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Confronting Common Assumptions

Designing Future-Oriented Doctoral Education

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Tempora mutantur et nos mutamur in illis; one would think that this Latin proverb—"The times are changing and we are changing with them"—applies to all sectors of life and all societies. However, in the United States, doctoral education is, for the most part, still structured as if it were meant to prepare students for life as university professors—as if times have not changed and graduate students have stayed the same. This outdated assumption is one of a number of common erroneous assumptions that are still in the minds of faculty and higher education policymakers and are perpetuated by the dominant media. Others are:

1. All students who study for a PhD want to become professors.
2. Professorial positions are highly desirable, and the best doctoral recipients become professors.
3. The career paths of these people are linear and smooth traditional academic careers, moving from PhD completion to assistant professor, with perhaps two years of postdoctoral fellowship in between, then to associate professor, and on to full professor.
4. Everybody who successfully completes a PhD will most likely choose the very best academic job offer, unconstrained by relationship and family concerns.
5. Professors enjoy the highest job satisfaction compared to any other employment group.

Most of these assumptions are outdated and based on anecdotal information rather than empirical data.

Astonishingly, there is little actual knowledge of what happens to PhD recipients or of their employment status five to ten years after degree completion (National Research Council 2005b; Nerad 2004; Long 2001; Nerad and Cerny 1999 (b); National Research Council 1998; COSEPUP 1995; Nerad 1997). Until very recently we were left with a perplexing problem: How can we understand the effectiveness of our programs when we have no idea what happens to our PhD holders? How can the next generation of faculty improve doctoral education if we do not create a feedback loop from those who have applied their education and who, from the advantage of employment experience, can also evaluate the quality of their education (Aanerud, Homer, Nerad, and Cerny 2006)? Although currently enrolled students can evaluate their experience—as is increasingly done today in institutional exit surveys—they cannot adequately evaluate the quality of their education without having had an opportunity to apply it (Golde and Dore 2001). To shed light on the effectiveness of doctoral education, three national studies set out to fill in the gaps by providing empirical evidence to answer these questions. Nerad and Cerny undertook the PhDs-Ten Years Later study in 1996 and 1997 with funding from the Andrew Mellon Foundation and the National Science Foundation. In 2001 they surveyed art historians, PhDs in Art History–Over a Decade Later, funded by a grant from the Getty Foundation. Social Science PhDs—Five+ Years Out, fielded in 2005 and 2006, is the third national survey of doctorate recipients directed by CIRGE principal investigator Maresi Nerad. This study was funded by the Ford Foundation.

In this chapter the results of these three comprehensive national PhD career path and educational outcome studies are presented. These studies have been the basis for confronting common assumptions about PhD holders and questioning whether we prepare our doctoral students adequately for the present and future in an era of globalization and increasing national interest in the role of doctoral education for the knowledge economy. In addition, comparative research that the author has undertaken over the years into innovation in doctoral education in Australia, Germany, and Japan has made it possible to identify characteristics of future-oriented doctoral education (Considine and Marginson et al. 2001; Grant 2002; Marginson 2004; Mcwilliam and James 2002; Nerad and Heggelund, 2008; Nerad 1994). The author argues that we need to begin now to implement such forward-looking doctoral education. The next generation of professors will need to prepare their doctoral students not just to be expert scholars but also to become world citizens who are aware of the negative effects of globalization and who

are equipped to operate as informed leaders and responsible citizens on the world stage (Banks 2004; Parker 1996). In the history of universities we have come full circle from universities being universal centers of learning in the ancient period, to becoming nation-state universities that pursued national interests, to again emerging as international centers of learning and scholarship (Kerr 1994).

Empirical Findings Challenge Outdated Assumptions

The following findings come from three national career-path studies: PhDs—Ten Years Later, (Nerad and Cerny 1999a; Nerad and Cerny 1999b; Nerad and Cerny 2000; Nerad and Cerny 2002; Nerad, Aanerud, and Cerny 2004) PhDs in Art History—Over a Decade Later, (Sadrozinski, Nerad, and Cerny 2003) and Social Science PhDs—Five+ Years Out (Nerad, Rudd, Morrison, and Picciano 2007). The first study, PhDs—Ten Years Later, surveyed six disciplines at sixty-one U.S. universities, capturing 57 percent of PhDs awarded in these disciplines during three consecutive years, 1982–85. The survey had a response rate of 66 percent for U.S. citizens and permanent resident PhD holders and 51 percent for international PhD holders. The disciplines surveyed were biochemistry, computer science, electrical engineering, English, mathematics, and political science. The second survey, PhDs in Art History—Over a Decade Later, surveyed all art history PhD holders who completed their degrees between 1985 and 1991. This study had a 70 percent response rate. The third study, Social Science PhDs—Five+ Years Out, surveyed anthropology, communication, geography, history, political science, and sociology PhD holders who graduated between 1995 and 1999. This study yielded a 45 percent response rate.

The questionnaires used in all these studies collected information on the career path, the search for a first job, a retrospective evaluation of the quality of doctoral programs, an assessment of the usefulness of the doctoral degree, and recommendations for current doctoral programs and students. Since 2002, starting with the art history study, the survey instrument has also tracked the relationship and family path parallel to the career path (Sadrozinski et al. 2003).

All PhD Students Want to Become Professors

The PhDs—Ten Years Later study showed that the first commonly held assumption—that all graduate students strive to become professors—was true for only about half of the PhD recipients in the six major fields

surveyed (Nerad et al. 2004; Nerad and Cerny 1997). Moreover, the variations among fields were great. When asked about their career goals at the completion of their doctoral studies, among PhD holders in English and political science, most (81 percent and 72 percent, respectively) wanted to become professors, while 19 percent of electrical engineering and 32 percent of those with PhDs in biochemistry had academic career ambitions. Among art history PhDs holders, upon degree completion 71 percent wanted to become professors (Sadrozinski et al. 2003). The Social Science PhDs—Five+ Years Out study found that the intent to become a professor ranged from a high of 78 percent of historians to a low of 57 percent of geographers at the start of PhD studies (Nerad et al. 2007). Upon PhD completion, 84 percent of historians and 65 percent of geographers wanted to become professors. The findings indicate that overall about one forth of the doctoral students and about half of science and engineering students did not intend to become professors at the time of degree completion.

TABLE. 5.1
Career Goal at PhD Completion and Percent Tenured or Tenure–Track 5+ Years Later

	(1) Wanted to Be Professor (%)	(2) Tenured or TT of (1) (%)	(3) Tenured or TT of All PhD Holders (%)	N of All PhD Holders (1)	(2)	(3)
Anthropology	72	64	52	*407*	*261*	*371*
Communication	75	84	71	*319*	*214*	*299*
Geography	65	74	53	*155*	*96*	*152*
History	84	76	66	*789*	*614*	*757*
Political Science	76	80	66	*674*	*489*	*647*
Sociology	75	78	63	*521*	*362*	*495*

Source: Center for Innovation and Research in Graduate Education, University of Washington, "Social Science PhDs–Five+ Years Out."

TABLE. 5.2
Career Goal at PhD Completion and Percent Tenured 10–14 Years Later

	(1) Wanted to Be Professor (%)	(2) Tenured of (1) (%)	(3) Tenured of All PhD Holders (%)	N of All PhD Holders
Biochemistry	32	34	19	(605)
Computer Science	46	61	34	(282)
Electrical Engineering	19	67	22	(328)
English	81	64	55	(767)
Mathematics	54	73	54	(522)
Political Science	72	66	53	(455)

Source: Center for Innovation and Research in Graduate Education, University of Washington, "PhDs–Ten Years Later."

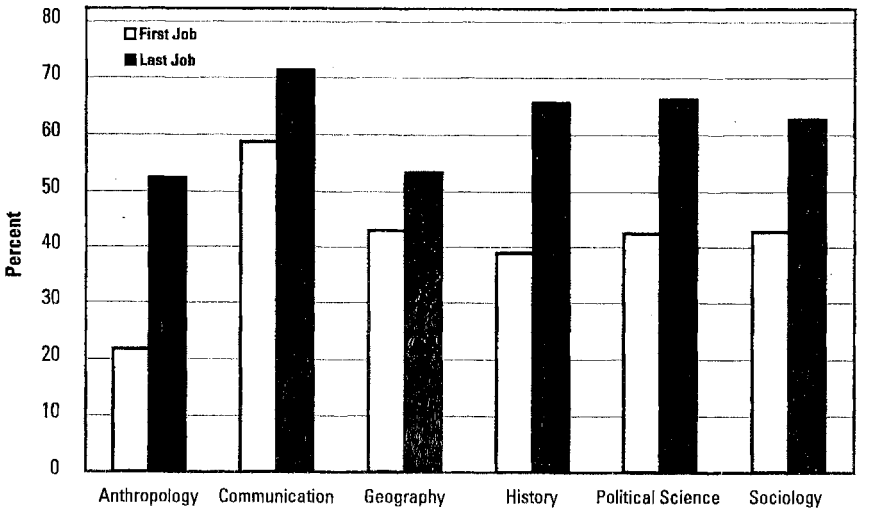

Figure 5.1. Percent tenure track and/or tenured in first and last job.

Source: Center for Innovation and Research in Graduate Education, University of Washington, "Social Science PhDs–Five+ Years Out."

The three national PhD outcome studies reviewed here find that, overall, between 50 and 65 percent of respondents, regardless of their career goals, held faculty positions at the time of survey completion. The other 35 to 50 percent of the PhD recipients were employed in business, government and nonprofit sectors (hereafter referred to as BGN). The largest proportions of PhD holders working outside academia were electrical engineers and computer scientists, followed by biochemists. In art history, 53 percent held faculty positions ten years after completing their studies and 47 percent worked outside academia, except for nine percent who were lecturers. The overall studies' findings revealed that not all doctoral students want to become professors and that among those who sought an academic career, not everybody realized their career goals.

The Best Doctoral Recipients Become Professors

The common assumption that the "best" people—measured by traditional standards of short time to degree and multiple publications at time of completion—become professors held true only for English and political science in the fields surveyed for PhDs—Ten Years Later. Logistic regression analyses indicated that short time to degree and number of publications was not associated with tenure status for PhDs in biochemistry, electrical engineering, and mathematics. Shorter time to degree

was associated with tenure at the time surveyed for computer scientists. Higher-ranking PhD programs were associated with higher likelihood of holding tenure when surveyed. However, in fields with an attractive job market outside academia, such as computer science and electrical engineering, the association with the rank of the program was not significant. Among art historians time to degree was not associated with tenure status at the time of the survey, and the number of publications was positively associated with the likelihood of holding tenure for women only. The study findings indicate that traditional indicators of PhD holders' qualities such as short time to degree and multiple publications were limited indicators of predicting professorial career outcomes.

Linear and Smooth Career Paths

Another assumption that proved not to be true was that the career path from PhD to postdoctoral appointment (if expected in a field) to assistant professor to tenured professor is the dominant pattern for PhD recipients and its primary hallmark is its linearity. All three studies showed the same picture. About one-third of the PhDs began their careers in a tenure-track position, however over half of all PhDs had ended up in a tenured or tenure-track position at the time of the surveys. This finding implies that academic career paths are not linear. Many people start out in non-tenure-track positions and over a period of four or more years switch to tenure-track positions (Nerad et al. 2007; Nerad et al. 2004; Nerad and Cerny 1999 [a]). This finding underscores the need to observe PhD career paths for several years after graduation rather than relying on surveys on doctorate employment one or two years after degree completion, in order to gain an accurate picture of the career path and career outcomes of PhDs.

Everybody Can Take the Best Academic Job Offered Unconstrained by Family Concerns

Embedded in the assumption of linearity is the fourth assumption, that a person is able to fully optimize her career options and take the best job offered after PhD completion. Among respondents to PhDs—Ten Years Later we found that the majority of women PhD holders partnered with someone who holds a PhD, MD, or JD, compared with one-third or fewer of the men. In biochemistry and mathematics the difference is even greater: 75 percent of the women biochemists had a partner with a PhD, MD, or JD, compared with only 24 percent of the men. In

mathematics, 84 percent of women had a highly educated spouse, but only 25 percent of men did (Aanerud et al. 2007). Among art history PhDs, almost half (47 percent) of partnered women had spouses with a PhD, MD, or JD, while only one-third of partnered men had such highly educated partners (Rudd et al. 2008).

After degree completion, during the time of the job search, the challenges of being a dual-career couple emerge. Our survey included a question about the most important reasons for choosing the first job. The answers from women and men differed significantly. The women were far more concerned that their partners also had a good opportunity than were the men. The difference can be explained by the fact that the women tended to live with someone who could not easily give up one job and find another similar one in any location. The majority of men were partnered with someone who was more mobile; thus, men did not need to be concerned about the partner's ability to move. This finding implies that the pursuit of careers is far more complicated for women than for men.

The career-path study PhDs in Art History—Over a Decade Later allowed us to shed more light into the complicated situation of dual-career couples—a situation that needs to be addressed at present and in the future as the number of women PhD holders increases (Rudd et al. 2008). In the art history study we tracked career paths simultaneously with relationship and family paths. Both men and women named their partners as the major influence on their careers. However, the proportion of women who named their partners as the most influential on their careers was significantly larger than that of men. Women named children as the second factor that influenced their career. A third factor was the caretaking of a family member, including a parent, which overwhelmingly is done by women (Sadrozinski et al. 2003).

Comparing tenure status at the time of the survey by gender and family status among art history PhDs reveals the complex interaction of family, gender, and careers. Women and men who remained single had the same rate of tenure. Women in stable relationships with no children received tenure at the same rate as did single women. However, men in stable relationships received tenure at a significantly higher rate than single men or women in stable relationships. Women in stable relationships with children had a lower tenure rate than women in relationships with no children. However, men in stable relationships with children had the highest tenure rate. Stable relationships and children increase men's likelihood for a successful faculty career, while both factors decrease the chances of earning tenure for women. In sum, the marriage patterns of women PhD holders have a significant impact on their career paths. Historically, women PhD recipients were either barred

from employment at the same institution as their husbands because of antinepotism laws or they took administrative rather than research and teaching positions to remain in academia (Shoben 1997; Stephan and Kassis 1997). Today, given the growing number of women earning PhDs, coupled with the changing economic structure of colleges and universities, the issue of an academic secondary labor market is especially acute. The reviewed studies indicate clearly that not all PhD holders can make career choices unconstrained by relationship and family considerations.

Academic Faculty Enjoy the Highest Job Satisfaction

Another common assumption—that academic faculty enjoy the highest job satisfaction—also proved to be outdated. In the PhDs—Ten Years Later study, managers and top executives in the BGN sectors were the most satisfied with their employment, and not the permanent faculty (Nerad, Aanerud, and Cerny 2004). The reason for their high job satisfaction was not salary but the intellectual challenge of work and autonomy at the workplace. Both of these are job qualities that we traditionally have attributed to an academic work setting. Tenured faculty ranked fourth in job satisfaction among those surveyed for PhDs—Ten Years Later. The Social Science PhDs—Five+ Years Out study compared job satisfaction on three dimensions that were constructed from twenty items with a factor analysis: satisfaction with the work itself, with status, and with overall quality of life. Overall, social science PhD holders indicate high levels of satisfaction with their work in and of itself, but they are less satisfied with their status (a dimension that includes income and advancement opportunities). Satisfaction with the quality of life (a dimension including work and family balance) ranged between the high satisfaction of their work in and of itself and the low satisfaction with their status. Comparing tenure-track and tenured faculty to other academic employees (including non-tenure-track faculty and senior professional positions) and to people working in the BGN sectors reveals few differences in patterns of satisfaction. Most notably, however, ladder faculty are more likely to be very satisfied with their work in and of itself, while those employed in academia but not on a tenure track are more likely to indicate being very satisfied with their overall quality of life. Employees in the BGN sectors and those in tenure-track and tenured faculty jobs are equally likely to be very satisfied with status and with quality of life, although BGN employees are somewhat less likely to indicate being very satisfied with their work itself. All three surveys found that in all fields, including English, PhDs employed in the BGN sectors earned a higher salary than those in academia.

These findings have several implications: first, that the doctoral degree itself is put to many different uses in a variety of employment sectors; second, that doctoral education has been and can be the passport to a successful career path in many sectors; and third, that the university as a workplace is not the most attractive destination, as has been commonly assumed. Such empirical information is essential in our attempt to prepare doctoral students for the future. This information tells us that PhD education proves to be useful and valuable for doctoral recipients. However, it also reveals that doctoral education needs some modification as the erroneous, but influential, assumptions mentioned earlier are still shaping curriculum, research, and professional development activities.

Characteristics of Future-Oriented Doctoral Education

The times are changing, and doctoral education will need to change with them. As we look into the future of knowledge-based societies, we can see that doctorate holders will increasingly be needed in a wider variety of societal roles. We need to consider whether existing and emerging doctoral programs are preparing students adequately to meet the challenges of working in and outside of academia, and across national and disciplinary boundaries within a context of globalization. Based on experiences with a decade of doctoral education outcomes studies, other CIRGE research, and previous evaluation work (Nerad 2005), the following characteristics for future-oriented doctoral education emerge:

1. Doctoral programs will prepare PhD holders for a variety of careers, both academic and nonacademic. Careers outside academia will need to be equally respected by faculty.
2. Doctoral programs will prepare students to work in interdisciplinary groups by providing epistemology courses that focus on the nature of knowledge, its foundation, and validity. As scientific, technical, or social problems become too complex to be solved individually or from a single perspective, research needs to be approached from a multidisciplinary perspective. Few scholars can master several disciplines, but all scholars need to understand and communicate with each other. A general graduate education introductory course, as Catherine Stimpson (2002) has advocated, should focus on what we know, how we know it, and what we regard as evidence.
3. Future-oriented doctoral programs integrate professional skill building into doctoral education by providing students with experiences in teaching, presenting research findings in front of a diverse audience, publishing, and writing for readers—in short, preparing doctoral students for a variety of future careers.

4. These programs introduce, when not already extant, collective supervision. The demand for one person to be the one and all—the ideal mentor—is unrealistic and contributes to faculty burnout. A panel of advisers can provide the students with more advice, insight, and consistent guidance.

5. Future-oriented programs introduce principles of effective teamwork and provide opportunities for practice. This can be in the form of collaborations on small research projects, or coauthoring of articles with other students or by students and faculty together.

6. These programs establish structured international collaborations with doctoral programs from other nations to develop research around global issues and problems.

7. These programs reintroduce foreign-language requirements, especially in English-speaking countries. The lack of foreign-language requirements for PhD education has negative consequences: first, much is lost by not being able to communicate directly with colleagues and collaborators and second, communicating solely in English privileges some and disadvantages others (Kerdeman 2003).

8. Future-oriented programs integrate cultural expertise and knowledge of international doctoral students and their needs into U.S. curricula.

9. These programs prepare students for leadership roles.

10. These programs initiate world citizenship education to revive awareness and obligation of civic engagement. They include the notion of a citizen who crosses national boundaries without seeking to assimilate and to homogenize, but instead to accept differences and embrace diversity.

In preparing for a knowledge-based society, higher education will need to make modifications. We recommend programs that focus on creating opportunities for doctoral students to become global citizens who can operate not only within academic circles, but are able to conduct socially responsible research and contribute to improving the quality of life on our planet. The next generation of faculty will need to implement doctoral programs in step with the changing times—programs that prepare graduates to work effectively in academic and nonacademic careers, to cross national and disciplinary boundaries, and to take on leadership roles in a globalizing world.