UNDERSTANDING DOCTORAL EDUCATION IN THE U.S.

An association of 63 leading public and private research universities

What Is the U.S. System of Doctoral Education?

After World War II, the United States decided to support much of its basic research through universities. That decision invigorated research with the energy, abilities, and fresh perspectives of students, while creating a fertile training ground for future researchers. Doctoral education in the U.S.—the education and training of Ph.D.s—became a combination of study and apprenticeship.

As a result, doctoral students work with faculty mentors in teaching and research, in addition to their coursework. This enables them to acquire an understanding of teaching and research techniques, and by the end of their doctoral programs, they are required to demonstrate that they can do independent research that advances the frontiers of knowledge.

Why Is Federal Support Important?

There is a strong federal interest in ensuring that enough of our most talented college graduates go on to earn doctoral degrees. If they do not, the country's innovative capacity and economic competitiveness will be weakened. However, these students have many options, from immediate employment to professional degrees that can lead to more lucrative careers. In general, these students are beyond the age when their families can be expected to fully support them, and without financial assistance, they often would be unable to complete the rigorous work needed to attain a doctoral degree.

Like the federal investment in basic research, the federal investment in doctoral education fills a critical gap that neither states nor industry can fill. Talented students who receive doctoral degrees are a highly mobile national resource, and state governments often are reluctant to invest in fellowships for students who might not remain in the state. Similarly, corporations may find doctoral fellowships difficult to justify when they cannot be certain that a student will join the company after attaining the degree. When the federal government makes the investment, the entire nation reaps the dividends.

How Are Doctoral Students Supported?

Along with their own resources—including any family support and student loans—U.S. doctoral students have a variety of mechanisms for financing their living and education costs.

According to the Council of Graduate Schools, 86 percent of doctoral students received some form of financial aid in academic year 2007-08. Among the types of aid received, 27 percent was in the form of individual fellowships, 26 percent

in research assistantships, 24 percent in teaching assistantships, and one percent in traineeships.

Individual Fellowships. Fellowships are awarded to individual students, not to institutions, and are offered by a variety of public and private organizations, federal and state governments, though the major programs are funded by the federal government. Many fellowships are "portable" and students can use them at any university of their choice.

Research Assistantships. Funded through a professor's research grant or through a university's own funds, a research assistantship provides a graduate student with research training and financial support. The advantage of this type of support is that it ensures that the faculty advisor will focus on the student's research and provide necessary research supplies and equipment. Since research assistantships are funded primarily through research grants, they are utilized in a wide variety of disciplines, but they are used primarily in the biological and physical sciences and engineering. Among the federal agencies that provide graduate student support through research grants are the National Institutes of Health NIH), the National Science Foundation (NSF), NASA, and the Departments of Agriculture, Defense, and Energy.

Research Traineeships and Training Grants. These are block grants awarded competitively to university departments or interdisciplinary groups for supporting graduate students they select. Along with support for individual students, the grants help support the graduate education programs. Such grants encourage the development of systematic training programs, facilitate interactions among the student trainees and multiple faculty members, build interdisciplinary programs or programs in emerging fields of study, and enable academic departments and programs to target particular types of students, such as first-generation college students and underrepresented minorities. Federally funded research training grants cover a range of academic disciplines, including education, but are most prevalent in the biological and physical sciences and engineering. Both NIH and NSF maintain major competitive research traineeship programs.

Teaching Assistantships. As part of preparation for a faculty career, a graduate student may receive a teaching assistantship from his or her university to acquire teaching skills by participating directly in the education of undergraduate students. This may include a variety of experiences, such as leading small discussion groups, developing and grading exams, conducting laboratory sessions, and presenting formal lectures. Teaching assistantships are offered in nearly all disciplines.

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