Assessment of Graduate Student Productivity and Satisfaction

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Abstract

The relative quality of graduate programs in the agricultural sciences is important for recruitment of students and for program improvement. The National Research Council (NRC) conducted a survey of doctoral programs across the country in 2006, but most areas of agricultural science and master's students were not included. Programs not included may desire to conduct surveys similar to the NRC study to fill this void. The authors conducted a survey of graduate students in the College of Agricultural and Life Sciences at the University of Florida, patterned after the NRC study. Master's and doctoral students indicated general satisfaction with their program. Most students were generally satisfied with advice received and resources available. Differences exist between Master of Science and doctoral students in terms of productivity, which is not unexpected given the goals of the separate programs and the time committed to complete the degree. More opportunities to gain teaching experience would be helpful for students who anticipate an academic career. The results of this study can be used by other institutions in surveying graduate students who were not part of the NRC project.

Introduction

The College of Agricultural and Life Sciences at the University of Florida maintains one of the largest graduate enrollments of any college of agriculture and related sciences in the United States (FAEIS, 2008). With more than 1,100 students enrolled, graduate degrees are offered in 23 fields of study. Graduate education is a vital part of the mission of the College and of the University.

The major goal of graduate education is to prepare students for academic, government or private sector careers in their chosen field or for further study. Identifying and addressing students' needs and expectations allows institutions to attract and retain quality students as well as to improve the quality of their programs (Elliot and Shinn, 2002). Student outcomes, including productivity while enrolled in a graduate program, can be a key measure of the quality and effectiveness of the degree program

(Hatcher et al., 1992; Redd, 1998). Student satisfaction has also been found to be one of the factors that affects the quality and overall effectiveness of a program (Aiken, 1982; Astin et al., 1987; Bailey et al., 1998).

In a summary of graduate students at the University of Maryland Baltimore County (Univ. of Maryland Baltimore County, 2000), students reported overall satisfaction with the quality of instruction, quality of their program and level of challenge. Less satisfaction was indicated regarding professional development opportunities (Univ. of Maryland Baltimore County, 2000). Although the survey was administered prior to the NRC study, the university stated as its goal to gauge student satisfaction in graduate programs.

A similar, but broader-focused, study at the University of Colorado-Boulder (2005), which also pre-dated the NRC study but was designed to collect similar information, included both master of science and doctoral students. Overall satisfaction with research opportunities was high; doctoral students had published more frequently than master's students; most indicated they had some experience in teaching; and the majority of respondents indicated satisfaction with their relationship with their research advisor (Univ. of Colorado-Boulder, 2005).

Results of the graduate student survey at Oklahoma State University in 2008 reported strengths and weaknesses of the graduate program as reported by currently enrolled students (Oklahoma State Univ., 2008). Perceived program strengths included relationship with faculty, faculty expertise, curriculum, research opportunities, and relationship with other students, among others. Perceived program weaknesses included course availability, course content or rigor, relationships with faculty, and financial support (Oklahoma State Univ., 2008). The Oklahoma State study addressed programs to a greater extent than student satisfaction and did not address student productivity during the graduate program.

Barrick et al. (2006) investigated the perceived current and ideal roles of graduate student faculty mentors at the University of Illinois. Graduate students reported that the availability of the mentor

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for help with research, regular and constructive feedback on progress toward degree completion and on their research, and information on career opportunities were currently less than their ideal expectations (Barrick et al., 2006). Patterned after an earlier study at Wisconsin-Madison, the Illinois study was narrowly focused on faculty mentoring as it is related to student satisfaction.

To meet the expectations of graduate students, to help ensure student success, and to provide information that can be used to strengthen graduate programs, data regarding student progress toward earning the degree as indicated by their productivity, as well as their satisfaction with the program, is essential. With increased information covering productivity and satisfaction, recommendations for change in programming could be warranted. Further, this study could provide guidance for other colleges that desire to investigate graduate student productivity and satisfaction, similar to the NRC study, especially for programs not included in the NRC study and for master's degree students.

Purpose and Objectives

The purpose of the study was to examine the overall productivity and satisfaction of graduate students enrolled in the College of Agricultural and Life Sciences. Specific objectives included:

1. Assess the productivity of graduate students enrolled in the University of Florida College of Agricultural and Life Sciences.

2. Assess the satisfaction of graduate students enrolled in the University of Florida College of Agricultural and Life Sciences regarding their graduate program.

Methodology

Population. The population for the study was all students enrolled in a graduate program offered through the University of Florida College of Agricultural and Life Sciences during the spring semester, 2009. A total of 1,113 students were included in the study.

Instrument. In 2006, the National Research Council (NRC) conducted a study of selected doctoral programs in the United States. The survey instrument used in the NRC study focused on satisfaction and productivity of doctoral students and was adapted for use in this study (Ostrike et al., 2009). The primary change in the NRC instrument was to revise selected questions so that responses from master's and doctoral students could be separated since the NRC instrument focused only on doctoral education. The instrument included a total of 50 items and used a branching logic to guide students to sets of questions based on their specific degree (master's or doctoral). The NRC study also collected information regarding programs, departments and

the institution; those portions of the NRC study were not included in this survey.

Data Collection. The survey instrument was administered electronically. Email addresses for all enrolled graduate students were obtained. An initial email was sent to all College of Agricultural and Life Sciences graduate students on March 1, 2009, with a link to the survey web site. Two follow-up email reminders were sent to non-responders, asking for their participation. A total of 492 usable responses were received by April 1, 2009.

Results

Demographics. Generally, the respondents reflected the demographics of the [College] graduate student population. Of the 492 respondents to the survey: 49% were master's students, 51% were doctoral students; 43% were male, 57% were female; 48% were married or living in a relationship; 92% have no children; 72% are U.S. citizens; and 71% are White, 14% Hispanic, 14% Asian, 5% Black, 4% Native American or Pacific Islander.

Productivity. Presentations and publications are common metrics of student research productivity. As shown in Table 1, students increase the number of presentations as they continue their graduate program. The most common location for doctoral student presentations is on-campus conferences followed by national meetings. Master's students presented at similar locations but at a lower rate.

Respondents also indicated that they expected to generate from none to six or more publications from their thesis or dissertation. The most frequent response was three publications. (Table not included per reviewer recommendation.)

Both doctoral and master's students continue to publish during their graduate program, as seen in Table 2. Both groups of students also authored or co-authored refereed articles most frequently, followed by abstracts, prior to enrollment in the graduate program. After enrollment, graduate students also primarily publish authored or co-authored refereed articles followed by abstracts (Table 2).

Goals and Training. Graduate student career goals do not change dramatically before and after the students enroll in the graduate program. The primary goal at both times is research and development, followed by teaching, professional service, management/administration, and other (data not shown).

Students were asked to indicate whether they had participated in 11 formal or informal instruction, practice or development training activities (Table 3). The four activities reported most frequently were: writing proposals for funding, oral communication and presentation skills, preparing articles for publication, and conducting independent research/scholarship, with participation ranging

Table 1. Percent of Students who have Made Research Presentations, Including Poster Presentations, by Number of Years since Matriculation and Location of Presentation

	Years Since Matriculation							
	% of Master's Students (N=208)			% of Doctoral Students (N=242)				
Location	1 year	2 years	> 2 years	1 year	2 years	3 years	4 years	> 4 years
	n = 100	n = 80	n = 28	n = 72	n = 51	n = 44	n = 48	n = 27
On-campus Conference	20	55	40	38	64	74	61	87
Regional Meeting	16	39	27	34	62	54	60	63
National Meeting	13	42	42	39	52	71	63	70
International Meeting	8	13	14	24	44	63	46	71

Table 2. Percent of Students who have authored and/or Co-authored Publications Before and During Enrollment, by Year of Matriculation

| | % of Master's Students (N=208) | | | % of Doctoral Students (N=242) | | | | |
| Publications | 2008 | 2007 | 2006 or before n=28 | 2008 | 2007 | 2006 | 2005 | 2004 |
	n=100	n=80		n=72	n=51	n=44	n=48	n=27
Before Enrollment								
Refereed articles	17	13	20	46	58	63	61	58
Book chapters	0	2	0	20	17	5	0	17
Book reviews	0	2	0	3	5	0	0	17
Abstracts	11	12	10	41	38	44	53	50
Popular press	4	8	0	20	30	23	17	29
EDIS*	8	2	6	10	5	17	9	17
After Enrollment								
Refereed articles	19	32	24	35	63	69	67	78
Book chapters	2	2	0	0	19	23	25	10
Book reviews	0	0	0	6	5	0	4	10
Abstracts	14	29	22	34	46	60	61	64
Popular press	0	20	6	11	40	35	38	33
EDIS*	10	42	0	19	24	28	24	33

*EDIS – Electronic Data Information Source, [Cooperative Extension Service]

Table 3. Percent of Students who have Participated or Plan to Participate in Formal or Informal Instruction, Practice or Development Training

Activity	Percent		
	Formal	Informal	Do not plan to participate
Writing proposals for funding	49	34	26
Oral communication and presentation skills	48	49	16
Preparing articles for publication	42	54	12
Conducting independent research/scholarship	42	49	18
Teaching/pedagogy	38	43	29
Working in collaborative groups	36	53	20
Research/professional ethics	30	51	24
Preparation for job interviews	29	48	28
Speaking to non-academic audiences	27	55	27
Project management	26	54	24
Supervision and evaluation	25	50	32

Note. Respondents could indicate more than one type of program.

Table 4. Graduate Student Teaching Experience by Matriculation Date

Experience	% of Master's Students (N=208)			% of Doctoral Students (N=242)				
	2008 n = 100	2007 n = 80	2006 or before n = 28	2008 n = 72	2007 n= 51	2006 n = 44	2005 n = 48	2004 or before n = 27
Mentor a high school student	13	19	15	16	18	15	18	14
Mentor/Tutor an undergrad	38	38	31	49	49	46	48	52
Mentor/tutor A grad student	7	17	23	26	38	32	32	52
Grade papers for an undergrad class	56	57	46	73	51	63	72	57
Lead discussion Sections	49	42	15	56	44	42	42	48
Lead lab sections	32	17	23	47	28	49	58	33
Guest lecture	25	49	23	71	51	73	72	86
Teach a course based on set curriculum	17	19	23	42	33	37	30	29
Teach a course based on curriculum you developed	7	15	23	29	29	24	15	16

Table 5. Formal, Periodic Assessment of Academic Progress

Assessment of Progress	Percent	
	Yes	No
Program provides a formal, periodic assessment of student's academic progress	75	25
Assessments are helpful	80	20
If assessment is helpful, was feedback timely	78*	12

* Five percent of respondents indicated that feedback was timely but not helpful.

Table 6. Source of Career Advice

Source of Career Advice	Percent
An individual who serves as both an adviser and mentor	35
Adviser	23
Committee chair	12
University-wide career office	12
Mentor	7
Other	7
Graduate program director/coordinator	4
Program staff	1
College office	0

Note. Respondents could indicate more than one source.

from 34 to 54% for each. The activities that graduate students participated in least frequently were formal programs on preparing for job interviews (29%), speaking to non-academic audiences (27%), project management (26%), and supervision and evaluation (25%).

Teaching Experience. Respondents indicated the extent of their involvement in teaching, whether completed or planned, during their graduate studies (Table 4). The most common experience for doctoral students was grading papers for an undergraduate course, followed by leading discussion sections. The most common experiences for master's students were also grading papers for an undergraduate course and leading discussion sections, followed by mentoring/tutoring an undergraduate student (more frequently for students who matriculated in 2006 or before).

Satisfaction. Students responded to a series of questions and statements associated with their satisfaction with various parts of the graduate program. Three-fourths of the respondents indicated that the graduate program provides a formal, periodic assessment of their work, 80% perceived the assessments to be helpful, and 78% indicated the assessment was timely. A small number (5%) indi-

cated that assessments were timely but not helpful (Table 5). Eighty-two percent of the students indicated that they were provided written expectations about academics when they enrolled.

Respondents identified the sources of any career advice they had received (Table 6). The most frequently named source was an individual serving as adviser and mentor (35%), followed by adviser (23%), committee chair (12%) and university-wide career office (12%). No student identified the college office as a source of career advice.

Nearly three-fourths of the students indicated that they had access to career advice, but 61% indicated that they had not taken advantage of that opportunity.

Students rated their relationship with their adviser and with faculty in the program on a scale ranging from highly interactive, supportive to distant, antagonistic or hostile (Table 7). Both groups of students rated their relationship with their adviser as highly supportive (59% Master's, 68% doctoral). Students most frequently rated their relationship with other faculty as somewhat supportive (42% Master's, 44% doctoral). All but 7% of the students indicated that other students in the program were somewhat or very supportive. Three-fourths of the students were satisfied or very satisfied with the social interaction activities, and 90% indicated they felt they "belonged" in the program.

Respondents also indicated their satisfaction with various aspects of the program (Table 8) on a 5-point scale from 1=Not satisfied to 5=Satisfied. Both groups rated teaching by faculty the highest (4.27 master's, 4.02 for doctoral). All program aspects were

Table 7. Relationship with Faculty Adviser and Faculty in Program

	Percent				
	Highly interactive, supportive	Somewhat supportive	Neutral	Somewhat Unsupportive	Distant, antagonistic or hostile
Master's students					
Faculty Adviser	59	24	11	5	2
Faculty in Program	36	42	20	2	0
Doctoral students					
Faculty Adviser	68	20	7	3	2
Faculty in Program	32	44	20	4	1

Table 8. Satisfaction with Aspects of the Graduate Program

	Mean Rating	
Program Aspects	Master's Students	Doctoral Students
Teaching by faculty	4.27	4.02
Intellectual environment of institution	4.24	4.05
Intellectual environment of program	4.17	3.97
Quality of the program	4.15	4.07
Curriculum	3.87	3.71
Research experience	3.19	4.00
Thesis and dissertation supervision	2.88	3.76

Scale: 1 = not satisfied to 5 = satisfied

Table 9. Perceived Adequacy of Support Available

	Percent					
Support	Excellent	Good	Fair	Poor	N/A	Don't know
Library resources	49	38	8	3	1	1
Computer resources	41	37	14	5	1	2
Recreation/athletic facilities	34	31	11	2	11	12
Personal workspace	34	30	15	8	11	3
Other research, field, or laboratory facilities	31	39	11	4	8	7
Health care	20	30	18	9	12	10
Social interaction space	16	24	22	26	8	4

rated above the mid-point of the scale except one. Master's students rated thesis and dissertation supervision 2.88 on the 5-point scale.

Students rated seven areas of support on a 4-point scale, from Excellent to Poor (Table 9). At least 50% of the students rated each of the support sources as Good or Excellent, except for social interaction space. Library resources were indicated as excellent most frequently (49%), followed by computer resources (41%).

Approximately 50% of the respondents indicated they had received funding for travel to professional conferences from the Graduate School or the College. Nearly half of the students were research assistants, one-fifth were teaching assistants, and one-fifth received a fellowship, with the typical stipend between $15,000 and $20,000.

Conclusions, Discussion and Recommendations

Based on the results of the survey, the following conclusions and recommendations are posited. Differences exist between Master of Science and doctoral students in terms of publication and presentations of research. Doctoral students have typically published or presented at twice the rate of master's students, similar to findings at the University of Colorado-Boulder (Univ. of Colorado-Boulder, 2005). This would be expected since doctoral students would have had more experience and perhaps more assistance in research. Opportunities for continued participation in these activities are recommended.

The largest portion of graduate students indicated their career goals to be in research and development. Likewise, the largest participation in training programs was in activities related most closely to research. Therefore, it appears that training programs are supportive of students' career goals. However, if the preparation for an academic career is central to the mission of the graduate program, additional training opportunities in teaching may be warranted. Less than half of the doctoral students have had experiences in teaching a course, similar to findings at Colorado (Univ. of Colorado-Boulder, 2005); interestingly, less than a third indicated a career goal of teaching. To meet future needs, more students may need to be encouraged to pursue teaching and be afforded teaching opportunities to complement their academic preparation in research.

Generally, students provided positive responses regarding the assessment of their academic progress. Concern is raised, however, about the 20% to 25% who indicated that formal and periodic assessment was not provided and/or not helpful. These results are similar to those reported by Oklahoma State (Oklahoma State Univ., 2008). In subsequent discussion, Graduate Coordinators in the college purported that all students are being evaluated, but they may not be aware that they are being formally evaluated.

The goal should be that all students are provided periodic, formal and helpful assessment of progress.

Students were generally positive about career advice and relationships with faculty, which differed from Oklahoma State (Oklahoma State Univ., 2008). More information is probably needed to ascertain why a small proportion of the students indicated that advisers and faculty are unsupportive.

Overall, graduate students indicated that they were satisfied with various aspects of the program. Individual graduate programs may need to conduct follow-up studies to gather additional information regarding satisfaction with the curriculum.

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