



# Communicator

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## Professional Science Master's Update: The Internship Component

Before the Professional Science Master's was developed, co-op programs—alternating work semesters with study semesters—were already standard at a number of institutions (such as Northeastern which became a PSM locale in 1998). But co-ops and internships tended to be aligned with undergraduate programs. For many undergraduates, it was the road to a job, while for employers it was the most effective method for recruiting new college graduates. Indeed, of the 2009 graduating seniors who have already landed a job, 73 percent had an internship at some point in their college careers.<sup>1</sup> What characterizes the PSM internship and makes it somewhat unusual is its place in graduate science programs and the far more intimate and intentional relationship between math and science program directors and off-campus internship providers.

The reason for this close relationship is that PSM programs are designed to supply non-academic employers with science- and math-trained professionals. In order to assess overall demand for graduates, keep the PSM faculty abreast of workforce needs, and provide input into the program, the programs set up employer advisory boards, made up of individuals who are well positioned to seek out or develop in their own firms appropriate internships for PSM enrollees. Faculty connected with the PSM learn how to prepare their graduate students for real-world work off campus and create means by which students will integrate their experience into their overall program.

“For a student [internships] provide an education experience with research that is broad and deep,” says Dr. Sal Genovese, Director of the Three Seas and Marine Biology program at Northeastern University. Dr. Genovese goes on to explain that the goal of their program and specifically the internship is to “produce self-sufficient scientists.”

For the majority of the PSM programs, the internship is standard, but has variations. In a recently conducted survey of the PSM program websites by the authors, well over 80% listed an internship as a program requirement.<sup>2</sup> There were two exceptions to this rule: some of the programs catering to working professionals and some of the bioinformatics programs did not require an internship. Many of these programs did however require a team or capstone project done in conjunction with employers. In addition, some internships are paid, others are unpaid. Some programs give credit for an internship, others do not.

Through a detailed analysis of PSM program websites, and specifically the program's internship characteristics, we will discuss examples of PSM internship models, both the standard model and PSM internships that are breaking new ground.

### The Standard Models

#### *Middle Tennessee State University*

Students enrolled in Middle Tennessee State University's PSM program take a range of PSM courses, including an internship, as part of its curriculum. The program's growth has been rapid and sustained, beginning with three enrollees in one track in 2005-06, increasing to 61 students in three tracks in 2008-09.

With specializations in Biostatistics, Biotechnology, and Health-care Informatics, the program has an advisory board which includes 20 employer-partners from for-profit enterprises such as BioVentures, National HealthCare Corporation, BICC Biostatistics, and from the Tennessee Bureau of Investigation.

Most of MTSU's PSM students are attending the university full time and thus have little experience in a tech-business environment. Thus, their internships are an essential part of their readiness for work. Because their science courses prepare them for real-work experiences, interns are valued at the Tennessee Bureau of Investigation, at nearby hospitals, environmental water supply firms and even at a local orchid farm. The internship is part of the program's business core, so it allows interns to develop professionally by exposure to lab management, problem solving in a business or agency environment and teamwork.

The commitment on the part of the employer is substantial. To provide multi-layered exposure to science in a business/government environment, the

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## PSM Update

employer has to assign a manager to mentor the intern and a special project for the intern. At the end of the internship, the intern produces a report on the project, including his or her own contribution, in the presence of the company's supervisors. The employer provides a written evaluation of the intern's performance. The commitment on the part of the student-intern is substantial. MTSU requires 250 hours or 6 weeks of work, or fewer hours/week over an entire semester. Linda McGrew, who serves as the coordinator for the business component of the MTSU PSM program, considers the students' internships a capstone course culminating in a single day of formal presentations.<sup>3</sup>

### *Case Western Reserve University*

A similar model is being used by Case Western Reserve University, where an industry liaison acts as a student mentor, while providing an essential link to the employer. According to Edward Caner, Director of Innovation and Entrepreneurship Programs, Case Western employs a structure, which places a large amount of responsibility on the students to go out into the field, knock on doors and pick up the phone to obtain an internship.

Case Western PSM programs also create an environment where students have additional opportunities to interact with employers.<sup>4</sup> Business leaders come to class, hand out problems to students, and turn the discussion into a case-study. Students receive immediate feedback as well as an overall idea about what regional industries are looking for and how PSM graduates can contribute.

Dr. Caner stressed the importance of regular reporting from the students and strong communication between the student and their advisor to ensure the internship is meeting their program goals. More importantly, industry connections are being maximized to create the best opportunities for students to obtain full-time positions upon graduation.

### *Oregon State University*

Oregon State University has four PSM programs. The Environmental Science one has been in operation long enough to have attracted numerous public and private employers to its ranks of intern providers. Students take three- to six-month internships with environmental consulting or engineering firms, businesses involved in land use planning, or with agencies in the public sector such as the Environmental Protection Agency and the U.S. Department of Agriculture. The PSM program coordinator, Ursula Bechert, provides guidance, but it is up to the student to formally secure the internship. In the past several years, environmental science interns have traveled as far as Yuma, Arizona and Tustin, California to participate in internships.

Meanwhile, students in OSU's applied physics PSM have done work at the Jet Propulsion Laboratory, Micro Systems Engineering, Inc., and Hewlett-Packard. Students in applied systematics have worked at U.S. Fish and Wildlife Service and the U.S. Department of Agriculture.

## PSM Internship Variations

### *Pennsylvania State University*

While an internship is an optional component of Penn State's program in applied statistics, two one-credit Statistical Consulting Practicums are required for the PSM degree. In the first practicum, PSM students meet with researchers needing statistical consultation where they master report preparation and communication and presentation skills. After completing that course, students can satisfy the second practicum requirement either by completing an internship or by doing more consulting.

Off-site internships are individualized for PSM students, so no two Penn State PSM students ever take the same internship but all are closely monitored. The site supervisor provides an interim report halfway through the student's internship. At the end, the student reports in detail on the work setting, the work assignments, the challenges and opportunities and how the internship related to their academic program. Participating businesses have included employers such as Merck, Minitab, and the Bureau of Labor Statistics. The internship often leads to permanent employment at the firm.

A more traditional internship at Penn State is in the PSM program in biotechnology. It is done either in industry or government laboratories and involves R&D or product promotion/marketing or product development activities in the summer of the two year program. There is no limit to where the students can go for the internship, in fact a few of them have gone abroad. Internship hosts are not necessarily involved in the employer advisory board, which provides a broader feedback about the program through the required student evaluation by the host. A written report is required as well as an evaluation from the internship supervisor. Upon completion of the internship, a research paper is delivered.

### *University of Utah*

At the University of Utah, PSM internships are also fitted to students' interests and skills. Brian Vinton, Senior Consultant to Kennecott Utah Copper, a Utah-based copper mining company, says projects are "tailored to the existing skills of the intern and designed to expand [their] current knowledge by using various methods." For example, one student intern, in calculating transmissivity and lime and providing KUC with the results of her work, was able to help the company understand "how the plume area can be managed."

### *University of Dayton*

The Financial Mathematics program at the University of Dayton favors paid internships generated through its industry advisory board, the program director's professional contacts, and the university's career placement service. Students are also encouraged to do their own searches.

Since the internships are "paid jobs," the business manager designs the internship which is co-supervised by a university faculty member. While no report is required, employers are made aware that a problem originating in the internship may become the student's capstone project. Students have held internships in Dayton, Cincinnati, Cleveland, and as far away as Washington, DC.

## EMPLOYEE TESTIMONIAL

In speaking about a recent intern, Golriz Khadem Yazdanpanah, from the University of Connecticut's PSM in Applied Genomics, to whom he later offered employment at his company, Dr. Gualberto Ruano, President and Chief Executive Officer of Genomas, Inc. in Hartford, Connecticut, noted:

*"Her work at Genomas revolved much around high throughput BIO ROBOTS during which she gained ... experience in ... processing samples in a short period of time. She took an active part in the maintenance and calibration issues involving these instruments.*

*In the later part of her internship, Golriz was made to focus on generating and maintaining patient records .... She handled these tasks with utmost ease and performed the tasks as required.<sup>6</sup>"*

### Michigan State University

Michigan State University houses seven distinct PSM programs, some online, some targeted at mid-career professionals, and others, like Michigan State's industrial mathematics PSM, for full-time students. In this particular program, students can substitute an independent study course (for 1-3 credits) for their summer internship, but must submit a final technical report as well as regular progress reports throughout. Because the internship is not required, members of MSU's Employer Advisory Board are not expected to design internships or provide them for PSM students.

### University of Texas at San Antonio

After 12 semester hours of course work in the Industrial Mathematics program, students sign up for an Internship and Research Project. The goal of the required internship is to "provide students with hands-on experience in industrial mathematics in a professional environment." The program's business advisers actively participate in the design of the internships.

The university requires a pre-proposal or an internship/employment letter, an internship evaluation by the supervisor, and an internship report including a detailed description of the work done, the methodology employed and how it benefited both the student and the employer.

### University of North Carolina at Charlotte and the University of North Carolina at Wilmington

UNC-Charlotte and UNC-Wilmington require three hours of internship credit out of a 36-hour PSM graduate program in their Bioinformatics and Computer Science and Information Systems programs. Once an employer is identified, a form is completed that lists the tasks that will be performed, and commits both work supervisor and intern to weekly communications.

It is important to remember that the business only hosts the student. All requirements are determined by the graduate/intern coordinator in discussion with the students and, when needed, the employer. At the conclusion of the internship the employer and the student both fill out an evaluation form. Students also are required to write a report that describes the employer, the work accomplished, and reflections on "lessons learned."

### Breaking New Ground

#### University of Maryland, University College

One of the most innovative models is the completely online, virtual internship experience offered by the PSM program in biotechnology at the University of Maryland, University

College. The capstone course curriculum integrates a semester-long group project (virtual internship) working with a biotechnology company in the DC metro area. Project ideas are solicited from companies in this area.

In addition to the group project, weekly readings and discussion topics promote critical thinking and add real-life perspective. Central to the capstone course is exposure to bio-entrepreneurship, personal growth, and the role of biotechnology in society. By working with a start-up company, students experience how concepts in the classroom are applied in practice and the challenges and rewards of working in a small business.<sup>5</sup>

### North Carolina State University

The Professional Science Master's degree in Microbial Biotechnology at North Carolina State University has three components of the professional skills development through industry/academic relationships. The first component—Industry Cases—exists in course format and involves students working in teams on a project either on- or off-site of the company. At the course end, each team presents the project to classmates, professors, and industry professionals. Companies which have participated in these cases include: Wyeth, Bioplex Therapeutics, and Novozymes. The second component requires each student to do an internship at a pharmaceutical or biotechnology company, usually between the first and second year of the program. This concludes with a presentation to classmates, faculty and industry professionals. The third component, "adopt a professional student" mentorship program, allows students to interact specifically with one individual from industry.

### California State University System

Private sector employers in high-growth sectors in California are being encouraged to develop intensive, longer-term relations with PSM faculty and students, meant to accelerate PSM placement.

Early stage, "pipeline internships" encourage undergraduates in science and mathematics to pursue an industry-based science career by placing them in rotating industrial assignments over two or three summers. A particular target population for these summer internships is under-represented minorities. Then, there are the more typical or semester-long paid internships for currently enrolled PSM students. "Extended duration recruitment internships" are designed to give the PSM in-depth work experience over six to 12 months as a pathway to permanent employment. Still in the design stage are internships of shorter duration for PSM students

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# Evaluating Applicants' Potential for Success in Graduate School: A New Tool

## Introduction

Whether they are called “noncognitive skills” or “personal attributes,” factors such as resilience and communication skills can play a significant role in determining success in graduate school. Currently, admissions committees rely on letters of recommendation to provide information about these qualities, which can be difficult to glean from GRE® scores and undergraduate transcripts.

As anyone who has ever served on an admissions committee can attest, however, interpreting recommendations is more a matter of art than science. It is necessary to read between the lines to determine what the letter writer is really trying to say. Is the recommender damning the applicant with faint praise or just not inclined to use superlatives? Is the writer's failure to mention a specific characteristic a meaningful omission or simply an oversight? And how is it possible that every student recommended by a certain faculty member is “the best student I have ever taught?”

Many graduate schools have attempted to make the information provided by letters of recommendation more quantifiable—for example, by structuring the questions and/or including check boxes and ratings on the recommendation forms. However, these “objective” changes have not been informed by research and, because they vary from institution to institution, do not permit meaningful comparisons among graduate schools. The lack of standardization also places a burden on evaluators who have to complete separate check box forms for each institution to which the student is applying.

## The ETS Personal Potential Index

The GRE Board has long been concerned with the lack of reliable information on personal attributes that are critical to success in graduate school. Following extensive research, researchers at Educational Testing Service (ETS) have developed a new instrument, the ETS® Personal Potential Index (ETS PPI).

The ETS PPI, which launched July 2009, is a web-based system for evaluating the personal attributes of applicants to graduate school. It yields information on six critical dimensions that graduate school deans and faculty have identified as essential for successful graduate study: Knowledge and Creativity; Communication Skills; Teamwork; Resilience; Planning and Organization; and Ethics and Integrity. As with conventional letters of recommendation, an applicant selects individuals to evaluate him or her—typically faculty members or supervisors. Unlike a conventional letter of recommendation, however, the ETS PPI is highly structured and provides standardized and quantifiable information, making it possible to compare candidates within a given year and from year to year—as well as from institution to institution. The ETS PPI evaluation report incorporates ratings from up to five evaluators, rather than

just one, adding to the reliability of the report.

The evaluation consists of 24 statements (four for each of the six dimensions) in addition to an overall evaluation. Evaluators use a five-point scale to rate the applicant relative to other students from the same department or unit who have gone on to graduate study. The scale points are “Below Average,” “Average,” “Above Average,” “Outstanding (Top 5%),” and “Truly Exceptional (Top 1%).” Evaluators may also provide comments for each of the six dimensions and for the overall rating.

ETS converts the ratings to numerical equivalents and computes means for each evaluator for each dimension, as well as for all evaluators across each dimension and for the “overall evaluation” category. The ETS PPI evaluation report provides graphical representations of the data and includes any comments provided by the evaluators. The reports are then sent to the institutions designated by the applicant. Sample Evaluation Reports, along with other information about the ETS PPI, may be viewed at the ETS PPI website: [www.ets.org/ppi](http://www.ets.org/ppi).

## Research Background

There has been a long history of interest in noncognitive factors by ETS as well as the GRE Board. Beginning in the late 1990s, extensive interviews were conducted with graduate school deans and faculty in an effort to understand qualities important for graduate school success. Interestingly, factors such as persistence and communication were more frequently cited than mastery of the discipline and ability to teach. Interviewees also expressed concern about the continued problem of graduate school attrition and time-to-degree, which they suggested might at least partly be accounted for by noncognitive factors.

These findings led the GRE Board to organize a special session at its 2001 Toronto meeting: “Noncognitive Traits and Assessments in the Context of Graduate Admissions.” At the meeting, a number of prominent researchers made presentations to the Board on what noncognitive factors might be most important to graduate school success and how they might best be measured. Subsequently, the GRE Board invited noncognitive experts to meet with them to discuss the possibility of adding noncognitive measures to the GRE. It became clear from that meeting that an evaluation of noncognitive abilities could not be accomplished by adding a section to the GRE, as self-assessments by applicants would be highly susceptible to faking and coaching. For this reason, the ETS PPI is based on ratings by others, rather than by the applicant. ETS scientists believe this is the only viable approach to measuring noncognitive factors in a high-stakes context at this time.

The instrument that became the ETS PPI has been extensively piloted, analyzed and refined. It has been used internally at ETS for the selection of graduate interns and

externally for the past three years through Project 1000, an initiative designed to increase the participation of historically under-represented groups in graduate school. ETS is continuing to study the instrument and is conducting a Validity Study that will examine the degree to which the ETS PPI predicts success in graduate school above and beyond traditional predictors, such as GRE scores and undergraduate grade-point average. Institutions that are interested in participating in the study should contact Dr. Cathrael Kazin at ckazin@ets.org.

### Summary

As Scott A. Bass, former Vice President for Research and Dean of the Graduate School at the University of Maryland, Baltimore County and now Provost at American University, has noted: “While we have objective information on the prior performance in undergraduate school and scores from the GRE, we lack standardized information on other important traits, such as persistence, determination and creative potential—all important factors in completing a graduate degree. The development of the ETS Personal Potential Index serves as an important step in providing admission decision makers with more background information about critical characteristics of the applicant.”

By Liora P. Schmelkin, Senior Vice Provost for Academic Affairs and Dean of Graduate Studies, Hofstra University

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## The ETS PPI

Evaluators—typically faculty members or supervisors—rate applicants relative to others in the department or unit who have gone on to graduate study. The ETS PPI covers six dimensions: Knowledge and Creativity; Communication Skills; Teamwork; Resilience; Planning and Organization; and Ethics and Integrity. Evaluators respond to a series of twenty-four statements (four for each of the six dimensions) by using a five-point scale that ranges from “Below Average” to “Truly Exceptional (Top 1%).”

Evaluators use the same scale to provide an overall rating for the applicant and can add optional comments for each of the six dimensions and for the overall rating.

The twenty-four statements are:

### Knowledge and Creativity

- Has a broad perspective on the field
- Is among the brightest persons I know
- Produces novel ideas
- Is intensely curious about the field

### Communication Skills

- Speaks in a clear, organized and logical manner
- Writes with precision and style
- Speaks in a way that is interesting
- Organizes writing well

### Teamwork

- Supports the efforts of others
- Behaves in an open and friendly manner
- Works well in group settings
- Gives criticism/feedback to others in a helpful way

### Resilience

- Accepts feedback without getting defensive
- Works well under stress
- Can overcome challenges and setbacks
- Works extremely hard

### Planning and Organization

- Sets realistic goals
- Organizes work and time effectively
- Meets deadlines
- Makes plans and sticks to them

### Ethics and Integrity

- Is among the most honest persons I know
- Maintains high ethical standards
- Is worthy of trust from others
- Demonstrates sincerity

# Welcome New Members

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## Corresponding Associates

### Embanet

### IELTS

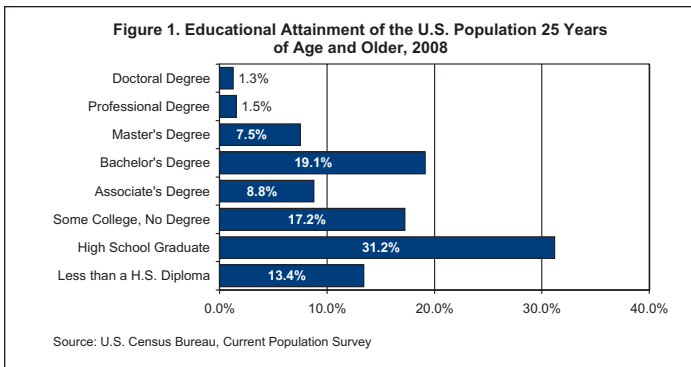
## Corresponding Affiliate

# The Fund for Theological Education

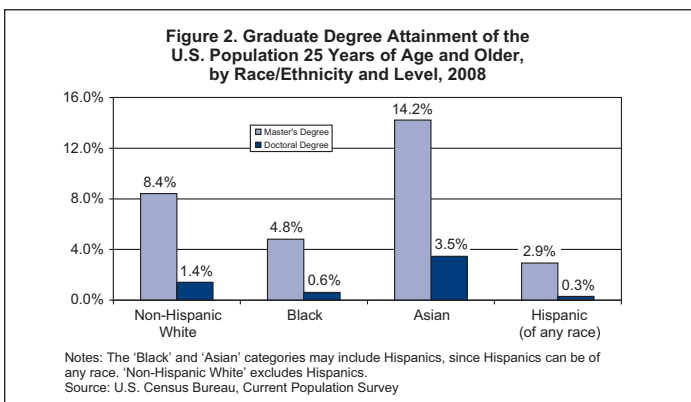
# Data Sources: Graduate Degree Attainment of the U.S. Population

More than 660,000 graduate degrees are now awarded each year (Snyder et al., 2009), but individuals with master's degrees and doctorates account for a very small share of the U.S. population. In 2008, just 8.8% of the U.S. population 25 years of age and older reported that a graduate degree was their highest degree (U.S. Census Bureau, 2009). These findings on educational attainment come from the Current Population Survey (CPS), a monthly sample survey of the U.S. population.

As shown in Figure 1, just 1.3% of the U.S. population 25 years of age and older had a doctorate as their highest degree in 2008, and only 7.5% had a master's degree. In contrast, nearly one-third (31.2%) held a high school diploma and one out of five (19.1%) a bachelor's degree as their highest degree.



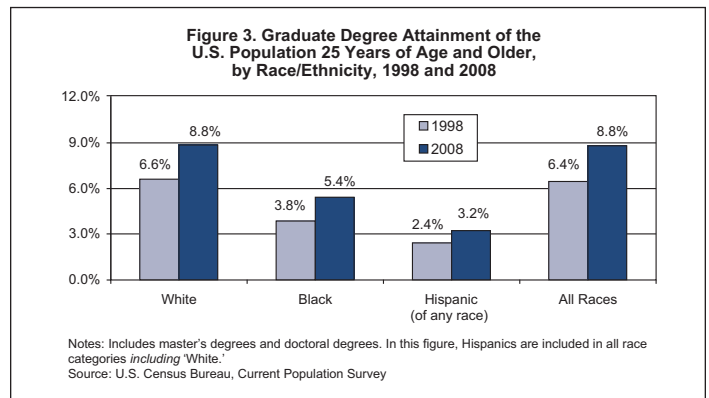
Women are slightly more likely than men to have a master's degree as their highest degree (7.7% vs. 7.3%), but men are about twice as likely as women to have a doctorate (1.7% vs. 0.8%). Educational attainment rates also vary considerably by race/ethnicity (see Figure 2). Asians and non-Hispanic whites are far more likely to have graduate degrees than their Black and Hispanic peers. In 2008, 3.5% of Asians and 1.4% of non-Hispanic whites had doctorates, compared with 0.6% of Blacks and 0.3% of Hispanics. Similarly, 14.2% of Asians and 8.4% of non-Hispanic whites had a master's degree as their highest degree, compared with 4.8% of Blacks and 2.9% of Hispanics. Due to sampling issues relating to small numbers, the CPS does not separately report data on the educational attainment of Native Americans.



Educational attainment rates have increased considerably over the last decade. In 1998, 16.4% of the U.S. population 25

years of age and older had a bachelor's degree as their highest degree (U.S. Census Bureau, 1998), compared with 19.1% in 2008. Similarly, 6.4% of the population had a master's degree or a doctorate as their highest degree in 1998, a figure that increased to 8.8% in 2008 (see Figure 3). The increase in graduate degree attainment over the past ten years has been driven in large part by greater increases in educational attainment by women than men. For men, 7.3% had a graduate degree in 1998, compared with 9.1% in 2008. For women, 5.7% had a graduate degree in 1998, compared with 8.6% in 2008.

Increases in educational attainment occurred for all racial/ethnic groups as well. Although the U.S. Census Bureau changed the way it collected data by race/ethnicity between 1998 and 2008, some comparisons can be made. The percentage of Hispanics with a graduate degree increased from 2.4% to 3.2% over the decade, and graduate degree attainment for Blacks increased from 3.8% to 5.4%. For whites, graduate degree attainment increased from 6.6% to 8.8% between 1998 and 2008. Note that the percentages for whites in Figure 3 include individuals of Hispanic ethnicity (since Hispanics can be of any race), but the percentages in Figure 2 are only for non-Hispanic whites. Since Hispanics have lower levels of educational attainment on average, the overall graduate degree attainment rate for whites in Figure 3 appears lower than in Figure 2. Due to small sample sizes, educational attainment rates were not reported separately for Asians and Native Americans in 1998.



## Implications

The 2008 CPS data includes both encouraging and troubling statistics. On the positive side, the rising level of bachelor's degree attainment in the past decade is promising for the future of graduate education. With more students academically prepared to enter graduate school, graduate enrollment is likely to continue to increase. Recent projections from the National Center for Education Statistics support this, predicting that graduate enrollment will increase 18% between 2006 and 2017 (Hussar and Bailey, 2008).

Currently, women far outnumber men in graduate education. In Fall 2007, 59% of all graduate students were women, and just 41% were men (Bell, 2008). Given women's representation in graduate education, and the considerable

increase over the past decade in the number of women with a graduate degree as their highest degree, it appears likely that the graduate degree attainment rate for women in the U.S. population will soon surpass that of men. While the increase in educational attainment is positive for women, the smaller numbers of men in graduate education, in combination with a rapidly growing population, raises the possibility that graduate degree attainment rates for men could actually decline in the future should these trends continue.

Finally, while it is encouraging that educational attainment has risen for Blacks and Hispanics over the past ten years, the percentages of these populations with graduate degrees still remain far below the percentages for Asians and non-Hispanic whites. Particularly troubling is the low percentage of Hispanics with graduate degrees. The U.S. Census Bureau predicts that the Hispanic population in the United States will nearly triple between 2008 and 2050, and that nearly one in three U.S. residents in 2050 will be Hispanic (U.S. Census Bureau, 2008). In order for the United States to continue to prosper, remain competitive, and be a world leader, it is imperative that educational attainment increase for Hispanics.

By Nathan E. Bell, Director, Research and Policy Analysis

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## CGS Announces New Award

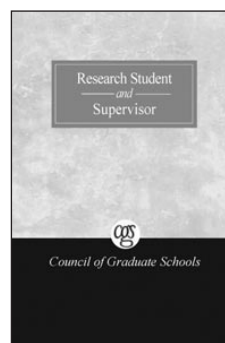
We are pleased to announce that through the generosity of our colleagues at Educational Testing Service, CGS has a new award opportunity for members. The Award for Innovation in Promoting Success in Graduate Education: From Admissions through Completion will be presented for the first time at the Annual Meeting in San Francisco on December 4.

The \$20,000 award is a matching grant which will recognize promising efforts in graduate education that occur from admission through successful completion of a degree program. This award program is especially interested in encouraging innovations to improve the success of a diverse and inclusive student population.

Detailed information and instructions on application procedures for the grant can be found at the CGS website in the awards section. Applications must be postmarked by September 15, 2009.

## RESEARCH STUDENT AND SUPERVISOR (2009)

A New Publication from the Council of Graduate Schools



This popular publication, revised and newly updated, provides guidelines for supervision at each stage of graduate study and highlights ways to make graduate students and supervisors more aware of their respective responsibilities in the PhD process.

Includes a checklist of good supervisory practice. Also includes a "Hall of Scholars" featuring reflections of the CGS/UMI Distinguished Dissertation Award winners and their supervisors on key factors in doctoral degree completion.

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## PSM Update

coming in as a group or a team. The variety allows individual programs to accommodate the special needs of local business.

San Jose State University's PSM program in biotechnology has a particular relationship with nearby Agilent Technologies, producer of high-end scientific instrumentation. All first-year PSM students are invited in the fall to corporate headquarters to be briefed by science professionals working in research, management, and marketing. From this encounter came a recent Agilent internship. The intern's task was to help design a marketing strategy aimed at academic and government customers. As reported by a senior marketing operations director at Agilent, the assignment was especially well-suited for a graduate student pursuing a PSM. It involved developing technical materials that would educate the customer as to the advantages of the company's products.

### Lessons Learned

Innovation doesn't stop with invention. Highly-skilled science professionals are essential to the nation's competitive advantage. In the spirit of sustaining creativity, the PSM internship fuses classroom skills and industry demands without sacrificing the integrity of either.

Essential to the success of the PSM internship is that, however involved business may be in internship planning and supervision, the faculty coordinator has responsibility for assigning credit. Finally, it is important to note that no one internship model fits all PSM programs.

*By Eleanor Babco, CGS Consultant and Associate Program Director; Professional Master's Initiatives, Council of Graduate Schools; Josh Mahler, Program and Operations Assistant, Council of Graduate Schools; and Sheila Tobias, Consultant, Alfred P. Sloan Foundation*

### Endnotes

<sup>1</sup>2009 Student Survey, National Association of Colleges and Employers, accessed May 26, 2009, [www.naceweb.org/spotlight/2009/c051309a.htm#1](http://www.naceweb.org/spotlight/2009/c051309a.htm#1).

<sup>2</sup>The institutions and programs mentioned in this article are just a sample. For a complete listing of PSM programs and specific information about each program's internships please visit [www.sciencemasters.com](http://www.sciencemasters.com).

<sup>3</sup>Information provided through an interview with Dr. Linda McGrew and the authors of the article.

<sup>4</sup>Case Western Reserve University has received PSM affiliation for five programs: Entrepreneurial Biotechnology, Chemistry for Entrepreneurship, Mathematics for Entrepreneurship, Physics for Entrepreneurship, and Statistics for Entrepreneurship.

<sup>5</sup>Information provided by Dr. Rana Khan, project director of PSM program in biotechnology, University of Maryland, University College.

<sup>6</sup>Information provided by Dr. Linda Strausbaugh, Professor, Department of Molecular & Cell Biology, University of Connecticut.

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