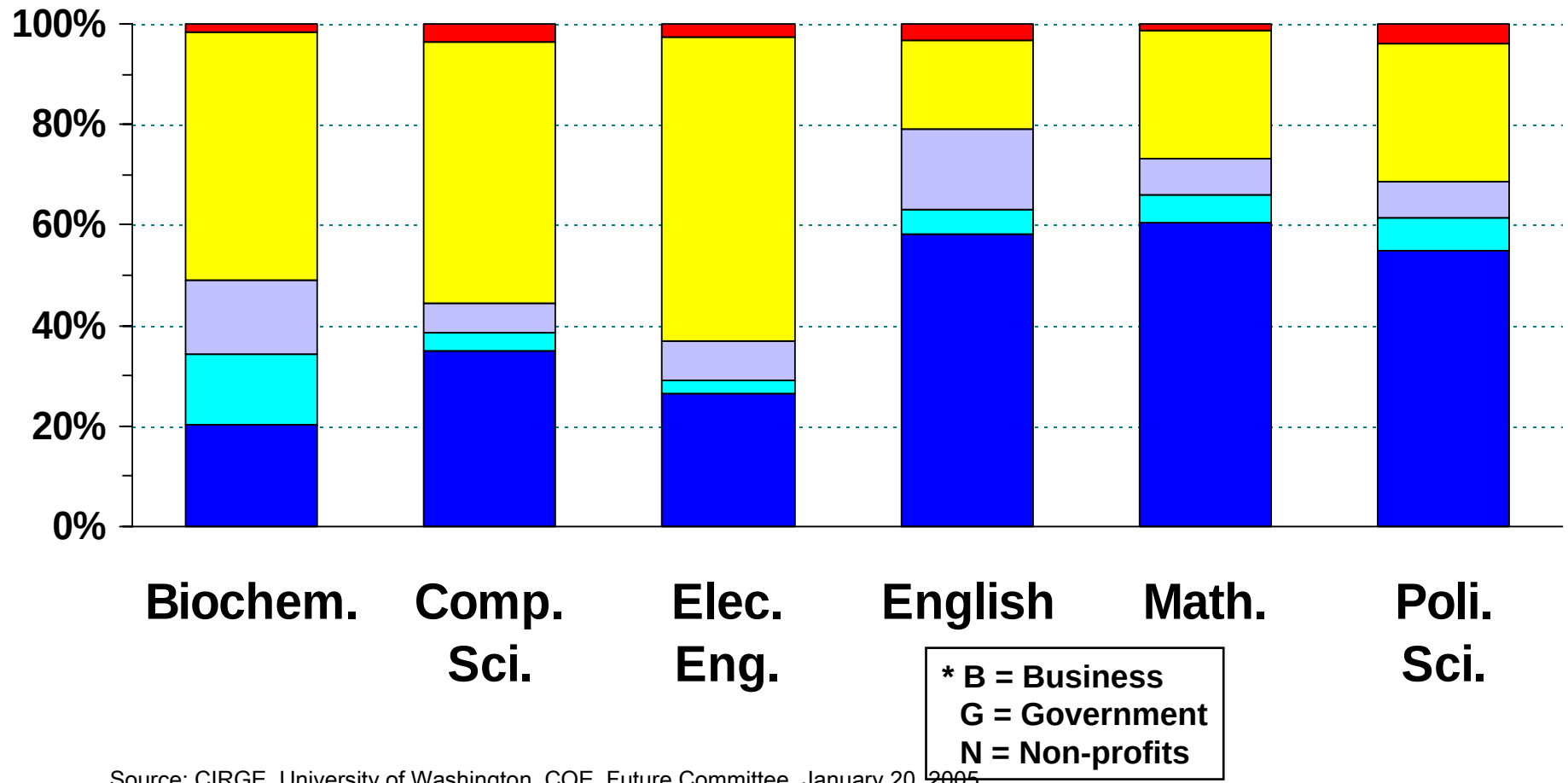
Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Career Goal at PhD Completion and Tenured 10-14 Years Later

	(1) % Wanted to Be Professor		(2) % Tenured of (1)		(3) % Tenured of All PhDs	
Bio-Chemistry	32		34		19	*(605)*
Computer Sc.	46		61		34	*(282)*
Electrical Engin.	19		67		22	*(328)*
English	81		64		55	*(767)*
Mathematics	54		73		54	*(522)*
Political Sc.	72		66		53	*(455)*

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Employment at Survey, 1996/97 10+ Years after PhD



Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common Assumption 2

The “best” PhD students do become professors

measures: short time-to-degree
many publications

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common Assumption 2
The "best" become professors

Short time-to-doctoral degree and number of publications only mattered significantly for English and political science PhDs.

These factors did NOT matter for biochemists, electrical engineers, and mathematicians. Time-to-degree mattered for computer scientists (logistic regression analysis).

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common Assumptions
the "best" and mentoring

What mattered most is the RANK of PhD-granting program.

However in fields with an attractive job market outside academia, computer science and electrical engineering, RANK did NOT matter significantly.

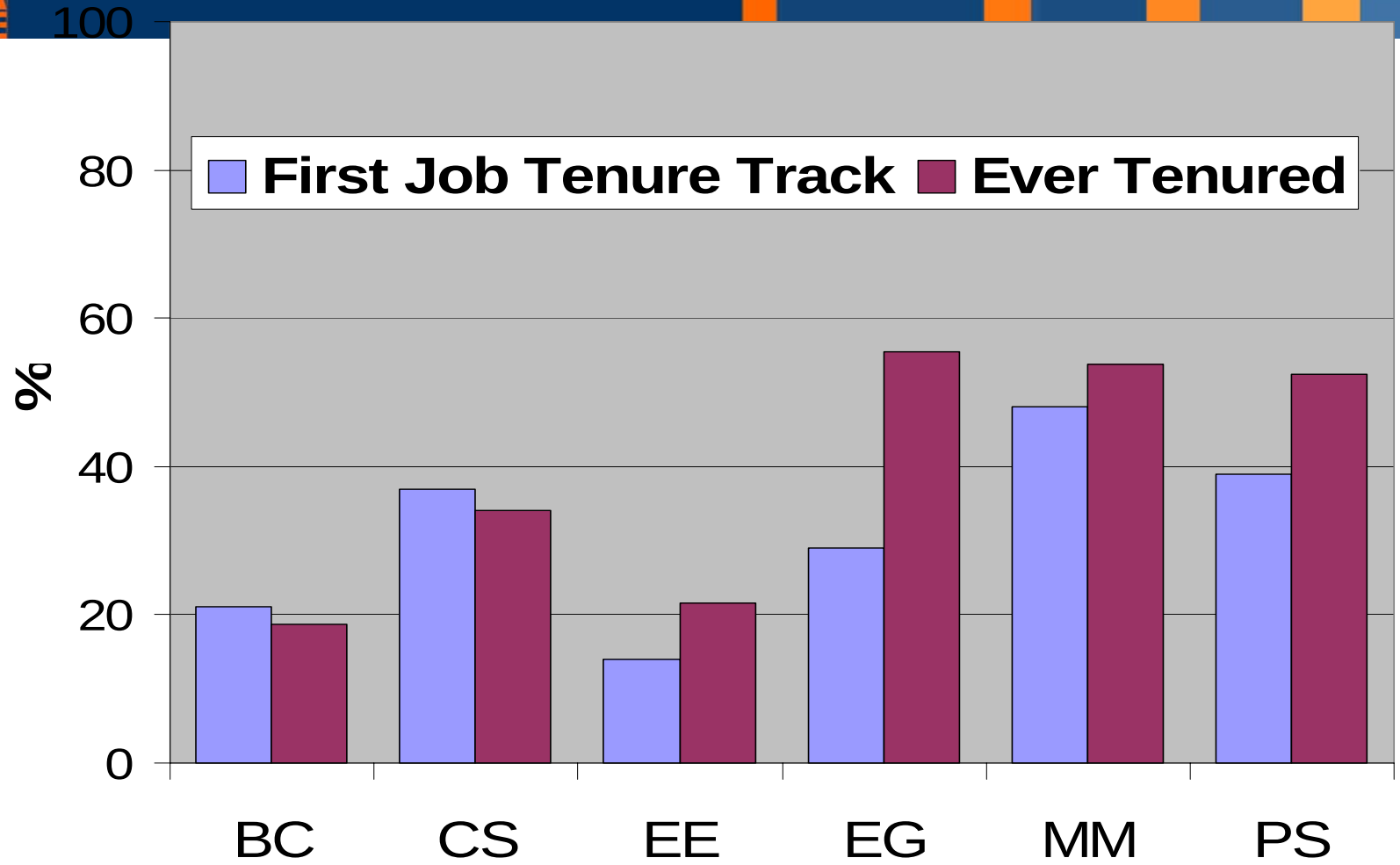
Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common Assumption 4

PhD recipients' career paths are linear and smooth

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

% PhDs First Job Assistant Professor and Ever Tenured



Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Three Major Trajectories: Political Science

			Percent of Total
1. Faculty	TT to Ten. (219)	→	42%
2. BGN Employees	Business (29)	6%	13%
	Government (21)	4%	
	Non-Profit (15)	3%	
3. Crossovers	Acad. to BGN (22)	4%	12%
	BGN to Acad. (10)	2%	
	Back and Forth (30)	6%	

Trajectory 1: Under 2yrs. BGN.
Trajectory 2: Under 1yr. Acad.
Trajectory 3: Over 2yrs. BGN and over 1yr. Acad.

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common Assumption 5

Everybody can take the best job offered

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Educational Level of Partner of PhDs by Gender (all fields)

Women in the Survey

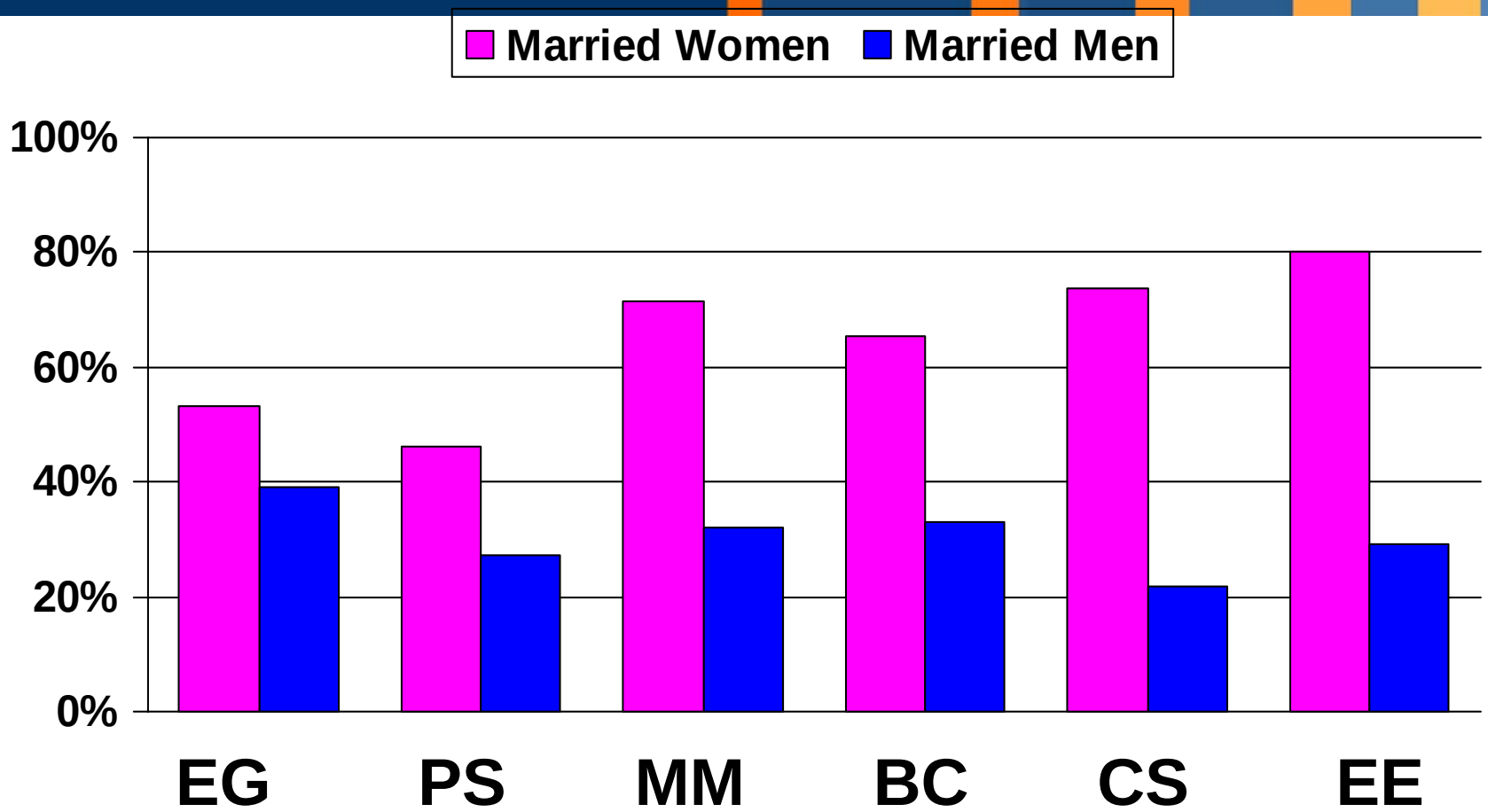
Partnered with PhD/Lawyer or Medical Doctor: 61%

Men in the Survey

Partnered with PhD/Lawyer or Medical Doctor: 27%

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

“Good Opportunities for My Partner” Very Important in First Job Choice



Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common Assumption 6

Children detract women from the pursuit of a faculty career

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Who Influenced the Career Path?

Art History

	Women	Men
Partner	**44%**	**26%**
Children	**38%**	13%
Taking Care of Relatives	**13%**	**4%**

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Ever Tenured by Family Trajectories and Gender: *Art History*

	Women	Men
Single w/o Children	53%	54%
Stable Relationship w/o Children	52%	76%
Stable Relationship w/ Children	38%	81%

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Common Assumption 7

Faculty enjoy the highest job satisfaction

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

% PhDs Very Satisfied in Job 10+ Years Later (*All Fields*)

	Rank	%	N
BNG manager/executive	1	40%	*243*
Academic administrator	2	39%	*54*
Acad. researcher	3	28%	*54*
Tenured professors	4	26%	*851*
BNG researcher	5	24%	*430*
Administrators	6	22%	*54*
Non-tenured faculty	7	18%	*131*

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Current Criticisms of US Doctoral Education

(National Academy –COSEPUP report 1995)

1. **Doctoral students are trained and educated too narrowly**
2. **They are ill prepared to teach**
3. **They are taking too long to complete and in some fields many do not complete their degrees at all**
4. **They are ill informed about employment outside academia**

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Current Criticisms of US Doctoral Education

5. Doctoral students lack key professional skills, such as collaborating effectively and working in teams.
6. They have a too-long transition period from PhD completion to stable employment (average of 4 years) ***by M. Nerad.***

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Median Age at Ph.D Completion and Median Time (since starting graduate school) by Major Fields (SED)

	Median Age (2004)	Median Time (Yrs) (2004)
Education	43.1	12.7
Social Sciences	33.1	7.9
Humanities	35.0	9.7
Engineering	31.4	7.2
Physical Sc.	30.6	6.7
Life Sciences	31.7	7.0

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Research Findings from Surveys of Doctoral Students and PhD Recipients

1. Preparation for faculty careers

1. Lack preparation for many roles of faculty and nor for different types of institutions
2. Lack of practical and theoretical pedagogic training (as TAs)
3. Lack of ethics education
4. The professorial profession looses in attraction

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Research Findings

2. Process:

1. **Structure:** unclear, don't know how to navigate
2. **Mentoring:** faculty-student relationship, want multiple mentors
3. **Funding:** for some fields unclear,

– stress, increasing debt, benefits of RAs and traineeship, need for some TA experience

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Research Findings

3 Quality of Life

1. **TA unionization** -cheap labor force
2. **Marginalization** - minority (cooled out), women/family, international students
3. **Are faculty models**?
4. **Learning environment** - lack of space, isolation particularly in social science, mathematics, humanities

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Research Findings

4. Outcomes

1. High job satisfactions after 10 years

intellectually challenging and stimulating work, autonomy of work most satisfied:(1) CEO, (2) managers, (3) researchers, (4) faculty

2. Program satisfaction: 40-50% would not do the PhD again in the same program

3. Problem area: dual career couples, a major problem for women and men

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Research Findings

5. Feedback

There need to be a feedback loop to the program, the campus, the individual faculty, the student

- annual doctoral student reviews
- institutional self-reflection
- current student satisfaction/ survey
- departmental/program self-studies
- alumni surveys

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Are we preparing our PhDs for the Future?

The context:

Globalization
and the knowledge economy

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Countries that prepare for the Knowledge Economy

Increase of PhD production + Governmental Financial Support (Examples)

- **Europe: Bologna Agreement (3.2 % of GDP for R&D)**
- **Canada: Increases PhD production**
- **Australia and New Zealand: Active recruitment of international PhDs**
- **Japan: Increases PhD production**

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Is the Traditional Doctoral Program Suited to the Demands of the New Economy?

Issues raised internationally

1. Disciplinary versus interdisciplinary
2. Individual versus collaborative
3. Producing relevant versus esoteric knowledge
4. Preparing for academic and non-academic jobs
5. Preparing for use and (critical) attitude towards the new technology
6. Preparing PhDs to become leaders that think and act globally and locally

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Characteristics of Doctoral Education for the 21st Century

1. It prepares PhDs to work in interdisciplinary groups (provide general epistemology course "how do we know what we know, and what do we regard as evidence?")
2. It integrates professional skill building
3. It Introduces collective advising
4. It integrates team work
5. It includes international collaborations into the doctoral program

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Characteristics of Doctoral Education for the 21st Century

6. It encourages multiple flows of students and research collaborations (north/south, rich/poor)

7. It re-introduces foreign language requirement (disadvantage with English only, and hierarchy)

8. It prepares for leadership (and makes one's own limitation transparent and acceptable)

9. It initiate world citizenship education

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Characteristics of the Innovative Doctoral Programs in the US and World-wide

They:

1. **Are problem-oriented, inquiry-based, theme-based rather than discipline oriented, multidisciplinary research programs (maximum 10 years existence)**

2. **Prepare for academic and non-academic careers, via connections to outside world (internships, professionals connected to program)**

3. **Make professional socialization (ethical values and norms of the field) explicit via multiple mentoring**

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Characteristics of the Innovative Doctoral Programs

4. Include professional skills training of the field (presenting at conferences, teaching, publishing, grant writing)
5. Team work is an explicit component of program (dissertation may include collectively written chapter)
6. International program components are encouraged (curriculum includes international collaboration with other doctoral programs)
7. Program proposals are reviewed for funding through an academic peer review scheme

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Examples of Innovative Doctoral Programs

1. German (DFG) Graduiertenkolleg (GRAKO): 1989

2. Australian Cooperative Research Center Training Program (CRC): 1990

3. US (NSF) Integrated Graduate Education and Research Trainee Program (IGERT): 1997
   125 programs at 65 universities, 5 year funding
   $2.5 million per program, student stipends

4. Many European and Japanese Graduate Schools (doctoral research centers)

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Innovative Doctoral Programs-
NSF/IGERT Doctoral Program

- **Problem-oriented, theme-based rather than discipline oriented, multidisciplinary research**
- **Prepares for academic and non-academic careers, via connections to outside world**
- **Includes professional skills training**
- **Includes an international perspective (since 2003)**

138 programs at 65 universities, 5-year funding,

$ 2.9 million per program, student stipends

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

What are Criteria for Measuring Program Effectiveness?

Traditional Criteria

1. % national fellowship holders
2. Selective admission
3. Recruitment of diverse student body
4. Reasonable time-to-degree
5. Low attrition rate
6. Student satisfaction
7. Placement

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Further Measurement criteria

1. job search experience
2. factors relevant in the choice of the first job
3. current job satisfaction
4. retrospective analyses of the quality of the doctoral education
5. their opinion of the usefulness of their doctoral education
6. recommendations for current students and current programs.

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005

Thank you!

CIRGE website

www.cirge.washington.edu

Source: CIRGE, University of Washington, COE, Future Committee, January 20, 2005