

STANFORD
UNIVERSITY



**REPORT OF THE COMMISSION ON
GRADUATE EDUCATION**

2005

STANFORD
UNIVERSITY



REPORT OF THE COMMISSION ON GRADUATE EDUCATION

Charles A. Holloway, Co-Chair

Mark A. Horowitz, Co-Chair

Keith M. Baker

James N. Baron

Stacey F. Bent

Arthur Bienenstock

John C. Boothroyd

Morris P. Fiorina

Andrea J. Goldsmith

Stephan A. Graham

Deborah R. Hensler

Roberta R. Katz

Mark G. Kelman

Ellen M. Markman

Julie Parsonnet

Martin L. Perl

Denis C. Phillips

Isaac Stein

Moriah E. Thomason

Robert M. Waymouth

2005

ACKNOWLEDGMENTS

At the final working meeting of the Commission on Graduate Education, one of the members made a comment that summed up the feelings of every other member: “I have learned a great deal about our wonderful but complex University.”

When the members of the Commission first came together some fifteen months ago, however, it was not at all clear that anyone would learn anything. Many of the members were not well-acquainted with each other, and all were uncertain as to how the group could possibly even begin to “articulate an overall vision of how graduate education at Stanford’s various schools might be enhanced over the next five years” in response to President John Hennessy’s Charge to the Commission.

The process of learning about the University was a rewarding one. Commission members learned from each other about their respective schools and fields, learned from the President, Provost, Deans and various other members of the administration about issues generally affecting Stanford faculty and graduate students, and, most importantly, learned from a broad cross-section of graduate students and alumni about their personal experiences of graduate education at Stanford. Some of what the Commission heard from those it interviewed was predictable, but much else was not, and over the course of the year’s work, Commission members became all the more engaged in and committed to discovering the present and thinking about the future.

The Commission is indebted to the many other members of the Stanford community who

contributed time, energy, and thought to this process. This group numbers in the hundreds and includes, for example, students who participated in focus groups and surveys, and faculty colleagues who took time to share their thoughts and ideas with the Commission and its four subcommittees. The Report that follows simply could not have been written without the contributions of all these individuals. They are too numerous to name here, but the Commission, through this Acknowledgment, wishes explicitly and sincerely to thank each of you who assisted in this process, for your generosity and your contributions.

The Commission also wishes to acknowledge by name a few who played very key roles. President John Hennessy, Provost John Etchemendy, and Vice Provost for Academic Affairs Stephanie Kalfayan provided support at all stages of the Commission’s work, offering essential guidance and institutional knowledge. Registrar Roger Printup and others in his office kindly responded to the Commission’s multiple requests for data and statistics. At the Carnegie Foundation for the Advancement of Teaching, President Lee Shulman and Chris Golde provided helpful comparative information and words of wisdom about graduate education in general. Jim Sheehan, former Chair of the Commission on Undergraduate Education (CUE), generously shared his knowledge about how best to move a comprehensive review process forward to completion, and John Bravman, Vice Provost for Undergraduate Education, provided valuable information about how the CUE recommendations have been implemented. The Graduate Student Council made multiple significant contributions

to the Commission's endeavors, including helping to establish and oversee student focus groups and making available the results of a recent graduate-student survey.

Finally, the Commission's work was made possible by the participation of several diligent staff members. Libby Hlavka, Claire Ravi, and Claudia Guzman Schweikert very ably staffed the Commission's subcommittees, coordinating interviews and meetings and keeping track of both people and information. Miranda Mata deserves special thanks. Miranda staffed the

Commission as a whole, coordinating calendars, finding meeting rooms and stocking them with cookies and coffee, serving as the central repository for Commission communications, and, in her quiet, always gracious way, keeping the Commission in forward motion.

It has been our honor and pleasure to serve as members of the Commission on Graduate Education. We are grateful for the opportunity to be able to share with others, through this Report, all that we have learned about this "wonderful but complex University."

November 2005
Stanford, California

CONTENTS

ACKNOWLEDGMENTS	3
EXECUTIVE SUMMARY	7
I. INTRODUCTION	9
The Commission on Graduate Education	9
The Commission and Stanford Graduate Education Today: Themes and Features To Carry Into The Future	10
Graduate Education at Stanford Today: Some Details	11
Overview of the Following Parts of this Report	14
II. VISION	15
III. RECOMMENDATIONS FOR FOSTERING INTELLECTUAL INNOVATION	18
Expanding Cross-disciplinary and Interdisciplinary Educational Opportunities for Students	18
Supporting the Development and Evolution of the Faculty and the Disciplines	23
Sustaining Excellence in Departments, Schools, and Programs	26
IV. RECOMMENDATIONS FOR OPTIMIZING THE GRADUATE EXPERIENCE	29
Embracing and Leveraging Diversity of People and Program	29
Creating Improved Opportunities for Students to Develop into Effective Leaders	32
Improving Student Advising and Mentoring	34
Improving Other Areas of Student Support	35
V. RECOMMENDATIONS FOR IMPROVING ORGANIZATIONAL FLEXIBILITY AND RESPONSIVENESS	38
APPENDIX 1. Charge	41
APPENDIX 2. Membership	43
APPENDIX 3. Subcommittees	44
APPENDIX 4. List of Recommendations	45

EXECUTIVE SUMMARY

In September 2004, President Hennessy charged the Commission on Graduate Education with examining Stanford's graduate programs, particularly in light of the challenges and opportunities confronting graduate students in the 21st century. The Commission—comprised primarily of faculty from all seven of Stanford's schools—coalesced around a clear vision of the University's future: continuing innovation and excellence in a broad range of disciplines, active educational and research collaboration across departments and schools, and a diverse community of world-renown faculty and high-caliber students.

Today Stanford is extremely strong across all of its schools and has garnered the highest respect throughout the world. The Commission has focused its attention on how Stanford can maintain and extend this position of excellence in the face of such anticipated societal developments as increased globalization and worldwide competition for the best graduate applicants; higher costs and, in some fields, reduced government funding for graduate education and research; ever-more complicated research problems; and added visa restrictions on international students. The goal is straightforward: to be THE place that attracts the best graduate students and provides them unparalleled education in preparation for their leadership roles in a complex, global society.

The Commission envisions graduate programs that, in addition to providing students with deep and rich disciplinary expertise, offer students and faculty ample opportunities and incentives to:

- approach problems multi-dimensionally through cross-disciplinary and interdisciplinary educational and research experiences (for example, giving a lawyer an understanding of earth sciences, or an historian a knowledge of business, or a physician a familiarity with engineering);
- interact with a diverse group of colleagues from across the University, building networks of contacts who can assist them while at Stanford and throughout their careers; and
- develop the knowledge and skills needed to be effective leaders in their chosen fields, whether within or outside academia.

Based on its year-long review, the Commission makes a number of recommendations for strengthening and refining graduate education at Stanford. At the heart of these recommendations is the Commission's endorsement of that which makes Stanford strong today: a highly rated and diverse set of graduate offerings, characterized by disciplinary depth and excellence in delivery; a critical mass of diverse and highly capable graduate students, most of whom live in close proximity on one campus; and a decentralized decision-making process, which allows many innovative ideas to be tested. It is critical that the proposed changes do not subvert these elements of strength but rather build upon them.

The Commission's Report organizes its recommendations into three parts, the first of which focuses on fostering intellectual innovation at

Stanford. This part includes a number of recommendations pertaining to the development and financial support of student opportunities for cross-disciplinary and interdisciplinary learning, such as a summer program for graduate students from across the campus. Other recommendations concern the removal of barriers to class access; the adoption of a common academic calendar across all schools; and the dissemination of information about courses and other matters of broad interest to the entire graduate student body. In recognition of the faculty's key role in graduate curricula and research, the recommendations in this part of the Report also concern incentives for faculty to explore new areas and work in collaboration with others. One example is a proposed Stanford Faculty Academy that would give faculty additional sabbatical time to work with colleagues on emerging research topics, helping them find others across campus whose research interests might bear on their own. Another recommendation calls for a competitive award program to support mid-career faculty who want to move their research programs to new fields.

Recommendations in the second part of the Report speak to optimizing the graduate experience for each student. There are recommendations for developing more classes and seminars that prepare students for leadership roles, in the vein of the current I-Write class and Negotiations seminar, and for more actively facilitating interaction among students who come from different backgrounds and experiences and have diverse academic interests. The recommendations in this part also address improving recruitment of and support for women and minority students as well as international students; changing graduate housing practices and procedures; improving advising processes; and strengthening a variety of other student services, ranging from career counseling to financial support.

Finally, the third part of the Report contains recommendations relating to organizational flexibility and responsiveness. As noted above, the Commission fully endorses decentralization, which it views as one of Stanford's greatest strengths. It believes, however, that the development of many of the programs it is recommending will require cooperation, as well as an allocation of funds, across schools. Moreover, the Commission discovered during the course of its work that since the Graduate Division was disbanded over a decade ago, the oversight of many graduate services and functions has been so widely dispersed that problems and inefficiencies have resulted. While none of the Commission members was interested in increasing the bureaucracy at Stanford, the need for a Vice Provost of Graduate Education who could represent graduate education at the highest levels of the University became clear. The Commission has stressed in its recommendations relating to this position that it should be a catalyst and provide resources to the faculty, deans, and graduate students, and not impose its will upon them.

The Commission has tried through its recommendations to remove barriers to, and offer incentives for, needed change while providing for the continuation of effective traditional means of evolving graduate education. But clearly, none of the Commission's recommendations will be achieved without the cooperation of the faculty, departments, and schools, and the skillful guidance of the University's leaders. The Commission has every confidence that, with this cooperation and guidance, Stanford will continue to be an institution of unsurpassed strength and excellence throughout the 21st century.

A full list of the recommendations can be found in Appendix 4.

I. INTRODUCTION

By any measure, Stanford, with its elite student body and distinguished faculty, is one of the most highly respected graduate universities in the world. Its myriad top-ranked departments well serve the goal of educating students who can preserve and extend knowledge and take leading roles in its application for society's benefit.

Notwithstanding this success, a review of Stanford graduate education is timely. There have been various past studies of Stanford's undergraduate program, but the most recent University-wide study of graduate education, completed over thirty years ago, substantially restricted its attention to Ph.D. programs in humanities and sciences. Moreover, as set forth in the Charge to the Commission discussed below, the opportunities and challenges our students face in the 21st century are very different from those anticipated when our current graduate structures were conceived.

Another reason for undertaking a review at this time is the growing belief that Stanford can build on its existing strengths to enhance graduate education, including by offering students more access to knowledge and experience outside their own disciplines. The relatively small size of the graduate student body and across-the-board excellence of Stanford's seven schools, all located in physical proximity on one campus, together with a dedicated effort by University leaders, provide opportunities to overcome disciplinary boundaries, motivational differences, and administrative arrangements that can prevent students from accessing valuable knowledge from other schools or departments.

Finally, it is now a decade after Stanford's Commission on Undergraduate Education (CUE) made its report, which suggested many significant changes to the undergraduate program. With the aid of hindsight, it is clear that Stanford undergraduate education benefited dramatically from that commission's recommendations, and this result reinforced the view that having a new commission look at graduate education would be beneficial.

THE COMMISSION ON GRADUATE EDUCATION

The Commission on Graduate Education (CGE) was established by President John Hennessy to review graduate programs and consider how Stanford can continue to evolve graduate education in light of the changing challenges and opportunities facing our graduate students today and in the years ahead. The Commission comprised 20 members, including faculty from all seven schools as well as the Stanford Linear Accelerator Center (SLAC) and Hoover Institution, a former chairman of the Board of Trustees, the Vice Provost and Dean of Research and Graduate Policy, the Associate Vice President for Strategic Planning, and the chair of the Graduate Student Council. It held its inaugural meeting in September 2004.

President Hennessy's Charge to the Commission noted, "Our challenge as a leading educational institution is to prepare our graduates to be leaders in finding solutions for the large-scale, complex problems of the 21st century. Dealing with the issues of our day, such as globalization, the impact on society of rapid scientific and technological advances, emerging and chronic health

care problems, and the effects of human activities on the environment, demands new approaches that are creative, collaborative, and multidisciplinary.” The Charge also emphasized that, “The career paths for the alumni of our graduate programs have changed dramatically in the last few decades. Alumni find themselves needing new skills and perspectives to deal with the complex and global situations in which they find themselves, and pursuing a wider range of careers than had been the case earlier.”

To carry out its responsibilities under the Charge, the Commission gathered a range of statistical data about Stanford’s graduate students and programs, conducted in-depth interviews with Stanford students (many of whom participated in a series of ten CGE-initiated focus groups), faculty, administrators, and alumni, and heard from experts in higher education, faculty from other universities, and representatives from various industries that employ Stanford graduate alumni. The Commission also was informed by the results of an online student survey conducted in early 2004 by the Committee on Graduate Studies and the Graduate Student Council.

The Commission met as a committee of the whole during Fall and Spring Quarters of 2004-05 and worked through four subcommittees—concerned respectively with Ph.D. degrees, master’s and professional degrees, graduate student life issues, and University-wide administrative issues—during Winter Quarter.

THE COMMISSION AND STANFORD GRADUATE EDUCATION TODAY: Themes and Features to Carry into the Future

As the Commission undertook its work, it became aware of several key themes and features that not only define graduate education at Stanford today but also should be carried forward into the future.

First, there is great strength in Stanford’s diversity and quality of program, and it will be important to preserve the broad spectrum of disciplines and styles that underpin Stanford’s excellence. Humanities disciplines have different requirements and needs from those in the sciences, and each of these is different from the disciplines in engineering and the professional schools. Similarly, master’s programs are different from professional programs, which are in turn different from doctoral education. This diversity allows for many parallel experiments and different approaches to teaching and research.

In recognition of this theme, the Commission determined that its recommendations could not be one-size-fits-all. It also determined that it could not become involved in the details of how the recommendations might be implemented by the various schools and departments. It chose to deal with overall issues and University-wide, high-level directions for graduate education, and to propose recommendations that would preserve the culture and environment that have long supported distinguished and productive research and education, while fostering intellectual innovation in research and education, and reducing barriers that limit the ability of faculty and students to access complementary disciplines to enrich their research and education.

A second theme relates to the strong coupling between graduate education and research. New research initiatives often produce the most compelling examples in graduate classes, and can lead to entirely new approaches, insights, and classes to teach. Similarly, teaching often brings new insights about an area, and can lead to new research programs. It is hard to imagine a vibrant graduate program without sustaining an innovative research program. Thus, given this strong tie between research and graduate education, some

of the Commission's recommendations deal with faculty as well as students. For example, there are recommendations favoring new sources of support for innovative research and course development by faculty.

A third theme has to do with disciplinary expertise. At the Ph.D. level, the deep understanding of an area of knowledge is a critical element of graduate education and must remain so as part of a distinguished graduate program. Similarly, in master's and professional programs, students must learn the fundamentals of subjects important to their professions. One challenge the Commission faced was how, given the importance of the disciplines and fundamentals, to recommend changes to graduate education that would allow our students and faculty to address the increasingly complex problems of the 21st century, many of which will require cross-disciplinary and interdisciplinary knowledge and approaches. From its earliest meetings, the Commission wrestled with the question of how the University can foster the continued pursuit and evolution of fundamental and deep disciplinary knowledge while, at the same time, providing new opportunities for our students and faculty to engage in cross-disciplinary and interdisciplinary experiences. The recommendations in this Report reflect the Commission's answers to this question, but an important part of the answer is that cross-disciplinary exposure frequently serves as a stimulus for important disciplinary growth by extending the disciplinary boundaries to address new classes of problems.

A fourth theme, alluded to above, is directly related to the faculty's dedication to graduate education and to Stanford's ability to attract the best students from around the world. It is clear that these two aspects of excellence reinforce each other, and are essential to creating a top graduate program. Stanford must remain a destination for the world's top faculty and graduate students. Many of the

Commission's recommendations relate to this theme, including those that pertain to the recruitment and support of a diverse, high-quality, and vibrant student and faculty community.

Finally, a fifth theme concerns the need to improve organizational flexibility and responsiveness. In the early 1990s, Stanford's Graduate Division was disbanded and its functions were distributed among various other University offices. Over the intervening years, this distribution of functions has caused a variety of inefficiencies and frustrations, both large and small, for students, faculty, and staff. While quickly recognizing the need to correct this problem, the Commission also was clear that it did not favor a heavy-handed solution. The result is a set of recommendations, explained more fully later in this Report, for a new Vice Provost of Graduate Education who would, as one member put it, "...go to bed at night and get up in the morning thinking about graduate education at Stanford—for today as well as tomorrow."

GRADUATE EDUCATION AT STANFORD TODAY: Some Details

All seven schools at Stanford are active in graduate education and grant graduate degrees. There are a number of different graduate degrees granted, including Doctor of Philosophy (Ph.D.), Master of Arts and of Science (M.A. and M.S.), Master of Fine Arts (M.F.A.), Engineer, Doctor of Musical Arts (D.M.A), Master of Arts in Teaching (M.A.T.), Educational Specialist (Ed.S.), Doctor of Education (Ed.D.), Master of Business Administration (M.B.A.), Doctor of Medicine (M.D.), Doctor of Jurisprudence (J.D.), Master of the Science of Law (J.S.D.), and Master of Laws (L.L.M.). In addition to schools and departments, a number of other offices and organizations provide support for graduate student concerns, from visa issues to career counseling.

Numbers

In academic year 2004-05, Stanford enrolled a total of 8,093 graduate students, with the following distribution by school:

Graduate School of Business	902	(11%)
School of Earth Sciences	256	(3%)
School of Education	335	(4%)
School of Engineering	3056	(38%)
School of Humanities & Sciences	2088	(26%)
School of Law	567	(7%)
School of Medicine	889	(11%)

Sixty-seven percent of these students were from the United States, and the remaining 33 percent were from a total of 87 other countries. Sixty-four percent of the students were male and 36 percent female. With respect to race and ethnicity, 3 percent of the students were African-American, 1 percent American Indian or Alaska Native, 12 percent Asian-American or Pacific Islander, 5 percent Hispanic/Latino, 36 percent White, and 43 percent Other.

As one can see, the size of the graduate program is quite different among the schools. Engineering has the largest graduate program, and its students make up about 40 percent of the total graduate population. Humanities & Sciences is next in size. In that school, around 37 percent of the graduate students are in the natural sciences, 28 percent in the humanities, and 35 percent in the social sciences. Approximately half of the graduate students at Stanford are in natural science or engineering, including the basic science Ph.D.s in the School of Medicine.

The differences among the schools are even more pronounced if you break down the graduate programs into the type of degree granted. In 2004, Stanford awarded 2,041 master-level degrees and 891 doctoral degrees. For the years 2000 through

2003, taken as a whole, the breakdown of master-level and doctoral degrees granted, by school, was approximately as follows:

	Doctoral*	Master's**
Graduate School of Business	1%	21%
School of Earth Sciences	3%	2%
School of Education	4%	8%
School of Engineering	23.5%	48%
School of Humanities & Sciences	26%	19%
School of Law	25.5%	< 1%
School of Medicine	17%	1%

*Includes D.M.A., Ed.D., J.D., J.S.D., J.S.M., M.D., and Ph.D.

**Includes M.S., M.B.A., M.A.T., M.F.A., J.M., Engineer, Ed.S., and M.L.S.

Diversity

Each department sets up its own requirements for its graduate degrees, with very few constraints set by the University. The University requirements generally are residency requirements relating to the number of academic units needed to complete the degree. In general, units can be applied only to one degree in one department or school, though exceptions may be granted.¹ Some departments specify a structured set of course requirements for a degree, while other departments have no course requirements at all, and these differences occur between departments in the same school. For example, Ph.D. candidates in Electrical Engineering are required to take a number of courses after

¹ There are a few joint-degree programs, notably the M.D./Ph.D., J.D./M.B.A., and M.B.A./M.A. in Education programs, where the total number of units required is less than the sum required for the two degrees on a separate basis. Students in a Ph.D. program may also pursue a minor or a master's degree in another department or program, and co-terminal bachelor's/master's degrees are offered by some departments.

their M.S. degree, while Computer Science candidates have no course requirements.

Even within a department, there is often a large difference in the styles of faculty/student interaction. Each faculty member sets up the style of interaction that she or he thinks works best personally. For thesis research, some students might meet with their advisors only once a quarter, and spend most of their time working independently on their own research. Others might be part of an organized lab effort and talk with their advisors on almost a daily basis. A broad spectrum of both topics and styles is essential to maintain an exceptional graduate program, recognizing that different students work best in different types of environments.

Financial support, a critical issue for graduate education, also varies widely across the University. In many departments faculty members are responsible for raising research grants to support their graduate students, and basically set the size of their research groups. Other departments are dependent on University fellowships and teaching assistantships (TAs) to support their graduate students. Non-doctoral students are not uniformly funded, and such funding as occurs often is in the form of student loans. Additional funding issues arise for international students, who are not eligible for loans from Stanford or U.S. government agencies, and may need to show support before they are given a visa to enter the United States. Funding and visa matters in general are a growing issue for many foreign students.

Housing

In contrast to most peer institutions, Stanford has made a significant investment in on-campus housing for graduate students. Over 50 percent of the graduate students and their families live on-

campus, and this number is likely to increase with the completion of new graduate housing that has been approved for construction. This housing provides opportunities to widen the collegial relationships a student develops while in graduate school.

Supporting Offices and Organizations

Stanford has a number of offices and organizations that work to improve the graduate experience. In 2005, Stanford opened a new Graduate Community Center, which is overseen in part by the Graduate Student Council, a separate division of the ASSU devoted to graduate students. The Graduate Life Office, Graduate Student Programming Board, and Bechtel International Center also offer a range of services specifically for the benefit of Stanford graduate students. The Bechtel International Center has taken up much of the load in dealing with visas for foreign students, which has strained resources that previously were used for more general support of foreign students. The Center for Teaching and Learning (CTL) offers seminars on improving teaching skills. These are directed to students with teaching assistantships, students preparing for academic positions, and faculty newly hired by Stanford.

In addition to various other Stanford offices that provide services for the benefit of all Stanford students, the Career Development Center offers counsel to graduate students as well as undergraduates. In recent years, as more Ph.D. students have sought jobs outside academia, the Career Development Center has widened its scope to address the needs of these students.

Post-doctoral Fellows

There has been a substantial growth in the number of post-doctoral fellows in many disciplines at Stanford, but especially in the biosciences, and the

ratio of these individuals to graduate students has been increasing steadily and markedly. While the CGE was not charged with looking at post-doctoral training, we feel it is a key area that should receive more attention. Post-doctoral fellows are a part of the ecology of education at a research-intensive university, and as such they have an effect on, and are affected by, various elements of graduate education at Stanford. It seems to the Commission that, to a significant degree, the recommendations made for graduate students apply to post-doctoral fellows as well, including the opportunity to take classes to build leadership skills. Accordingly, the CGE would urge the University to look further into the role and experience of post-doctoral fellows at Stanford in conjunction with its review of this Report and to consider enhancing the opportunities for post-doctoral fellows as well as graduate students.

OVERVIEW OF THE FOLLOWING PARTS OF THIS REPORT

The next part of this Report discusses the Commission's vision for graduate education in the next decade in response to overall trends and the challenges and changes noted in the Charge. The subsequent three parts of the Report contain the Commission's recommendations organized around three themes: Fostering Intellectual Innovation, Optimizing the Graduate Experience, and Improving Organizational Flexibility and Responsiveness.

The Charge to the Commission can be found in Appendix 1 to the Report. Appendix 2 lists the Commission members, and Appendix 3 lists the members of the Commission's four subcommittees. Appendix 4 is a list of the recommendations, without discussion. Although the reports of the subcommittees are not formally appended, they will be delivered to the President and Provost together with this Report.

II. VISION

A key question the Commission faced was what should graduate education look like in ten years. Answering this question required the Commission to identify social, economic, and political trends, focusing on the role of graduate education in the future, and educational and research trends to understand how to improve the education Stanford provides.

A driving social trend today is globalization. As the world becomes “flatter,” and as demographics change, there is a pronounced increase in the competition for jobs and the complexity of societal problems. These changes are likely to make graduate education all the more important and valuable, and will force a further change in institutions at all levels, including educational institutions. Moreover, many other countries, including China, India, and Korea, have new capabilities and resources to conduct and commercialize advanced research, which will in turn have an effect on the global market for students and faculty. Stanford and its graduates must be able to compete well in this new global market.

In research and education, the dominant trend is a continued evolution of disciplines by looking for new challenges to solve, often at the boundaries of the disciplines. Addressing pressing social needs as they occur over time also generates broad new research initiatives, and given the complexity and global nature of today’s social issues, we can expect more researchers to be working outside the current boundaries of traditional disciplines and applying deep disciplinary expertise in a multidisciplinary or interdisciplinary setting. Multidisciplinary

projects create a growing need for graduate education to prepare students not only to deal with these new contexts but also to develop skills that will allow them to assume positions of leadership.

Finally, as indicated in the Charge, a significant number of today’s graduate students, including doctoral students, will change careers from time to time over their lifetimes and will work outside academia for at least some part of those careers.

In light of these trends, the CGE concluded that a successful graduate education program would need to reflect the following characteristics:

- **Students are challenged to prepare for leadership roles in society.** Extra-disciplinary opportunities are available for students to enhance their abilities to become distinguished leaders and contributors in their fields and communities. Students are offered classes, seminars, and programs focused on such topics as communication (both speaking and writing), including teaching where appropriate, and basic organizational effectiveness. There is broad participation in project-based courses and housing programs that encourage students from various disciplines and various backgrounds to become more conversant with one another. Stanford’s aim in this regard is for students to graduate not just with academic expertise but also with leadership skills and a network of colleagues from throughout the University.
- **Department and school boundaries are more permeable.** Access to classes throughout the

University will not be precluded by institutional barriers. There is a uniform academic calendar in all schools and departments, and course schedules are similarly uniform enough to accommodate students from various schools. Team teaching, cross-listing of courses, and cross-disciplinary classes are easy for faculty to initiate. Information on courses throughout the University is easy to obtain and accessible by both topic and department. More school and department needs for expertise are accomplished through leveraging faculty and students from other schools and departments (as opposed to creating multiple positions in order to “internalize” the expertise).

- **Students have adequate support, both inside and outside the classroom, to allow them to take advantage of broad academic opportunities.** Graduate students are supported by access to good mentoring and advising about their research, their coursework, their careers, and the services and opportunities available in all areas of the University. There are good health benefits for all students, and recognition of and adequate support for the special needs of international, minority, and women students and students with spouses and children. Campus housing is adequate and offers a plentiful agenda of culturally and intellectually interesting programs.
- **Faculty have access to and freely collaborate with colleagues throughout the University irrespective of school and departmental affiliations.** There is broad participation in a wide range of interactions among faculty, including cross-disciplinary dialogues and multidisciplinary research projects. Faculty have sufficient interactions across the University to allow them to find appropriate

colleagues with whom to carry out collaborative teaching and research, and, where appropriate, to facilitate multidisciplinary experiences for their students and disciplinary colleagues, and these efforts are rewarded by their departments and schools.

- **There is broad diversity—in student body, faculty and administration, academic programs, curricula, methods of teaching, and extracurricular activities—and throughout the University we embrace a rich variety of disciplines and cultures.** This diversity is key to Stanford’s identity as an international research university that attracts the best faculty and students in the world, regardless of their ethnicity, gender, citizenship, or area of academic interest. Through this diversity, students and faculty are able to build essential connections, both inside and outside the classroom and the laboratory, to people from other cultures, countries, and disciplines.
- **A spirit of continuing innovation pervades the University’s endeavors.** This spirit is reflected in a research and teaching environment that is willing to experiment with new ideas that appear promising, and to pursue intellectually exciting problems and areas as they evolve. This spirit is also reflected in a willingness to periodically and forthrightly evaluate existing programs, and to improve or discontinue them where warranted. Perhaps most significantly, this spirit is reflected in a willingness to encourage and reward risk-taking by making available resources for the constant refreshment of ideas, programs, curricula, and structures.

Formulating this vision helped the Commission to better understand that the University will need to address a number of issues, including some that are not under its direct control, in order to remain

a preeminent graduate institution a decade from now. The Commission's recommendations are intended to help Stanford achieve that goal.

As noted above, the Commission's recommendations are organized into three main parts. Recommendations in the first part speak to helping Stanford foster intellectual innovation. It is critical that Stanford find methods of continuing to encourage, and support, the type of cutting-edge teaching and research that has driven it in the past. Looking forward, the Commission expects that much of this teaching and research will involve not only the broadening and evolution of traditional disciplinary boundaries, but also the cutting across of those boundaries in multidisciplinary contexts. It will be important to ensure that administrative divisions (i.e., departments and schools) and insufficient resources do not impede the critical research and teaching that needs to be done. This will occur through the fostering of opportunities for students to obtain knowledge not only within their departments and schools but across the University, and through the creation of mechanisms to help interested faculty become better aware of other people and resources at Stanford working in areas that relate to their current research interests.

Recommendations in the second part speak to optimizing the graduate experience for each student at Stanford. These recommendations range from dealing with basic issues, such as living conditions

and childcare, to looking harder at what Stanford can offer its students, to making sure each student has the opportunity to get the most possible out of his or her years on campus. These recommendations point to the possibility of changing how students experience graduate school, allowing them to meet and build a social network with top students from a broad range of academic backgrounds and experience, and to work with, and possibly lead, a diverse group of researchers to address a significant problem. For this possibility to become a reality, the faculty must believe that it is also in their best interests for their students to engage broadly and deeply with their fellow students.

Recommendations in the third part pertain to improving organizational flexibility and responsiveness, largely through the appointment of the Vice Provost of Graduate Education mentioned in the Introduction. In looking over many of the issues that graduate education at Stanford faces, the Commission confronted a dilemma: decentralization has been and will be essential to allow innovation to flourish, yet it has caused various administrative issues of critical importance to fall through the cracks in the last ten years. While none of the Commission members was interested in increasing the bureaucracy at Stanford, the need for a central organization to represent graduate education at the highest levels of the University became clear. The key will be to create an office that provides resources to the faculty and graduate students, but does not impose its will on them.

III. RECOMMENDATIONS FOR FOSTERING INTELLECTUAL INNOVATION

Intellectual innovation has driven Stanford's evolution over the last half-century from a local/regional university to an international leader, and it will remain the key driver of Stanford's success in the future. In order for graduate studies to address the large, complex, often interdisciplinary technical/social issues that the world is facing, we need to ensure that our organizational structure supports new types of activities. Intellectual problems do not necessarily fit into the disciplinary boxes that have evolved over the years. Thus the first set of recommendations in this part of the Report deals with methods of expanding cross-disciplinary and interdisciplinary educational opportunities² for our students.

The faculty, who are the primary generators and disseminators of knowledge in a university, have fostered through their research Stanford's tradition of embracing innovation and integrating new ideas into ongoing educational programs. Accordingly, the second set of recommendations below deals with ways Stanford can support its faculty to grow and evolve over time. Financial issues are clearly important in this respect, but removing barriers and fostering new collaborations among the faculty are also critical.

While it is easier to talk about creating new programs and opportunities, it would be irrespon-

sible of the Commission not to talk as well about evaluating the quality of our schools, departments, and programs, and taking corrective action, when needed, to sustain overall excellence. This is the topic of the last set of recommendations in this part.

EXPANDING CROSS-DISCIPLINARY AND INTERDISCIPLINARY EDUCATIONAL OPPORTUNITIES FOR STUDENTS

As previously explained, the Commission believes the availability of opportunities for more cross-disciplinary and interdisciplinary educational experience will be an essential part of a top-quality graduate education. The Commission has grappled, however, with questions about how to expand the offering of these classes without reducing the disciplinary excellence that currently exists. The Commission recognizes that increasing opportunities for cross-disciplinary and interdisciplinary education will impose significant new financial and administrative burdens on the University and its component schools and departments, and has kept these burdens in mind while formulating the recommendations and ideas below, looking for efficiencies and economies of scale where possible. Nonetheless, the Commission believes that Stanford has no choice but to incur the costs associated with expanding cross-disciplinary and interdisciplinary education as a necessary step in realizing the vision of graduate education outlined in Part II of this Report.

² A course team-taught by a historian and a geologist where each is teaching his or her own discipline would be a cross-disciplinary interaction, as would a class in the Graduate School of Business taught for engineering students. An interdisciplinary course is a more integrated blending of expertise—for example, the fields of bioengineering and neuroeconomics, or lawyers with Ph.D.s in sociology or education.

1) The CGE recommends that Stanford clearly articulate its commitment to cross-disciplinary and interdisciplinary education and then deliver on this commitment.

We reiterate that Stanford’s longstanding commitment to excellence in disciplinary education remains key to its future. A critical mass of highly qualified graduate students working in the disciplines will be an essential basis for the continuing excellence in basic research upon which cross-disciplinary and interdisciplinary research must depend. However, just as Stanford has explicitly articulated that commitment, it is now important for Stanford similarly to make clear—to all its constituencies—that it will give strong support to developing cross-disciplinary and interdisciplinary educational opportunities. This statement of support will demonstrate Stanford’s belief that graduate students’ investment in some understanding of disciplines beyond their own will be important to their research and career goals, and its belief in the value to both students and faculty of additive insights and skills. This point was vividly articulated in the report of the CGE subcommittee on the master’s and professional degree programs; members found that, in their interviews with students and faculty, “[w]e have heard some dramatic examples [of the value of cross-disciplinary exposure]: having even a handful of B-school students at the School of Education breaks the intellectual monopoly on a particular form of public school system-oriented policy debates....”

The Commission also anticipates that a clear statement about opportunities at Stanford for cross-disciplinary and interdisciplinary education will enhance the University’s ability to attract the most forward-looking and outstanding graduate applicants, helping to keep Stanford at the forefront of the world’s research universities.

In considering how best to deliver on this commitment, the Commission discussed and informally evaluated a wide variety of existing examples of cross-disciplinary courses and experiences. The Commission reached several general conclusions based on its analysis and discussion of these issues. First, project-based classes appear to be a particularly effective way to deliver cross-disciplinary education; bringing students from different disciplines together to work on a common challenge allows the students to help educate each other, with faculty guidance, about their respective disciplinary knowledge and skills.

Second, if cross-disciplinary education is provided through general introductory classes, it is important that the offering department or school not deliver a dumbed-down version of what it would otherwise provide to its own students. The courses should be substantial, delivered at the graduate level, and set up to take advantage of the backgrounds of the students. For instance, a finance or operations course in the Graduate School of Business (GSB) for engineering students should take into consideration the superior mathematical knowledge of those students.

Third, team teaching is an underutilized means of providing cross-disciplinary education and offers educational benefits to faculty as well as students. In part, this underutilization stems from certain institutional disincentives that need to be addressed, as well as lack of teaching capacity.

Fourth, it is important for Deans and department chairs to support and encourage faculty who provide cross-disciplinary and interdisciplinary courses. Often these courses are harder to develop than are disciplinary courses because they require more coordination with others, may be perceived by colleagues as conflicting with “core” courses, and may require more research and student-advising time.

Finally, even if Stanford is able to create a number of cross-disciplinary class offerings, there will remain some supply-and-demand issues if faculty are not supportive. There is generally a strong relationship between a student and her or his advisor in graduate school (especially in Ph.D. programs), and unless the faculty advisor agrees with the importance of these classes, the student is unlikely to be encouraged (or in some cases allowed) to take them. Such discouragement by advisors could easily limit the success of the program. The Commission believes that the benefits of these new course offerings, both direct and indirect, will accrue to faculty as well as students. The direct benefits will come from having students who are more skilled in communications and group interactions and, one hopes, who are more motivated, since they see how their work fits into larger issues. The indirect benefit is that these offerings will help Stanford continue to attract the best graduate students and maintain a very strong student pool.

2) The CGE recommends that in order to encourage and deliver cross-disciplinary and interdisciplinary programs, Stanford should fund, and otherwise ensure the capacity of, departments and schools to develop and deliver such courses.

The Commission recognizes that developing and delivering cross-disciplinary and interdisciplinary courses will require new resources, as well as the possible reallocation of existing resources as appropriate, and believes that it is essential that Stanford commit to obtaining and allocating these resources.

Funds and resource flows are complex matters, but it became clear to the Commission that there are some specific issues that will have to be addressed to further the development of cross-disciplinary and interdisciplinary programs.

a) Create a fund to support cross-disciplinary and interdisciplinary course development activities and startup costs.

Whether done by individuals or a team, creating courses costs money and time. In some cases there are lab materials that are needed for the class, but in all cases there is faculty time involved. While departments and schools might be willing to front this cost for classes for their own students and provide relief time for faculty, this equation becomes more difficult when the class is for a broader cross-section of the graduate student body. While some of these broader classes will nonetheless be initiated and paid for by a school or department, the University should be prepared at the outset of this program to help with the startup costs of the new cross-disciplinary and interdisciplinary courses.

b) Recognize that the long-term support of cross-disciplinary and interdisciplinary classes must come from traditional course funding sources, such as general student tuition dollars or dedicated endowment.

If the proposed program is successful, the number of cross-disciplinary and interdisciplinary classes will grow and involve an increasing percentage of Stanford graduate students. Substantial growth in the program will quickly deplete the course startup fund described above. The only viable solution is one in which successful classes are supported by the normal funding mechanisms at Stanford.

c) Develop a “funds flow” process to ensure that schools or departments that experience increased student units taught as a result of these classes can be compensated for their efforts.

While it is possible that the number of students who cross school and department boundaries will exactly balance, that is not a likely outcome. There must be some mechanism to provide compensating funds if student imbalances occur. This task is complicated by the presence of formula schools, which make funds transfer more complex, and by the fact that in some cases extra faculty resources may be needed to support the teaching load. There are methods to accomplish all of these goals, but the specific solution needs to be carefully worked out.

- d) **Create a fund to support TGR students and post-doctoral fellows who want to enroll in cross-disciplinary classes.**

A graduate student might well become more interested in broadening his or her background later in his or her graduate career, and it is likely that both post-doctoral and TGR students will want to enroll in many of the new classes being offered. Unless the University wants to prohibit these students from participating, funds will need to be secured to make up for the missing tuition dollars.

- e) **Facilitate increased educational collaboration among faculty from diverse departments and schools.**

There are two issues to address here. The first is the need to remove the disincentives currently in place for cross-department and cross-school teaching; these disincentives often have to do with administrative hurdles. The second issue relates to faculty participation; incentives such as full-course teaching credit for faculty who team-teach a class and other policies as needed to balance responsibilities for faculty who develop and deliver cross-disciplinary and interdisciplinary courses will encourage faculty to participate.

- f) **Enable a series of seminars in which faculty can explore topics they would teach together with colleagues from other disciplines.**

Initially there might be a need for seminars set up expressly for the purpose of helping faculty explore possible educational collaborations. Some of the established interdisciplinary programs employ a type of “speed match” meetings, where a large number of researchers give short descriptions of their work, and a process similar to this might be used to generate ideas for interesting interdisciplinary or cross-disciplinary classes.

- g) **Increase students’ opportunities to find flexible educational and research funding.**

Many graduate students come to Stanford supported by a specific research grant that creates a tight link between student and advisor and may have the effect of limiting the students’ ability to take advantage of various educational experiences or even to change fields or advisors. While there is no universal solution to this problem, there are a number of research groups that have managed to decouple the research advisor assignment from the guarantee of funding. The Stanford Graduate Fellowships (SGFs) are one example of a solution for this problem.

3) The CGE recommends that Stanford develop a Summer Education program for graduate students that would focus on various topics of cross-disciplinary interest and allow students to interact with a wide cross-section of faculty and students from outside their own fields.

This recommendation concerns a cross-disciplinary summer program that would be built around topics of widespread interest. It derives in part from the Commission’s discussions about the successes of the summer program for undergraduates (“FroSoCo”) that resulted from the CUE

recommendations. Topics might relate, for example, to Stanford's university-wide research initiatives (in human health, the environment, international issues, and arts and creativity) or other similarly broad subject areas. The courses in these programs would be delivered by the appropriate schools and departments and coordinated by the proposed office of the Vice Provost for Graduate Education.

4) The CGE recommends that Stanford take additional steps to improve student access to cross-disciplinary and interdisciplinary education, including removing school barriers to class access, revising requirements for joint and dual degrees, and updating processes for listing and cross-listing classes.

In addition to the large problems of creating a commitment to, and finding funding for, cross-disciplinary and interdisciplinary classes, there are also a number of logistical problems. Some of the most difficult are also the most straightforward—e.g., different schools use different academic calendars. Clearly, if we are going to be successful in rebuilding Stanford into an institution that embraces students forming cross-disciplinary bonds, these logistical barriers will have to be removed.

The Commission applauds the steps that Stanford has taken to date to improve access to cross-disciplinary and interdisciplinary education. Nonetheless, through its interviews with students, faculty, and administrators, the Commission found a number of disincentives that remain. All of these disincentives need to be addressed through a coordinated effort by the President and Provost, the Deans, department chairs, and faculty. While these issues are quite complex to implement, certain steps need to be taken so that students can truly see a program in which departmental and school boundaries do not dominate the picture.

a) Transition all schools to the quarter system, schedule graduate and undergraduate classes according to the same calendar, and request that all schools follow a Monday/Wednesday/Friday and Tuesday/Thursday class schedule, matching hours where possible to allow access across schools.

The law school offers semester-long courses, while all other schools are on the quarter system. The GSB has just changed its schedule from Monday/Thursday, Tuesday/Friday classes to Monday/Wednesday/Friday, Tuesday/Thursday courses to come into line with most other schools. Even within schools there may be different start dates for different degree programs (e.g., M.D. students start three weeks before Ph.D. students in the medical school). If students are going to easily take classes in different schools, the calendar problem must be fixed.

b) Reduce administrative complexity for cross-school students.

Students in one school may face cumbersome obstacles to registering for a class in another school (making it all the more likely that the class will fill before the student can complete the registration process), or may even be prohibited from registering for the class. In some cases this may be due to prerequisite issues or practical concerns relating to a degree program, but the sense of the Commission is that in many cases the restrictions could be lifted or at least eased.

There are a slew of other cross-school impediments that will have to be resolved through inter-school discussions. These impediments include differences in grading, add/drop deadlines, withdrawal policies, and credit units per course.

- c) **Change the way classes are listed and searched to make it easier for students to find classes of interest, and remove the need to cross-list classes.**

A recurring theme heard by the Commission is that Stanford graduate students cannot readily discover courses that are available to them outside their own fields. Communication to graduate students, particularly with respect to academic matters, is handled almost entirely at the school level, and the *Stanford Bulletin* lists courses only by department and school. In today's online world, there is no reason that the *Stanford Bulletin* could not be organized in a manner that would permit a student to search it by topics, without regard to department structure. Since students would have easy access to class information, instead of cross-listing classes, departments could simply have a list of classes both internal and external that satisfy departmental requirements. Explicitly listing a class twice would not be needed.

- d) **Review the requirements for joint and dual degrees to ensure that artificial barriers to developing new and innovative programs do not exist.**

A student desiring two graduate degrees from Stanford generally must earn full credits and pay full tuition for both, except in the case of the officially approved joint-degree programs (see footnote 1 in the Introduction). There are relatively few approved joint-degree programs, meaning there are no, or very limited, efficiencies offered to many students pursuing interdisciplinary studies. In addition, application to two-degree programs is uncoordinated and costly. Current policy generally limits students to applying to only

one program at a time; students interested in two programs must apply to each separately, and the two applications are then handled individually without any dialogue between the two targeted programs. As a result, students who want to participate in more than one program are discouraged from applying to Stanford. The requirements relating to both joint and dual degrees should be reviewed and revised to eliminate unnecessary disincentives to cross-disciplinary and interdisciplinary education (while being sensitive to the issue of resume-padding).

SUPPORTING THE DEVELOPMENT AND EVOLUTION OF THE FACULTY AND THE DISCIPLINES

There are many ways that Stanford can facilitate faculty development. Since the faculty by its nature is entrepreneurial, the most important guideline is to try to “do no harm” to this spirit, and form policies that reward faculty who manage to move their disciplines forward.

In general, faculty members require the incentives, resources, and opportunities to undertake the research that will change their disciplines and graduate education. As the Commission looks forward to the future, it sees that disciplines, departments, and schools all must evolve in order to remain responsive to the ever-changing research and educational issues of society and the world, and that this will require significant investments. Most of the funding and other resources required for new research will, and should, come from established sources that have traditionally supported each field or discipline. However, the Commission also foresees the need for additional sources of support. Given the tie between innovative research and the vitality of the University, Stanford must be prepared to support those areas of research that

it views as strategically important even in the face of changes in traditional sources of support. Such changes could include revised priorities or reduced capabilities of government funding agencies, or new gaps in research requirements and funders' traditional expectations (e.g., such as might occur as researchers in the humanities begin using more costly databases).

New support will also be needed in connection with cross-disciplinary and interdisciplinary research. As previously stated, research on emerging problems can require a knowledge of more than one discipline or a team of diverse disciplinary researchers, and faculty will increasingly need support for opportunities to learn and work outside their traditional environments. Providing faculty with these opportunities will allow them to extend knowledge and evolve their disciplines, and thus will be key to Stanford's staying on the cutting edge.

5) The CGE recommends that Stanford enhance its ability to support new and innovative research programs.

In thinking about new sources of support for innovative research and related faculty development, the Commission noted that one option might be to increase the funds available for academic innovation through the President. It recognized, however, that other sources will also need to be identified to provide the needed funds.

a) Create an Innovation Enhancement Fund.

The monies in such a fund could be used for a variety of purposes. For example, they could be awarded to faculty for innovative research following a competitive proposal process, or they could be used to "buy out" the time of faculty who are teaching a new kind of seminar for faculty and students from other disciplines.

b) Increase and expand the availability of the Stanford Graduate Fellowships.

The SGFs provide a direct source of funding to students doing innovative research. These fellowships not only directly aid graduate education but have the advantage of being re-directed every few years (as each SGF holder graduates) to support another student's new, innovative research interests. Not only should the number of these fellowships be increased through added endowment funds, but the fields of students entitled to receive them should be broadened beyond the sciences and engineering.

c) Encourage some coordination between groups currently raising research funding.

There are a number of groups in the University that provide early-stage research funding, including the school development offices, the central development office, and centers and affiliate programs like Media X. While it is essential that these programs remain in place, encouraging them to share knowledge, both on fundraising and on developing new research areas, would be useful. As a corollary, Stanford should develop mechanisms to permit faculty to more easily determine which of these many organizations would be most likely to offer funds for a particular type of research program.

6) The CGE recommends that Stanford encourage, and develop better mechanisms for, faculty members to engage intellectually with faculty from other departments and schools.

Stanford has a good history of facilitating social interaction among faculty through campus housing and the Faculty Club, and the Commission appreciates that such social interaction has been the source of considerable exchange among

faculty from diverse fields. The Commission is also aware of the importance of the recently established University-wide, multidisciplinary initiatives. This recommendation urges the University to create and support more such opportunities for interaction, not necessarily tied to large initiatives, especially within the academic and research context. Exposure to other ways of thinking can enrich an individual's own academic and research perspective, and this is as true for faculty as for students. Moreover, the broader a faculty member's networks within the University, the more helpful that member can be to graduate students seeking cross-disciplinary and interdisciplinary experiences.

a) Create the Stanford Faculty Academy.

In a university as large as Stanford, a significant part of the problem in creating new research collaborations is simply knowing to whom to talk. To help solve this problem at Stanford, it is essential that at least some of the faculty build bridges into other areas. This program would provide support, including internal sabbaticals, to diverse faculty who come together around selected topics of mutual interest that allow participating faculty to learn about different aspects and approaches to the selected topic. The Commission believes such a program will, over time, result in a vibrant network of cross-school engagement. Faculty members would apply and be chosen for these sabbaticals through a competitive process. The Stanford Faculty Academy would comprise a physical space where faculty would convene and work (similar, for example, to the Stanford Humanities Center or the Center for Advanced Study in the Behavioral Sciences), and would provide funding to help cover the costs of the sabbatical for the member and his or her department.

b) Support the development of faculty-to-faculty courses/seminars in growing interdisciplinary areas.

At Stanford there are a few seminars that are set up for faculty to get together and learn more about their colleagues' research. Currently they mainly occur within a department, or to facilitate a group of researchers working in the same area. The Commission envisions programs for faculty (and, to the extent they can help faculty better engage, graduate students) with little background in an area to enable them to learn more about what is going on in a growing field. Such a program would provide a relatively low-cost mechanism to give a group of faculty the common vocabulary needed to talk with each other and find out if there are common research interests, and to meet people from a wide range of fields. This type of program appears to be enjoying success at several other universities.

c) Expand the Stanford Fellows Program.

The Stanford Fellows Program has been an excellent example of how faculty from across the University can come together for fruitful social and academic exchange. This group has been ongoing for many years, but always seems to be at risk because of budget issues. Programs such as this seem essential for building bridges, and should be expanded rather than cut back.

d) Provide an opportunity for each school's academic associate deans to learn about issues and problems in other schools.

If we are serious about building bridges among the schools, we must create connections at all levels in the hierarchy. One mechanism to accomplish this would be to establish a Stanford Fellows-type program, including

rotating presentations about all the schools, for each school's associate school deans. This would not only build personal connections among the schools, but also facilitate the flow of information about best practices through the University.

- e) Create a competitive award program to support mid-career faculty who want to move their entire research programs into new areas.

While Stanford cannot, and should not, support every faculty member who is interested in moving his or her research program, it could demonstrate the value it places on continued faculty development by creating a program to provide a small number of faculty awards, perhaps in the form of named chairs, for this purpose. This would be particularly helpful to mid-career faculty who want to change or substantially broaden their research directions.

SUSTAINING EXCELLENCE IN DEPARTMENTS, SCHOOLS, AND PROGRAMS

The Commission spent considerable time discussing the need to keep Stanford's departments, schools, and programs strong and vital. This need arises not only from Stanford's longstanding role as a provider of excellent disciplinary education, but also from its more recent role as a home for multidisciplinary and interdisciplinary research. As one Commission member put it, "You can't have good multidisciplinary work if you don't have good disciplinary expertise underlying it."

A key issue in sustaining excellence is determining what is working well and what needs improvement. The first step in that process is obtaining the data relevant to the evaluation. Thus the key

recommendation in this section is to periodically generate the needed data. The Commission generally recommends use of an independent entity to gather such data, given expected concerns about confidentiality and response bias problems.

7) The CGE recommends that all departments (or schools, where there are no departments), as well as all interdepartmental and inter-school programs (IDPs), undergo regular external reviews of their graduate education functions at least every seven years, and that they include student and alumni data in such reviews.

The need for regular periodic academic reviews was strongly expressed by many people interviewed by the Commission. A principle in maintaining quality in organizations is to engage early enough to reverse adverse trends before they become fatal, and regular review processes are essential for achieving this. The exact time period between the reviews may vary depending on circumstances but should be no more than seven years.

Although some departments have diligently undertaken external reviews on a regular basis, many others have not. Moreover, some of those departments that conduct reviews do so only with respect to undergraduate education. While the Commission feels it is very important to recognize and support the differing needs and requirements of the various graduate degree programs at Stanford, and does not in any way propose a single set of requirements or standards for all graduate students, departments, or schools, or all faculty, it does believe that each department, school, and IDP should undertake periodic external reviews in order to assure itself that it is staying at the forefront of its discipline or area and offering its graduate students a top-notch education. This review could be part of a standard visiting committee review in order to reduce the costs both internally and for external colleagues. As stated above, the

Commission also believes that it is essential to collect better data from students and alumni on an ongoing basis for use in the periodic academic reviews.

The Commission recognizes that alumni surveys can be expensive and hard for an individual department to carry out but nonetheless believes that some of the most important evaluation data can come from former matriculants of a department or school. Perhaps incentives such as discounted membership in the Stanford Alumni Association or other benefits could be offered to alumni who keep their contact information up-to-date and periodically participate in such surveys.

- a) **Ask the faculty to contact their former Ph.D. students to encourage them to participate in a simple web survey form set up by either the Stanford Alumni Association or the proposed Vice Provost of Graduate Education.**

Faculty generally have the ability to contact many of their former students and would probably enjoy catching up with at least some of them. These conversations could generate information about the students' career paths and perspectives about their graduate education, as well as lead to broader participation in the web surveys.

- b) **Make sure that students who drop out of graduate programs are interviewed about their reasons for doing so, including any concerns they might have about their education or research.**
- c) **In consultation with the Committee on Graduate Studies, create and implement more thorough and rigorous evaluation criteria for the establishment and the discontinuation of IDPs.**

Various interviewees raised the question of whether and how well the current IDP review process is working. The Commission's view is that a more rigorous evaluation approach would serve both the IDPs and their oversight body, the Committee on Graduate Studies. Review criteria should include information about how the IDP relates to existing programs and initiatives and how/when the IDP's activities might be transferred to another entity, as well as specific identification of sources of funds and administrative support for the IDP over the proposed renewal term. The Faculty Senate should revisit its charge to the Committee on Graduate Studies as part of this revised approach.

8) The CGE recommends that Stanford develop mechanisms to address more affirmatively the issue of stagnant departments and programs.

Many people interviewed by the Commission acknowledged that, in the academic environment, it can be difficult to reinvigorate or disband a departmental program or IDP that no longer is of high quality or relevance. The Commission understands that while it is easy to call for improvement in dealing with this issue, ultimately it falls to the department chairs, Deans, and the Provost and President to accomplish this task, and these individuals are limited by the mechanisms and processes at hand. One helpful mechanism, the recapture of billets for reallocation at both the Dean and Provost level, is already in place. The University should explicitly acknowledge that departments are not structures that last forever, and that there is, and should be, a slow change in the structures that lie at the heart of the institution. The Commission believes that, to begin addressing the problem, the suggestions outlined below should be closely considered.

- a) Acknowledge that as new departments are created, other departments will be closed or merged with others so the number of departments remains relatively constant.
- b) In the face of continuing campus growth pressures, develop better means to leverage the use of campus faculty resources, including through cross-appointments and other coordinated cross-department/cross-school hiring and teaching.

An issue that needs to be addressed is how resources are allocated to different disciplines. Particularly in times of limited growth, there is a need to ensure that a critical mass can be achieved through cross-department cooperation.

In this regard, one of the concerns raised by Commission interviewees is the apparent redundancy of certain disciplinary expertise on campus. Some of this redundancy is the result of various departments, schools, and programs each internalizing the same faculty expertise in lieu of coordinating with another Stanford department, school, or program to share a single resource. Sometimes such internalization is necessary in order to protect the quality of an academic program, but other times it is not. Because this issue is likely to become more apparent as the University's physical growth is further constrained, the Commission believes that the faculty and administration need to pay increased attention to the possibilities of coordinated faculty hires and teaching, as well as cross-appointments.

IV. RECOMMENDATIONS FOR OPTIMIZING THE GRADUATE EXPERIENCE

In looking at how to improve graduate education at Stanford, the Commission was very interested in hearing from the students, to see what they thought of the graduate program. The Commission held a number of meetings with current students to understand their impressions of the program, and also had less formal discussions with a number of alumni. The results were quite illuminating. In addition to hearing about current limitations of student support, including advising problems, the Commission heard other recurring themes. Many interviewees talked about the deep friendships formed in graduate school, and the relative isolation of different student groups from each other. For some students, nearly their entire graduate career is spent with their classmates in a single school or department, or with their lab mates.

As the Commission thought more about how to improve graduate education, it understood the benefits and opportunities associated with applying Stanford's resources to enlarge and enrich each student's experience at the University. The first set of recommendations in this part calls for Stanford to embrace and leverage the diversity of people and programs it attracts. Graduate students should have the opportunity to meet a broad cross-section of people, beyond those in their labs or even in their departments. With an eye to the roles these students are likely to play after they leave the University, expanding their ability to engage with a broad and diverse group of colleagues from multiple backgrounds and disciplines will significantly increase the value of their Stanford experience.

The Commission also observed that Stanford's graduate program is training the leaders of the next generation, including future academic leaders who will drive advances in their fields, policy experts, and individuals who will guide organizations and institutions into new and different directions. Although both faculty and students understand that we are focusing on developing leaders, and have that as a mutual goal, there is little direct coursework to support this goal. For example, it was of concern to find that, with some notable exceptions, basic training in how to teach is not part of many of Stanford's Ph.D. programs. Thus, the topic of how to provide competence in communications, persuasion, and organizational effectiveness forms the second set of recommendations in this part.

The last two sets of recommendations in this part deal with issues where Stanford's current students had concerns. These center on improving the advising that graduate students receive while they are at Stanford, and other issues that relate to the general quality of graduate life.

EMBRACING AND LEVERAGING DIVERSITY OF PEOPLE AND PROGRAM

Diversity in schools, departments, programs, students, and faculty leads to the distinction and vitality of Stanford. Many of the recommendations below concern enhancing our commitment to diversity of people. With respect to diversity of program, a key concern of the Commission throughout all of its deliberations has been to insure that its recommendations do not undermine the many and

varied structures and programs that are already providing high-quality, productive research and educational opportunities for Stanford's graduate students. Rather, as seen in Part III, Fostering Intellectual Innovation, the Commission's goal has been to create new opportunities to complement worthwhile existing structures and programs, and to make clear that these new opportunities are not one-size-fits-all.

9) The CGE recommends that Stanford continue to recognize explicitly that diversity—of both people and program—is essential to its identity as a top research university, and proactively take steps as necessary to protect and promote that diversity.

Stanford is, and must remain, the home of excellence in people and program; its excellence is based to a great extent on its ability to attract and accommodate a wide spectrum of interests, structures, and personal styles. While in the past Stanford has made explicit its commitment to diversity of people, this commitment should be underscored, and the commitment to diversity of program, which has been more implicit, should be made explicit.

As noted previously, the humanities disciplines necessarily have different academic requirements and approaches from those in the sciences, which in turn can be distinguished from the engineering disciplines and programs in law or medicine. Similarly, master's students have different academic and, often, career objectives from students in doctoral and professional programs. The diverse offerings that define Stanford as a whole can be the source of some overlap and confusion, but for the most part the offerings are the product of thoughtful responses to the varying needs of the disciplines and the students who are drawn to them. More importantly this diversity creates a rich environment that fosters multiple approaches to similar problems. The successful approaches not only

survive, but also eventually find wider use within the larger academic community.

Diverse student and faculty bodies also enhance the University, as they bring to campus a rich array of talent, experience, and perspective. The next three recommendations pertain more specifically to increasing Stanford's efforts with respect to diversity of people.

10) The CGE recommends that Stanford take additional steps to expand graduate student body and faculty diversity, including with respect to race, gender, culture, and nationality, and act to ensure that top diversity students continue to select Stanford for their graduate education and research.

The Commission determined that there is a need for more efficient and effective efforts to expand diversity of graduate students and faculty at Stanford. This conclusion was based largely on its review of a report from the Diversity Committee of the Graduate Student Council, its discussions with Deans and other members of the administration who have been addressing student and faculty diversity, and the findings gathered in the three student focus groups that had ethnic, gender, and nationality diversity as their respective topic areas. Interestingly, the student focus groups addressing minority and gender issues each concluded that the single most effective way for Stanford to resolve such issues as real and perceived inhospitality to women and minorities in some departments would be to have more representative numbers of women and minorities in those departments, both as students and as faculty. Although there is no easy solution to achieve this goal, it is clear that we must continue to work toward it through more energetic recruitment and attention, including by the proposed Vice Provost of Graduate Education. Also, as with international students (discussed below), unique financial hardships incurred by women and minority graduate students

should receive attention. Some specific alternatives that are worth considering are given below.

- a) **To deal with the critical mass problem for minorities, and minority recruitment, create and support groups that span different schools to be used as resources for minority students and faculty and in recruitment.**

Many times the problem for minorities is that they feel isolated in their research group or department. By creating and supporting organizations that span larger student and faculty populations, it might be possible to build larger communities for these students and faculty. These groups not only would support the current students and faculty, but also would be effective recruiting tools. This function could be under the proposed Vice Provost of Graduate Education.

- b) **Have each department report its admission statistics concerning minority application acceptance rates and current trends.**

While the Commission does not think that creating rigid and uniform requirements is the right approach to this problem (because it would not support the desired diversity of program), it does believe that highlighting the data and even presenting it in a shared forum, as is now done with some data in the Faculty Senate, can provide added incentive for the departments to improve their track records. This process would also provide a method for successful departments to share their techniques.

11) The CGE recommends that Stanford act to ensure that the best foreign students continue to select Stanford for their graduate education and research.

In its discussions about this issue, the Commission noted that recent immigration changes have had

the effect of discouraging some of the best and brightest foreign students from seeking higher education in the United States. The Commission also discussed the expected increase in international competition for top graduate students and faculty, especially as research universities in other countries become able to offer more attractive financial-incentive packages.

At the same time, interviews with the University Ombudsperson and other administrators dealing with graduate student life issues led the Commission to conclude that Stanford can do more to encourage and support foreign student enrollments. This view was reinforced by the comments of students who participated in the focus group looking at international-student issues. Among the areas that need continuing attention is support for Bechtel International Center (the I-Center), which has had to divert resources from needed social services in order to deal with the myriad visa and work-related problems caused by the recent changes in U.S. immigration procedures.

- a) **Together with peer institutions, develop and implement a strategy to revise immigration laws and procedures that impede the matriculation of foreign students.**

Just when the competition for graduate students is starting to heat up, U.S. laws have created barriers that make American universities less attractive to international students. While this is an area that Stanford does not control, it is critical to its long-term success as a premier research institution. Fully one-third of Stanford's graduate students come from outside the United States, and in engineering and natural sciences the ratio is much higher. In twenty years, it is unlikely that any university without an international population will still be top ranked.

- b) **Develop innovative methods of reducing the financial hardship on international students.**

Visa issues limit work opportunities for foreign graduate students and their spouses, which often makes their financial situation more difficult than that of other students. The University should explore whether there are new ways to reduce this hardship on foreign graduate students and their families without violating the immigration laws.

12) The CGE recommends the creation of more programs (and better use of on-campus housing) to encourage graduate students from throughout the University to interact with one another.

The full benefits of diversity in the graduate student body can only be realized when there is meaningful interaction and exchange among the diverse students. Most of this interaction will be motivated through academic programs that are proposed in other parts of this Report. Yet with the recent opening of the Graduate Community Center (GCC) and the development of plans to build the Munger Graduate Housing Center, Stanford has exciting new opportunities to encourage students to meet others from different cultures and with different interests, experiences, and perspectives from their own.

- a) **Allocate graduate housing space with the express goal of mixing students from different cultures, disciplines and backgrounds. One way to create a broad community for new graduate students is to cluster first-year students from a variety of cultures and schools in specific dorms.**
- b) **Allocate spaces in graduate dorms to an interdisciplinary theme.**
- c) **Facilitate systems by which graduate students can exchange their diverse skills and talents**

(e.g., a computer science student could exchange computer support services for editing services provided by an English student).

CREATING IMPROVED OPPORTUNITIES FOR STUDENTS TO DEVELOP INTO EFFECTIVE LEADERS

We expect our graduates to have major impacts on the organizational, intellectual, and social communities to which they belong—not merely to contribute to these communities, but to help transform them. Toward that end, our students require competencies that are not generally attended to in graduate education, including (but not limited to): communication, persuasion, and influence; organizational effectiveness; and an understanding of the broader contexts (cultural, legal, ethical, and so on) in which they are working.

For the most part, Stanford’s efforts in this arena have been implicit rather than explicit and have centered on the student’s acquisition of a profound understanding and knowledge of one or perhaps two disciplines. After speaking with administrators, faculty, students, and alumni, the Commission has come to the conclusion that Stanford’s approach to developing leaders should be expanded, recognizing that the exact mix of desired skills will vary depending on the student and his or her field and career expectations. A highly effective University-wide effort is needed to develop and support this more comprehensive approach to the development of leaders who can use the knowledge gained at Stanford to impact their fields, their organizations, and ultimately the world.

13) The CGE recommends that Stanford create and support improved opportunities for graduate students to develop into effective leaders.

Many ideas about how this recommendation might be implemented surfaced during the

Commission's deliberations. There are some programs already in existence that speak to the heart of this recommendation and that simply need a financial or administrative boost in order to be useful to a broad cross-section of graduate students. Examples include the I-Write program, which helps students communicate clearly and succinctly, but which has struggled financially, as well as the law school's Negotiation seminar, and an extensive set of courses in the GSB. Such courses, which bring law, business, engineering, and other students together in hands-on, project-oriented settings, have only been able to accommodate limited numbers of registrants. The Commission recognizes that broad-based management and organizational-behavior skills classes might place an especially heavy burden on the GSB, particularly in light of its smaller size relative to other schools, and understands that accommodations will have to be made to ease that burden.

The Commission expects that some of these leadership programs will not be quarter-long, three-hour-per-week classes. They might also include one-day or weekend workshops, summer programs, or once-a-week evening seminars. Well structured, these programs would be one of the ways Stanford could facilitate interaction among a wider cross-section of students. We recommend that each school consider the ways in which the development of these programs will be appropriate for its students. Specific alternatives worth considering include:

- a) **In addition to the I-Write and Negotiation courses, expand the use of other already-existing programs like the law school's problem-solving class and the pedagogy programs at the Center for Teaching and Learning.**
- b) **Leverage the Design Institute to help create a number of project-based classes for students**

to practice working in groups and generally learn more about group dynamics.

There is a need to create better opportunities and incentives for students to practice exercising leadership, including through more project-based courses, seminars, and teaching experiences. Working with exciting programs like the Design Institute that have experience in this arena might serve as a way to jumpstart this process.

- c) **Outsource responsibility for providing certain classes to other organizations that are in the business of providing education in the relevant areas.**

While there is always a question about delivering material that cannot be provided by regular faculty, in some cases this education might be best presented by outside instructors. For example, utilizing various educators from nearby Silicon Valley enterprises could be expedient. This approach might be particularly attractive at the outset of these classes, when it will not yet be clear how best to present the information. Using outside instructors would leverage their prior work and potentially allow Stanford to more rapidly create a quality program.

- d) **Allow graduate students to take a small number of these leadership courses post-TGR.**
- e) **Provide graduate students with more opportunities for educational and research experiences outside the United States.**

One aspect of leadership in an era of globalization is the ability to be comfortable in international settings. The recommendations relating to diversity above are one avenue to such comfort, but ideally Stanford graduate students would also have the opportunity to

travel to foreign settings to meet and work with colleagues. Stanford could support expanded international exchange programs for graduate students, providing stipends for students to attend international conferences and summer programs, and encourage student participation in appropriate international professional organizations.

IMPROVING STUDENT ADVISING AND MENTORING

One of the clearest needs for improvement in graduate education at Stanford concerns student advising and mentoring. This issue was raised time and again as the Commission conducted its interviews and other research. The 2004 online student survey sponsored by the Committee on Graduate Studies and the Graduate Student Council revealed that, with respect to initial academic advising, "...[s]atisfaction rates by school ranged from 33 to 70 percent. One school had more than 25 percent of respondents indicating they were dissatisfied." The survey also revealed concerns about resolution of conflicts with advisors, clarity of standards and feedback about qualifying exams, and preparedness for dissertation research. The CGE subcommittee on student life similarly reported that concerns about advising and mentoring were raised at student presidential dinners, in subcommittee discussions with members of the Graduate Student Council, and in nearly all of the ten CGE-sponsored student focus groups. One particularly disturbing problem is that some students who, for one reason or another consider not pursuing an academic career track, feel unable to discuss this with their advisors for fear of antagonizing the advisor or otherwise losing the advisor's support. Information about these concerns was provided in detail in several of the CGE subcommittee reports. As the CGE subcommittee on master's and professional degrees generalized, "...[n]ot surprisingly,

all students in these programs complain about advising. They don't know what courses to take, they don't know what to do with their lives, they don't know what's available to them."

Clearly the advising situation needs to be improved, but that can't be accomplished by creating a single set of standards; no one approach would work for everyone. This problem has led the Commission to suggest a two-pronged solution. The first involves trying to improve the quality of advising, or at least the match between student expectations and reality for the faculty advisor. The second involves ensuring that each graduate student has someone besides the research advisor to act as a mentor.

14) The CGE recommends that Stanford make clear that research advising is an important faculty responsibility and develop methods to help faculty perform this responsibility.

The challenge is how to create a method of evaluating advising and rewarding faculty who perform well without limiting the interaction styles that different advisors might use. The approaches below rely primarily on making information available.

- a) **Ask faculty members to describe their interaction styles so incoming students can get a feeling for the expected advising relationship, and evaluate faculty based on how well their advising behavior conforms to these descriptions as well as to other departmental expectations.**

Each department could develop an overview of the diverse types of advising relationships and styles within the department. This overview could illustrate to faculty members how their styles compare with those of their colleagues. Peer pressure and competitive behaviors will often improve the situation without explicit department guidelines, but these can be added if needed.

- b) **Ensure that there are clear guidelines and procedures for a student to change research advisors.**

Independently of how well advising styles are advertised, some advising relationships will not work out, and it is important that students know there is a mechanism to change advisors. The value of this approach will be limited, of course, to the extent students become concerned that changing advisors and offending a current advisor could have a negative effect on their research or even long-term career prospects.

- c) **Create an introductory survey course where professors talk about their research, the review process for papers, what teaching is like, how to write a grant, what the Ph.D. process is like, how to prepare a course and develop a syllabus, etc.**

This approach has been used successfully by some departments and should be expanded. In addition to giving students more information about the academic life in their respective departments and fields, this approach can provide them with education about writing grants, reviewing papers, and preparing lectures.

- d) **Create a program for training faculty on best practices in student advising. Ideally this program would bring together faculty from different departments and schools for generic training sessions but could also include discipline-specific sessions to cover topics that are unique to an area.**

15) The CGE recommends that schools and departments provide students with at least one other mentor in addition to the research advisor.

The fact is that not all faculty are natural mentors. Many student complaints about advisors would be

ameliorated by more of a team approach to student advising. Additional mentors could be drawn from faculty, staff, alumni, and senior graduate students. The team approach would be particularly helpful to the student seeking advice about various career options. There are many possible alternatives to implementing this recommendation, and the best option might strongly depend on the characteristics of the department. Examples include:

- a) **Assign a senior graduate student or post-doctoral student as a mentor to each new graduate student.**
- b) **Appoint one experienced administrator or faculty member (e.g., the director of graduate studies) to be a mentor to all of the graduate students.**
- c) **Consider periodic committee reviews of students (in lieu of single-advisor reviews); use these reviews as an opportunity to give additional feedback and guidance to each student regarding research and career preparation.**

IMPROVING OTHER AREAS OF STUDENT SUPPORT

In addition to advising and mentoring, there are various areas in which Stanford can improve its support of graduate student life to optimize the graduate experience. The quality-of-life areas strongly affect the way in which academic life at Stanford is experienced (and vice versa). As explained earlier, one common theme in the remarks of students, faculty, and staff interviewed by the Commission was that functions relating to graduate student welfare are widely dispersed across the Stanford administrative landscape and not well coordinated, with the result that decisions affecting one aspect of graduate student life may inadvertently have a negative effect on overall student welfare. The recommendation for a Vice Provost

of Graduate Education, explained more fully in the next part of this Report, is focused on this issue. The following recommendations also are intended to help address existing concerns.

16) The CGE recommends that Stanford improve University-wide graduate student services, including housing, family support, and career counseling services.

Several housing issues were brought up for the Commission's consideration, including the desire for better nonacademic programs in on-campus residences (which was discussed above). One particularly troubling housing issue is that, as a result of the lottery system, graduate students who live in dormitories are often forced to move at the end of the academic year, even though their coursework or research projects continue throughout the summer.

In addition, women and students with families raised several support issues. Among their concerns are the lack of information about support resources, the absence of a maternity leave policy for women students, the difficulty and high expense of finding good quality child care in the Palo Alto area, and the variation in the availability of student health insurance programs.

- a) **Change the way the housing lottery works for graduate students by increasing the length of time each lottery result lasts in order to reduce disruption to graduate students.**
- b) **Develop policies on maternity leave, child care subsidies (or alternatives, such as shared care), and health care for families, and develop methods to effectively advise students about these areas.**

It should be noted that the University recently has begun to take steps to develop some of these policies. The Commission also

recognizes that the needs of some graduate students will be greater than those of others, and that this diversity of need complicates, but does not preclude, the implementation of the policies.

- c) **Ensure that the Graduate Life Office, the Career Counseling Center, and the Counseling and Psychological Services (CAPS) office have appropriate capacity.**
- d) **Develop a program for graduate alumni to provide career and other counseling to graduate students.**

17) The CGE recommends that Stanford undertake a comprehensive review of the TGR fee and its impact on time to degree completion, and of graduate student compensation, including stipends, fellowships, and assistantships.

Many students and faculty raised the TGR fee in particular as needing review. This fee was sharply increased in the recent past, in part to help motivate students (and their departments) to hasten completion of their dissertations and graduate more quickly, but many expressed concern that the increase has led to unintended hardships on students whose guaranteed funding has ended and who are left to find the added funds on their own (leading in some cases to further delay in completing the dissertation). There is also concern that the fee has exacerbated a perceived inequity between departmentally funded students and students who are funded through a faculty research project or external pre-doctoral grant. For those departments trying to help cover the increase in the fee, the relatively higher cost of senior student support may also inadvertently lead to an overall reduction in the number of graduate students accepted for training and a push toward the use of lower-cost post-doctoral fellows as the preferred research workforce.

The Commission recognizes that the increase in the TGR fee was implemented after careful consideration and that there are important financial ramifications associated with it. However, as the Commission carried out its work, it heard strong concerns about the increase from a wide cross-section of faculty and students and thus is recommending that the fee be looked at again with these concerns in mind. Separately, the Commission recognizes that there are widespread concerns about the time it takes for many Ph.D. students to complete their studies, and recommends that the proposed Vice Provost of Graduate Education assess whether there are additional opportunities for dealing with this issue, including considering the advisability of establishing stricter guidelines or requirements for degree completion in some circumstances. Data about time to degree comple-

tion should be part of the periodic departmental review process discussed above.

The Commission also spent considerable time discussing other financial issues that affect graduate students. Many areas of student compensation, including stipends and assistantship rates, vary significantly by school and even department. Recognizing that some of this variation results from market forces, including federally mandated pay rates, and resource availability, and that ultimately we are in competition for the best students, the Commission believes periodic reviews of rates is important.

Finally, the comprehensive review of student compensation should determine whether the processes involved in coordinating multiple sources of support for a student could be simplified.

V. RECOMMENDATIONS FOR IMPROVING ORGANIZATIONAL FLEXIBILITY AND RESPONSIVENESS

The Commission spent many hours discussing this topic. Pervading this discussion was the existing need, discussed above, for more centralized oversight of certain aspects of graduate education at Stanford. In addition, the Commission recognized that implementing its recommendations would require someone working directly with the President, Provost, and Deans to coordinate and drive the effort.

In certain respects, the proposed Vice Provost of Graduate Education will have two distinct roles—one as an agent of change who has control over significant resources to support experimentation and activities that expand the experience of students and faculty, and the other as an administrative coordinator and facilitator. The Commission has not attempted to address how the office of the Vice Provost of Graduate Education will be organized but recognizes that these two roles will both need to be accommodated in an efficient and effective manner.

18) The CGE recommends that the University appoint a Vice Provost for Graduate Education (VPGE), who will report directly to the Provost and be a member of the Executive Cabinet.

The Commission considered at great length whether it would recommend the creation of a new vice-provostial position. On the one hand, it had as a model the office of Vice Provost for Undergraduate Education (VPUE), which was created as a result of the CUE process. The office of the VPUE has assumed an important role in helping to oversee a number of functions relating specifically to the education of Stanford undergraduates.

On the other hand, the Commission was wary of creating a large and potentially stifling bureaucracy. Ultimately the Commission concluded that the needed position must be sufficiently close to the President, Provost, and Deans to be effective, but that it must also remain “lean and mean.” Although not a driver of its decision about where to place this position, the Commission also observed that the creation of a vice-provostial office would make clear to all the University’s constituents that graduate education is as important at Stanford as undergraduate education.

The Commission believes the VPGE will be extremely important in fulfilling the Commission’s vision of the future of graduate education at Stanford. In considering how to implement its wide-ranging recommendations, the Commission realized that the VPGE could carry out many tasks, such as:

- (i) being an advocate for and facilitator of cross-school interaction for the benefit of students and faculty (including taking primary responsibility for thinking proactively about graduate education at Stanford);
- (ii) developing and providing coordinated oversight of certain University-wide graduate functions and programs (including the diversity issues noted previously, as well as health care, child care and other support services, programs in graduate housing, etc.);
- (iii) providing coordinated, strategic allocation of funds for University-wide graduate-level purposes (including startup funds for leadership

and cross-disciplinary classes, the summer program, and the Innovation Enhancement Fund); and

- (iv) collecting and disseminating cross-school information (including information about “best practices” throughout the University).

The Commission expects that the VPGE will, as a priority, take an active role in promoting graduate diversity, providing information and assistance to help the schools and departments in their efforts to increase the diversity of their graduate students populations.

The Commission expects that the VPGE would consult on a regular basis with an advisory board consisting of representatives from each of the schools. This board would likely function in a manner similar to the board that advises the VPUE.

Finally, the Commission anticipates that the VPGE will work closely with the Vice Provost and Dean of Research and Graduate Policy, whose responsibilities for overseeing research policies and funding will continue to have a significant impact on graduate student life.

When this position is created, Stanford should reevaluate the reporting relationship of a number of organizations that help provide services to graduate students. Alternatives that should be considered include:

- a) **Transfer oversight of the Stanford Graduate Fellowship program to the VPGE.**
- b) **Transfer oversight of the Bechtel International Center to the VPGE.**

The Commission expects that the VPGE will be the focal point for the continued development of these recommendations and the driving force in their implementation.

Stanford University
Commission on Graduate Education
APPENDIX 1. CHARGE

The Commission on Graduate Education (CGE) has been established to consider how to enhance graduate education at Stanford. Like the Commission on Undergraduate Education (CUE), which ten years ago recommended many beneficial changes to undergraduate education, it is intended to ensure that Stanford stays true to its abiding mission to meet the evolving needs of its students.

Stanford's innovative spirit and pioneering tradition have helped build a university of exceptional quality and breadth. Our challenge as a leading educational institution is to prepare our graduates to be leaders in finding solutions for the large-scale, complex problems of the 21st century. Dealing with the issues of our day, such as globalization, the impact on society of rapid scientific and technological advances, emerging and chronic health care problems, and the effects of human activities on the environment demands new approaches that are creative, collaborative, and multidisciplinary.

In addition, the career paths for the alumni of our graduate programs have changed dramatically in the last few decades. Alumni find themselves changing their careers over their lives, needing different skills and perspectives to deal with the complex and global situations in which they find themselves, and pursuing a wider range of careers than had been the case earlier. These changes force us to consider how we transform our graduate programs to respond.

The hallmark of Stanford's departments and schools is excellence. The Commission on Graduate Education is charged with exploring how that

excellence might be used to augment our graduate students' abilities to think critically and communicate effectively in a complicated world, prepare them well for the range of careers they expect to be engaged in, and further enhance a Stanford graduate education. To carry out this Charge, the Commission will need to gather a body of information about our existing graduate programs, the expected career paths of our graduate students, and the graduate experience in general at Stanford. Once that information is gathered, the Commission will consider and recommend enhancements to our current programs.

The Commission comprises faculty representatives from each of Stanford's seven schools, the Dean of Research, a former Chair of the Board of Trustees, graduate student members, and a staff member. The Commission will also consult with additional graduate students, faculty, trustees, staff, and alumni.

Within the broader scope outlined above, the Commission is specifically charged with the following responsibilities:

- Articulate an overall vision of how graduate education at Stanford's various schools might be enhanced over the next five years;
- Review the range and nature of educational programs that are currently available to Stanford's Ph.D. and professional degree students;
- Consider the professional issues and career choices that Stanford graduate students are likely to encounter, and the expertise and

skill sets they are likely to need after receiving their degrees;

- Consider the expressed desires of Stanford graduate students for educational opportunities beyond those now available to them, including those outside their own departments and schools;
- Consider the possibilities of additional cross-disciplinary graduate experiences and the modalities (e.g., classes, seminars, special

programs, and research projects) that might be the most effective vehicles for cross-disciplinary learning; and

- Address the purposes and goals discussed in this Charge and determine any adjustments to current practices and policies that would be necessary or desirable as a result.

The Commission is asked to report its findings and make recommendations for change by June 1, 2005.

Stanford University
Commission on Graduate Education
APPENDIX 2. MEMBERSHIP

Keith M. Baker

J.E. Wallace Sterling Professor of Humanities;
Professor of Early Modern European History;
Jean-Paul Gimon Director of the France-Stanford
Center

James N. Baron

Walter Kenneth Kilpatrick Professor of
Organizational Behavior and Human Resources

Stacey F. Bent

Professor of Chemical Engineering and, by
courtesy, of Electrical Engineering, of Materials
Science and Engineering, and of Chemistry

Arthur Bienenstock

Vice Provost and Dean of Research and Graduate
Policy, Professor at SSRL and of Materials Science
and Engineering and of Applied Physics

John C. Boothroyd

Professor of Microbiology and Immunology

Morris P. Fiorina

Wendt Family Professor of Political Science;
Senior Fellow at the Hoover Institution

Andrea J. Goldsmith

Associate Professor of Electrical Engineering

Stephan A. Graham

Welton Joseph & Maude L'Anphere Crook
Professor and Associate Dean of the School of
Earth Sciences

Deborah R. Hensler

Judge John W. Ford Professor of Dispute
Resolution

Charles A. Holloway

Kleiner Perkins Caufield & Byers Professor of
Management, Emeritus; Co-Director of the Center
for Entrepreneurial Studies

Mark A. Horowitz

Yahoo! Chair; Director, Computer Systems
Laboratory; Professor of Electrical Engineering
and Computer Science

Roberta R. Katz

Associate Vice President for Strategic Planning

Mark G. Kelman

William Nelson Cromwell Professor of Law and
Vice Dean of the School of Law

Ellen M. Markman

Lewis M. Terman Professor

Julie Parsonnet

George DeForest Barnett Professor in Medicine
and Professor of Health Research and Policy

Martin L. Perl

Professor at the Stanford Linear Accelerator,
Emeritus

Denis C. Phillips

Professor of Education and, by courtesy,
of Philosophy

Isaac Stein

Stanford University Board of Trustees Chair,
Emeritus

Moriah E. Thomason

Graduate Student Representative, Neurosciences
Program; Graduate Student Council, Chair
2004-05

Robert M. Waymouth

Robert Eckles Swain Professor in Chemistry, and
Professor, by courtesy, of Chemical Engineering

Miranda Mata [Staff]

Administrative Assistant

Stanford University
Commission on Graduate Education
APPENDIX 3. SUBCOMMITTEES

Graduate Student Life

Denis C. Phillips [Chair]

Arthur Bienenstock

Christine M. Griffith

Associate Dean of Students, Director of the
Graduate Life Office

Deborah R. Hensler

Moriah E. Thomason

Claudia M. Guzman Schweikert [Staff]

Assistant Dean for the Vice Provost and Dean of
Research and Graduate Policy

Master's and Professional Degrees

Mark G. Kelman [Chair]

Charles A. Holloway

Ellen M. Markman

Julie Parsonnet

Bruce A. Wooley

The Robert L. and Audrey S. Hancock Professor
in the School of Engineering; Electrical
Engineering Chair

Libby D. Hlavka [Staff]

Director, Program Development, Graduate School
of Business Executive Education

Doctoral Degrees

Keith M. Baker [Co-Chair]

Mark A. Horowitz [Co-Chair]

James N. Baron

Karen Cook

Ray Lyman Wilbur Professor of Sociology;
Sociology Department Chair

Andrea J. Goldsmith

Stephan A. Graham

Robert M. Waymouth

Claire Ravi [Staff]

Administrative Services Administrator

University-Wide Issues

John C. Boothroyd [Chair]

Stacey F. Bent

Eamonn Callan

Professor of Education

Morris P. Fiorina

Roberta R. Katz

Martin L. Perl

Roger Printup

University Registrar; Director of Student
Information Systems

Isaac Stein

Miranda Mata [Staff]

Commission on Graduate Education

APPENDIX 4. LIST OF RECOMMENDATIONS

- 1) The CGE recommends that Stanford clearly articulate its commitment to cross-disciplinary and interdisciplinary education and then deliver on this commitment.
- 2) The CGE recommends that in order to encourage and deliver cross-disciplinary and interdisciplinary programs, Stanford should fund, and otherwise ensure the capacity of, departments and schools to develop and deliver such courses.
 - Create a fund to support cross-disciplinary and interdisciplinary course development activities and startup costs.
 - Recognize that the long-term support of cross-disciplinary and interdisciplinary classes must come from traditional course funding sources, such as general student tuition dollars or dedicated endowment.
 - Develop a “funds flow” process to ensure that schools or departments that experience increased student units taught as a result of these classes can be compensated for their efforts.
 - Create a fund to support TGR students and post-doctoral fellows who want to enroll in cross-disciplinary classes.
 - Facilitate increased educational collaboration among faculty from diverse departments and schools.
 - Enable a series of seminars in which faculty can explore topics they would teach together with colleagues from other disciplines.
- 3) The CGE recommends that Stanford develop a Summer Education program for graduate students that would focus on various topics of cross-disciplinary interest and allow students to interact with a wide cross-section of faculty and students from outside their own fields.
- 4) The CGE recommends that Stanford take additional steps to improve student access to cross-disciplinary and interdisciplinary education, including removing school barriers to class access, revising requirements for joint and dual degrees, and updating processes for listing and cross-listing classes.
 - Increase students’ opportunities to find flexible educational and research funding.
 - Transition all schools to the quarter system, schedule graduate and undergraduate classes according to the same calendar, and request that all schools follow a Monday/Wednesday/Friday and Tuesday/Thursday class schedule, matching hours where possible to allow access across schools.
 - Reduce administrative complexity for cross-school students.
 - Change the way classes are listed and searched to make it easier for students to find classes of interest, and remove the need to cross-list classes.
 - Review the requirements for joint and dual degrees to ensure that artificial barriers to developing new and innovative programs do not exist.

- 5) **The CGE recommends that Stanford enhance its ability to support new and innovative research programs.**
 - Create an Innovation Enhancement Fund.
 - Increase and expand the availability of the Stanford Graduate Fellowships.
 - Encourage some coordination between groups currently raising research funding.
- 6) **The CGE recommends that Stanford encourage, and develop better mechanisms for, faculty members to engage intellectually with faculty from other departments and schools.**
 - Create the Stanford Faculty Academy.
 - Support the development of faculty-to-faculty courses/seminars in growing interdisciplinary areas.
 - Expand the Stanford Fellows Program.
 - Provide an opportunity for each school's academic associate deans to learn about issues and problems in other schools.
 - Create a competitive award program to support mid-career faculty who want to move their entire research programs into new areas.
- 7) **The CGE recommends that all departments (or schools, where there are no departments), as well as all interdepartmental and inter-school programs (IDPs), undergo regular external reviews of their graduate education functions at least every seven years, and that they include student and alumni data in such reviews.**
 - Ask the faculty to contact their former Ph.D. students to encourage them to participate in a simple web survey form set up by either the Stanford Alumni Association or the proposed Vice Provost of Graduate Education.
 - Make sure that students who drop out of graduate programs are interviewed about their reasons for doing so, including any concerns they might have about their education or research.
 - In consultation with the Committee on Graduate Studies, create and implement more thorough and rigorous evaluation criteria for the establishment and the discontinuation of IDPs.
- 8) **The CGE recommends that Stanford develop mechanisms to address more affirmatively the issue of stagnant departments and programs.**
 - Acknowledge that as new departments are created, other departments will be closed or merged with others so the number of departments remains relatively constant.
 - In the face of continuing campus growth pressures, develop better means to leverage the use of campus faculty resources, including through cross-appointments and other coordinated cross-department/cross-school hiring and teaching.
- 9) **The CGE recommends that Stanford continue to recognize explicitly that diversity—of both people and program—is essential to its identity as a top research university and proactively take steps as necessary to protect and promote that diversity.**
- 10) **The CGE recommends that Stanford take additional steps to expand graduate student body and faculty diversity, including with respect to race, gender, culture, and nationality, and act to ensure that top diversity students continue to select Stanford for their graduate education and research.**

- To deal with the critical mass problem for minorities, and minority recruitment, create and support groups that span different schools to be used as resources for minority students and faculty and in recruitment.
 - Have each department report its admission statistics concerning minority application acceptance rates and current trends.
- 11) **The CGE recommends that Stanford act to ensure that the best foreign students continue to select Stanford for their graduate education and research.**
- Together with peer institutions, develop and implement a strategy to revise immigration laws and procedures that impede the matriculation of foreign students.
 - Develop innovative methods of reducing the financial hardship on international students.
- 12) **The CGE recommends the creation of more programs (and better use of on-campus housing) to encourage graduate students from throughout the University to interact with one another.**
- Allocate graduate housing space with the express goal of mixing students from different cultures, disciplines, and backgrounds. One way to create a broad community for new graduate students is to cluster first-year students from a variety of cultures and schools in specific dorms.
 - Allocate spaces in graduate dorms to an interdisciplinary theme.
 - Facilitate systems by which graduate students can exchange their diverse skills and talents (e.g., a computer science student could exchange computer support services for editing services provided by an English student).
- 13) **The CGE recommends that Stanford create and support improved opportunities for graduate students to develop into effective leaders.**
- In addition to the I-Write and Negotiation courses, expand the use of other already-existing programs like the law school's problem-solving class and the pedagogy programs at the Center for Teaching and Learning.
 - Leverage the Design Institute to help create a number of project-based classes for students to practice working in groups and generally learn more about group dynamics.
 - Outsource responsibility for providing certain classes to other organizations that are in the business of providing education in the relevant areas.
 - Allow graduate students to take a small number of these leadership courses post-TGR.
 - Provide graduate students with more opportunities for educational and research experiences outside the United States.
- 14) **The CGE recommends that Stanford make clear that research advising is an important faculty responsibility and develop methods to help faculty perform this responsibility.**
- Ask faculty members to describe their interaction styles so incoming students can get a feeling for the expected advising relationship, and evaluate faculty based

on how well their advising behavior conforms to these descriptions as well as to other departmental expectations.

- Ensure that there are clear guidelines and procedures for a student to change research advisors.
- Create an introductory survey course where professors talk about their research, the review process for papers, what teaching is like, how to write a grant, what the Ph.D. process is like, how to prepare a course and develop a syllabus, etc.
- Create a program for training faculty on best practices in student advising. Ideally this program would bring together faculty from different departments and schools for generic training sessions but could also include discipline-specific sessions to cover topics that are unique to an area.

15) **The CGE recommends that schools and departments provide students with at least one other mentor in addition to the research advisor.**

- Assign a senior graduate student or post-doctoral student as a mentor to each new graduate student.
- Appoint one experienced administrator or faculty member (e.g., the director of graduate studies) to be a mentor to all of the graduate students.
- Consider periodic committee reviews of students (in lieu of single-advisor reviews); use these reviews as an opportunity to give additional feedback and guidance to each student regarding research and career preparation.

16) **The CGE recommends that Stanford improve University-wide graduate student services, including housing, family support, and career counseling services.**

- Change the way the housing lottery works for graduate students by increasing the length of time each lottery result lasts in order to reduce disruption to graduate students.
- Develop policies on maternity leave, child care subsidies (or alternatives, such as shared care), and health care for families, and develop methods to effectively advise students about these areas.
- Ensure that the Graduate Life Office, the Career Counseling Center, and the Counseling and Psychological Services (CAPS) office have appropriate capacity.
- Develop a program for graduate alumni to provide career and other counseling to graduate students.

17) **The CGE recommends that Stanford undertake a comprehensive review of the TGR fee and its impact on time to degree completion, and of graduate student compensation, including stipends, fellowships, and assistantships.**

18) **The CGE recommends that the University appoint a Vice Provost for Graduate Education (VPGE), who will report directly to the Provost and be a member of the Executive Cabinet.**

- Transfer oversight of the Stanford Graduate Fellowship program to the VPGE.
- Transfer oversight of the Bechtel International Center to the VPGE.

Office of the President
Stanford University
Building 10, Main Quadrangle
Stanford, CA 94305-2060