

**Report to the Provost/President from the Doctoral Education Improvement Plan Review
Committee**

July 25, 2012

Executive Summary

The Importance of Graduate Education and Research

*“U.S. universities have been the incubators of the nation's prosperity. . . . The talent and knowledge produced by research universities underpin many of the finest U.S. achievements, from seeding the modern agricultural system to enabling the World Wide Web.”*¹ Charles O. Holliday, former chairman and chief executive officer of E. I. du Pont de Nemours and Company and Chair of the National Research Council on Research Universities and the Future of America.

Ph.D. education is crucial to UF's future as well as that of the state of Florida and the nation. Every elite RU/VH [Research Universities Very High Activity] institution in the nation has a vibrant and diverse range of Ph.D. programs, and UF cannot improve its place among the leaders of higher education without strong and effective Ph.D. programs. Preserving and enhancing Ph.D. education at UF is not merely a matter of academic conceit, professional rankings, and bragging rights within the ivory tower. Rather, Ph.D. education is essential to UF's core mission and the economic growth of the State of Florida. The majority of the scientific and medical research at American universities is done in close collaboration with Ph.D. students, who bring new ideas and perspectives that enrich the science and scholarship that fuel our research environment. Hence, without the ability to recruit to UF the best and the brightest Ph.D. students in the global environment, research at UF will be weakened and UF's leading scientists will be less successful.

Equally important is the critical instructional contribution of UF's Ph.D. students. For the lion's share of UF undergraduates, exposure to the sciences and humanities comes in courses in which Ph.D. students serve as discussion leaders and laboratory supervisors. For the scores of business leaders, journalists, creative writers, and lawyers produced by UF, their understanding of the scientific method, of the laws of physics, and of the behavior of the atom is gained in classes far from their area of concentration and in courses where Ph.D. students provide important instruction. Indeed, it is mainly in general-education classes, where Ph.D. students lead discussion sections, that the next generation of engineers and journalists and physicians will learn about the U.S. Constitution, the roots of racial conflict in America, and Aristotelian philosophy.

If UF is unable to attract top Ph.D. students, we will fail in our core mission of education. We seek to train students who will be highly competitive in their chosen fields, but we also strive to produce well-informed, educated citizens. If the laboratory assistant who teaches future political leaders is not effective or if the discussion leader who explains how the Fourteenth Amendment to the Constitution defines citizenship in modern America is not first rate, then our students will suffer because, following graduation, they are unlikely to be exposed to ideas far from their career paths.

Finally, employers report that holders of the Ph.D. rise to leadership positions, engage quickly with organizations, and bring with them new and innovative ideas. In today's global economy, companies desire people who are sensitive to cultural differences, possess an ability to communicate at advanced levels both orally and in writing, apply ethical principles in decision making, and possess a depth of knowledge about the technologies necessary to help run the organization. In short, Ph.D. education fuels the creation of knowledge in our research universities and brings innovation to the marketplace and to the wider society. Simply put,

sustaining top-quality Ph.D. programs is critical to UF's research and instructional missions and to the social and economic well being of the state.

¹ Editorial, Holliday. JUNE 2012: VOL 336 SCIENCE www.sciencemag.org

Looking Forward

Although there is value in the detailed analyses of the individual units, our macro-level observations may be of greater and longer-lasting consequence. The tasks of this committee and its predecessor have been to evaluate the quality of Ph.D. programs and to make recommendations for their improvement. Any directive made to individual units to improve performance quality, however, will raise questions regarding objectives, metrics, and stakeholders:

1. *Faculty Satisfaction.* The University of Florida has a research mission, which requires that it attract and retain research faculty who, in turn, expect a strong Ph.D. training presence. Achievement of this internal, faculty-centric objective can be measured through assessment of faculty satisfaction with its Ph.D. programs.
2. *Institutional Reputation.* The quality of Ph.D. education contributes to the overall stature of the institution, and therefore this metric should capture the extent to which Ph.D. graduates reflect favorably on UF. In many instances, the target will be prestigious academic placement, but numerous fields may view industry or government as highly attractive destinations. Regardless, visibility should weigh heavily.
3. *Scholarship.* Research universities have an obligation to advance knowledge through training of the next generation of scholars. Success can be measured through an accounting of the student's post-graduation scholarly activity.
4. *Pragmatics.* (a) UF has a budgetary incentive to increase the number of upper-level graduate credit hours. (b) Individual units have needs—staffing and otherwise—that are addressed, in part, through graduate-assistant assignments.

Even if the legitimacy of each objective is universally acknowledged, attainment of one is likely to require tradeoffs against others and, moreover, different stakeholders will be naturally disposed to make different tradeoffs. We emphasize this point in light of the overriding desire to improve UF's Ph.D. programs. Effective management and basic fairness require that the individuals and units responsible for Ph.D. education be informed of what it means to perform at a higher level and how their efforts will be assessed and incentivized. Fairness also requires an understanding of the degree of flexibility different units possess in prioritizing their activities to achieve their designated objectives. Some units, for example, do not have the luxury of decreasing quantity (in the service of higher quality) due to the role that teaching assistants play in delivering undergraduate education. More generally, it is unrealistic to expect a unit to increase quantity and quality simultaneously without a sizeable infusion of resources.

When the situation is less constrained, there should be discussions regarding priorities. Many faculty members, for instance, will desire to improve their research productivity in the most financially efficient manner. Hence, they have a strong incentive to allocate grant money to post-docs rather than Ph.D. students. Compared to many peer institutions, UF's graduate tuition remains modest, but we require significantly more credit hours to complete the Ph.D. than most of our peers—sometimes double or even triple the number of credit hours. Hence, despite our low tuition, supporting graduate students is significantly more expensive at UF than at peer institutions, and even modest hikes in tuition are magnified by the high credit-hour requirement. As a consequence, UF researchers expend more grant money supporting Ph.D. students than do colleagues at peer institutions, potentially leading some researchers to hire post-docs rather than to support Ph.D. students, an option at odds with UF's emphasis on graduate education and Ph.D. production.

Guidelines for Tradeoffs

1. Any review of Ph.D. programs will quickly reveal an enormous degree of heterogeneity across units, not only in quality but also in mission and structure. For example, some disciplines have an appropriately international mission, whereas others have more local constituency; some units are driven largely by basic discovery, whereas others have a more applied orientation; some units are funded largely through grants to individual investigators, whereas others rely on university support. These dimensions, among others, should help inform decisions about objectives and tradeoffs.
2. We are cognizant of the priorities held by non-faculty stakeholders. State-level desires to emphasize particular disciplines at the expense of others may be unavoidable. At the institutional level, we appreciate the need for a broad strategy, but we also expect that shared governance will be respected.
3. There has long been a consensus at the University of Florida that interdisciplinary graduate programs provide an important vehicle for educating doctoral students. Indeed, the University of Florida has been a national leader in interdisciplinary graduate education. The development of interdisciplinary graduate concentrations under the leadership of Madelyn Lockhart (Dean of the Graduate School, 1985-1993) preceded the development of interdisciplinary graduate training programs instituted by the National Science Foundation (NSF) in 1998. A recent document commissioned by NSF (Bridging Disciplinary Divides: Developing an Interdisciplinary STEM Workforce, Abt. Associates et al., 2010) highlighted the particular value of interdisciplinary graduate education. Among its conclusions was that “the growing complexity of today’s scientific problems along with advancements in science and technology have spurred the need for greater interdisciplinary collaboration” and that “these changes have amplified the demand in the job market for interdisciplinary individuals.” Meeting the challenge of increasing the number of Florida graduates can be facilitated by strengthening interdisciplinary education at UF.

Unfortunately, the RCM budget model at UF poses a threat to interdisciplinary programs when these programs extend across budgetary units. Units are legitimately reluctant to invest in programs that generate economic returns that accrue to another budgetary unit. The danger is that RCM will lead to disinvestment in interdisciplinary programs. The administration recognizes the need to adjust RCM to allow interdisciplinary graduate programs to thrive. Such a solution, however, should be developed without delay.

Guidelines for Evaluation

1. *Objectives/Criteria/Metrics.* As implied, one size will not fit all. The UF survey that formed the basis for the committee’s deliberations included measures such as selectivity, yield, time-to-degree, attrition and completion rates, mentoring practices, and placement measures. Although the best practices reported elsewhere in this report provide many laudable reference points, the heterogeneity across disciplines suggests that individual units are in the best position to determine how best to achieve their objectives. Once objectives are established, appropriate criteria and metrics should naturally follow. UF can then incentivize units to meet their particular objectives. We note that the graduate school is making steady progress in the creation of placement statistics, which will serve an “institutional reputation” objective. We urge that, wherever appropriate, units be compelled to collect data at the most granular level, both with regard to their own performance and the performance of their peers.

2. *Program Reviews.* The committee also urges that external reviews be conducted for each unit on a regular basis. These reviews should include an explicit evaluation of the unit's Ph.D. program. The establishment of a review committee containing professors from leading institutions in a particular field should be developed through consultation between the program's leadership and the Graduate School Dean.

The importance of a thriving humanities program for our society. It may be argued that, among other benefits, humanities programs create opportunities for integrating humanities with the STEM disciplines to improve creativity across graduate programs. Evidence to support this position was highlighted in a recent publication, see:

<http://www.ippsr.msu.edu/ppie/Presentations/Successes.pdf>. In Walter Isaacson's recent biography of Steve Jobs, the founder of Apple and McIntosh computers, two important quotations are provided. Jobs, one of the greatest minds of our times stated that "...the best way to create value in the 21st Century was to connect creativity with technology . . ." and "Then I read something that one of my heroes, Edwin Land of Polaroid, said about the importance of people who can stand at the intersection of humanities and sciences, and I decided that's what I wanted to do. . ."

Developing the minds of tomorrow. It is particularly important to bring science and scholarship to primary and secondary schools, especially to those with large numbers of people from groups underrepresented in graduate school. Almost all graduate programs at Florida struggle to recruit African-American students and people from other minority groups. In large part, we start to recruit when it is too late, when students have already decided on career tracks. Plant Molecular and Cellular Biology can provide an example of how outreach to students in their formative years can be achieved. Graduate students can play a major role in teaching at all levels to improve the early educational system and hence to produce the students for future training.

²*Steve Jobs* by Walter Isaacson, 2011

The findings of the 2012 Doctoral Education Improvement Plan Review Committee have been summarized in five appendices to this Executive Summary

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APPENDIX 1

Top Performing Programs for the President's Attention

Following extensive discussion among the committee members, we have selected what we consider to be the **Top Ten** Ph.D. programs at UF. They are discussed briefly below for the special attention of President Machen. Under healthier budgetary conditions, these ten programs are recommended for increased funding through university resources. It is also recommended that these programs be used as standards for graduate recruiting, training, and mentoring at UF.

The programs are presented in alphabetical order; no attempt has been made to rank these from one to ten. All are considered meritorious and of importance to the mission of the university.

Agricultural and Biological Engineering

This is the largest program of its kind in the U.S., and only two other programs produce more Ph.D. graduates per tenure-track faculty per year. It is also ranked highly nationally (7 of 43). The Ph.D. program in Agricultural and Biological Engineering is also particularly important on campus because it has been a prime mover in the formation of the UF Water Institute and the UF Climate Institute. Finally, it should be pointed out that the program provides leadership for the Art/Science/Engineering Collective; this effort, which seeks to increase creativity among STEM graduate students, is innovative and important. Recent statistics indicate that Nobel Prize Winners in the sciences are much more likely to be artistically inclined than other scientists, and it is likely that the increased emphasis on creativity will produce more effective engineering and science Ph.D.s.

The unit's plan for enhancing the ranking of its Ph.D. program is well conceived, novel, and likely to be successful. A major component of the plan is to seek training grants from USDA and other agencies. Agricultural and Biological Engineering has obtained funds for undergraduate researchers (National Science Foundation and Department of Education) and so has already experienced success in this area. The number of African-American Ph.D.s is low in this program (two at the time of writing), but its faculty plan to serve on the Advisory Board for Biological and Agricultural Systems Engineering at FAMU, which will increase their contact with African-American students interested in engineering. Although the program struggles with the large diversity of faculty research interests, it has formulated a strategy to create a common experience and theme for the program by developing Modeling and Simulation for Decision Support Systems as a unifying theme.

Biomedical Sciences

This interdisciplinary program presented a very solid program plan and is listed as one of the top Ph.D. programs at UF. The Biomedical Sciences Ph.D. program has a large enrollment, a spectacular graduation rate of 82.6 percent, and an attrition rate of only 16.9 percent. The mentoring program appears to be a strong component. The mentoring/advising process begins in the students' first year under the direction of the associate dean of graduate affairs, but a more comprehensive mentoring program is being developed that will involve a substantial number of faculty members and thus provide individual students with greater attention through a one or two student to one faculty ratio through the first year until students formally select their dissertation supervisors. Biomedical Sciences enrolls a large number of students and has a solid minority enrollment as well, and, according to its plan, the program intends to increase that enrollment. Students tend to be adequately funded, and an increase in T32 training grants would be a benefit and could serve to increase the number of Ph.D. students to some degree, though research grants appear to be the critical factor in driving student enrollment. Even then there will be competition

as to whether such support will go toward post-doctoral fellows or pre-doctoral students as there has been a growing tendency to fund more post-doctoral fellows on research grants rather than Ph.D. students. Funding notwithstanding, an increase in graduate students can be easily accommodated by current faculty members given that the faculty to Ph.D. recipient ratio is only 0.15 over the last five years. Regarding post-doctoral placement of Ph.D. graduates, the majority appear to be successful at getting post-doctoral fellowships, but this cannot be said with certainty because there are no reported job data for more than half of the graduating Ph.D.s from 2006 to 2011.

Chemical Engineering

This program has achieved an outstanding record, placing it among the top units at UF. The recruiting process is vigorous, including sending letters to graduating seniors at a number of peer institutions and initiating personal contacts from faculty members, as well as participating in a Career Fair during the AIChE National Meeting in mid-November. On average 154 applications are received each year, with only 10 percent receiving invitations to enter the program. With 14 acceptances, the program is both selective (87.5 percent) and successful in attracting outstanding students. With a Ph.D. produced per faculty per year ratio of 0.8, the program is also among the best at UF and compares favorably to its peers. In terms of participation in graduate training, 24/25 faculty have graduated students in the past five years, but the program expects even better results as younger faculty mature. Even more notable is the program's graduation rate of 90 percent. Teaching assistantships are not used to support students; rather, funded research pays most stipends.

In the 2011 internal Ph.D. assessment, the Ph.D. program in Chemical Engineering ranked in the top quartile in seven of the nine criteria used by the Graduate School. Its five-year plan is excellent and features solid strategies for improving the process of Ph.D. education even more. The program plans to emphasize applications to NSF and NIH for all graduate students and seeks to guarantee a minimum of four years of support. In an external report, the review committee praised Chair Dickinson and suggested that obtaining twice as many extramural research grants be made a priority. The program seems well poised to apply for an IGERT-type support application for graduate student training.

Chemistry

The Ph.D. program in Chemistry is recommended to the President for special attention. It is one of UF's strongest programs and has the potential to increase in national standing. The Doctoral Education Improvement Plan was reviewed by experts from Emory and the University of Illinois and unanimously accepted by the Chemistry faculty. Its report detailed student successes, an excellent mentoring plan, and a strong five-year strategy for continued improvement. This Ph.D. program was highly ranked in the most recent National Research Council assessment of U.S. doctoral programs and holds a strong ranking by *U.S. News & World Report*, particularly in analytical chemistry. The Graduate School's quantitative assessment of UF's Ph.D. programs lists Chemistry in the top quartile in six of eight measures: selectivity, yield, low attrition, high completion, the number of graduates, and the student-to-faculty ratio. Based on these measures, few programs at UF are as successful as this one. An area of concern though is the relatively low number of minority students enrolled in Chemistry's Ph.D. program. Given the national number of minority students graduating with bachelor degrees in chemistry, this should be an area upon which the program should focus.

Clinical and Health Psychology

The Ph.D. program in Clinical and Health Psychology is an academic unit of the College of Public Health and Health Professions. *U.S. News & World Report* ranks the program at #25 placing it in the top 10 percent of over 200 APA accredited programs. Clinical and Health

Psychology (CHP) is highly selective, making offers to approximately 10 percent of applicants each year, and maintains high retention rates (approximately 97 percent). CHP also demonstrates a strong commitment to minority students in the following ways: 1) 23 percent of its current students represent minority groups; 2) 100 percent of these students are financially supported via fellowships and extramural grants; and 3) goals have been set and strategies identified for furthering the diversity of its Ph.D. student group. In general, CHP has been very successful in providing full support to all of its Ph.D. students through multiple sources, including federal research grants and private foundation funding. To continue providing support during the present economic downturn and bolster stipend levels to NIH standards, the program is actively seeking additional training grant funding for its doctoral students. While progressing through the program, students' productivity is tracked by the Director of Clinical Training with an annual faculty review of student activity reports. This assessment focuses on students' progress and their research activities. CHP develops individual plans for at-risk students in need of additional support. The program's mean time-to-degree of five years is, on average, lower than those at peer institutions. With a yearly production of 0.53 Ph.D. graduates per faculty member, CHP productivity is at or above expectations at peer institutions. Overall, the Doctoral Education Improvement Plan Review Committee views the CHP plan as a serious effort to self-evaluate and put forth reasonable goals for improving its Ph.D. program.

Industrial & Systems Engineering

The Ph.D. program in Industrial & Systems Engineering (ISE) is highly ranked within its discipline (tenth among public universities, according to *U.S. News & World Report*) and is an exemplary Ph.D. program. It graduates and places a significant number of Ph.D. students but is limited by the size of its faculty. Due to aggressive recruiting, the input to the program is good, with high selectivity and high yield. The throughput phase is student-centered, efficient, and rigorous. The program's curriculum is admirably designed to develop and maximize student potential: they are closely mentored and given frequent diagnostic feedback; students complete the degree in approximately four years, which is lower than the peer average; and, there is an early "up-or-out" assessment that identifies and counsels out weak students. Students are expected to be very productive during their time in the program, with unusually high standards for scholarly productivity. Consequently, output/outcome is enviable and significant numbers of students being placed in academic positions each year. An attractive market also exists in the government sector, especially for domestic students. Looking forward, the ISE program is well positioned to satisfy this critical demand and, more generally, to enhance the reputation of the College of Engineering and UF.

Mass Communications

The Ph.D. program in Mass Communications is successful and highly regarded nationally, placing it among the elite programs in the university and in the field. In external assessments, it is consistently ranked among the leaders in the discipline, and virtually every quantitative measure underscores its strength. One of the largest programs in the field, it is highly selective and efficient; nearly two-thirds of the students who entered between 2002 and 2005, for example, completed their Ph.D.s, and the mean time-to-degree is 3.7 years, which is faster than peers and among the fastest at UF. Students are well supported with travel funds for conference participation and receive careful mentoring, both from faculty advisors and from peers working through a student organization. These efforts produce sound outcomes, with almost two-thirds of its graduates securing faculty positions. In short, the Ph.D. program in Mass Communications recruits excellent students, trains them efficiently, places them effectively, and hence maintains its elite national ranking. Further investment in Ph.D. production in Mass Communications will strengthen a well-established, highly visible, and top-ranked program, bolstering UF's overall reputation for graduate education.

Materials Science and Engineering

The Ph.D. program in Materials Science and Engineering (MSE) is ranked second by the National Research Council and is in the top ten according to recent *U.S. News & World Report* assessments. Furthermore, MSE has solid ratings based on the internal Ph.D. Program Assessment Data. MSE has a large Ph.D. student enrollment and a generally successful graduation rate of 64 percent, and the program graduates a high number of Ph.D. recipients annually, reportedly the highest average number in the country. Moreover, the program may have the largest number and the highest proportion of minority students among MSE programs at major research universities and particularly within AAU schools, even though the program pointed out that its minority enrollment numbers have actually slipped and the intent is to increase minority enrollment. Notably, MSE faculty members are active in graduating Ph.D. students, averaging over one Ph.D. graduate per faculty member per year. MSE faculty members also readily put their Ph.D. students on research grants. A solid mentoring/advising program is at hand with the expectation that every new Ph.D. student will be assigned to a faculty advisor. Finally, the MSE program formulated a strong plan, and this is an academic unit that UF should point to.

Microbiology and Cell Science

The Ph.D. program in Microbiology and Cell Science (MCS) is housed in the department by the same name in the Institute of Food and Agricultural Sciences. The program has been in existence for more than thirty years. There are multiple aspects of this program that were recognized by the Doctoral Education Improvement Plan Review Committee. First, the program does a very good job of recruiting. The averages computed over the past five years are: 57 applicants, 12.4 acceptances, while 9.8 have matriculated per year. In addition, the retention rate is excellent, with 95 percent retained. More important, the program's graduation rate is 92.4 percent. A most impressive aspect of the MCS program is that over 20 percent of its students are from underrepresented minority groups. Part of the reason for its success is that the faculty in MCS includes three African Americans and two Hispanic tenured or tenure-track members. Another laudable aspect of this program is that it conducts a departmental retreat soon after the new students arrive. This allows the new students to become quickly immersed in the program, including meeting faculty and other students, being introduced to the faculty research projects, and beginning to establish a network of support.

Statistics

The Ph.D. program in Statistics is highly ranked nationally (in the top 20 percent in one estimate) and includes world leaders in the field, such as Malay Gosh, a Distinguished Professor. The program is strong in student recruitment and international diversity; students move through the program efficiently, graduating, on average, in five years. Retention of students is good with clear plans for improving retention and increasing diversity. Some faculty members in the program maintain a strong involvement in inter-disciplinary student training and research. This highlights the fact that Statistics is a critical program because of the need to include statistics or a statistician in many grant applications in a variety of disciplines across campus. There is a good mix of established senior faculty and up and coming younger faculty. However, given the recent passing of Dr. George Casella, the recruitment of a suitable replacement should be a priority.

APPENDIX 2

Programs for the Provost's attention

Programs ranked just below the Top Ten that are also worthy of support

In addition to the **Top Ten** programs identified above, the committee also found six other programs with many positive features, although they did not meet the high standards set by the first ten programs. They are listed below in the category of "11-16" top programs. Each of these had support by several members of the committee.

Applied Physiology & Kinesiology

This is a strong program with excellent selectivity in admission (about 20 percent) and 80 percent of acceptances matriculate, as well as good minority representation (12 percent). The Ph.D. program in Applied Physiology & Kinesiology stands out in having a doctoral directive advising status (DDS) that faculty members must obtain in order to supervise Ph.D. students, with the status reviewed every five years. All faculty with graduate status direct Ph.D. students with good productivity of 0.44 Ph.D. per faculty per year. The program provides good support for professional development of students, including a course in grant writing and travel grants. Applied Physiology & Kinesiology has also been successful in obtaining many training grants, but it acknowledges that its average assistantships are lower than in peer institutions. This must be remedied if the program is to further improve the quality of its students.

Pharmaceutical Sciences

The Ph.D. in Pharmaceutical Sciences program includes five concentrations: Medicinal Chemistry, Pharmacodynamics, Pharmaceutics, Pharmaceutical Outcomes and Policy, and Clinical Pharmaceutical Sciences. Each of the established concentrations underwent in-depth internal and external reviews in 2008. This program has impressive admissions data during the past five years: the admissions rate has averaged 10.4 percent, and the matriculation average has been 84.2 percent per year, making Pharmaceutical Sciences one of the most selective Ph.D. programs at UF. Noteworthy is the fact that the stipends in this program average as much as \$7000 below those of its peers.

The goal for the Pharmaceutical Sciences program is to maintain and even improve its selectivity, by increasing the stipends to the average of its peer programs. Based on this and the overall quality of the program, we would expect the program not only to maintain but to improve in national rankings in the future.

Rehabilitation Science

The Ph.D. program in Rehabilitation Sciences is successful and highly regarded in the disciplines of occupational and physical therapy, placing it among the top programs at UF. This program has numerous strengths, including the selective admission of graduate students and an excellent retention rate of enrolled students. Most graduates of this program go on to post-doctoral positions and/or faculty positions at major research universities. The program has an impressive number of faculty members with research awards from the National Institutes of Health. Moreover, the Rehabilitation Sciences program boasts an interdisciplinary pre-doctoral NIH T32 training grant in "Neuromuscular Plasticity" for the support of its graduate students. These graduate students are also well supported with travel funds for conference participation and receive excellent mentoring from faculty advisors.

Religion

Although this young program suffers from low selectivity (52 percent) and a low yield rate (55 percent), its innovative plan charts a bright future for the Ph.D. production in Religion, identifying an important niche (religion and nature/science/the environment) that taps the strengths of its faculty and promises to connect to far-reaching interdisciplinary scholarship. The program proposes to use limited increases in resources to increase stipends to attract better students.

Research and Evaluation Methodology

The Research and Evaluation Methodology (REM) Program deserves attention because of the potential that exists, and the need for graduates from this program is exceedingly high. REM graduates are in high demand in a broad number of fields: faculty positions; research and assessment centers or units at universities and colleges; research and evaluation center or units at national organizations; research, evaluation, and assessment departments and divisions in school systems; national statistical, research, evaluation, and assessment centers and institutes.

REM can recruit students from a variety of disciplines that have mathematical underpinnings. Thus, there is a large pool of potential doctoral students from a wide array of mathematical-based fields, including engineering and students with quantitative aptitudes. Students in Ph.D. programs in math and science education should be encouraged to establish strong minors in research and evaluation, and the same would most certainly be true for students in the psychological based fields in education.

The following comments are intended to point out areas where this program can improve further. Currently, given the low REM student numbers, student enrollment has to be substantially increased. Up to this point, the average annual number of Ph.D. recipients has been low, i.e., one student per year. In addressing the question regarding the process to encourage recruitment, retention, and graduation of minority doctoral students, the presented plan indicated that REM does not target minority students for recruitment. Such a statement is unacceptable and disappointing. Furthermore, the number of faculty who can chair dissertations is too low. Additionally, the program should be devoted to full-time Ph.D. students. Significantly, the will to mount a productive program will have to be present if REM is to meet its potential to produce graduates to satisfy national needs. A strong and clear plan needs to be established for recruiting, mentoring/advising, and retaining students along with a commitment to build a strong doctoral program if additional support is to be forthcoming.

Special Education

The Special Education Program is the fourth-ranked program in the nation, according to *U.S. News & World Report*. Compared to three other top-ten special education programs at peer AAU institutions, the UF program is highest in the average number of Ph.D.s produced per faculty per year (.43), highest in percent of Ph.D. students graduating annually (17 percent), and fastest in time-to-degree (median 3.8 years). With an average of 17 faculty members holding Graduate Faculty Status and 35 doctoral students, the Special Education Program graduates six Ph.D.s per year, compared to two Ph.D.s per year among 56 national programs surveyed. The UF program is able to provide financial support for 98-100 percent of its doctoral students due in part to its extraordinary success in obtaining federal research and training grants.

Doctoral students in the Special Education program receive active mentoring; they are assigned a tentative advisor upon admission and form their permanent supervisory committees by the end of their second semester. The students are quickly engaged in writing professional papers and grant applications as well as attending national conferences. They have opportunities to serve as reviewers for national conferences, and when their own proposals are accepted for presentation, the students are assured travel support at least twice. Three affiliated centers—in the School of Special Education, School Psychology, and Early Childhood Studies—also enable the

students to interact with faculty from other universities. These excellent professional development opportunities, along with the program's clearly structured curriculum, likely contribute to the high retention rate (only two students have dropped out in the past five years). The Special Education Program's Improvement Plans were detailed, well conceived, and realistic across the 11 areas of inquiry.

In addition, several programs elicited strong support from a few committee members. Comments on these programs are provided below here.

Animal Sciences

This Ph.D. program is recommended for attention by the Provost and College Dean. Although the program was not highly ranked by this committee last year, the Doctoral Education Improvement Plan that it submitted provided insights previously unavailable to us. The program laid out an excellent plan for improvement. The faculty will grow, with 12-14 new hires beginning July 1, and will focus on grantsmanship and doctoral student support. Its goals and strategies for improvement were well conceived. The poor retention rate from 2002-2005 was due to the formation of the Animal Molecular and Cell Biology Graduate Program and the transfer of students into it from Animal Sciences. The addition of new faculty and a cogent plan for student support will likely improve the program's rather poor retention rate. Animal Sciences also plans to increase collaboration with HBCUs to enhance minority recruitment.

Anthropology

This is a large and sound program with clear strengths, including good students, high selectivity (25 percent), and a wide distribution of faculty supervising Ph.D. students. Its two relative weaknesses (a low completion rate, ranging from 33 percent to 56 percent) and a long time-to-degree (mean of 8.8 years) mainly reflect the nature of anthropological research, which typically requires extensive field work, and inadequate research-and-travel support. Students take longer to complete their degrees because they spend extended periods in the field, and they struggle to raise their own travel funding, leading some to drop out because the financial burden of supporting extensive travel becomes overwhelming. The insufficient levels of funding for student support across the board—living, research, and required travel—warrants considerable attention and concern.

Astronomy

The Ph.D. in Astronomy is a solid program with an encouraging trajectory. Based on an apparent upswing in the overall stature of the group, there is potential to increase the quality and size of its Ph.D. program. The data suggest that selectivity is already on the rise and could be boosted further with aggressive recruiting efforts. Yield is good but would benefit significantly from an increase in graduate fellowships. There appears to be a commitment to Ph.D. education as evidenced by Astronomy's own year-long self-evaluation. A key outcome of the process has been a revised curriculum that more quickly involves students in scholarly research.

History

Like Anthropology, this is a solid program but one with low completion rates, reflecting the unsupported travel demands required for Ph.D. research. The program is very selective (offering admissions to 18 percent of applicants), has a high yield rate (77 percent of accepted applicants enroll), and boasts a time-to-degree considerably faster than the mean for peers. But with low stipends, support tied to teaching, and inadequate research funding, students either take on part-time jobs or accumulate mounting levels of indebtedness to support travel to archives, both of

which contribute to a high attrition rate. As with Anthropology, a modest investment in research/travel support would likely address the one glaring shortcoming in the program.

Nutritional Science

The Interdisciplinary Nutritional Sciences Doctoral Program, including 25 faculty from CALS, CVM and CLAS, has been in existence for less than three years. Therefore, there is not yet sufficient data to judge the success of the program. The Doctoral Education Improvement Plan Review Committee, however, wishes to highlight this program because of its potential to become a highly ranked program. The director, Dr. R.J. Cousins, is a member of the National Academy of Sciences and thus very highly regarded in the field. The program is designed to be small, with a goal of 25 students, so as to keep the program very selective and to insure that students are financially well supported. The stipends provided in this program are on par with peer programs, further favoring the selectivity of the program. In addition, the career opportunities for its graduates are very good and include positions in academia, industry, and government.

Plant Molecular and Cellular Biology

This is an innovative, highly ranked, interdisciplinary program that, by every measure, is effective and successful. With careful recruitment, a newly streamlined curriculum, and vigilant institutional oversight, the Ph.D. program in Plant Molecular and Cellular Biology moves students efficiently toward the degree. An impressive three-fourths of its incoming students receive their Ph.D.s, and the average time-to-degree is four years. This program also places its graduates at a very high rate. Finally, Plant Molecular and Cellular Biology has identified thoughtful ways to attract the next generation of scientists, actively recruiting high-quality undergraduates and even forging ties to K-12 schools.

Speech, Language, and Hearing Sciences

This is one of the oldest (established in 1949) and strongest Ph.D. programs at UF. It is consistently ranked among the elite in the field. In 2010, for example, *U.S. News & World Report* ranked UF's audiology program sixth in the nation and UF's speech-language pathology program eleventh. Students move through the program quickly and efficiently, with an average time-to-degree of four years. Still more impressive, Speech, Language, and Hearing Sciences has one of the highest completion rates at UF; more than 81 percent of students in the 2000-03 and 2001-04 incoming cohorts completed their degrees. Such success is achieved through careful recruitment and effective mentoring and professionalization. Finally, this program has achieved laudable levels of diversity. More than two-thirds of its students, for instance, are women. The Speech, Language, and Hearing Sciences program is well established, well run, and ranked at the top of its discipline.

APPENDIX 3

Programs with Weaknesses

Several programs were found to have significant weaknesses and are discussed below.

Classical Studies

The Ph.D. program in Classical Studies is recommended for attention by the Provost and College Dean. The program began in 2001 and admits both on-campus and distance-learning cohorts. It is one of the few Ph.D. programs that can be taken largely through a distance-learning platform. Over the past five years, the program has graduated an average of two students annually. Although its plan was satisfactory, the Committee was concerned about its description of how it mentors students and its low stipends. According to the Graduate School's quantitative assessment, the program has poor minority representation, high attrition rates (62.1 percent), and inadequate retention rates (20.7 percent). On balance, the program does not appear to provide adequate student support to be a successful program.

Classical Studies recently established an innovative on-line Ph.D. program, though this is not designed to produce scholars. Its completion rates are low, ranging from 15 percent to 36 percent. Furthermore, this program, further tilting away from the training of scholars and the production of knowledge, is increasingly focused on students from UF and other state colleges.

Ecology

The Interdisciplinary Ecology program illustrates the problems that now exist for groups of faculty from different departments and colleges who seek to collaborate in a multidisciplinary area. While at one point the university encouraged the establishment of such programs, today's budgetary model discourages this type of collaboration. The program has only a single FTE faculty member, who is the director of the program. Unfortunately, the report provided was unresponsive to the request of the Provost.

All of the faculty have appointments in their disciplinary units, and all credit for tuition received and Ph.D.s produced accrues to those units, with Interdisciplinary Ecology getting none. It must be added that this kind of interdisciplinary program combines the talents of many scientists and educators to tackle problems that are critical to a state such as Florida that relies heavily on tourism. Proper stewardship of our natural resources is vital to the tourism industry and, given the complexity of the different ecosystems in Florida, including rivers, streams, lakes, coastlines, and forests, it takes a coordinated effort to achieve this. If interdisciplinary programs are still desired at UF, adjustments will have to be made to the current budgetary model that will enable these programs to thrive.

Economics

The Doctoral Education Improvement Plan from the Warrington College of Business Administration included statements about the Ph.D. in Economics along with the Ph.D. in Business Administration. The Committee is aware of the considerations to defund the Economics degree program or possibly move it to the College of Liberal Arts and Sciences. The report noted the program's high cost and relatively poor job placement record of its graduates as reasons to cease funding for the program. Given the value that a strong Economics program has to UF, the Committee urges the administration to explore all possible avenues that will result in its continuation and improvement.

Educational Leadership

The Ph.D. program in Educational Leadership is an academic unit of the College of Education that has been in existence since 1946. Approximately 51 percent of Ph.D. applicants

are admitted to the program and of these 91 percent matriculate. With Florida residents comprising almost 100 percent of students enrolled, the program serves a local constituency. According to the 2011-2012 Ph.D. program assessment data collected by the Graduate School, Educational Leadership had 14 Ph.D. students enrolled in the Fall 2011 semester. However, data included in the Doctoral Education Improvement Plan submitted by the program reveal an average program size of 73.4 students from 2006-2010. This enrollment discrepancy is explained by the inclusion of Ed.D. degree program data in the program's report. With only three faculty members with graduate faculty status serving both degree programs, Ph.D. program indicators such as time-to-degree, attrition rates, and completion rates are among the weakest at UF. The additional finding that few students in Educational Leadership receive financial support from the program exacerbates these outcomes, as funded students are more likely to graduate in a timely fashion. The Doctoral Education Improvement Plan Review Committee recommends careful review and monitoring of both degree programs (Ph.D. and Ed.D.) to improve the current situation.

Food Resource Economics

The Ph.D. program in Food Resource Economics (FRE) is not highly ranked but has the potential to improve. It should, therefore, be monitored. On the input side, prior recruiting efforts appear not to have been aggressive. The data suggest low selectivity but high yield. Broad-based faculty involvement in Ph.D. advising has been lacking, but a recent influx of new faculty could change the situation. Stipends are low, with some students unfunded, in part due to a lack of research grants. Consequently, Ph.D. students have been diverted into undergraduate teaching as a source of financial support. FRE is an important discipline, and the program should aspire to be nationally recognized, but a tremendous amount of effort will be required.

French

In the fall of 2008, the Paul D'Anieri, the dean of CLAS, suspended admissions to the French Ph.D. program, and the faculty moved from the Department of Romance Languages to the newly established Department of Languages, Literatures, and Cultures (LLC), which combined German, French, Italian, African, Asian, and Creole language/literature specialists. This institutional reconfiguration makes it difficult to interpret recent data on the French Ph.D. program, for without an influx of new students, the size of the program and the number of Ph.D.s produced has inevitably contracted. Such complicating factors notwithstanding, indicators of output and outcome place the French Ph.D. program in the bottom quartile of UF Ph.D. programs. Prior to 2008, the French program had a low level of admissions selectivity, offering acceptances to nearly two-thirds of applicants; fewer than half of those admitted enrolled in the program (48 percent); virtually none was a minority student; and a modest proportion of the 2000-03 entering cohort completed the Ph.D. According to its program plan, additional faculty lines would be needed to effectively train Ph.D. students in French. In her preface to the program report, Mary Watt, the chair of LLC, proposes a new, innovative, cross-national Ph.D. program in which the skills of the French language/literature faculty might make a signal contribution.

German

In 2008, CLAS Dean Paul D'Anieri suspended admissions to the Ph.D. program in German, and the German Studies faculty moved from the Department of Germanic and Slavic Studies to the newly established Department of Languages, Literatures, and Cultures (LLC), which combined German, French, Italian, African, Asian, and Creole language/literature specialists. Although students already enrolled in the German Ph.D. program were permitted to continue, no new students have been admitted. As a consequence of these institutional changes, the data on the German Ph.D. program are difficult to interpret; without new admissions, the number of students enrolled and the number of Ph.D.s produced have dropped sharply in recent

years, and the reconfiguration of the department undoubtedly contributed to its attrition rate. Prior to the 2008, however, the German Ph.D. program was small, admitted nearly 80 percent of applicants, had few minority students, and had a low completion rate (20 percent for the cohort entering in 2000-03). Reflecting a combination of the 2008 suspension and some existing shortcomings, the German Ph.D. program ranks in the bottom quartile in most indicators of output and outcome. Retirements and resignations have winnowed the unit to 4.5 graduate faculty members, which is likely not sufficient to train Ph.D. students in the field. But the remaining faculty operate a vibrant and successful M.A. program, and the new umbrella department (LLC) has proposed an integrated, cross-national Ph.D. program, which holds considerable promise.

Health Education and Behavior

The Ph.D. program in Health Education and Behavior in the College of Health and Human Performance submitted a good report on its program. Some features of this report, however, deserve mention here. First, the program lost four faculty members who left for other professional opportunities and took some graduate students with them. This caused a decrease in the production of Ph.D.s in the years immediately after these events. The department has hired four new faculty members, but they are still in the process of establishing their research programs and securing grant funding. This situation will require monitoring at the College and Health Center levels to insure their success.

Second, the report from this program provided details of its current plans but lacks specific plans for the coming five years as requested by the Provost. Upon careful reading, one can pick out specific elements of what will follow, though much seems to indicate a continuation of the current policies.

Third, while the report details a generally good structure for mentoring and evaluating students on an annual basis, like many other units, this program operates under the assumption that the chairs of the supervisory committees will follow through with appropriate advice, mentoring, and other elements of good training. The narrative acknowledges that this is a problem and suggests that more careful attention to this point will be paid in the future.

Higher Education Administration

The Ph.D. program in Higher Education Administration is an academic unit of the College of Education in the School of Human Development and Organizational Studies in Education. According to the 2011-2012 Ph.D. program assessment data collected by the Graduate School, the Higher Education Administration Ph.D. program admits approximately 46 percent of applicants and of those admitted, 77 percent matriculate. Furthermore, of the 22 students admitted in the Fall 2011, almost 14 percent of these Ph.D. students were from underrepresented minority groups. However, data included in the program's five-year plan reveal an average program size of 73 students from 2006-2011. This inconsistency between data sources can be explained by the inclusion of on-campus and on-line Ed.D. degree program data in the Doctoral Education Improvement Plan. With only two faculty members with graduate faculty status currently serving all three doctoral degree programs, the Doctoral Education Improvement Plan Review Committee questions the rigor of this Ph.D. program experience. In addition, the finding that few Ph.D. students receive financial support from the program beyond those with Graduate School Fellowships can have a negative impact on indicators such as time-to-degree and the likelihood of Ph.D. students receiving university positions upon graduation. The preferred doctoral degree for job placement in higher education is the Ph.D. If the commitment toward producing Ph.D. recipients is weak, that degree component should be removed. The Doctoral Education Improvement Plan Review Committee recommends careful oversight of all three doctoral degree programs in Higher Education Administration to improve the current situation.

Linguistics

Though boasting a solid completion rate (50 percent to 64 percent), this program suffers from a low yield rate (45 percent), has no minority students, and needs significantly greater institutional oversight. The program plan explains that students typically leave as a consequence of poor performance. But the report also laments the relative absence of adequate screening and recruiting. The document acknowledges the need “to scrutinize applicants more carefully” and to “remind faculty not to encourage marginal students” to apply and to enter the program. Finally, the program plan concurs with the NCR’s assessment of the “significant weakness in our department’s reputation.”

Music & Music Education

The quantitative indicators may be misleading, as the elision of a strong music program and a considerably weaker music education program distorts the metrics, masking the strengths of the former and hiding the shortcomings of the latter. Furthermore, the extraordinarily low stipends in the music program pose vexing challenges for the recruitment of top students.

Nuclear Engineering

The Nuclear Engineering program went through a catastrophic upheaval from 2009 to 2011. Several faculty members left or retired; the Medical Physics part of the program moved to the Department of Biomedical Engineering, and the remaining faculty merged with Materials Science and Engineering, with one faculty member moving to Mechanical and Aerospace Engineering. At the time the report was written, there were only two junior faculty members in the program, with plans to hire four more including the program director. It is not clear that the program will be able to reconstitute itself to a reasonable size and quality under the cloud of its history and the current financial crisis.

Nursing Science

The Nursing Science Ph.D. Program averages 20 applicants, nine admission offers, and seven acceptances per year, with a five-year average program size of 28 full or part-time students. The program reports particular difficulty attracting minority students. Doctoral students’ average time-to-degree is 5.3 years. Among the 20 faculty members holding graduate faculty status, the program allows nine to chair doctoral dissertations. These nine faculty have each graduated one or two doctoral students in the past five years. The program also has difficulty attracting new faculty, with three endowed-chair positions and three tenure-track positions currently unfilled. The Doctoral Education Improvement Plan largely involves continuing current efforts. To enhance student employment opportunities after graduation, it plans to encourage students to consider its newly faculty-approved dissertation option of writing publishable manuscripts instead.

Philosophy

Admissions to this program were suspended in 2009. Even before the suspension, however, the completion rate was low; for the 2000-03 entering cohort, 33 percent of Ph.D. students completed the Ph.D., and 9 percent of students left the program each year between 2004 and 2008. Data since the suspension of admissions—on the size of the program, the number of Ph.D.s produced each year, and the number of Ph.D.s produced per graduate faculty member, for example—are misleading, since new students have not replaced those who have left the program or completed their degrees. The program’s plan for the future, which advocates lifting the suspension on admissions, focuses on state and local recruitment.

Plant Pathology

The Plant Pathology Graduate Program is in the process of transition, with a significant turnover in faculty and the recent appointment of a new chair. While the program has been adequate, there is little evidence of a compelling vision to push the program upwards in quality and quantity. The hiring of six new faculty members should provide an impetus for increasing the size of the graduate program. The current five-year plan, however, is weak, and it is imperative that the new chair, working with the faculty, revise the plan in light of recommendations by this committee to develop a document that can lead to significant improvements in the program. The program has an extremely strong Ph.D. completion rate of 88 percent but low enrollment and a very low graduated-Ph.D.-to-faculty ratio of .08.

Political Science

While the students are solid, this program suffers from a low completion rate of 39 percent for the 2002-05 cohort and an attrition rate of 55 percent, both are which are unacceptable. Additionally, the program suffers from low selectivity (47 percent), a low yield rate (35 percent), and a lack of direction. Low stipends and the requirement of travel for some areas within the programs probably contribute to the attrition problem but do not account for a major portion of that picture, though all of the CLAS programs in which extensive travel is required for dissertation research suffer from low completion rates. This is an area that should be addressed for many programs.

Spanish

Ph.D. students enrolled in the Spanish program have the lowest GREs at UF, averaging a combined 956. The program's plan calls for more selective recruiting but provides few details.

Wildlife Ecology and Conservation

An international reputation in tropical ecology is a strength of this unit, so that many foreign students with their own funding apply to the program. Like most IFAS programs, quantitative measurements of faculty productivity are skewed by the fact that a proportion of the faculty has extension appointments. In addition, some faculty members are at Research and Education Centers (REC), and it is difficult to recruit students to these locations. The five-year plan is a weak one that identifies some issues affecting the program (for example, graduate education at RECs) but does not provide clear solutions or ways forward. There are many statements such as "we should do . . ." rather than "we will do . . ."

APPENDIX 4

Best practices from examination of the graduate programs at UF

The Committee gleaned from both the submitted reports and the broader experience of its individual members a list of practices worthy of consideration by all Ph.D. programs. The Committee recognizes that these practices do not fit all units equally well, but all programs should be receptive to the underlying intent of these activities and should be willing to tailor them to their own context.

1. Each program should provide prospective students with access to the program data compiled by the graduate school.
2. Programs should recruit prospective students as juniors, if possible, to optimize the chances of securing commitments for matriculation.
3. While many programs conduct telephone interviews during the recruitment process, it is also important to place personal telephone calls to accepted students to maximize the chances of securing commitments from the top applicants.
4. An effort should be made to analyze peer school admissions; following up on accepted-but-not-matriculated students can help to determine where they enrolled and, most important, why they chose to study elsewhere. This information can enhance and strengthen our recruitment process.
5. Each program should develop and regularly update a handbook for entering students.
6. Each program should organize a graduate student or department retreat at the beginning of school year (This helps to immerse the student into the program more quickly).
7. Each program should establish a student organization for graduate students; such an organization has numerous benefits to the program.
8. Some programs may find it very helpful to assign a more senior student as a peer mentor. (This can be coordinated by the student organization.)
9. Each program should communicate with students regarding its expectations from a Ph.D. mentor/chair of committee and the dissertation committee.
10. Programs should require regular meetings of dissertation committees throughout a student's program, with at least one per year. In addition, each student should submit an annual reports of his/her activities for the year, and this document should become part of the student's file.
11. Each program should consider providing funds for all first-year Ph.D. students to attend a national meeting to observe presentations by leaders of the field and to see how more senior students present their research in poster format. This also can allow students to get a feeling for the job-placement services provided by national organizations.
12. All opportunities for graduate-assistant funding should be provided on the program's web site, which should also list open positions.
13. Programs should mentor students in all aspects of proposal development and grantsmanship.
14. Programs should provide benchmark awards (such as an increase in stipend) for students who have passed their qualifying exam or been awarded outside grants or fellowships.

15. All programs should actively pursue external funding to support students via research, training, and dissertation grants from federal and state agencies and private funding agencies.
16. Efforts should be made to expose students to successful professors in the field through seminar visits, guided reading assignments, and regional and national/international meetings.
17. In the final year, programs should provide mock job interviews to assist students in obtaining the best placement.
18. Programs should conduct exit interviews with all graduating Ph.D. students and students leaving the program early to assess their experiences and to learn from the students' perspective what features of a program were best and what features need improvement.
19. It is critical for optimal evaluation of the success of a graduate program that the programs collect and report job placement data for their graduates. This is a vital parameter and will require ongoing communication with graduates.
20. Programs should highlight the accomplishments of alumni (including job-placement information) on its website.

The Provost also asked for some additional comments in the specific "Five-Year Plan" for improvement of each graduate program. In his request to the leaders of each program, he asked "...please address a paragraph each to: recruitment, retention, mentoring, size of program, graduation statistics (numbers, time-to-degree), involvement of graduate faculty in doctoral education, minority support, internal and external funding, program structure and expectations, clarity of communications with students, and professional development opportunities." The following paragraphs will offer some general points about the overall responses from the programs that were provided to the Provost and evaluated by the committee.

Recruitment

In the majority of programs the recruiting of new graduate students has been left to the efforts of individual faculty members. On the one hand, this is a good system because typically a professor will communicate with a counterpart in another university, for example in China, and ask for recommendations of graduating seniors who may wish to come to UF for graduate study. Because the UF professor may have developed strong ties with his/her colleague at an outstanding university in China or other country, this can result in good recommendations and successful students. On the other hand, this system can result in highly variable student quality and questionable admissions to graduate programs.

It was not made clear by most programs that use this system whether or not a faculty committee is charged with overseeing the quality of admitted graduate students and vets the candidates. Such a committee could be composed of professors who are actively seeking new graduate students to obtain applications and provide a joint evaluation of the candidate's qualifications. A secondary benefit of this type of system would be that more faculty would become familiar with the new students and would thus have a greater impact on their initial training and mentoring.

Mentoring

Again, in the majority of cases, the mentoring of new graduate students is left in some cases to the professor who recruited them to come to UF and in whose laboratory the student will most likely carry out his/her doctoral work. This system has the one advantage of utilizing the

professor who cares the most about the success of that student. However, such a system is also subject to great variability in the quality of the effort because every professor does not approach mentoring with a similar enthusiasm, training, or experience. In other cases, the student is assigned an initial mentor by the program.

One possibly better system would utilize both the person responsible in each for management of the progress of the students through the program, typically called the “Graduate Coordinator” or similar term, plus a committee of faculty who, again, are highly interested in the management of graduate training. While this asks faculty to do some extra work, the benefits in terms of consistency in training students would be well worth the effort. The professor who may have initiated the recruitment of a specific student can play a leading role in this mentoring, but they would have the assistance of their peers in the process.

Another proposal is that the Graduate School should play a more proactive role in this issue, i.e., establishing standards for mentoring of students, for writing of program handbooks for students entering the program, and for monitoring student progress toward advancement to candidacy. By developing workshops where all program coordinators could be taught the common expectations expected for all graduate programs at UF and the best practices utilized at successful programs at UF and elsewhere, the entire focus of graduate programs could be better coordinated. The role of the graduate coordinators should be clarified so that their efforts are respected and rewarded. This system, or one similar to it, might provide a better means to ensure that each student is attended to and reduces the likelihood of anyone “falling through the cracks.”

Size of Program

In a very diverse university, there will be variation in the size of the different graduate programs. Some appear to be so small that they might not be viable for the future. Others appear to be larger than needed and have high attrition rates most likely because a number of students are not sufficiently attended to; such programs could be improved by better recruitment of higher-quality candidates, in most instances, and improved mentoring in most. An additional problem related to large programs with high attrition rates are low (or even no) stipends provided to doctoral students.

Each program must decide what the field offers in terms of future employment for its graduates and must recruit a suitable number of students for training opportunities. Admission of excessive numbers of students to serve as assistants to the professors for whatever reason without solid job prospects is not conducive to building a high-quality program.

Graduation Statistics (Numbers, time-to-degree)

The numbers reported by the different programs are, in general, improved over the numbers that were collected for the National Research Council report during the 2004-2006 timeframe. Record keeping is also more complete in respect to these numbers, but in nearly all cases further improvement is warranted. The Graduate School has made this a very high priority over the past few years and is continuing to emphasize systematic record keeping. However, the various programs must take the lead in maintaining contact with their graduates as they are the closest points of contact for students.

Involvement of Graduate Faculty in doctoral education

It is now very clear that less than half of UF professors are fully engaged in serving as the primary faculty mentors in Ph.D. education and training, while many other professors have missions including teaching, extension, and clinical care that prevent them from being actively involved in the process.

It should also be emphasized that many of these professors play important roles in serving on Ph.D. dissertation committees and thus mentoring students during the training years through to the completion of the degree. However, assessments such as the National Research

Council effort use the ratio of the number of graduates to the number of faculty in a department or program eligible to serve as a primary mentor or to serve on a dissertation committee. It is time to more clearly define graduate faculty status and purge the rolls of many graduate programs of large numbers of faculty without sufficient time or resources to train Ph.D. students.

Support of minority enrollment

All programs indicated their support for improved minority enrollment in Ph.D. programs; accomplishing this, however, will require greater effort than has been described in the reports. Some programs actively recruit at minority conferences around the country, and the administration should encourage and support this practice. Programs seeking to more effectively recruit and enroll minority students can collaborate with the Graduate School's Office Graduate Minority Programs, which is eager to work with graduate programs on recruitment efforts.

Internal and external funding

This is the hardest aspect of the reports to evaluate simply because there is such a large variance between programs in the sciences and in the humanities, as well as among other programs. Some fields are not able to take advantage of the external funding mechanisms that are available to others. Consequently, some programs are completely dependent upon funding through the Graduate School or through college resources to support graduate students. With the exception of the Graduate School fellowships (full stipends up to \$25,000), these typically pay lower stipends relative to similar programs at peer institutions, with the result being that the quality of graduate students attracted to some programs are below acceptable standards. In addition, the attrition rate in these low-stipend programs can be very high as students give up and pursue other career opportunities, including quality jobs where an advanced degree is not required (e.g., Mindtree). Additional mechanisms must be identified to provide resources in these cases or else reductions in the number of graduate students enrolled will have to be considered in such programs. On the other hand, reductions in Florida residents will have negative effects of state funding to UF. Efforts to combine professors from different departments and colleges on some grant applications should be encouraged by the higher administration. This should be accomplished by clearing away barriers, such as those established with the employment of RCM, for such interactive programs, and funding should be provided to encourage such collaborative efforts.

Program structure and expectations

Too often the reports provided were deficient in thoughtful planning, and graduate programs seemed content with the *status quo*. Additional effort needs to be made in revising and reconfiguring program structures to achieve the improvements in graduate education that will be necessary to bring UF into a leading position in the production of Ph.D.s for tomorrow's jobs.

Clarity of communications with students

This is another area in which many programs defaulted to the dissertation advisor of the student and expected all training and expectations to be handled that way. Again, the potential for extreme variability in the outcome of the graduate experience is unacceptable at a major research institution. From the outset, graduate coordinators should make students fully aware of the expectations for them and for their advisors. Students should be annually assessed, initially by advisors and then by their doctoral committees, regarding their level of progress, and this information should be reported to the graduate coordinator.

Professional development opportunities

While there was a considerable spread in the level of opportunities provided to graduate students in the different departments and colleges, most programs seem to understand the

importance of this concept. It is recommended that the campus as a whole work to develop advising practices that emphasize the breadth of opportunities for graduates with advanced degrees, which can include non-academic positions, such as with companies developing new software, with government or non-government organizations, with publishing companies, intellectual property advisory, and others.

APPENDIX 5

Committee Composition, History, and Procedures

Following the release of a report on the status of Ph.D. education at the University of Florida in 2011, Provost Joseph Glover directed deans, department chairs, and graduate coordinators to respond to a structured questionnaire regarding their graduate programs. The Provost also requested that each program prepare a “Five-Year Plan” to address weaknesses and articulate procedures to improve Ph.D. education.

To assess the plans, the Provost established a committee composed of a representative mix of distinguished professors and key administrators, many of whom served on a preceding committee that assessed Ph.D. programs in light of the recent National Research Council report.

2011-2012 Doctoral Education Improvement Plan Review Committee

Ben Dunn, Chair (Medicine)
Jeffrey Adler (Liberal Arts and Sciences)
Joseph Alba (Business Administration)
Sheila Eyberg (Public Health and Health Professions)
Henry Frierson (Dean of the Graduate School)
Kenneth Gerhardt (Senior Associate Dean of the Graduate School)
Cynthia Griffin (Education)
Raphael Haftka (Engineering)
Peter Hansen (Agricultural and Life Sciences)
Paul Koonce (Fine Arts)
Scott Powers (Health and Human Performance)
Ann Progulske-Fox (Dentistry)
Douglas Soltis (Liberal Arts and Sciences)
Marie Zeglen (Director of Institutional Planning and Research)

The committee met for several hours on most Tuesday mornings during the Spring 2012 semester. It considered each program individually and (for the most part) alphabetically on two separate series of meetings. The first pass through the list resulted in preliminary evaluations. A second pass was then made in light of the assessments from the initial review. Finally, the committee voted on choices for the top programs and noted programs with deficiencies. Committee members were assigned to write summaries of programs, which are collected in Appendices 1-3.