Committee on the Future of PhD Education

Final Report
September 2013

Executive Summary

Vibrant, innovative PhD programs that attract top national and international students and develop them into world-class talent are essential to the mission of Johns Hopkins University as a leading research university. In this report, we explore the challenges of and opportunities for PhD education given the current economic, social, and political context. By examining the broad range of programs at JHU, we identify excellent practices and areas in need of improvements. Our recommendations are intended to resolve common problems and foster excellent practices, while continuing to promote the distinction and distinctiveness of Johns Hopkins graduate programs.

The report begins with an overview of PhD education at Johns Hopkins and a discussion of University and national trends. The report states findings of the Committee and offers our recommendations on educational methods, mentoring, outcomes and their assessment, internal assessments of progress and performance, time to degree, scholarly community and student support, career path-specific education and educational collaboration with the private sector, and creation and maintenance of a thriving, diverse scholarly community. Overarching recommendations conclude the report. Additional data in support of our findings and recommendations can be found in the appendices.

The Committee, comprising representatives from each of the PhD-granting divisions of the University (Bloomberg School of Public Health, Krieger School of Arts and Sciences, School of Advanced International Studies, School of Education, School of Medicine, School of Nursing, and Whiting School of Engineering) and the Applied Physics Laboratory unanimously supports this report and the recommendations.

Committee on the Future of PhD Education

Full Report

Overview and Trends

Today, Johns Hopkins University has over 2,900 PhD students in 63 PhD programs (Figure 1). Vibrant, innovative PhD programs that attract top national and international students and develop them into world-class talent are essential to the mission of Johns Hopkins University as a leading research university. Two core missions of the University – our teaching and mentoring of PhD students to produce the next generation of path-breaking scholars and our conduct of research on the frontiers of knowledge – are inextricably intertwined. PhD students need the University to be a place for deep learning about their fields of study and about the crafts of research and teaching, and the University needs PhD students who contribute to these missions directly (working on their professors' and their own research) and indirectly (contributing to the intellectual environment in seminars and in less formal interactions).

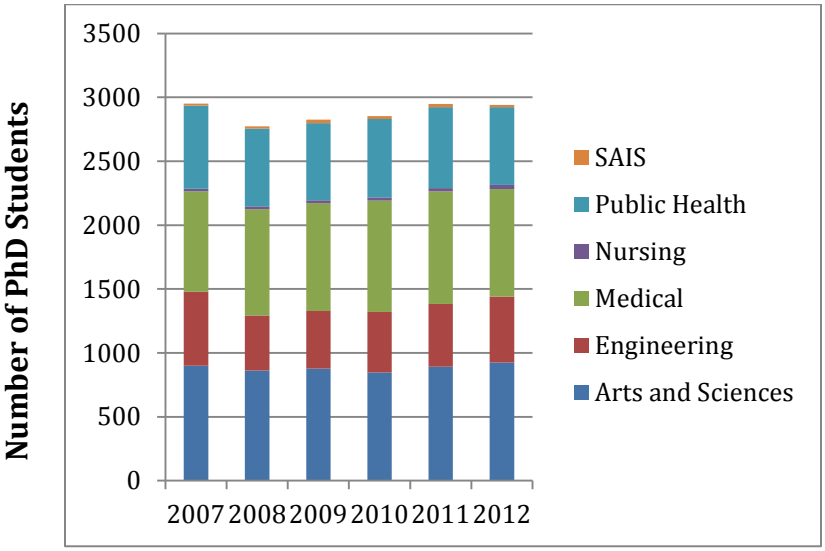


Figure 1. Total number of PhD Students enrolled per year, 2007-2012.
Source: Johns Hopkins University Office of Institutional Research

At a time when resources are scarce for the University, we are concerned about the temptation to implement policies that would emphasize reallocation of support away from PhD education and toward undergraduate and MA level education. Neither undergraduates nor MA students are necessarily expected to conduct research that creates new knowledge, a goal that is a fundamental expectation for PhD students. PhD education thus plays a special role in the quality and success of a research intensive university in a way that other degrees or certificates do not.

In this report, we explore the challenges of PhD education given the current economic, social, and political context. We examine PhD education at Johns Hopkins, looking closely at excellent practices, some of which can serve as models that could be adopted or adapted by other programs at the University. We identify, as well, opportunities for improvement. Our committee's goal is to put forth recommendations that will resolve or ameliorate some

concerns, continue and expand excellent practices, and move forward with continuing attention to the distinctiveness and the distinction of our programs. We first discuss national and JHU trends in PhD education and then turn to an overview of PhD programs at JHU. The following sections address educational methods, mentoring, PhD student life, outcomes and their assessment, internal assessments of progress and performance, time to degree, career path-specific education, educational collaboration with the private and public sector, and creation and maintenance of a thriving, diverse scholarly community.

What are the National and JHU Trends?

There has been a dramatic increase (4-5-fold) in Life Sciences doctorates nationwide since 1966, as shown in Figure 2 below.

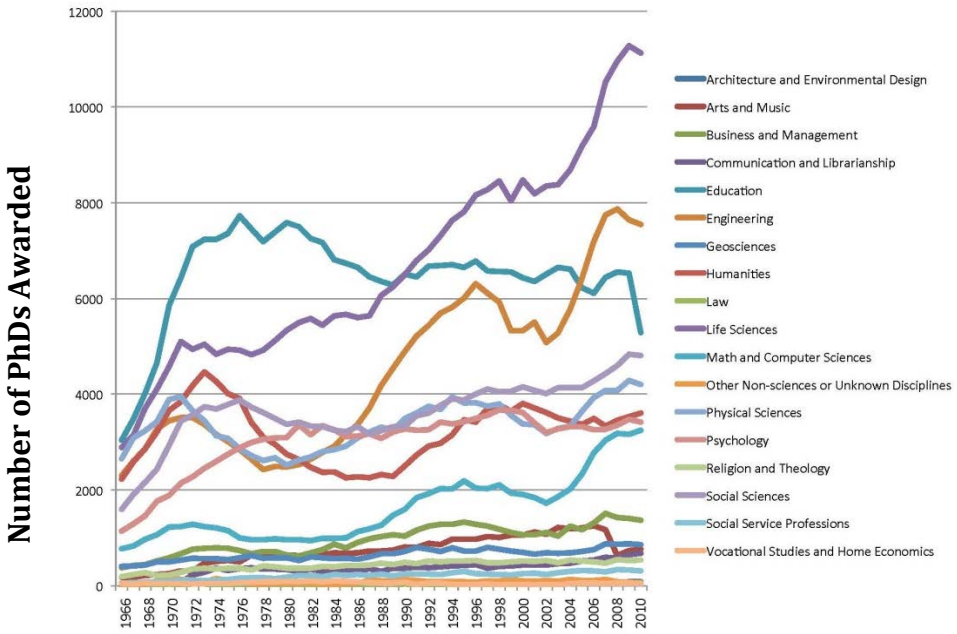


Figure 2. National trends in PhD completion by discipline, 1966-2010.
Source: http://www.nsf.gov/statistics/sed/

With the exceptions of Engineering and Math and Computer Science, other fields have remained relatively constant. These same trends can also be seen at JHU. (See Figure 3.)

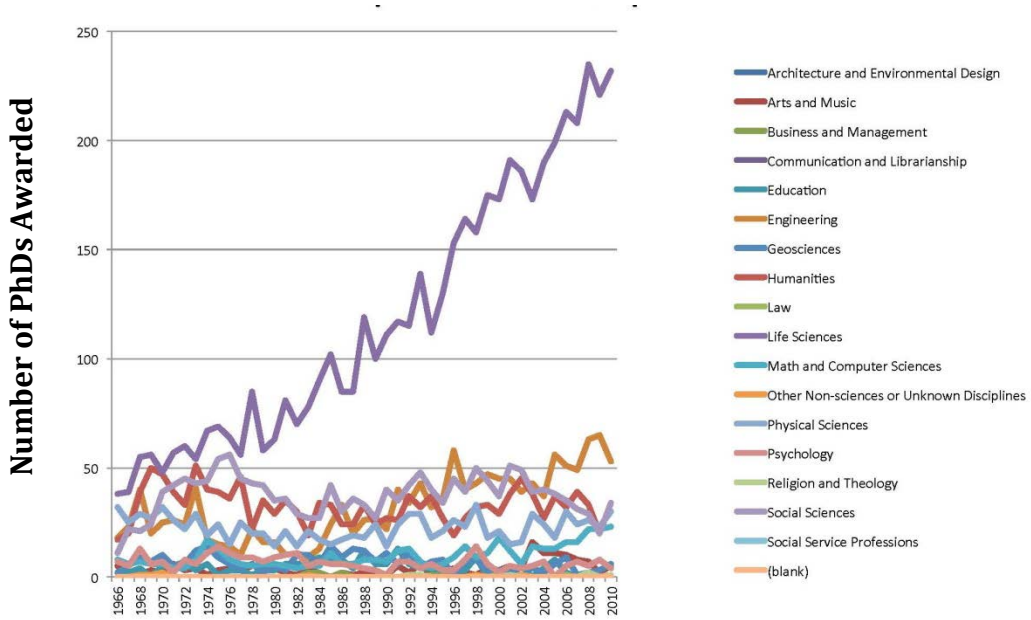


Figure 3. JHU Trends in in PhD completion by discipline, 1966-2010.
Source: http://www.nsf.gov/statistics/sed/

Nationwide, many students, particularly in the social sciences, humanities, and education have accumulated heavy debt burdens by the time they finish their degree. Figure 4 shows mean graduate education-related debt of respondents to the NSF Survey of Earned Doctorates for 2011.

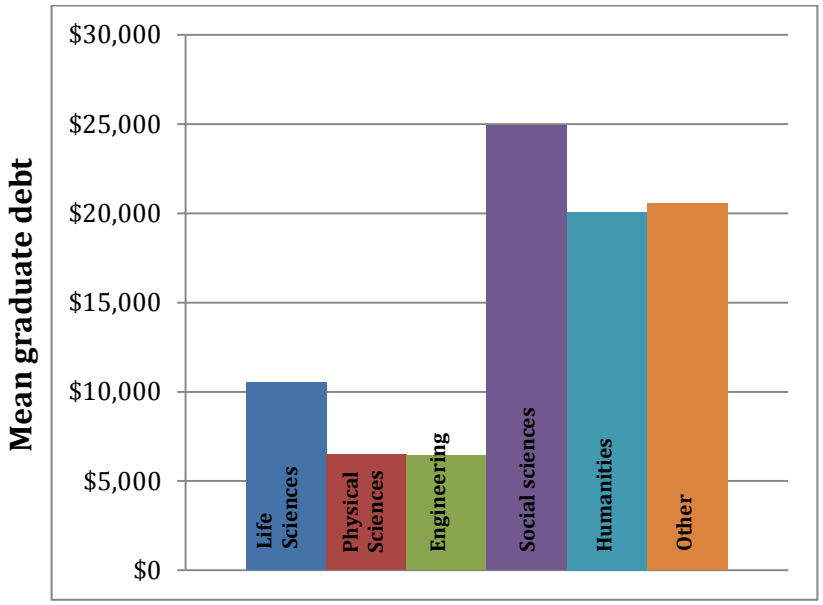


Figure 4. Mean education-related debt of doctorate recipients (for graduate studies), by broad field of study, 2011. **Source: www.nsf.gov/statistics/sed/**

Further, the NSF data suggest that many students are highly indebted, owing more than $30,000, by the time they complete their PhDs, a problem most obvious for students in the social sciences, education, and humanities. In the social sciences, 32% of the students graduate with large debt burdens. For education, the proportion is 29%; for humanities,

26%; and for other non-science and engineering fields, 26% (http://www.nsf.gov/statistics/sed/digest/2011/theme4.cfm#4). The Committee was unable to obtain corresponding data for Johns Hopkins, a theme that will be repeated throughout this report. (See the discussion in Appendix A.)

Nationwide, the time-to-degree is 2-3 years longer for humanities and 5-6 years longer for education, than for sciences and social sciences. There has been little change in time to degree between 1991 and 2011. Figure 5 illustrates median time to degree from the NSF survey for 2011. The corresponding mean time data for JHU are shown in Figure 6. Time to degree issues at JHU are discussed in more detail below, but it should be noted that quantifying the time it takes for a student to attain her or his PhD is complicated by the different definitions that can be used (e.g., matriculation to completion of requirements vs. matriculation to awarding of degree; inclusion or omission of leaves of absence).

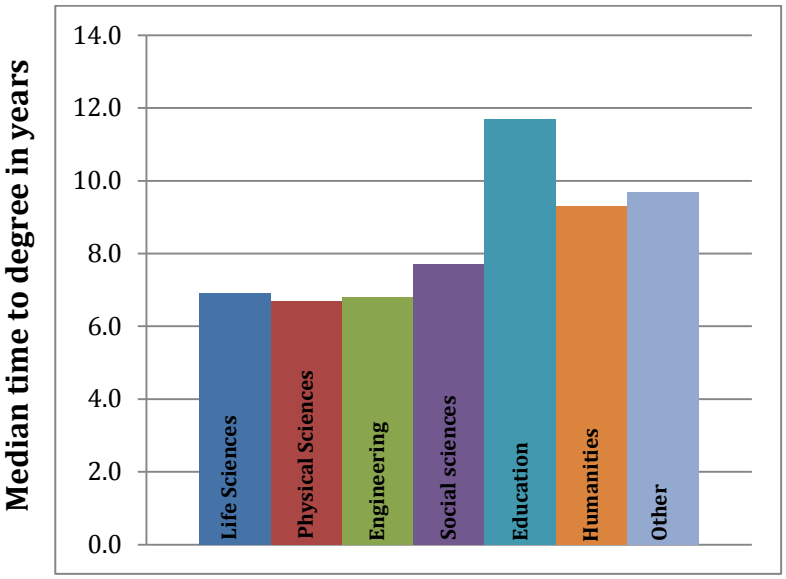


Figure 5. Median years to doctorate since starting graduate school, by broad field of study, 2011.
Source: http://www.nsf.gov/statistics/sed/

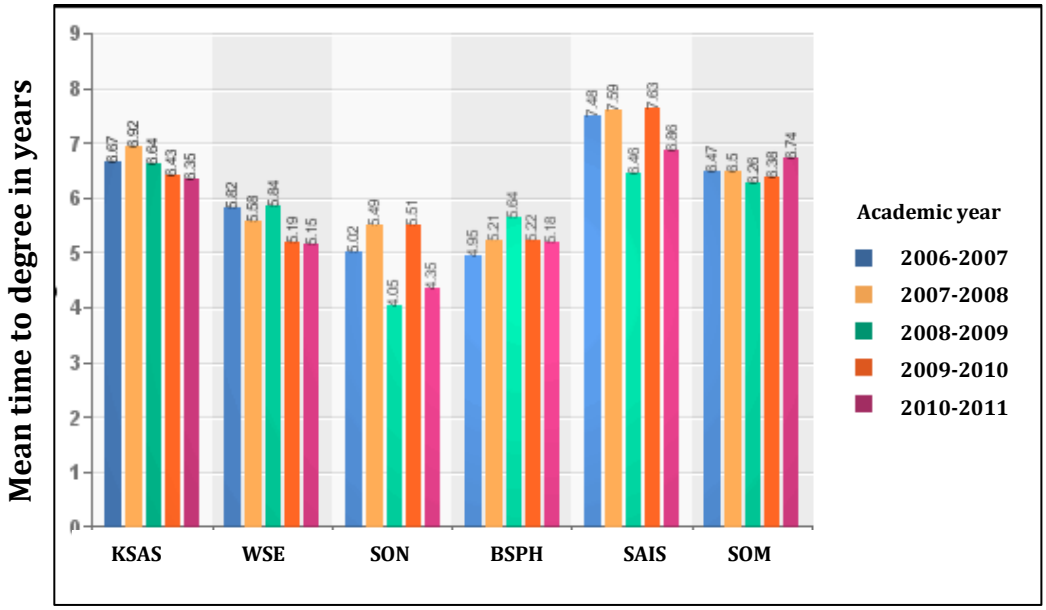


Figure 6. Mean time to degree data for JHU divisions, 2006 - 2012.
Source: Johns Hopkins University Office of Institutional Research

Nationally, from 2001 to 2011, the use of students' own resources to support doctoral studies decreased by about half and support from fellowships and grants increased (both directly to students and research grants to PIs). Figure 7 illustrates these changes. Again, the Committee was unable to get the corresponding data for JHU.

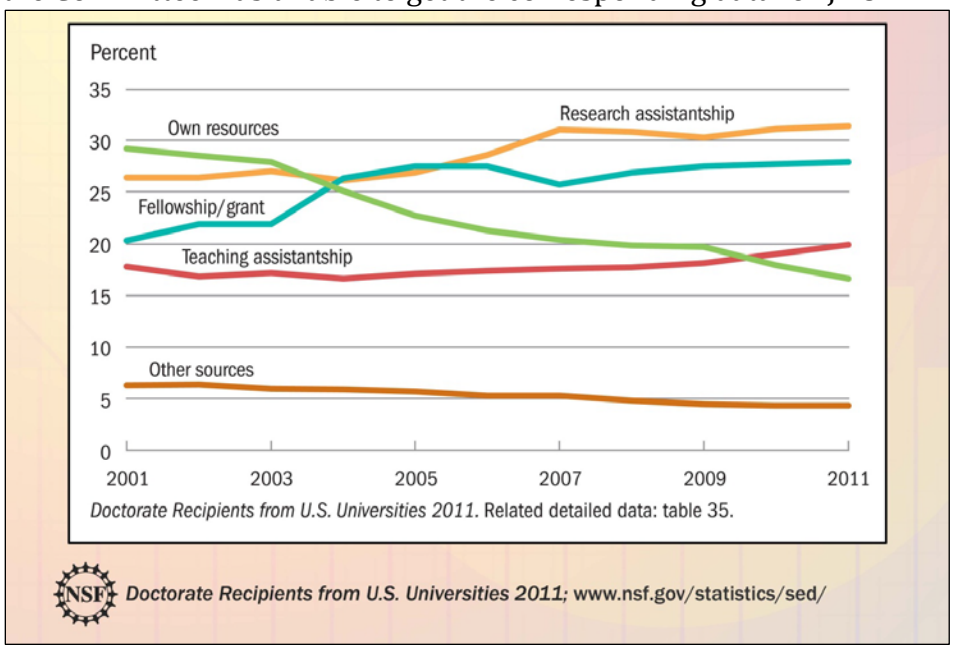


Figure 7. National trends in primary sources of financial support, 2001-2011.
Source: http://www.nsf.gov/statistics/sed/

There has also been a general increase between 1991 and 2011 in the fraction of students in the sciences and social sciences employed in post-doctoral positions after receiving their PhDs (Figure 8). Data for the humanities are not shown. Postdocs have the potential for creating excellent opportunities for PhD graduates. A good postdoctoral fellowship can

assist new scholars and scientists in the launching of their careers by allowing them to build additional skills and areas of expertise and to develop independent research projects. On the downside, postdocs – especially when serial positions are expected or when permanent jobs cannot be found – can be disruptive to family life and may be particularly discouraging to women PhDs. (The NSF data do not provide information on how many postdoctoral positions graduates take on before finding a permanent position.) The problem of serial postdocs is similar to the serious issue of long-term adjunct professor status, which is endemic in the humanities. No systematic, quantitative data regarding post-PhD employment for JHU students is available currently.

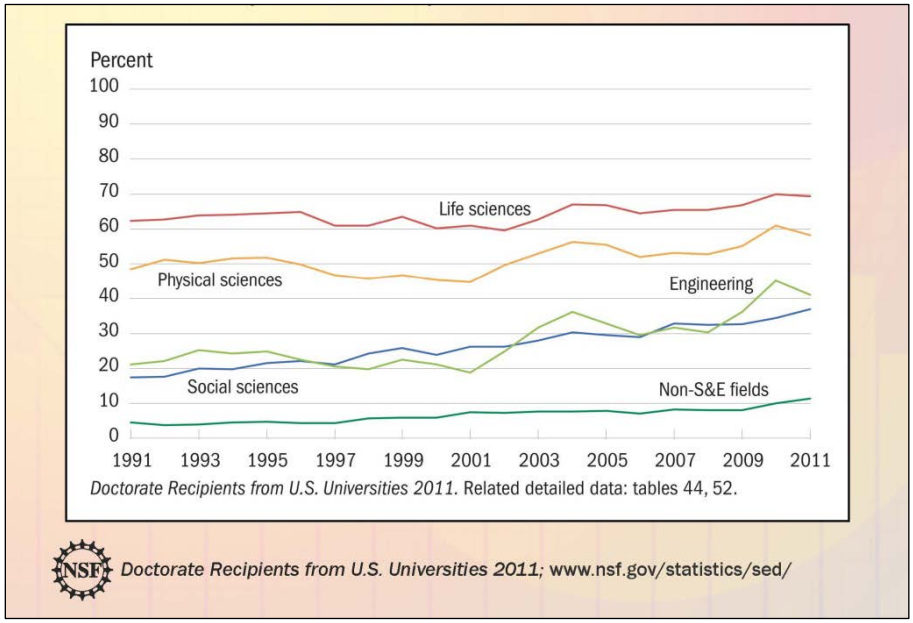


Figure 8. Percentage of students employed in postdoctoral fellowship positions after PhD graduation, national trends, by field of study, 1991-2011.
Source: http://www.nsf.gov/statistics/sed/

The nationwide data suggest that humanities PhDs also fare worst in terms of definite employment (contract for a job or postdoc) after graduation – only 57% in 2011. Yet even in the fields with the best employment outlooks, a substantial proportion of students complete their degrees and do not have definite commitments for work after graduation. The best outlook in 2011 was for the physical science and social science graduates: 69.3% and 69.5%, respectively, had definite commitments for employment when they graduated, which meant that over 30% did not. Figures 8 and 9 summarize these trends. We expect that JHU PhDs, coming, as they do, from a highly ranked institution, find jobs more easily than what we see in the national trends, but we do not have reliable data to compare.

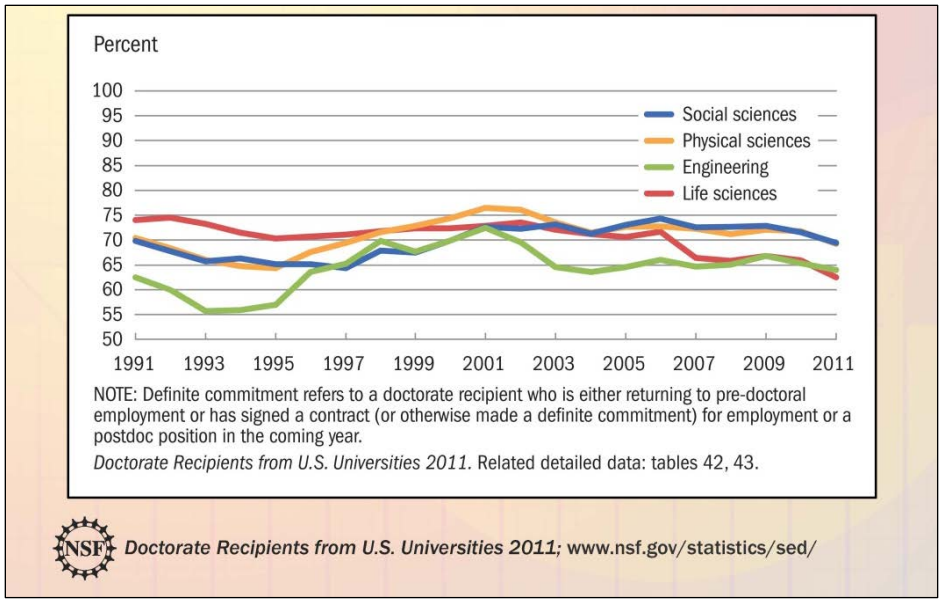


Figure 9. Definite commitments at doctorate award, by science and engineering fields of study, national trends, 1991-2011.
Source: http://www.nsf.gov/statistics/sed/

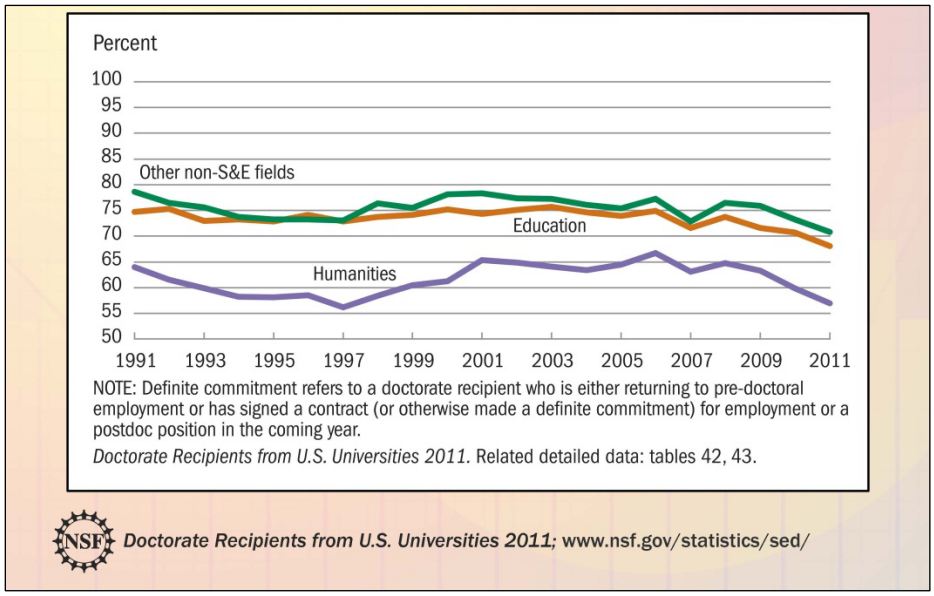


Figure 10. Definite commitments at doctorate award, by non-science and engineering fields of study, national trends, 1991-2011.
Source: http://www.nsf.gov/statistics/sed/

In addition, national trends, as shown in Figure 11, suggest that humanities graduates have the lowest salaries upon graduation, both in academia and "industry."

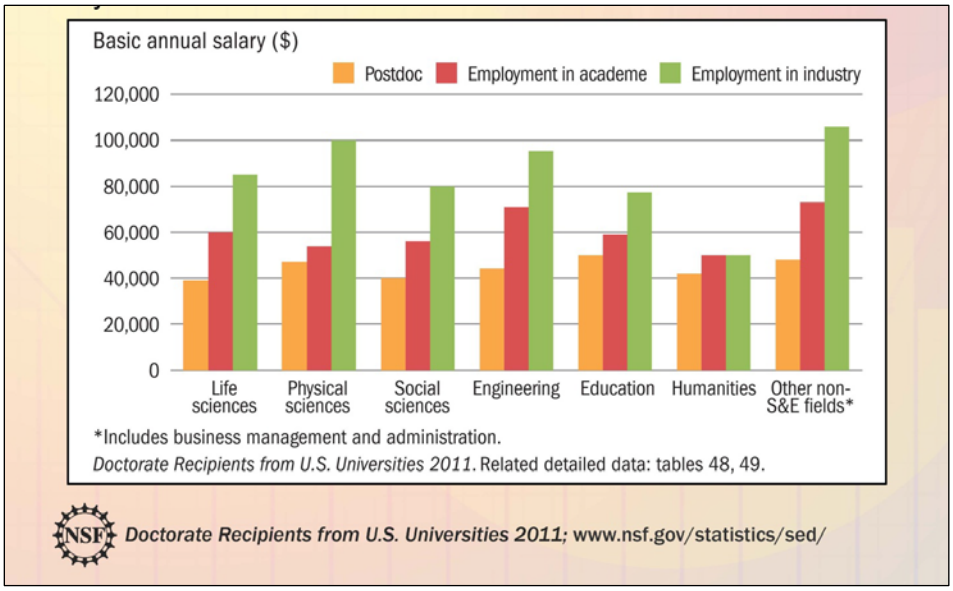


Figure 11. Mean basic annual salary of doctorate recipients with definite commitments in the United States, by position type and field of study, 2011.
Source: http://www.nsf.gov/statistics/sed/

The national trends present sobering challenges for PhD education at JHU. With this report, in the sections that follow, we seek to address these national challenges as well the challenges and opportunities that are specific to JHU to insure that our PhD programs graduate global leaders in their respective fields.

Findings and Recommendations

The Committee discussed educational methods, mentoring, outcomes and their assessment, internal assessments of progress and performance, time to degree, career path-specific education, educational collaboration with the private and public sector, and creation and maintenance of a thriving, diverse scholarly community.

Educational Methods

Doctoral programs are very different across the University and vary by division and department. Some programs continue to use lecture courses, some small seminars, some a mixture. Other programs are more technology-oriented with hybrid courses or online e-course offerings. Of course, a solid mentoring relationship between a PhD student and his/her advisor continues to be an important method for doctoral education. There is no doubt that JHU doctoral programs all have a strong and primary commitment to prepare students to become researchers ("We strongly emphasize research from the first year and give them a lot of mentoring" according to a survey respondent). Students are exposed to a variety of educational methods, including courses, grant writing and submission, peer/conference presentations, peer reviewed research papers, and teaching residencies. Interdisciplinary approaches are encouraged at JHU, but there continue to be problems in the delivery and access across departments ("We run an interdivisional and

interdepartmental program in a University that has absolutely no idea how to handle interdivisional and interdepartmental programs," asserted a survey respondent).

Challenges to the University and to programs' efforts to recruit students over the last decade have forced doctoral programs to reevaluate their educational programs. Challenges identified by respondents to the survey included declining enrollment numbers ("The shrinking of our program"), a declining number of faculty ("The small faculty size is especially problematic, especially in conjunction with faculty leaves"), and poor funding packages offered from the University to attract students ("We are outspent by all our major competitors, vastly so by several of them"). As a result of these reasons and others (i.e. faculty never receiving professional development for teaching and mentoring students), educational methods vary in kind and quality across programs, and some programs may welcome opportunities for improvement. In general, the level of innovation in educational methods used by graduate programs appears to be very low, lagging significantly behind the undergraduate institutions from which our students come.

Recommendation: Remove administrative impediments to faculty collaboration across departments or divisions to create innovative interdisciplinary courses. Provide guidelines that enable such efforts.

Recommendation: Create PhD Education Innovation Centers – analogous to the Center for Educational Resources at Homewood – that would provide support and expertise for faculty and programs to adopt, create, and assess new educational methods. Alternatively, the JHU Center for Educational Resources could serve as a resource to the other units of the University, as well. Professional development materials on new and proven educational methods could be made available to faculty, along with incentives for faculty to incorporate new teaching methods into their courses.

Recommendation: Implement evaluation of PhD educational methods. It is important that a central data collection point be implemented and maintained on all doctoral programs at the University. Linking PhD Education Innovation Centers with outcome data is critical for continual program improvement. Evidence of effective teaching at the graduate level may become relevant to doctoral program rankings in the future.

Mentoring

Mentoring, a less formal type of relationship than thesis supervision, includes professional, research, and teaching guidance. It is central to PhD education. A PhD student's main thesis adviser is expected to be his or her principal mentor, but other faculty and possibly alumni and others can play an important role, too. Respondents to the survey reported widely varying mentoring practices among programs, ranging from leaving mentoring up to individual faculty members and not doing any assessment to having exit interviews of students about the quality of the mentoring they received and providing formal mentoring training. The frequency of mentoring interactions varies among fields and programs. In some, students meet with their mentor only once a month or even less frequently, while in others, interaction is almost daily. In some programs, the student's advisor has sole or

almost sole responsibility for mentoring the student; in other programs, all the faculty collectively mentor all the students and provide feedback for, as an example, students' departmental colloquium presentations. In some programs one professor, the student's advisor, provides research and professional mentorship, while another professor advises on teaching.

Concern was raised in the Committee and in some of the responses to the survey about the unevenness of mentoring quality and the reports that some faculty fail to provide sufficient guidance for professional growth, research training, and teaching skills. The Committee members emphasized that mentors should help students develop into capable scientists and scholars and not view the student as a means for the professor's research ends. Good mentoring, it was noted, is especially important for ethnic/racial minorities (a topic raised in the section on diversity).

Concerns were also raised about whether the students were getting the kind of mentoring they wanted. A recent survey of school of medicine graduates showed that an overwhelming majority (75%) felt that they were inadequately trained to teach. In other programs, however, teaching mentorship may be overly emphasized at the expense of other kinds of professional guidance. (This subject is also discussed in the section on career path-specific education.)

Providing mentoring on the profession can be an opportunity to encourage students to develop the interpersonal relationships and communications skills that will help them be successful in their careers. Creating opportunities to do interdisciplinary work to prepare them for real-world collaborations is one example. Fostering interactions among the first-year students during required classwork that hopefully will blossom into professional relationships during their remaining years is another. Developing these diverse relationships is helpful for several reasons: they increase a student's professional network and accustom students to collaborative work; measures promoting such relationships can be implemented into the curriculum without the need for additional add-ons that cost time and money; and building such can help decrease the time to degree completion. Many of these efforts will be program and school specific, and will require coordination between professors and course directors.

Another way to broaden PhD students' opportunities to find mentors is to create an institutional structure that allows students to meet faculty who are interested in mentoring the next generation of scholars and scientists. An Academy of Mentors, described in the recommendation below, is our suggestion for a way to introduce students to potential mentors outside their usual circle of faculty acquaintances.

Most mentoring relationships, we believe, generally work well. In some cases, however, they do not work out at all. Students find themselves in a difficult, stressful situation when they cannot extricate themselves from mentoring relationships that do not contribute to their growth as scholars and scientists and that, indeed, may be harming their progress. This situation is considered in the next section on PhD Student Life.

Because of structural and cultural differences among PhD programs, each program should be allowed to address the recommendations below in ways that do or will work for them, with the exception of the recommendation for a University-wide requirement of at least annual feedback to students on their progress.

Recommendation: Students should receive feedback from their thesis committee members or, for students who do not yet have a thesis committee, from a faculty advisor at least yearly. Though the exact form of the feedback mechanism will vary by department, a record of the feedback should be maintained in the student's departmental file.

Recommendation: An Academy of Mentors that consists of the most energetic, excellent and dedicated mentors chosen from active faculty and emeriti should be created. This academy would serve as a resource for students and fellows outside of the current program-specific mentoring opportunities that already exist.

Recommendation: The University should consider the possibility of providing an online Individual Development Plan (IDP) that could be used by students and trainees to initiate yearly conversations about short- and long-term goals with their advisors and other mentors (e.g., second and third readers on theses, teaching mentors). This system would keep track of when the IDP was filled out each year and record the IDP from each year so students and mentors can see past goals and plans. The system might even remind students and mentors when it is time for each successive discussion. In creating such a system, the University should look to successful examples that are currently in operation, such as that used by the Computer Science Department.

PhD Student Life

The committee considered the circumstances of PhD student life, that is, the extent to which students' graduate studies take place in and contribute to a fulfilling personal life. Johns Hopkins students are met with very high standards, demands for intensive effort, and high expectations. While we are mindful of the necessity of maintaining the rigor of our programs, we strongly approve of a collegial atmosphere in which students balance their work and personal lives, find friends and emotional support within the University community, and experience personal as well as professional growth.

This view was echoed by several of the responses to our survey. When asked about the positive aspects of their PhD programs, several respondents commented on the collegial relations between students and faculty. These relationships were described as "a supportive community," "bonding and collegiality," "cohesiveness," and "espirt-de-corps." Of particular importance is that students feel satisfied "with the respect they are accorded by the faculty." At least one program fosters this sentiment among the students by "soliciting and incorporating student feedback."

The graduate student organizations of the University also work to create a good social environment. For example, the School of Medicine's Graduate Student Association (GSA) organizes ski trips, bowling, dating events, Halloween parties, welcoming student socials,

and other free and reduced cost events. The Homewood divisions' Graduate Representative Organization hosts similar social events, including coffee breaks, happy hours, and other activities.

Despite these positive aspects of PhD student life at JHU, challenges remain, and we note three in particular. The first challenge, as many survey respondents noted, is that insufficient funding of PhD students leads to financial problems and debt, and that such issues were not just problems for recruitment of good students but also posed serious hardships for the students we have. The very fact of financial hardship and of needing to take on part time jobs, either in the field or outside of it, can lengthen the time to degree. In turn, the longer time to degree causes further financial and other personal stress. (Also see the section on collaboration with the private sector for ways of mitigating this problem for some fields of study.) A respondent for an interdivisional PhD program further highlighted the problems of coordinating appropriate funding across divisional boundaries.

The broader issue of compensation for PhD students should also take into account the adequacy of health insurance programs, policies on maternity leave, and the availability of affordable, high-quality childcare.

Yet another compensation-linked student life issue that should be considered is vacation time. For students who are not funded over the summer, the general assumption is that they will take vacation time during the summer, even if they are busy studying for qualifying exams or doing thesis research. For students who are funded over the summer and who are expected to be working in the lab or elsewhere, the situation is more ambiguous. Students currently make ad hoc arrangements with their advisors. Inequities can arise in this situation as some advisors will allow students to take more time off and some will allow less. Establishing a University-wide, division-wide, or department-wide minimum for PhD students' vacation leave each year could be a way to ease student stress and eliminate inequities of treatment.

A second challenge is the relationship with the student's dissertation supervisor. In their presentation to the Committee, Homewood Counseling Center psychologists Drs. Eric Rose and Barbara Baum noted that dissertation supervisors have enormous influence over students' lives, their success as students, and their future prospects. A poor relationship with the dissertation supervisor can spiral into a serious stressor. This, in turn, can be a precipitating factor for suffering and even depression. (Data from the Counseling Center can be found in Appendix D.) Drs. Baum and Rose gave the examples of an inattentive advisor who does not respond to student requests for feedback on work; a micro-managing advisor, who does not allow the student to work independently; and the advisor who seems to "keep moving the goal post," continually changing what has to be done in order to complete the dissertation. Students suffer when they feel they have no agency to change this situation. Switching programs would be risky; even switching advisors within the department may be difficult because of the sunken costs of work already done on the current research project. The recommendation for establishing a departmental ombudsperson addresses this concern. Another way of addressing this concern is to make

it possible to switch advisors when there is no way to make the relationship work out. (See also the recommendations for mentoring and for assessing outcomes.)

A third concern is that many students struggle with feelings of inferiority and competition with others in their department. This too, according to Drs. Baum and Rose, is a common cause of depression in graduate students. This is a difficult problem to address because it is not possible to do away with the fact that students who were highly successful in their undergraduate programs now, as PhD students, are unavoidably comparing themselves to other, similarly successful or even more successful students. Efforts should be taken to emphasize collegiality and respect. Some of the appropriate steps are outlined in the section on diversity. Other recommendations are listed below.

Recommendation: University, divisional, and departmental leadership should take note of information provided by the graduate student organizations, including the annual Graduate Student Association Student Survey on the quality of PhD student life at Johns Hopkins. The University, divisional, and departmental leadership may also wish to collaborate with the GSA and other groups to keep track of students' needs and concerns (e.g., by adding questions to the survey).

Recommendation: The University should work toward raising funds that would provide PhD students income at levels that are both competitive with other top ranked programs and that provide a living wage. (See also the recommendation on forging partnerships with the private sector as a way to assist with funding PhD students.)

Recommendation: Department/University-wide policy for vacation time for students could be beneficial as this issue is typically dealt with by students and their advisors on a case-by-case basis. It could provide guidance for students taking too much or too little time off.

Recommendation: PhD programs should assign a full professor as a PhD ombudsperson. The role of the ombudsperson will be to resolve difficulties and disputes between students and their advisors. The expectation is that a satisfactory resolution will be achieved and matters will be kept as confidential as possible. In intractable situations, the ombudsperson, with the permission of the student involved, may report on the case to the dean. An alternate should be designated for situations in which the ombudsperson's own students have concerns. We strongly recommend that the faculty members filling these roles be full professors. Small programs may wish to work together with other small programs in cognate fields to assign a shared ombudsperson. PhD students should be fully informed of the willingness of the ombudsperson to help resolve students' difficulties with their key professors.

Recommendation: Students should have the opportunity to switch advisors. This should be the case even in those programs in which students are admitted to work for a particular advisor.

Recommendation: PhD programs should monitor the departmental climate by periodically asking students about collegiality, mutual respect, and support among the students and faculty of the program. Programs would design their own formal or informal means (anonymous if possible) of eliciting this information.

Recommendation: The Homewood Counseling Center's graduate student therapy groups and dissertation support therapy group could be emulated by other campuses, if such groups do not now exist. Since the numbers of PhD students in other divisions may not make this option practical, an alternative would be to open the Homewood group to any JHU PhD student.

Outcomes and Their Assessment

How do we measure the success of our PhD programs? A great deal of ink has been spilled over national and international rankings of departments and PhD programs. Many of the aspects of JHU PhD education that make it innovative and distinctive (e.g., transdisciplinary fields, selective excellence) can also have negative impacts on national rankings. In this section, we focus on how to assess JHU PhD programs to capture the range of possible outcomes. We reject simplistic metrics and instead call for nuanced, quantitative and qualitative analysis of multiple indicators of outcomes, taking into account our commitment to educating world-class scholars and scientists and being sensitive to the personal goals of our PhD graduates.

Judging by the responses to our survey and our discussions within the committee, the faculty has a sense that, overall, current outcomes are positive. Our students are able to secure good positions after graduation. Those who continue in research acquire strong records of publication, rise up the ranks, are awarded external funding, and receive positive reviews at the national and international levels. This assessment would be stronger if we had systematic data to support it, but the data are not currently available.

According to the responses we received from the survey, programs use a range of measures to assess outcomes, but most rely heavily on how easily graduates move into tenure track positions within academia. One respondent identified "placement in academic careers" as the sole criterion for success of PhD programs and for success of PhD graduates. Another replied that "well over half our graduates have tenure-track positions in American universities" and further that "all have good positions" and "most publish articles based on their thesis research." Some programs look to reputational measures: how the department is viewed by peers, rankings provided by *US News and World Report* or National Research Council, and feedback from non-JHU faculty who sit on DBO panels. Students' and graduates' receipt of prizes and funding counts, as well. For other programs, successful outcomes seem to rely on the timely movement of students through the program and faculty members' judgment that the students' have performed well on required milestone projects and exams. Respondents from a minority of programs identified attempts to include employment of students outside academia as measures of program success.

The Committee's view is that defining success solely in terms of graduates' placement in tenure track positions may not take into consideration trends in university and college hiring, the global social organization of research (some of it taking place outside academia), and the life choices that students themselves make. According to the American Association of University Professors, the number of tenure line faculty has dropped dramatically in the US from 1975 to 2011. This decrease has been accompanied by an alarming rise in the number of part-time faculty positions. Even though we expect graduates of our programs to be highly attractive job candidates in a competitive academic market, the market is such that not all highly attractive candidates will find tenure track jobs. (See Figure 12 below.) Further, because of market conditions, graduates may find themselves in the position of being able to find academic jobs only in places where they do not want to live for personal or family reasons. And finally, some graduates may simply prefer to use the knowledge and skills developed through their PhD programs for work outside academia. As noted in the introduction, levels of remuneration in industry are generally higher than they are in academia for entry level PhDs.

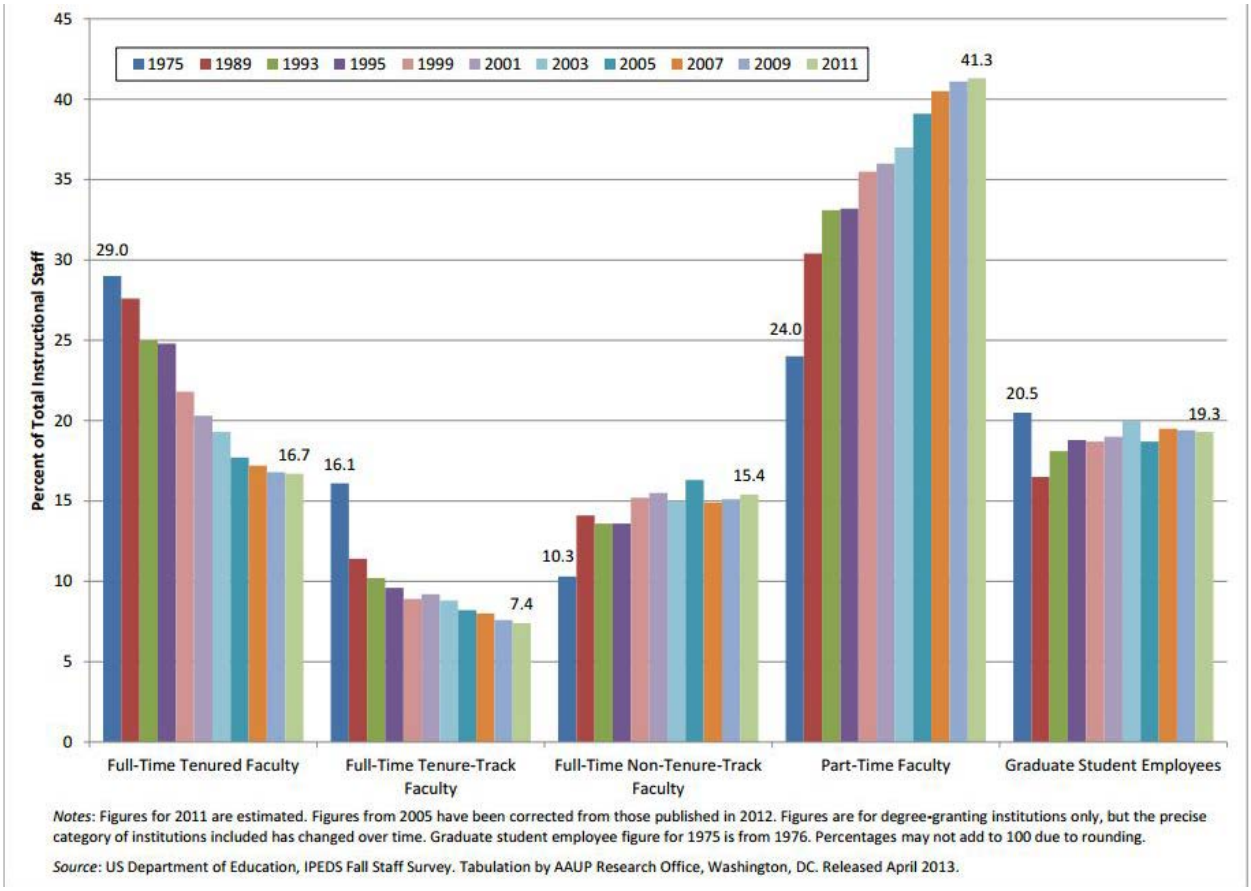


Figure 12. Trends in Instructional Staff Employment Status, 1975-2011: all institutions, national trends.
Source: American Association of University Professors, http://www.aaup.org/sites/default/files/files/AAUP_Report_InstrStaff-75-11_apr2013.pdf.

How might we better evaluate outcomes of PhD programs to help us maintain standards of excellence? Conceptually, PhD programs' outcomes include the depth of graduates' knowledge of their field of inquiry, the quality of graduates' ability to formulate questions

for innovative research, and the quality of graduates' capacity for carrying out and leading that research. We also base evaluation of outcomes on the quality of graduates' communication skills for writing, oral presentation, and, in some cases, other forms (i.e., information technology-enabled communication). From a practical perspective, we assess the quality of programs' outcomes by looking at whether graduates find jobs and what kind of jobs they find, how successful they are in their careers, and perhaps how satisfied the graduates themselves are with the quality of the education they received. For some programs, evaluating the research productivity of current students and recent graduates is particularly important. These programs may want to track the number of papers students and graduates publish, how many refereed conference papers they present, and their winning applications for grants. Reasonable time to degree (discussed in a separate section, below) is also an important component of successful outcomes.

Broadening the category of jobs that constitute "successful" employment of graduates represents a practical response to society's evolving needs and the reality faced by current PhD job seekers. When a program's graduates find employment in career paths that use their PhD education, the outcome is good, at least. Differentiating between "good" and "excellent" employment requires sensitive qualitative analysis: a tenure track position at an R1 university may not be as good an outcome as a job in industry for a graduate who does not want to live where the R1 university is or who prefers industry to academia. The university position might be a better outcome for someone with different preferences. Furthermore, some R1 universities do not have as much support for research as some highly selective liberal arts colleges with large endowments. In some fields of study, the position at a liberal arts college could be "more excellent" than a position at the R1.

Another way of assessing outcomes for programs is to examine a program's proportion of employed students. A pattern of all of a program's graduates finding appropriate employment (either postdoctoral fellowships followed by jobs or jobs immediately after graduation) is a sign of excellence. When a low proportion of graduates are so employed, the outcome is worse.

Graduates' satisfaction with the quality of the education they receive is also a component of a successful outcome. Some departments conduct exit surveys or interviews of graduating students that may elicit some of this information. An additional measure of successful PhD education might be how satisfied employers and other stakeholders (e.g., students, customers) are with our graduates. Some medical schools, including Johns Hopkins, survey residency program directors to gain insight into the success of graduates, and similar models might be developed to assess outcomes of PhD education.

At present, we lack the means to assess outcomes systematically across programs. Quantitative data (e.g., proportion of a program's graduates employed and in what kinds of jobs) and qualitative data (awards received by graduates and their significance; quality of jobs) would make tracking program outcomes possible. A good system of data collection would be flexible and include multiple kinds of evidence. The value of systematic evaluation across programs is not, however, outweighed by the reality that programs differ from each other and one size does not fit all. Furthermore, some indicators of outcomes

cannot necessarily be assessed immediately, since it may take years to realize the importance, for example, of a particular scientific finding. Consequently finding information on graduates of five, ten, and more years ago is crucial.

Recommendation: Draw on the expertise of PhD alumni and other knowledgeable external advisors from academia, and the public, private, and non-profit sectors to help create a set of program success indicators for which data (both quantitative and qualitative) can be routinely collected across all JHU PhD programs. We suggest that data from a minimal set of indicators be used throughout the University and that programs be allowed to add other indicators, if they choose. The data should include detailed information on the graduates' employment and other markers of professional achievement as well as their satisfaction with the education they received. To the extent possible, these data should allow us to differentiate between qualitative levels of positive (or negative) outcomes, especially so that truly excellent outcomes can be recognized. These data should be evaluated annually and tracked over time. The Office of Institutional Research should lead these efforts.

Recommendation: Developing methods for tracking graduates and measuring their performance in their careers should be a priority for the University. This could be achieved by engaging the Alumni Relations and Development Offices; ensuring that students keep their email addresses after graduation; surveying graduates when they leave and periodically thereafter; connecting with former students via social media and internet searches; surveying employers about our graduates' preparation and feeding data into the Graduate Education Dashboard developed and maintained by Vice-Provost for Institutional Research.

Internal Assessments of Progress and Performance (DBO, Thesis, and Defense)

Through discussions in Committee meetings and responses to the survey, we have found that programs assess individual students' progress toward completion of the PhD degree and their performance on coursework, independent research, and professional activities in a variety of ways, depending on the particular field of study. For example, in some programs course grades are especially important, while in others a major "second year paper" or a colloquium presentation are critical milestones. All programs at JHU share the Doctoral Board Oral (DBO) examination and the thesis as major milestones for student assessment. This section focuses on the DBO, the thesis, and the defense.

The DBO, an oral examination of doctoral candidates by members of their program and external members of the University faculty, is a longstanding JHU tradition. At present, the Doctoral Board Oral may be administered either as a preliminary exam or as a part of the dissertation defense. According to the Doctor of Philosophy Board:

> [This exam] has three major objectives:
> 1. To assess a candidate's proficiency in the discipline;
> 2. To give a student the benefit of a critical examination of his or her work by scholars outside the department or program committee;

3. To provide a means for extra-departmental monitoring of the academic quality of departments and committees sponsoring candidates

(http://grad.jhu.edu/academics/gradboard/policies/gbo/).

In addition, the oral exam may provide an assessment of the student's suitability for independent scholarly/scientific research, a fundamental hallmark of a JHU PhD.

The committee members recognize that there are many views about the DBO and its efficacy as an important part of Johns Hopkins doctoral education or, on the other extreme, an empty ritual that imposes a burden on faculty members, students, and their available time. Committee members had varying views on the DBO, but there was agreement that the timing of the exam shifts how the objectives are emphasized.

For those departments that have an early DBO, at the point of the qualifying examination, the DBO provides a check on the student's grasp of his or her field of study. When the DBO is administered early in the thesis research but after the qualifying exam (perhaps in conjunction with the defense of a dissertation prospectus), the DBO structure emphasizes critical examination of the student's work (including by faculty outside the field) and further provides a check on the suitability of the student for independent research as well as the student's grasp of the field of study. In contrast, when the DBO is part of the doctoral thesis defense, the suitability of the student for independent research has implicitly been accepted by his or her committee, and his or her sufficient grasp of the field has been assumed. At this point, the DBO becomes more of an external review of the program's quality and standards. Several committee members strongly felt that a very early exam focusing on grasp of the field from courses is best and ought to be a University-wide requirement. Other committee members favored an exam that took place early in the thesis research but after any qualifying examinations. Yet others thought that combining the DBO with the thesis defense was best.

An additional issue raised by several committee members was whether an oral exam was necessarily the best format for all programs and disciplines.

The thesis, a work of original scholarship or science research that contributes meaningfully to knowledge, is at the core of PhD education. Exactly what a thesis is – the extent to which the research was done independently, the expected length of the manuscript, what is included in the manuscript's content, and the like – differs from field to field. Humanities students are often expected to write long manuscripts that will serve as the first draft of their first book. Physics and Astronomy students may present a write up of one piece of a much larger experiment that is under the supervision of the advisor. Other fields may expect three published papers loosely tied together with some text – or not.

The thesis defense provides a critical, final opportunity to intervene and to make sure that the quality of the work presented by the student is sufficient for a PhD from Hopkins. The extent to which members of the examining board will be willing to require additional work

to be done if the dissertation is subpar depends, in part, on how the examining board is composed. This relates, as well, to the question of whether the defense serves as the DBO.

In general, the Committee liked the idea of including external examiners on dissertation boards, and actually preferred moving to a system of bringing in non-JHU examiners, as some fields do now. Having examiners from outside JHU immediately broadens the graduating student's professional network. We were mindful, however, of the cost that such a policy, if implemented University-wide, would entail.

The last task of the graduating student has been the onerous job of preparing the approved dissertation manuscript for submission to the library. This requirement has been made simpler by the change to electronic submission of theses. The continuing revolution in media may create opportunities for components of dissertations to take on different forms, though we see a value in making sure that each dissertation includes a textual component in which, at a minimum, the research is situated within the scholarly or scientific literature, the main findings are described, and their importance is argued. The library should identify means for archiving dissertations comprising both text and other media.

Recommendation: The committee recommends that the Doctor of Philosophy Board revisit the current rules that allow programs to choose the timing of their DBO. Further, the committee suggests that the Doctor of Philosophy Board also reflect on whether the mandate that the exam be given orally should remain in effect. Should there be a University-wide rule regarding the timing in order to clarify the main objective of the exam; a consistent rule within each School, but allowing each School to choose its own approach; or the current system of allowing each program to choose? If a University-wide rule is to be implemented, we recommend that the Doctor of Philosophy Board further decide the timing on the basis of the goals that are to be achieved. A majority of the Committee recommends that the dissertation defense *not* serve as the DB0.

Recommendation: The Committee recommends that the Doctoral Board consider a University-wide requirement of including external (non-JHU) examiners on the dissertation board. We further recommend that the University administration look into whether funds could be made available for this purpose.

Recommendation: Now and into the future, scholarship will be served by new modes of communication that allow the expression of important ideas without resorting to ordinary text. The Committee recommends that the rules for dissertations be broadened to accommodate new possibilities for recording and transmitting the scholarship/science of the doctoral research. To balance the need for demonstrating the quality and sufficiency of the research for the doctoral degree with the need to adapt to new technologies, we recommend that the rules specify that a dissertation may comprise non-textual material in addition to written text. The goal is to allow ways of presenting the results of the research using new media while recognizing the continuing practice of using text to communicate new scholarship/science and to locate new scholarship/science within the relevant literature. The University library should develop ways of accepting deposits of the alternative format components of theses and maintaining them in an accessible archive.

Time to Degree

The total time it takes a student to earn his or her degree is a widely used metric for comparing degree programs. It is important for Johns Hopkins University to pay attention to this metric overall, to understand its differences between divisions, departments, and degree programs, and to monitor the progress of each student as an indicator of progress towards his or her defense.

With this general goal in mind, it is necessary to understand what is meant by "time to degree" and what number should actually be reported. It should be understood that time spent on activities that are normally related to their degree program should be counted within the metric. For example, it is customary in some programs to have students spend time on teaching assistantships, research assistantships, mentoring, outside internships, rotations in multiple labs, laboratory training, field work, and professional development training. These practices, and additional customary practices not mentioned here, should be counted as part of the time toward the degree. Leaves of absence, including maternity leaves, and other leaves for activities or life events unrelated to the normal education and training for the PhD, should not be counted in this metric.

Current understanding of acceptable time to degree varies by department and program. Many departments hold to the standard of 4-5 years, while some view 5-6 years and even 6-7 years as appropriate. Such variation across the institution most likely reflects differences in training by field rather than relative strictness or laxity in managing PhD programs. However, it is good practice to put in measures that will encourage all students to make steady progress towards their degrees. There is some concern that lack of attentiveness to each student's research, teaching, and classroom activities might allow some students to stagnate. Some programs address this by regularly monitoring the progress of all PhD students; others use the threat of financial support reduction to encourage accelerated progress. The general feeling is that regular review and awareness of progress toward the degree will go a long way to help keep time to degree as low as possible.

Recommendation: Time to degree should be defined University-wide as the time, in fractional years, from matriculation to completion of all degree requirements, including the acceptance of the thesis by the library. Leaves of absence should not be counted in time to degree.

Recommendation: When pooling data to average the time to degree across departments and programs, fundamental differences in programs should be acknowledged and accounted for. For example, degree programs requiring a Master's degree for entrance should usually not be pooled with programs granting PhD admission directly after the Bachelor's degree. Minimizing the time to degree is generally desirable, but must not be carried out to the detriment of the students who are earning the degree. On the other hand,

programs whose times are extraordinarily long (relative to peer institutions and our own departments and programs) should review their own requirements to discern whether students are being delayed for work or activities that do not significantly enhance their education and training, but instead are taking place for the convenience of a department, program, or faculty member or just happen for lack of individual monitoring.

Recommendation: Departments and programs granting PhD degrees should review on a periodic basis (not to exceed every five years) the accepted practices that students engage in while earning their PhD degrees. Time limits on certain accepted activities, such as number of semesters spent as teaching assistants or on field research not directly related to the student's research, should be established and guidelines developed. The guidelines should be shared with faculty, students, and prospective students.

Recommendation: Each year, each student's progress towards their degree should be measured using established milestones (such as department qualifying exam, class progress, DBO exam, thesis proposal, and thesis committee reviews).

Career Path-Specific Education

Today's PhD students are following a wide variety of career paths due to several factors, ranging from the negatives of decreases in public support for research in many areas and the declining number of tenure track jobs in academia to the positives of increasing opportunities for entrepreneurship and employment in research intensive and information technology intensive industries. Starting from the expectation that our PhDs will find meaningful, appropriately remunerative employment in the private sector, in academia (both at research intensive institutions and at those that are more teaching intensive), and in the public and non-profit sectors, we recognize that students need career path-specific skills beyond expertise in their disciplines. This section illustrates current and potential ways to help PhD students attain their career goals.

For students seeking careers in public, private, or non-profit sectors, one way to gain skills is through internships, but internships are not without their difficulties for PhD students and their programs. Taking students away from the lab, their fieldwork, or other PhD research requirements may be problematic for the students and for the University research group that relies on their contributions. A question of best practices for timing internships thus remains: during summer or during the regular term, early in the PhD studies or near the conclusion of them. We suggest that the answer to this question may depend on the characteristics of different programs.

An example of a promising model for internships at the PhD level at Hopkins is the JHU Biomedical Careers Initiative, which has received pilot funding from the Provost's PhD Innovation Initiative. Part of this initiative will be developing partnerships with private- and public-sector institutions to allow JHU graduate students and post-doctoral fellows to do internships. Some initial funding is available, but the host organization is expected to provide the rest of the support. The experience so far is that students benefit from these experiences and return highly motivated to finish their doctoral program.

For students wishing to explore careers in the public sector, especially the US government and international organizations, a number of internship and early career professional programs for PhD students exist. To our knowledge, there is no organized mechanism to advertise these programs to PhD students across the University. A number of these programs specifically require that students be enrolled in a graduate program in social sciences or humanities, thus providing a needed opportunity for these students. On the less positive side, a number of these programs are unpaid, and to our knowledge no mechanisms currently exist to support students who participate in them.

Students seeking careers in academia or who anticipate careers in which they will be involved in providing training for others (clients, team members) can benefit similarly from the practical experience of teaching under the guidance of a mentor. At a time when the public is demanding teaching value for tuition dollars, future professors should be ready to meet the challenge by having been trained to teach as well as conduct research. Well-established programs include the Dean's Teaching Fellowship program within KSAS and the Gordis Teaching Fellowship program in the School of Public Health. Further supporting pedagogical training is the Preparing Future Faculty Teaching Academy, a newly established University-wide program. The purpose of the Academy is to provide advanced doctoral students with an overview of pedagogy, help them explore different educational models, acquire teaching and assessment skills, and have them work with faculty teaching mentors in a classroom, online course, or laboratory environment.

Short courses and lectures made available within programs, through interdepartmental collaborations, and across the University through interdivisional efforts could provide other opportunities for career-specific education. For example, students interested in becoming entrepreneurs could benefit from specific business courses. We see opportunities to work through the Career Development offices to bring experts from the Carey Business School and from the business community (perhaps drawing on the expertise of JHU Trustees and alumni, as well) to the campuses to help students learn specific skills and help them identify the kinds of skills they will need in the future if they choose this path.

External mentors, individuals who have the kinds of positions that our PhD students aspire to, are yet another potential resource to help our students acquire career-specific training. To find individuals who will take an appropriate interest in our students requires the development of connections between University faculty and private, public, and non-profit organizations. Alumni working in these sectors are one source of connections. Building bridges through current and future internship programs is another approach. So too are efforts to bring individuals in different career paths to the campuses to speak about their work, as exemplified by the speaker series initiated through the SOM PhD Innovation Initiative.

A very effective step might be to take advantage of the relations that already exist between the Whiting School and private technology companies, which may perhaps be leveraged to the advantage of other schools as well. The Whiting School and the Applied Physics

Laboratory jointly administer what is believed to be the largest part-time engineering master's degree program in the nation, Engineering for Professionals (EP). Most students in this program work in the private sector, and they can be useful in establishing bridges with it. Engineering PhD graduates already working in private companies can help establish relationships with the private sector, as well.

Recommendation: Create private/public/non-profit sector educational advisory groups (as appropriate) for each broad discipline (e.g., humanities) or division (e.g., medicine, engineering) across the University. The members could be drawn in part from alumni and Trustees. Also use the advisory groups to build new bridges with corporations by inviting non-JHU-related people to serve. These boards could provide advice on new educational and skills training offerings JHU should develop for its PhD students.

Recommendation: Develop, in collaboration with the sectoral educational advisory groups, internship programs that address the needs of PhD students for developing flexible skills for a dynamic job market in ways that take advantage of (and recognize the constraints of) PhD education. One possibility is the creation of short-term mini-internship rotations, which may ameliorate the problem of loss of student contribution to on-campus research projects. A mini-internship would still benefit both students, who seek experience outside academia, and firms, which can use short term placement to "try out" the students they may wish to hire in the future.

Recommendation: Continue and enhance support for teaching our PhDs how to become excellent teachers. This support could take the form of additional workshops, classes, and mentored teaching experiences.

Recommendation: The University should work to build educational partnerships between JHU and corporations, government, and non-profits for the benefit of PhD students. The development staff working on these efforts should have experience in or knowledge of the relevant sectors.

Recommendation: Reorganize one or more Center(s) for Career Development to provide additional career guidance in private, public, and non-profit sector opportunities for PhD graduates. Collaboration among the divisions in this effort would seem desirable as it would likely lead to synergies and economies of scale.

Recommendation: The University should provide educational offerings (possibly through the Carey School) relevant to careers in the private, public, and non-profit sectors for PhD students and fellows. Examples of such offerings could include:

1. Targeted short courses on business and organizational practices in areas such as entrepreneurship, industrial practice, intellectual property law, public relations, finance, etc.;

2. Skills-building courses in areas including writing, teaching and curriculum development, teamwork, public speaking, etc.

The courses should be recorded on student transcripts or on some other official record. The recently created Preparing Future Faculty Teaching Academy could be used as a template for efforts of this type of skills-or career-focused training.

Educational collaboration with the private and public sector: Opportunities for funding PhD education?

Connections to the private and public sectors also open up additional possibilities for funding of PhD education. Currently, some PhD students are being wholly funded by their employers for PhD study, with the usual requirement that they will return to work for their employer after completing their degrees. While a student should not be admitted to a program because he or she has funding from the government or from a firm, such funding for highly qualified applicants that programs would otherwise want to admit provides a net benefit to the University.

A forward looking model of funding for PhD education may adapt the employer-paid approach to funding students who are not yet employees of the organization. Although this is not as likely for the public sector, a clearer opportunity exists for the private sector and specifically for PhD programs in science and engineering. In these fields, industry may have a specific interest in creating a pipeline of highly qualified PhD level researchers. Students in such a program could tailor part of their educational experience, in consultation with their supporting company, to make them more valuable potential employees (see Career Path-Specific Education section, above). Additionally, collaboration with academic research groups on problems and questions that are fundamental in nature and not yet ready for development or commercialization (the "pre-competitive space") may be appealing to industry because it does not have the capabilities or expertise to explore deeply in many areas. Yet, there are a number of challenges for this model that will need to be overcome:

1. Industry typically requires faster progress than academia, where the student is slowed down by coursework, teaching assistant duties and, often, the scholarly need to go deep into the nature of a problem;

2. Unlike in other countries, where industries fully fund doctoral students for the entire duration of their program, industrial research collaboration contracts with universities in the US are usually for much shorter periods of time and only provide funding for advanced PhD students. No funding is generally provided for students in the first 1-2 years of their programs, during which they are mostly taking courses and "coming up to speed." This leaves the problem of securing support by other means during at least part of the students' education;

3. While publication of the results is an essential aspect of scholarship, doing so may be in conflict with industry's need to safeguard intellectual property;

4. The work required by an industrial project may involve routine activities which, although time consuming, do not add to the knowledge of the student or to the progress of the academic research.

5. Students who want to shift to another project because their interests have changed or for another reason could lose funding and future employment guarantees if they are no longer working on the specific project funded by the firm.

Recommendation: University and divisional leadership should explore possibilities of industry-sponsored PhD education based on a scholarship model rather than a "work for hire" model. In a scholarship model, the student's eligibility for funding would not be limited to a specific research project. Rather, the student would be able to choose exactly what to study. Additional career-specific enhancements to this could be the opportunity for the student to work as an intern at the firm providing the scholarship, consult with a mentor from the firm, and be considered for employment by the firm after completion of the PhD.

Recommendation: University and divisional leadership should explore possibilities of having research contracts last longer and specifically include funding for the first two years of students' PhD education as well as for their efforts when they are actively working on the contracted projects.

Recommendation: The University and programs seeking industry funding for PhD education should be vigilant about protecting the interests of students and should create conditions conducive to industry-University collaboration. Protecting the interests of students includes, but is not limited to, the students' work conditions, intellectual property interests, progress toward completion of the PhD, and depth and breadth of learning in their field of study. Creating conditions conducive to industry-University collaborations that fund PhD students may require, for example, that the University be willing to negotiate reasonable terms for its own share of intellectual property rights.

Diversity

The Need for Diversity

Diversity is critical to a thriving academic community because the different perspectives of students and scholars from varied backgrounds promote innovation in both research subjects and approaches. This need for "hybrid vigor" (Al-Rodhan, Nayef R.F., "emotional amoral egoism:" A Neurophilosophical Theory of Human Nature and its Universal Security Implications, LIT 2008; Al-Rodhan, Nayef R.F., Sustainable History and the Dignity of Man: A Philosophy of History and Civilisational Triumph, Berlin, LIT, 2009) in academic research is a profoundly compelling reason for the University to focus considerable efforts on promoting the creation of a diverse PhD education community.

More specifically, there are four critical benefits to developing a diverse academic community: (1) Having a diverse faculty and student body fosters critical thinking, intellectual curiosity, and appreciation of multiple perspectives; (2) engagement of diverse

perspectives generates new questions, novel research in unexplored areas, and innovative ideas; (3) diversity bolsters our competitive edge by attracting the most talented students, faculty, and staff and sustaining a robust and cutting edge research agenda; and (4) diversity allows maximal, productive engagement with the surrounding community, enabling us to address Baltimore City's education, health, and resource needs, and provide opportunities for disadvantaged populations in the City, especially Baltimore City public school students.

In the context of this report, diversity should be defined broadly and should include differences in gender, race, ethnicity, religion, sexual orientation, socio-economic background, physical ability and geographic origin. In broad terms, the University should strive to: (1) Ensure that fair and inclusive processes are in place to foster different ways individuals can contribute to the educational and research missions of the University; (2) continually evaluate its operations to determine if certain policies, processes, or other systems disproportionately affect one population; (3) ensure representation of different voices in leadership roles, especially those from traditionally marginalized communities that have been historically absent.

Trends

In the 2012-2013 academic year, just over half (52%) of the PhD students at the University were women, a value that has held steady for the past six years. In contrast, the fraction of under-represented minority (URM) students is only 10% of all PhD students and decreased in the 2012-2013 academic year from its peak of 11% in 2010-2011 and 2011-2012 to 9.7% (Figure 13). Whether this downward trend will continue and the origins of the decline are unclear.

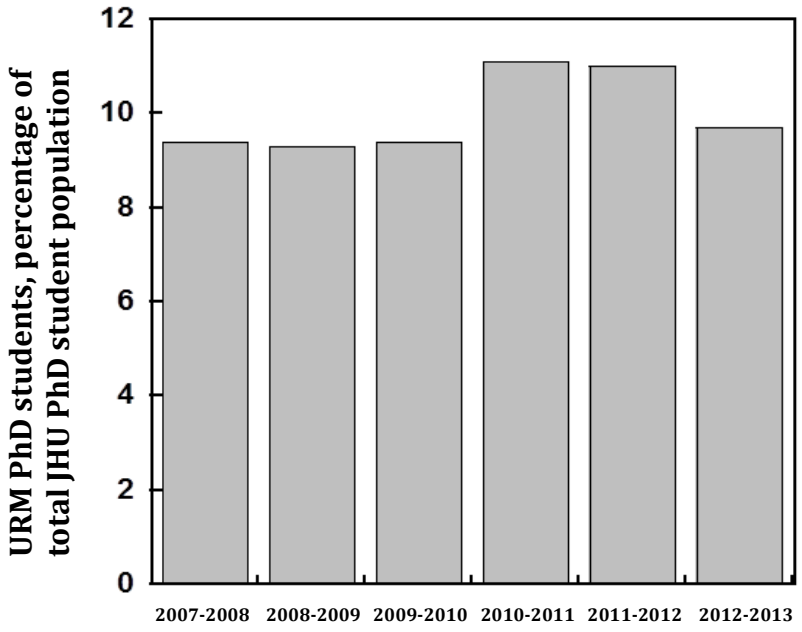


Figure 13. URM PhD students as a percentage of total JHU PhD student population.
Source: Johns Hopkins University Office of Institutional Research

Barriers and Challenges

A significant barrier to recruitment and retention of students from under-represented groups is the lack of a critical mass of members required to form a coherent and supportive community. The absence of such communities can lead to student isolation and attrition (e.g., Clark C., et al., Barriers to the Success of Ethnic Minority Students in School Psychology Graduate Programs, School Psychology Review 2012 41: 176-192; Gardner J., Barriers Influencing the Success of Racial and Ethnic Minority Students in Nursing Programs, J Transcult Nurs. 2005 16:155-62). Throughout the University there are a number of societies and programs designed to provide communities and support services for members of under-represented groups. However, there is little integration of these groups among the divisions and in many cases the local groups do not represent the critical mass required to produce a thriving community that can attract and support additional members of the particular group.

Another challenge for student societies and programs designed to support PhD candidates from under-represented groups is the concept of stereotype threat (e.g., Steele, Claude M., A threat in the air: How stereotypes shape intellectual identity and performance, American Psychologist 1997 52: 613-629). There is a large body of evidence indicating that the act of identifying an individual as being from a particular group – even when that identification is well intentioned, as in the case of providing group-specific support programs – can depress academic (and other) performance because of a perception that others will expect the person to fall into a stereotype. In other words, if a student believes others think he is likely to underperform, he is more likely to underperform. A careful balance must be struck between creating supportive communities and programs to attract and retain members of under-represented groups and avoiding triggering stereotype threat, which can be caused by identifying certain students as separate from the majority population.

A third area of concern is the debt-burden of URM PhD students. Several recent studies have indicated that nationally URM PhD students have a considerably higher debt burden associated with their graduate studies than do students from non-minority groups (e.g., Mervis, J., Minorities Run Up Significant Debt in Earning STEM Ph.D.s, Science 2013 340:1510-1511). The committee did not have access to data regarding the debt burden of students at JHU, but because debt and lack of sufficient financial aid could represent significant barriers to URM students obtaining PhDs, the relevant data should be collected and analyzed.

Opportunities and Recommendations

For the reasons mentioned above, attracting greater numbers of students from under-represented groups into the University's PhD programs will strengthen both research and education at Johns Hopkins. Programs designed to achieve this goal should be continued and expanded, with a focus on creating economies of scale and critical masses of students by integrating efforts across the divisions. From a societal standpoint, however, these efforts represent a zero-sum game because if a student from an under-represented group attends Johns Hopkins University instead of one of our peer institutions it is a gain for us but a loss for our peer school. In general, the student would likely receive comparable education and training at any of the schools competing for her or him. What would be of

significant benefit to society would be to increase the number of students from these under-represented groups who enter PhD programs nationally – that is, expand the pipeline. The committee felt strongly that Johns Hopkins has the responsibility to create and support programs that will increase the number of students from under-represented groups who eventually choose to enter PhD programs. The University is in an excellent position to serve as a model for other institutions in this critical endeavor.

Recommendation: The Office of Institutional Research should conduct an ongoing study of debt-burden and financial support of PhD students and use these data to determine whether there is currently disparity among different groups at JHU and to ensure that such disparities do not arise.

Recommendation: The University should strengthen existing efforts to create supportive communities and services for PhD students in under-represented groups by integrating these efforts across the divisions. To better create critical masses and economies of scale, programs for PhD students should be linked (where appropriate) to programs for other student groups (e.g., undergraduates, medical and nursing students, etc.). To coordinate this integration, a Council on Diversity, made up of the deans/directors of the divisional diversity or multicultural affairs offices, should be established by the Office of the Provost. The Council should pay special attention to the problem of stereotype threat for all existing and future programs. It should be responsible for ensuring that students, faculty and staff are aware of the programs and that any advising or counseling aspects of the programs are confidential. The Council should also work closely with the Office of Institutional Research to develop mechanisms for measuring the outcomes of these programs and using the resulting data to improve program performance.

Recommendation: The University should invest in programs to expand the national pipeline of students from under-represented groups who eventually pursue PhDs. These programs should target all educational levels, with particular focus on high school and undergraduate students. The Council on Diversity should take the lead in coordination of these programs and on ensuring mechanisms for measuring program efficacy are in place. Although an increase in the number of PhD students from under-represented groups at Johns Hopkins would be a desirable outcome of these programs, their fundamental goals are to increase the pipeline of such students nationally and to serve as models for other institutions to follow.

Conclusion

A major strength of PhD education at Johns Hopkins University is the autonomy that individual programs have within each division. This autonomy allows excellence because departments and programs are able to focus on educating students in the manner best suited to each discipline and field. Autonomy also gives programs the freedom to innovate to overcome challenges and improve their educational and research methods. The autonomy and abundance of the PhD programs also presents a number of challenges, however, that need to be balanced through cooperative efforts that are centrally

coordinated. Ensuring that programs provide the best possible experiences for their students – the best education, the best research opportunities, the best mentoring, the best support of career development, and the healthiest possible community – frequently will require resources that cannot be provided by individual programs but must be developed instead through division-wide or University-wide collaboration. It will be essential for the health of PhD education at the University to strike the optimal balance between allowing sufficient autonomy for our diverse graduate programs to specialize and innovate while at the same time providing the services necessary to ensure excellence. These services will require coordination, economies of scale and critical masses of participants. The Committee strove to find this balance and reflect it in our recommendations.

Although all of the members of the Committee were committed to developing a report that was based on a careful analysis of data regarding PhD education nationally and at Johns Hopkins, we were dogged by an inability to actually get most of the data we wanted to analyze. (See Appendix A– Data Collection Questions.) Nationally, the best data set is the NSF's Survey of Earned Doctorates, which we relied upon for the information on national trends presented in the Overview and Trends section. These data suffer from a number of problems, however, including the limited sub-set that is available for analysis outside of the NSF (due in part to confidentiality issues) and the unknown reliability due to the self-reported nature of the data, the response rate, selection bias, etc. Nonetheless, these data are significantly better than those available internally. Until recently, data collection on PhD education at the University was done only on an ad hoc, local basis, mostly by individual graduate programs. The data are incomplete, not housed centrally, and are in many different formats. Their quality is dubious in most cases. Recently, the Office of Institutional Research began a major effort to start a program of data collection and analysis for PhD education across the University. The Committee strongly endorses this effort and believes it will be essential to the continued health of PhD education at Johns Hopkins.

We end with two overarching recommendations.

Recommendation: The Schools and their PhD programs should work together to develop interdivisional mechanisms to support excellence in PhD education and research across the University. These collaborative efforts should be coordinated by the Office of the Provost and should focus on areas where synergies are possible or economies of scale or critical masses of participants are required.

Recommendation: The data collection and analysis program within the Office of Institutional Research should be continued and enhanced. Efforts should focus on relieving individual programs of the burden of attempting to carry out these functions with insufficient resources or expertise and on allowing programs and the University to assess the efficacy of PhD education and make iterative improvements. An important focus of this effort should be on developing methods to measure the short- and long-term outcomes of PhD education. In addition, the Office of Institutional Research should support innovative experiments in PhD educational methodology by providing analysis of student

performance and outcomes, which will allow different models to be tested, compared and refined.

Appendix A

Data Collection Questions Compiled by the Committee

The Committee requested the following data from the Office of Institutional Research. In many cases the data were not available, which reduced the depth of analyses the Committee could perform. Enhancing the Office of Institutional Research's data collection capabilities is a critical need for the University.

1. What was the total number of PhD students enrolled in each program every year for the past 10 years?
2. How many students graduated from each program with a PhD each year for the past 10 years? How many with a terminal Masters? How many did not graduate (left without a degree)?
3. What were the mean and median times from matriculation to PhD for each program over the past 2, 5, and 10 years (exclusive and inclusive of leaves of absence)?
4. What were the mean and median GPAs and GREs of applicants, accepted and matriculating students for each program over the past 10 years?
5. What undergraduate institutions did the students in each entering class of each program attend over the past 10 years? (If we have some kind of classification system for these schools it might be easier to use the data.)
6. What was the gender and racial distribution of each program's PhD students and faculty each year for the past 10 years?
7. Does each program require a yearly (or more frequent) thesis committee meeting? If not, which do not?
8. What is the average year and range of years in which PhD students take their DBO exams in each program? What is the success rate on the first and second attempts?
9. Is there a written component associated with the DBO in addition to the oral component?
10. What is the average financial aid (and range) provided by the University/school/department for students in each program each year for the past 10 years (broken down as tuition support and stipends)? Same question for external support (e.g., federal training grants, individual fellowships, etc.).
11. What is the mean and median debt for students in each program upon graduation?
12. Where are students who left each program 1, 5 and 10 years after graduating/leaving? For what fraction of students from each program do we know this information?

Appendix B

Graduate Student Data Management

Prepared by Sean Fahey, Office of Institutional Research

Institutional Research Analytic Data Warehouse (IRAD) Overview
The goal of the JHU Institutional Research Analytic Data Warehouse (IRAD) is to enable longitudinal and cross-school analysis of admission, enrollment, graduation and career progression data for JHU undergraduate students, graduate students faculty.

The primary source of graduate student data for the warehouse is the JHU student information system (ISIS). The warehouse includes the extracts of all student enrollments created from ISIS at the 6th week of the summer and fall terms from 2007-2013. Additional data have also been added to the warehouse to create as complete of a dataset as possible (e.g., NRC data on PhD students).

The data within the warehouse has been normalized across years and between schools to allow for longitudinal comparison. A variety of normalizations are required to allow for data analysis including normalizing department or names that are entered differently in different years, (e.g., Astronomy vs. Astronomy and Physics), normalizing race/ethnicity codes when changed by the federal government (as in 2010), etc.

The data are stored in a SQLServer database and can be accessed by connection to the database (e.g., JDBC) or by access via a Business Objects Dashboard. The dashboard is designed to allow analysts to explore the data via drill downs, charts, and graphs. Data can also be exported from the system into MS Excel or other desktop analysis tools. This latter mode, however, is not preferred since future edits or corrections to the data will not be captured in the copied data file.

IRAD Development Status

The IRAD has been in development since 2009 and is an integral part of the Office of Institutional Research analysis and reporting processes. Data from the warehouse are used both for internal business analysis and external compliance reporting. The system integrates student, academic program, and faculty data into a single environment and aligns the variety of internal information system data models with externally required data definitions and standards (e.g., IPEDS, CDS, COFHE, AAU, etc.).

IRAD Issues Impacting the Committee on the Future of PhD Education

While the IRAD provides better access to graduate student data than previous student information systems at JHU, there are still several known data issues which impact the University's ability to analyze graduate programs or graduate student experiences. Many of these have a direct bearing on the analysis being conducted by the Committee on the Future of the PhD Education and so are listed below:

Missing data – Some important elements for managing and assessing graduate programs have not, to date, been systematically captured by all schools or stored in the data warehouse. Major missing data elements include:

- graduate admissions data (e.g., number of applications, number of admits, yield rate, etc.),
- student quality data (e.g., undergraduate institution, major, GPA, GRE scores, etc.),
- graduate financial support data (e.g., stipend and tuition waiver amount, duration of stipend coverage, work expectations, etc.),
- retention and progress to degree (e.g., longitudinal tracking of students through key milestones in their program, capture of when students disenroll from a program)

If these data are deemed critical to assessing and managing graduate programs, Institutional Research (IR) should work with the schools to develop and implement business processes and information systems to capture and maintain this information.

Degree start date recording – Students follow different paths to get their masters and doctoral degrees. While some are admitted as doctoral students and earn a master's "along the way" others begin in a PhD program but opt to exit the program with a master's degree before completion of the PhD. Still others start in a master's program and then move into a PhD program. At present the business processes and data structures in ISIS do not capture these multiple start dates in a manner that allows accurate analysis of graduate student trajectories or time to degree analysis. *IR should work with the schools and IT to develop and implement a system to capture all of the start dates required for analysis.*

Joint and dual degree programs – Many JHU graduate students are enrolled in joint or dual degree programs. These programs enter data into the JHU student information systems in different ways, making it difficult to calculate time to completion metrics from the data in the student information system. For example, some programs use the start date for the first degree as the start date for both degrees (making both appear to have taken longer than actual), while other programs set a later start date for the second program making it appear to be shorter than the actual time*. IR needs to work with the schools to develop and implement business practices to define, capture and validate the actual start times of multiple degrees.*

Alumni tracking data – One input to assessing program quality is to monitor where students from the program go for their first job or later in their careers. Some departments maintain systems for informal tracking of their graduates but few if any have a comprehensive alumni tracking process. *IR should work with the schools to design a process that can be used to easily collect data on graduates to support program assessments.*

Leave of Absence data – When analyzing the time students take to complete their degrees, a necessary variable to include in the analysis is whether or not the student took a leave of absence during their time at JHU. At present that data is not captured in a systemic way in ISIS and so is not able to be factored in to the calculation. *IR needs to work with the JHU schools to develop and implement a business process to capture and store and make available in a structured format the time periods of students' leaves of absence.*

Appendix C

JHU PhD Program Data

Prepared by Cathy Lebo, Office of Institutional Research

As of fall 2012, Johns Hopkins offers 63 Doctor of Philosophy degree programs. This figure does not include specialized concentrations within degree programs. The Krieger School of Arts Sciences offers the largest number of Ph.D. programs and has the largest enrollment, followed by the School of Medicine, Public Health, Engineering, Nursing, and SAIS.

Table 1 – JHU PhD Enrollment, Fall 2012

	Full-Time	Part-Time	Total	
	Count	Count	Count	%
KSAS	923	2	925	31%
WSE	509	6	515	18%
SAIS	18	0	18	1%
BSPH	548	61	609	21%
SoM	842	0	842	29%
SoN	32	0	32	1%
TOTAL	**2872**	**69**	**2941**	**100%**

Johns Hopkins offers a large number of Ph.D. programs compared to other leading research universities. Tables 2 and 3 show the number of Ph.D. programs in broad fields of study (Agriculture, Biological and Health Sciences, Engineering, Humanities, Physical and Mathematical Sciences, Social and Behavioral Sciences) offered at peer universities. Table 2 compares Johns Hopkins to 18 highly selective, private universities in the COFHE consortium. Table 3 lists the number of Ph.D. programs at each AAU institution.

Among leading private universities, Table 2 shows that only Cornell and Harvard offer more Ph.D. programs. There are different approaches to Ph.D. education at each of the COFHE universities. MIT, for example, runs fewer, but larger Ph.D. programs. Harvard runs roughly the same number of Ph.D. programs as Johns Hopkins, with larger average enrollment per program. These relationships between number of Ph.D. programs and average enrollment are illustrated in Figure 1.

This information on the number of Ph.D. programs at peer universities is based on data provided by each institution for the NRC Assessment of Research Doctorate programs, released in 2010. The number of Ph.D. programs reported for Johns Hopkins in the NRC study (n=55) included a few programs that were grouped together (e.g. History of Science and History of Medicine) and excluded the doctoral program at SAIS. Since the NRC study, Johns Hopkins has added 3 Ph.D. programs, in Chemical Biology, Health Science Informatics, and Education. The programs listed in the broad field of Agricultural Sciences include Nutrition at Columbia, Cornell, and Hopkins; Animal Sciences, Entomology, Food Science, Plant Sciences at Cornell; Plant Sciences at Washington St. Louis; and Forestry at Yale.

Table 2 - Number of PhD Programs at COFHE Universities

		Broad Field						
		Agricultural Sciences	Biological and Health Sciences	Engineering	Humanities	Physical and Mathematical Sciences	Social and Behavioral Sciences	Total
		Count	Count	Count	Count	Count	Count	Count
Hopkins	JOHNS HOPKINS UNIVERSITY	1	20	7	11	7	9	55(*)
COFHE Univ	CORNELL UNIVERSITY	9	16	8	13	9	8	63
	HARVARD UNIVERSITY	0	17	1	20	10	11	59
	YALE UNIVERSITY	1	14	5	20	8	6	54
	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	1	13	8	16	8	5	51
	STANFORD UNIVERSITY	0	11	8	15	7	9	50
	UNIVERSITY OF PENNSYLVANIA	0	9	6	13	7	9	44
	UNIVERSITY OF CHICAGO	0	12	0	14	7	8	41
	DUKE UNIVERSITY	0	11	4	11	7	6	39
	PRINCETON UNIVERSITY	0	2	5	16	9	6	38
	BROWN UNIVERSITY	0	7	4	13	6	6	36
	WASHINGTON UNIVERSITY IN ST. LOUIS	1	10	6	9	5	4	35
	NORTHWESTERN UNIVERSITY	0	2	7	9	7	7	32
	UNIVERSITY OF ROCHESTER	0	10	4	5	7	5	31
	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	0	5	9	2	8	4	28
	RICE UNIVERSITY	0	2	7	5	9	5	28
	GEORGETOWN UNIVERSITY	0	8	0	4	1	3	16
	DARTMOUTH COLLEGE	0	5	1	0	5	1	12

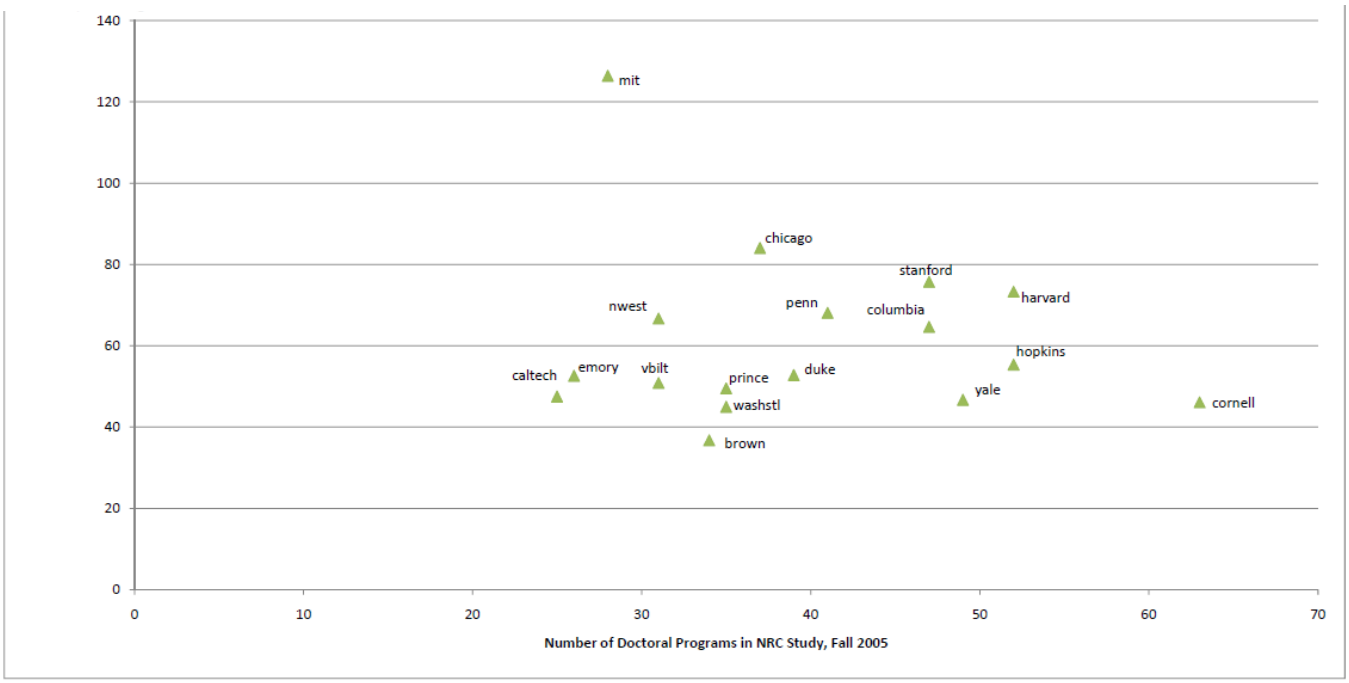
*Reflects programs grouped together (e.g. History of Science and History of Medicine) and exclusion of SAIS PhD program. Actual number of PhD Programs is 63.

Table 3 - Number of PhD Programs, AAU universities

		Broad Field						
		Agricultural Sciences	Biological and Health Sciences	Engineering	Humanities	Physical and Mathematical Sciences	Social and Behavioral Sciences	Total
		Count	Count	Count	Count	Count	Count	Count
Hopkins	JOHNS HOPKINS UNIVERSITY	1	20	7	11	7	9	55(*)
AAU Private	CORNELL UNIVERSITY	9	16	8	13	9	8	63
	HARVARD UNIVERSITY	0	17	1	20	10	11	59
	YALE UNIVERSITY	1	14	5	20	8	6	54
	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	1	13	8	16	8	5	51
	STANFORD UNIVERSITY	0	11	8	15	7	9	50
	UNIVERSITY OF SOUTHERN CALIFORNIA	0	15	9	8	6	9	47
	UNIVERSITY OF PENNSYLVANIA	0	9	6	13	7	9	44
	NEW YORK UNIVERSITY	0	12	0	16	5	9	42
	UNIVERSITY OF CHICAGO	0	12	0	14	7	8	41
	BOSTON UNIVERSITY	0	12	5	9	7	7	40
	DUKE UNIVERSITY	0	11	4	11	7	6	39
	PRINCETON UNIVERSITY	0	2	5	16	9	6	38
	BROWN UNIVERSITY	0	7	4	13	6	6	36
	WASHINGTON UNIVERSITY IN ST. LOUIS	1	10	6	9	5	4	35
	NORTHWESTERN UNIVERSITY	0	2	7	9	7	7	32
	CASE WESTERN RESERVE UNIVERSITY	1	10	10	3	4	3	31
	UNIVERSITY OF ROCHESTER	0	10	4	5	7	5	31
	VANDERBILT UNIVERSITY	0	10	7	6	4	4	31
	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	0	5	9	2	8	4	28
	RICE UNIVERSITY	0	2	7	5	9	5	28
	EMORY UNIVERSITY	1	10	0	8	2	5	26
	CALIFORNIA INSTITUTE OF TECHNOLOGY	0	3	9	0	12	1	25
	CARNEGIE MELLON UNIVERSITY	0	1	8	3	5	5	22
	BRANDEIS UNIVERSITY	0	4	0	6	4	5	19
	TULANE UNIVERSITY	0	5	2	3	3	2	15
AAU Public	UNIVERSITY OF WISCONSIN-MADISON	12	19	11	18	12	12	84
	UNIVERSITY OF MINNESOTA-TWIN CITIES	9	16	8	13	11	12	69
	UNIVERSITY OF MICHIGAN-ANN ARBOR	0	24	10	16	9	9	68
	OHIO STATE UNIVERSITY MAIN CAMPUS	7	14	9	12	13	11	66
	PENN STATE UNIVERSITY	9	13	14	8	9	13	66
	UNIVERSITY OF CALIFORNIA-LOS ANGELES	0	18	7	20	11	8	64
	UNIVERSITY OF WASHINGTON	3	20	8	12	11	8	62
	UNIVERSITY OF FLORIDA	12	15	10	5	8	10	60
	UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN	8	11	10	10	8	12	59
	UNIVERSITY OF ARIZONA	4	14	11	6	12	9	56
	UNIVERSITY OF CALIFORNIA-BERKELEY	2	15	6	18	7	8	56
	UNIVERSITY OF TEXAS AT AUSTIN	2	8	9	15	8	14	56
	UNIVERSITY OF MARYLAND COLLEGE PARK	6	8	8	12	10	11	55
	MICHIGAN STATE UNIVERSITY	11	13	6	6	7	11	54
	UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL	1	20	3	13	7	9	53
	IOWA STATE UNIVERSITY	12	13	9	2	12	4	52
	INDIANA UNIVERSITY AT BLOOMINGTON	1	7	0	21	7	15	51
	UNIVERSITY OF CALIFORNIA-DAVIS	5	14	7	8	10	7	51
	UNIVERSITY OF IOWA	0	16	6	11	7	9	49
	TEXAS A & M UNIVERSITY	11	7	11	2	9	8	48
	PURDUE UNIVERSITY MAIN CAMPUS	8	9	8	6	8	7	46
	UNIVERSITY OF MISSOURI - COLUMBIA	4	10	7	7	6	10	44
	UNIVERSITY OF KANSAS	0	11	5	9	7	10	42
	UNIVERSITY OF VIRGINIA	0	10	7	9	8	5	39
	UNIVERSITY OF PITTSBURGH PITTSBURGH CAMPUS	0	14	7	8	4	5	38
	STATE UNIVERSITY OF NEW YORK AT BUFFALO	0	7	6	8	5	8	34
	UNIVERSITY OF CALIFORNIA-IRVINE	0	9	6	6	5	8	34
	UNIVERSITY OF COLORADO AT BOULDER	0	4	5	7	8	9	33
	STATE UNIVERSITY OF NEW YORK AT STONY BROOK	0	8	4	7	7	6	32
	UNIVERSITY OF CALIFORNIA-SANTA BARBARA	0	3	4	9	7	8	31
	UNIVERSITY OF CALIFORNIA-SAN DIEGO	0	3	5	4	5	8	25
	UNIVERSITY OF OREGON	0	2	0	8	5	8	23
	GEORGIA INSTITUTE OF TECHNOLOGY	0	1	10	2	6	2	21

*Reflects programs grouped together (e.g. History of Science and History of Medicine) and exclusion of SAIS PhD program. Actual number of PhD Programs is 63.

Figure 1. Average Doctoral Enrollment per Program by Number of Programs, Fall 2005, NRC Programs



Appendix D

Student Counseling Data

Prepared by Eric Rose, Homewood Campus Counseling Center

The great majority of students who come to see us for intake are experiencing some form of suffering (ranging from feeling normal stress, doubts, difficulties to experiencing something more like what one might describe as mental illness). Although it is possible for students who are not suffering to come to the Counseling Center to seek proactively a new skill to better their quality of life (e.g., the Introduction to Mindfulness Meditation group), in my experience such students are the minority. Most typically, students join our therapy groups because one of our psychologists has met a student on intake and recognized that one our groups could provide her or him with needed support.

Please see AppendixD_JHUCC_2008-2013 Data_CombinedReport.pdf

Note: The data look at separate intake visits over the last five years, but the same student may be counted more than once. A student can only have one intake with us a year. So over the course of five years one student could maximally have had five intakes.

Appendix E

Open-ended Questionnaire

Prepared by the Committee

Please see AppendixE_CoFPhDSurveyResponses.pdf

Appendix F

Committee Membership and Procedures of the Committee

The Provost's Committee on the Future of PhD Education included representatives of each of the PhD granting divisions of the University (the Bloomberg School of Public Health, the Krieger School of Arts and Sciences, the School of Advanced International Studies, the School of Education, the School of Medicine, the School of Nursing, and the Whiting School of Engineering) and the Applied Physics Lab. One co-chair was from SOM and the other was from KSAS. The students were represented by two advanced PhD students, one from the SOM and one from KSAS.

We were assisted in our deliberations by advice from Mr. Sean Fahey and Ms. Cathy Lebo (Institutional Research), who provided internal data on our programs; Dr. Candice Dalrymple (Center for Educational Resources), with whom we discussed curricula and teaching methods; Dr. Peter Espenshade (SOM) and Ms. Lani Hummel (Corporate Relations), who briefed us on the kinds of educational options needed for different kinds of careers and the role of external stakeholders; Dr. Eric Rose and Dr. Barbara Baum (Homewood Counseling Center), who told us about the trends they see in terms of PhD student stress and personal difficulties, some of which can be alleviated by tweaking policies; and Dr. Daniel Teraguchi (SOM), who briefed us on issues of diversity. Ms. Kelly Miller provided support and data analysis.

The Committee met eight times from the beginning of February to the end of July, 2013. A list of the meeting dates and topics of discussion can be found in Table 2 below. In addition, the Committee requested that directors of graduate studies or department chairs respond to an open-ended questionnaire. The answers provided by the respondents is included a separate appendix (Appendix E). We also had access to responses to a similar questionnaire that had been sent to KSAS department chairs by the dean's office.

Sections of the report were drafted by a Committee member or two and then edited by others. The final version of the report was circulated to the Committee. The final version was approved by all members of the Committee.

Table 1. Members of the Committee on the Future of PhD Education

Name	Department	School
Collin Broholm	Physics and Astronomy	Krieger School of Arts and Sciences
Deborah Carran	Education	School of Education
Pam Jeffries	Nursing	School of Nursing
Jerry Krill	Assistant Director	Applied Physics Lab
Peter Lewis	Africa Studies	School of Advanced International Studies
Jon Lorsch *(co-chair)*	Biophysics and Biophysical Chemistry	School of Medicine
Renée Marlin-Bennett *(co-chair)*	Political Science	Krieger School of Arts and Sciences
John Matsui	Graduate Student (History)	Krieger School of Arts and Sciences
Jerry Prince	Electrical Engineering	School of Medicine
Andrea Prosperetti	Mechanical Engineering	Whiting School of Engineering
Eric Stevens	Graduate Student (Human Genetics)	School of Medicine
Michael Williams	Humanities	Krieger School of Arts and Sciences
Ying Zhang	Molecular Microbiology and Immunology	Bloomberg School of Public Health

Table 2. Committee on the Future of PhD Education Meeting Dates, Meeting Topics and Expert Guests

Date	Meeting Topic	Expert Guests
02/2013	Kick-off Meeting	
2/22/2013	Outcomes of PhD Education/ Assessment of Students and Programs	Sean Fahey Office of Institutional Research Cathy Lebo Office of Institutional Research
3/22/2013	Curricula and Teaching Methods	Candice Dalrymple, PhD Associate Dean, Director of Center for Educational Resources
4/19/2013	Mentoring, Degree Requirements and Time to Degree	
5/10/2013	Career Path-Specific Education and the Role of External Stakeholders	Peter Espenshade, PhD School of Medicine Lani Hummel, JD Corporate Relations
5/24/2013	Funding Models	Sean Fahey Office of Institutional Research
6/7/2013	Student Stress	Eric Rose, PhD Counseling Center – Homewood Student Affairs Barbara Baum, PhD Counseling Center – Homewood Student Affairs
7/19/2013	Diversity	Daniel H Teraguchi, ED.D School of Medicine Dean for Student Diversity

Co-chairs' Acknowledgments

In our committee's discussions, we quickly learned that disciplines vary in terms of the precise nature of what is expected for the PhD and how this is to be accomplished. We also learned that the divisions of the University have different institutional cultures. Through these discussions, though, it quickly became apparent that many more similarities than differences marked our shared interests in finding best practices and overcoming challenges in our mutual goal of excellence.

It has been our pleasure to work with and learn from the members of CoFPhD. We would like to express our sincere thanks to the members for their hard work and willingness to deliberate, reconsider, convince and be convinced, and compromise. We also wish to express our appreciation to the experts who took time to advise us during our deliberations and to Kelly Miller who supported the entire project and provided data analysis for the report.