

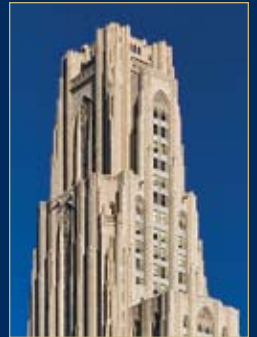


UNIVERSITY OF PITTSBURGH

Graduate and Professional Education: Mapping the Future

Reprinted from the *Pitt Chronicle* series 2007–09

The role of a top research university is not only the creation and communication of knowledge, but also the preparation of the next generation of leaders in their fields. Graduate and professional education is the most critical part of that effort. This series was created by the Office of the Provost of the University of Pittsburgh to illustrate the value of graduate and professional education and to show the many ways in which it is being transformed at Pitt.



Graduate and Professional Education: Mapping the Future



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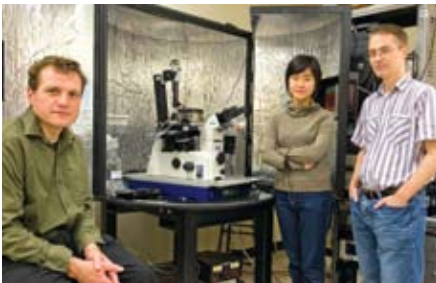
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Pitt Has Impressive History in Graduate Research

Advanced education at Pitt is designed to provide innovators for all fields

By James V. Maher
Provost and Senior Vice Chancellor

As one of the nation's best public research universities, the University of Pittsburgh takes very seriously its mission to offer educational programs that will prepare the leadership for a broad range of the nation's institutions and for the practice of its professions, to provide high-quality undergraduate programs and to run research programs that will drive the development of human understanding and the economy. In all of these endeavors, graduate—and graduate-level professional—education plays a very important role. The complexity of graduate education makes it difficult to talk about this critical endeavor in easy sound bites. Through this opening article and through subsequent articles in this series on Graduate and Professional Education at the University of Pittsburgh, I hope that the richness and value of those programs become apparent.

Advanced education at Pitt is designed to provide innovators for all fields. In science, engineering, and technology, we seek to drive the deepening of our understanding of nature along with the growth and competitiveness of our economy. Enhanced creativity in the social sciences and humanities lays the foundation for greater understanding across cultural, economic, and political boundaries. Leadership in business, health sciences, public affairs, law, and government—along with leadership in academia—strengthens the institutional framework of both private and public sectors of our country and our world.

Graduate and Professional Education at Pitt

Looking more closely at how that advanced education is carried out here, we see that, like many of the country's very best public research universities, only a little more than half of the degrees granted from Pitt are at the undergraduate level. Graduate and professional programs here produce 42 percent of all Pitt degrees. We are consistently one of the top 25 producers of doctoral degrees among public universities in the United States and in the top 30 among both public and private universities. This is an expensive form of education for the University, but it is an expense we embrace because of our understanding of our mission and the value of graduate education.

The students in our graduate programs are educated by faculty in 14 schools of the



University, with the largest number of those students in the School of Arts and Sciences. [see accompanying graph] As is true of most of the best graduate and professional programs in this country, admissions, curriculum, and other programmatic decisions are determined by the faculty of the graduate programs themselves. That lack of a centralized structure means that our graduate education can be both highly specialized and multidimensional, always directed at the perceived needs of the discipline or profession.

Describing such a multidimensional enterprise in sweeping terms is a challenge. Future stories in this series will delve into specifics of some interesting examples of graduate education programs. For now, while acknowledging the inherent fallibility of any imposed taxonomy for categorizing graduate education, let me propose two very broad groupings to describe the numerous specific programs in which students at the University pursue graduate education:

- Master's and professional education
- PhD education

Through master's and professional education, we develop highly skilled professionals operating at the frontiers of that profession's practice. Throughout Pennsylvania, alumni of Pitt's master's and professional education programs serve as doctors, corporate leaders, lawyers, engineers, librarians and information science specialists, teachers, pharmacists, social workers, occupational therapists.... The list goes on and on. We meet the region's, the country's, and the world's needs through these specifically designed programs. Two of the



three Pitt alumni honored as Nobel Laureates received their advanced degrees in these programs: Philip Showalter Hench, who won the Nobel Prize in Medicine in 1950, earned his Doctor of Medicine degree at our School of Medicine; and Wangari Matthai, who won the Nobel Peace Prize in 2004, earned her Master of Science in biological sciences in the School of Arts and Sciences.

Our third Nobel Laureate, Paul Lauterbur, earned his PhD in chemistry, again in the School of Arts and Sciences. Through the PhD, the Doctor of Philosophy degree, we educate people who are expected to extend human knowledge. This mission is slightly different from the mission of graduate professional education, for with the PhD we prepare people to meet needs that we may not yet be aware of. This is truly education for a future world. With PhD education, we prepare research scientists

and engineers, world-class scholars, and those researchers and scholars who often go on to become the faculty of colleges and universities. Our tradition of strong disciplinary programs develops graduates who are professors around the country or who are leading researchers at industrial laboratories and government laboratories or who contribute in many ways to the development of human understanding of the fields they've chosen.

This University, one of the country's leaders in research, must also be a leader in producing the most highly qualified graduates to work in these research disciplines in the future. In the overall approach to graduate education at Pitt, we recognized that our PhD students, who are earning that very advanced degree by working in a pioneering area of the field with faculty here, are working at the intersection of older questions that may have come from different fields in those strong disciplinary programs.

And so we have, in the last 10 years, instituted a number of interdisciplinary degrees at the graduate level to link important activities in various schools. For example, in the biological sciences there is no longer the separation that once existed between the biology PhD programs in the Arts and Sciences and the biologically-oriented PhD programs in the health sciences. Instead there are now campuswide PhD programs in biological specialties that are sciences in themselves:

- Molecular Biophysics and Structural Biology: Arts and Sciences/School of Medicine
- Integrative Molecular Biology: Arts and Sciences/School of Medicine
- Computational Biology: Arts and Sciences/School of Medicine
- Neuroscience: Arts and Sciences/School of Medicine
- Bioengineering: Engineering/School of Medicine.

The Students

The quality of students admitted to our graduate and professional programs continues to improve. This is somewhat harder to capture quantitatively at the graduate level compared with the undergraduate level because we don't have access to across-the-board standard measures, like the SATs and class rank, for graduate students nationally. But a survey of entrance exam scores of students admitted into key programs indicates a steady increase in quality in the past 10 years, enhancing what was already a very good standard.

Not only do very many good students want to come here to the University and pursue a degree, but we are consistently in the top 25 public universities in doctorates awarded, according to The Center for Measuring University Performance. That's a very effective measure of how many of the good young people in the country who want an advanced degree are choosing the University of Pittsburgh because of its eminence—and because of how well we are doing in educating and mentoring them to graduation.

Measuring Success

On the whole, then, we have very competitive raw material to work with as we develop graduate programs: strong students and exceptional faculty. We match that raw material with significant University investments. And so how do we know if the investments are worth it? What are we—and by 'we' I'm referring not so much even to the University as to our broader communities—getting in return?

First of all, as noted earlier, we are producing students with degrees demonstrating advanced skills. The largest proportion of our graduate and professional students graduate with master's degrees (67 percent in 2007), and many of those students with advanced degrees are settling across Pennsylvania, providing exactly the kind of professional needs the Commonwealth demands for growth and development. In addition to our master's-level graduates, graduates of our professional programs that are not called master's degree programs (such as those in law, medicine, and pharmacy, among others) have a strong impact on the region's health and infrastructure.

A majority of our PhD graduates go on to become faculty and researchers. Some who graduate and move directly into postdoctoral positions will move into faculty positions, while others will move on to industry or corporate positions. In addition to working in research and academia, graduates of Pitt's PhD programs become business and civic leaders, corporate and nonprofit CEOs, and assume other positions of leadership. Our collection of placement data at the graduate level is a work in progress, but the picture that emerges is one of which to be very proud.

For instance, five members of Harvard's faculty are recent graduates of Pitt's graduate programs in Arts and Sciences. Three of these faculty members graduated with PhDs in philosophy. And if we look not just at recent graduate and professional alumni, but those who have had more time to make an impact, we note the Nobel Prize winners mentioned earlier, U.S. Congress members, a governor, scholars, and researchers who have received

the highest acclaim in their fields by being elected to the Academies, and faculty who are awarded named professorships or who have served as college deans or presidents.

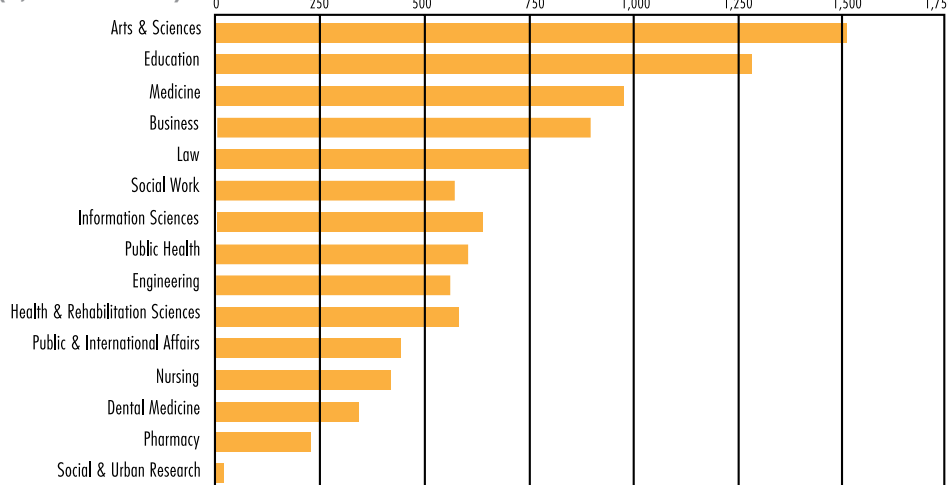
For example:

- General Roscoe Robinson Jr., who earned his master's degree in international affairs at GSPIA, was the first African American to achieve the rank of 4-star general in the U.S. Army.
- John A. Swanson, who received his PhD from Pitt's School of Engineering, is an acclaimed inventor, the founder of ANSYS, Inc., and a philanthropist. His \$41.3 million of support to the University's School of Engineering, announced last week, is the largest individual contribution made in the history of Pitt.
- Sung-Hou Kim, a prominent graduate of our Department of Chemistry in Arts and Sciences, heads the structural biology group at the University of California, Berkeley, and led the team that mapped the protein universe.
- Herb Boyer, of our biological sciences department in the Arts and Sciences, is the founder of Genentech.
- Graduates of our law school have been in very prominent government positions: U.S. Senator Orin Hatch; former Congresswoman Melissa Hart; Allegheny County Chief Executive Dan Onorato; Pennsylvania Chief Justice Ralph Cappy; former Speaker of the House K. Leroy Irvis; and former Governor Dick Thornburgh, who also served as U.S. Attorney General.

These are just a few examples of leaders who received their graduate and professional education at the University of Pittsburgh. Many more examples can be seen by visiting the Legacy Gallery kiosks in the lobby of Alumni Hall.

The University's commitment to and success in graduate and professional education are worth celebrating. I hope that this brief overview of some of the factors underlying graduate education here helps to lay the groundwork for the more in-depth considerations you will read in the coming months regarding this very complex endeavor.

Pitt's Graduate and First-Professional Enrollment, Fall 2007 (9,812 students)



Doctoral Students Without Borders

To train scientists of the future, Pitt rethinks what a graduate program in the life sciences should be



Lin Liu, a molecular biophysics and structural biology graduate student, works in the Nuclear Magnetic Resonance (NMR) facility in the Department of Structural Biology.

In the past generation or so, scientists have been rethinking how they study human biology. Today's powerful imaging helps them see how a cell's tiniest particles behave. The untangling of the human genome allows them to trace precisely how human bodies are built, or impacted by disease. Scientists borrow techniques from disparate disciplines to sort through the big questions of biology: Why do cancer cells behave the way they do? How does the brain work? Can we rebuild dead tissue? They use molecular biophysics, pharmacology, and cognitive psychology to study mental illness; they use mathematics, computer science, and chemistry to study cancer.

Clearly, this is a brave new world. It's also a challenging landscape to train the next generation of researchers in the biomedical and biological sciences. After all, the disciplines

“We created these programs to stay ahead of the curve in training the professors and researchers who will shape the next generation of science. We’re training people to address the questions of the future even though we often don’t know what those questions will be.”

—James V. Maher

may look entirely different in 20 years. But the University of Pittsburgh has emerged as a leader in training young scientists in this new terrain—mainly by rethinking the very notion of what graduate studies can be. It has established new graduate programs that are based upon collaborations among schools within the University, including the schools of medicine, arts and sciences, and engineering.

“We’ve consciously tried to develop this approach,” explains Provost James V. Maher. “Creating these programs has gone hand in hand with strides in biological and biomedical research at Pitt. The old distinctions between disciplines are increasingly becoming obsolete. Scientists need to be able to think across traditional boundaries to solve the big questions. We find it is these PhD



(From left) Naveena Yanamala and Arpana Dutta, graduate students in the Program in Integrative Molecular Biology, work with their mentor, Judith Klein-Seetharaman.

programs we are creating—and the students themselves—that are breaking down walls, unifying both the research and graduate study across this campus and beyond.”

This wave of innovation began in the 1990s, with the creation of programs in neuroscience and bioengineering. More recently, we developed PhD programs in computational biology, molecular biophysics and structural biology, and integrative molecular biology to capture trends in emerging fields. “Many of these fields simply didn’t exist a generation ago,” says Maher. “We created these programs to stay ahead of the curve in training the professors and researchers who will shape the next generation of science. We’re training people to address the questions of the future

even though we often don’t know what those questions will be.”

Arthur Levine, senior vice chancellor for the health sciences and dean of the School of Medicine, says the programs leverage Pitt’s considerable research talent in the biological and biomedical fields. The University of Pittsburgh faculty ranks 6th in the nation in grants from the National Institutes of Health (NIH)—the gold standard for measuring a university’s biological and biomedical research prowess.

“I think the interdisciplinary nature of these programs reflects the science of the times in which we live,” says

Levine. “There are excellent investigators across this campus and at Carnegie Mellon, and we need to take advantage of that.”

“It makes a lot of sense to bridge disciplines, to bridge ideas, and to use different technologies. It’s where the science is leading us. There have been so many changes in technology over the last 20 years. We now have tremendous database resources, very sophisticated imaging, and new ways of tracking molecules within single cells. We’ve learned more about the biology of the human body in the last 20 years than in the history of science,” Levine adds.



Angela Gronenborn

“To be cutting edge, you have to provide the opportunity for faculty and graduate students to get in-depth in these interdisciplinary areas. You need to be ahead of the curve in creating these programs. I think that Pitt, in the last five years, has been moving faster than other places. And we are now thinking about the next generation,” he says.

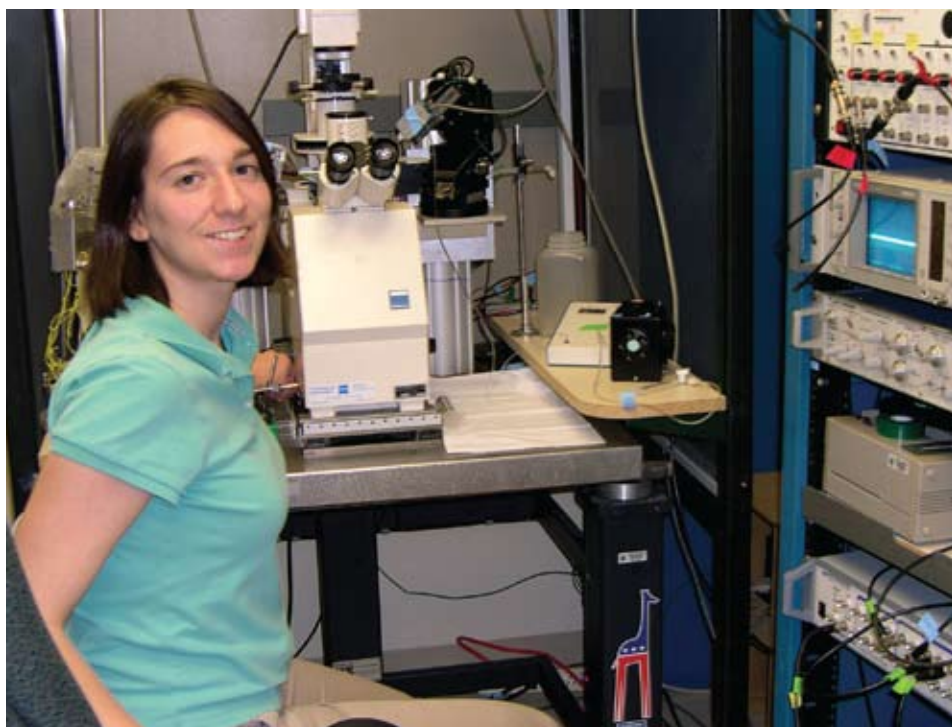
One such key recruitment was the School of Medicine’s hiring of faculty member Angela Gronenborn, UPMC Rosalind Franklin Professor and chair of the Department of Structural Biology. Gronenborn came to Pitt from the National Institutes of Health, where she developed and used nuclear magnetic resonance to study cellular processes at molecular and atomic levels.

She says her field involves an interaction between disciplines that was rare 30 years ago. “A physicist never used to talk with a biologist during their studies,” says Gronenborn, who was elected to the National Academy of Sciences in 2007. “Students should move seamlessly across those boundaries. In terms of their education, and of science in general, those boundaries to me are artificial.”

NEUROSCIENCE

One of the earliest and best examples of these interdisciplinary and inter-school graduate programs is neuroscience. Through the Center for Neuroscience at the University of Pittsburgh (CNUP), PhD students have access to more than 90 faculty in more than a dozen departments across the campus and beyond.

“What I like about it is we encompass a huge neuroscience community,” says Beth Siegler Retchless, a PhD candidate. Siegler Retchless majored in neuroscience as an undergraduate at Brown University. When choosing a graduate school, her adviser cited Pitt as one of the top neuroscience programs in the country. “We have people from all over the University—and the University is huge. All these people work on different aspects of brain function—everything from



Neuroscience graduate student Beth Siegler Retchless in her lab at the Center for Neuroscience at the University of Pittsburgh.



Rachel Brower-Sinning, a computational biology graduate student, talks with Pitt faculty member Bino John in a computational biology classroom.

MRI studies, where they can look at what areas of the brain are active during a learning task, to figuring out how molecules work, and everything in between.”

Siegler Retchless is conducting her doctoral research on a protein that acts as a target for glutamate, a neurotransmitter important for learning and memory. She studies how a single amino acid can change the behavior of the protein, which is found in brain cell membranes. When activated by glutamate, the protein opens up a pore in the membrane through which electricity can flow. But sometimes the pore is blocked by specific ions—and Siegler Retchless wants to know why. Scientists believe that learning more about these targets will give insight into how complex phenomena like Alzheimer’s and schizophrenia work. Siegler Retchless says she has relied on mentoring from CNUP faculty in an array of disciplines—mathematics, molecular genetics and biochemistry, and neurobiology.

“The degree of collaboration here means I have this tremendous resource that just isn’t available in other places,” she says.

Alan Sved, CNUP codirector, professor of neuroscience, and chair of that department, says the program is designed to give students a broad range of experiences and

skills as they begin their scientific careers. “We’re not simply a collection of outstanding neuroscientists. We’re an interactive group of outstanding neuroscientists. Students aren’t simply working with one primary investigator locked away in a lab somewhere.”

It wasn’t always this way. For years, Pitt neuroscientists were scattered around the campus—some in neuroscience within the School of Arts and Sciences, some in neurobiology within in the School of Medicine. This worked well enough, but it confused many within and outside the University. What’s the difference between neuroscience and

schizophrenia, and pain.

But the integration didn’t just happen. The University worked hard to break down traditional barriers between disciplines, Sved says. For instance, there was a learning curve before students in Arts and Sciences and the medical school faculty became accustomed to working with one another—and vice versa.

“It was a major divide,” Sved says. “It was a barrier to doing things. Now, we don’t even see it. It is transparent to the students. We have students who on any given day couldn’t tell whether they were working with Pat Card, (professor in Arts and Sciences’ neuroscience department) or Bill Yates (professor in the School of Medicine’s otolaryngology department). In fact, they’re working with both of them.”

David Moorman, who received his PhD in neuroscience in 2005, did his doctoral research at the CNUP and the Center for the Neural Basis of Cognition, a joint Pitt-Carnegie Mellon University initiative. He worked

with neuroscientists, computer scientists, and psychologists to study the way the brain processes certain kinds of spatial information. Each faculty member brought different skills and strategies from their discipline, their own particular “toolbox.”

“Part of it just has to do with knowing what techniques are available to you,” says



CNUP codirectors Alan Sved (left) and Susan Amara

“The important thing we do here is create a mindset of problem-solving, rather than a specific technique that you master. We can train students for what they do now, but they’re not going to be doing what they do now forever.”
—Susan Amara

neurobiology? In truth, there wasn’t much of one, says Cooper.

So Pitt united these programs under the CNUP banner—bringing together psychologists, cell biologists, pathologists, and others for research and graduate training. “The idea was that instead of running two PhD programs that would be different, but look

Moorman, now a postdoctoral neuroscience fellow at the Medical University of South Carolina studying the neural basis of drug addiction. “If your research lies at the interface of all these different disciplines, you have to pay attention to all these different things.”

At Pitt, he studied cognitive neuroscience, which is the study of neural circuitry underpinning cognition and behavior. In his current fellowship, he’s had to learn a more molecular approach to neuroscience—studying drug targets on specific neurons. The CNUP’s emphasis on collaboration laid the foundation for Moorman to learn from others in his current lab.

“It’s almost impossible to use all these techniques yourself. If you want to ultimately tackle some of these problems, you’re going to have to work with other people. That’s how the big problems get solved,” Moorman adds.

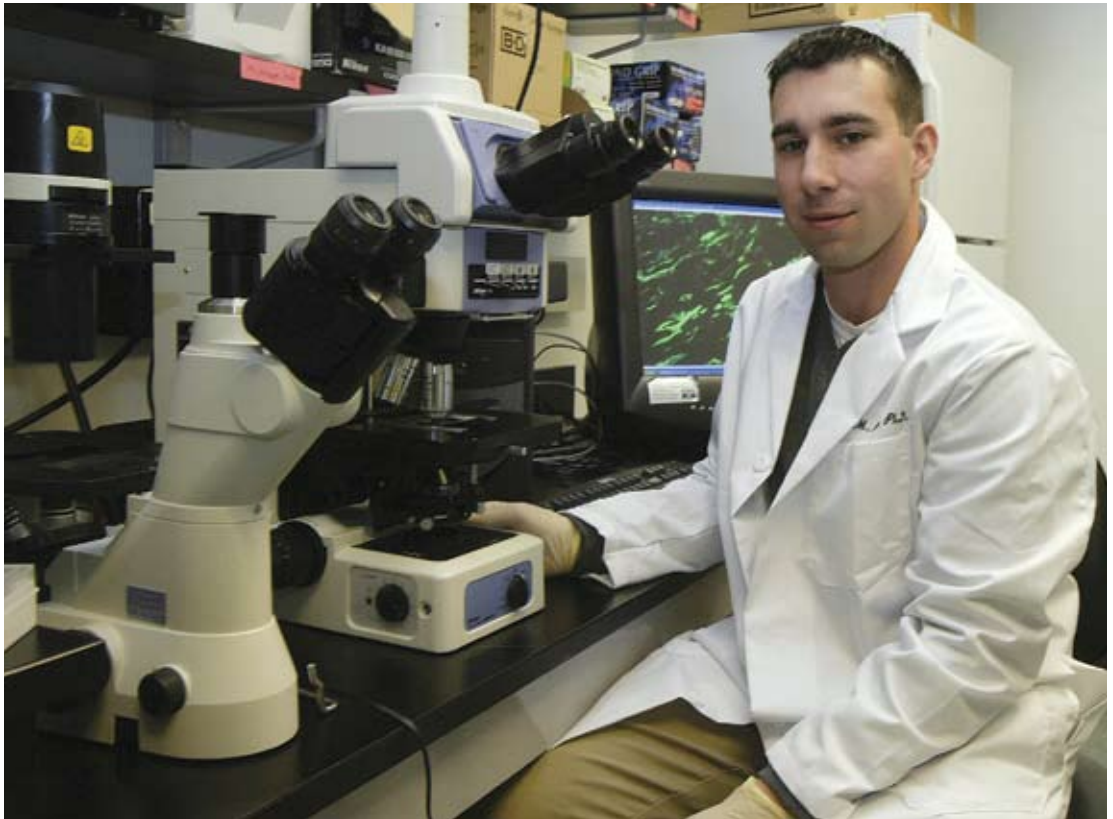
Susan G. Amara, CNUP codirector, Thomas Detre Professor, and chair of the Department of Neurobiology, says graduate students need to be able to keep pace with the rapidly changing field.

“One of the interesting challenges for neuroscience education is training students to be adaptable, to be nimble when they’re confronted with the landscape of the future,” says Amara, a member of the National Academy of Sciences. “The important thing we do here is create a mindset of problem-solving, rather than a specific technique that you master. We can train students for what they do now, but they’re not going to be doing what they do now forever.”

BIOENGINEERING

Pitt’s Department of Bioengineering has a long history of training students to use multiple disciplines to tackle complex medical and biological problems. The department celebrated its 10th anniversary last fall, but its roots go deeper. Pitt bioengineers were instrumental in UPMC’s groundbreaking artificial heart program, which implanted its first artificial heart device in 1985, and discharged the first patient on a ventricular-assist device five years later.

Today, Pitt’s bioengineering program is among the best in the country, ranked in the top 10 by such publications as *U.S. News & World Report*.



Tim Maul (ENGR '07) is a postdoctoral fellow in biomedical research at Pitt’s McGowan Institute for Regenerative Medicine.

“Our students come from everywhere, they’re interested in everything,” says Harvey S. Borovetz, chair of the Department of Bioengineering and Robert L. Hardesty Professor of Surgery. “Every year they become more and more diverse.”

Though their degrees are granted by the Swanson School of Engineering, graduate students conduct research in labs at the School of Medicine, the McGowan Institute for Regenerative Medicine, the University of Pittsburgh Cancer Institute, the School of Dental Medicine, the Graduate School of Public Health, and the School of Health and Rehabilitation Sciences, in addition to laboratories within the Swanson School.



Harvey S. Borovetz

This open access to broad swaths of campus expertise, Borovetz says, “is not part of the reason for our success. It is the reason. It’s what other places would love to be able to claim.”

From his office in Benedum Hall, Borovetz has a view of the medical school and UPMC’s training hospitals perched atop “Cardiac Hill.” It is a reassuring sight for Borovetz, who spent two decades in Pitt’s artificial heart program, along with cardiac transplant surgeons and cardiovascular physicians at UPMC and the School of Medicine.

The bioengineering program’s success stems in large part from its access to clinical

The bioengineering program’s success stems in large part from its access to clinical settings, lab space, and faculty talent provided through its unique partnership with the medical school. “We are totally integrated with the School of Medicine. That gives our students opportunities that are, quite frankly, limitless in terms of what they want to do.”
—Harvey S. Borovetz

settings, lab space, and faculty talent provided through its unique partnership with the medical school. “We are totally integrated with the School of Medicine,” says Borovetz. “That gives our students opportunities that are, quite frankly, limitless in terms of what they want to do.”

Rebecca Long, a fifth-year PhD student, uses the science of mechanical engineering and physiology to conduct basic research into tissue engineering science. With biomechanics, Long says, “you’re taking principles you learn in mechanical engineering or basic physics and seeing how to apply them to things

that don't behave like a steel beam. It's taking those same concepts and using them to learn how the body works."

Long, who majored in chemical engineering and biomedical engineering at Carnegie Mellon as an undergrad, was drawn to Pitt's program by the opportunity to work with Michael S. Sacks, William Kepler Whiteford Professor of Bioengineering. In 2006, Sacks shared a *Scientific American 50* award with William R. Wagner, deputy director of the McGowan Institute and a professor of surgery, bioengineering, and chemical engineering. The award recognized their pioneering research into tissue engineering.

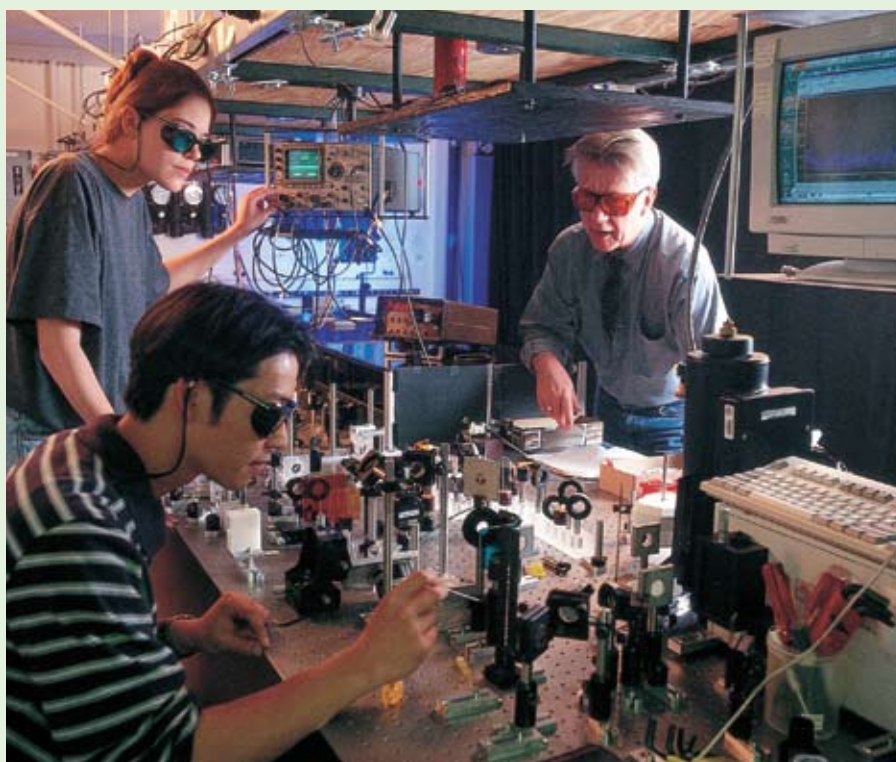
For her PhD dissertation, Long is studying the biomechanics of bladder cells. Sacks, Wagner, and their McGowan Institute colleagues are working to engineer soft tissue that could eventually replace defective tissues, such as heart valves. Long's research on cell behavior in the bladder—an organ which frequently atrophies following a spinal cord injury, could lead to drugs to prevent urinary tract problems in spinal patients.

Pitt's bioengineering program prepared Tim Maul (ENGR '07) well for the interdisciplinary environment of biomedical research. A postdoctoral fellow in Wagner's lab at the McGowan Institute, Maul is working to design injectable polymer- and lipid-based microbubbles that will seek out inflamed blood vessels. His current lab includes a biophysicist, a biochemist, a physician, and a chemical engineer. "The bioengineering program is the ideal incubator for learning how to grow in this kind of environment," he says. "Working in these highly interdisciplinary teams is the key to having big successes in research."

For his doctoral research, Maul studied the mechanics of stem cells—how they reacted to conditions similar to those inside a blood vessel. His work touched several different disciplines—mechanical engineering, cellular and molecular biology, and statistics. He worked with chemical and molecular biologists, and experts in tissue engineering. "A lot of times, people who study biology and mechanical engineering or chemical engineering have a hard time communicating because they don't speak the same language. But I learned in my labs how to learn from people around me."

Students coming out of the program enter a field bursting with opportunities in private industry, academia, and government-funded research institutions. Borovetz is convinced that Pitt is training the next generation of leaders in fields such as tissue engineering, imaging technology, and prosthetics.

"I don't know how or when, but I know that this is going to be the place where you're going to see these kinds of discoveries being made. That's what's so great about having our students participate in this research. Turn them loose and they're going to bio-engineer great solutions down the road," Borovetz says.



Students from Pitt's chemistry PhD program, part of the Carnegie Initiative on the Doctorate, work with chemistry professor David Pratt (right).

Re-envisioning the PhD The Carnegie Initiative on the Doctorate

The importance of doctoral education to the future of the United States cannot be overestimated, according to the Carnegie Foundation for the Advancement of Teaching, an independent policy and research center. In particular, the foundation cites the crucial role that PhD holders play in educating undergraduates and future scholars, creating new knowledge, developing life-saving medical interventions, and shaping social programs and policies.

The University of Pittsburgh is helping to shape how graduate training is done nationally. Pitt's prominence in this area was a factor in its being invited to participate in the foundation's Carnegie Initiative on the Doctorate, a multiyear research and action project aimed at improving doctoral education at American universities.

Initiative leaders decided to examine the best practices in graduate programs to determine changes on a national level. Five units from the University were chosen to participate in the study—more than from any other university.

Recognized as being "stewards of their discipline" were Pitt's departments of chemistry, history, English, and mathematics, and the Center for Neuroscience, all of which provided cutting-edge programs as models.

One of the Carnegie Initiative outcomes identified the "need to create an intellectual community as one of the key approaches to change in doctoral education." Clearly, the rich intellectual community offered through such a multidisciplinary, multischool experience like neuroscience is helping to re-envision the doctorate of the future.

Pitt Chronicle March 3, 2008

A New Vision for the Future at Katz

A revitalized MBA program emphasizes more experience-based learning, entrepreneurship, value chain management, and a global perspective



Pitt professor Brian Butler (far left) talks with Katz Graduate School of Business MBA students who are participating in a study for pharmaceutical giant GlaxoSmithKline.

The project seemed straightforward to Ying Nee Yap. A second-year Master of Business Administration student in Pitt's Joseph M. Katz Graduate School of Business, Yap and two fellow students were asked to calculate the economic impact of Allegheny County's Department of Human Services as part of a three-credit "project course."

But after a couple of meetings with the county agency's staff, Yap's team felt a bit overwhelmed: The agency deals with more than 400 social services providers in the Pittsburgh region, all of whom had different methods of record keeping. Worse, unlike private industry, where the value of inventory can be measured in terms of profits and margins, social services are difficult to quantify.

With support from faculty adviser Ravi Madhavan, a Katz professor of business administration, Yap's team set its boundaries, chose common data sets for comparison, and concluded that Allegheny County's Department of Human Services returns about \$1.75 to the economy for every dollar of tax money spent.

It's important information that will allow county officials to measure the success of future human-services programs. Yap calls the experience one of the most valuable periods of her Katz education.

"Most of us had not negotiated or talked to or been in meetings with executive-level people at all," says Yap, a native of Malaysia with a medical degree from the University

of Calgary in Alberta, Canada. "It gave us practical experience in negotiating and also in running a project with people you don't really know."

Experience-Based Learning

Such project courses are one of the most visible signs of how the faculty members of Pitt's graduate school of business are implementing a continuing process of improvement across the curriculum. Since arriving in August 2006, business school Dean John T. Delaney has set a new direction for Katz. The revitalized MBA curriculum stresses real-world, or "experience-based," learning; a solid grounding in the principles of "supply chain" and "value chain" management; entrepreneurship



Architect's rendering of the \$2.3 million trading room simulator in Mervis Hall

in organizations large and small; the global nature of business; and collaboration with the University's other schools.

"The school has to distinguish itself from hundreds of other business schools and can't adopt a me-too, cookie-cutter mentality," says Delaney. "This is a tremendously challenging time, but we're in a world with greater competition, and it's clear to me that we have to change what we do to be successful."

Delaney's course of change is aimed at ensuring that Katz remains on the cutting edge—and that the school continues its success in placing its graduates in high-paying, prominent roles. Average salaries for new Katz MBAs reached the mid-\$70,000s in 2007, not including signing bonuses. More than 60 percent of Katz MBA students have a job offer before graduation, and 93 percent accepted job offers within three months of graduation.

The list of employers who recruited and hired Katz graduates in 2007 includes a number of international business powerhouses: ArcelorMittal, Bristol Myers Squibb Co., Ernst & Young, Ford Motor Co., IBM, Johnson & Johnson, Kaiser Permanente, PricewaterhouseCoopers, and Raytheon Co. Katz placed interns with major multinational firms such as Citigroup, Emerson Electric Co., General Electric Co., H.J. Heinz Co., Nestlé, and Texas Instruments Inc.; some corporations offered more than one Katz student an internship.

Focus on Education, Not Rankings

Katz's demanding doctoral program achieved similarly impressive results last year. It placed students in research and teaching positions at 13 universities, including Texas A&M, the University of Maryland, Bucknell University, and Rochester Institute of Technology. Katz doctoral graduates currently

hold more than two dozen endowed chairs at American universities, and several now lead business schools, including Daniel Smith (KGSB '89), dean of the Kelley School of Business at Indiana University, who was named a Katz Distinguished Alumnus in 2007.

Katz also is successful when measured by third-party standards: In January, for instance, the Financial Times of London listed Katz's full-time MBA programs as the 27th-best in the United States among public universities, and first overall in the "value for money" category, while *U.S. News & World Report* in 2007 ranked Katz 24th among U.S. business schools in public universities.

But Delaney cautions that rankings and alumni achievements offer only a "rear-view mirror" perspective—they show where the school's been, not where it's going.

"You can't focus on rankings if you want to get better," he cautions. "You've got to focus on education."

And that means an end to "business as usual," he says. One clear sign of Katz's new direction is the expanded emphasis on project courses in its MBA curriculum. G.M. "Bud" Smith, Katz visiting senior lecturer in strategy, oversees these three-credit courses, which place small

teams of Katz students into partnerships with multinational businesses, nonprofits, and local government agencies. Each client assigns its team a real problem and the team has one academic term to devise solutions, Smith says. For this academic year, Smith has organized 29 projects for 125 students with help from numerous clients, including Allegheny County, Bank of New York Mellon Corp., Bayer, GlaxoSmithKline, and Westinghouse Electric Co.

McKinsey & Company, an international management-consulting firm with offices in Pittsburgh, supports the project courses by providing consulting workshops for enrolled students and by helping to judge a competition between project teams at the end of each term. The project courses may be required for all Katz MBA students in the future, Smith says, but the infrastructure must be developed first to handle the demand.

Variety of Tracks

Demand for a Katz education remains heavy. Katz's annual MBA enrollment, in both full- and part-time and executive programs, includes more than 900 students concentrating in six different areas of business administration: finance; information systems; marketing; operations; organizational behavior and human resources management; and strategy, environment, and organizations.

While many MBA candidates are recent college graduates or are changing careers, about 200 of these students each year are enrolled in Katz's international Executive MBA program, or EMBA, aimed at experienced professionals who need additional graduate-level education to advance their careers. EMBA operates at the University's Pittsburgh campus as well as in São Paulo, Brazil, and Prague, Czech Republic. An Asian site is also under consideration.

Though EMBA students have already established their careers, new MBA students face a challenging job market, Delaney and others say. The implosion of the "Internet boom" in the late 1990s left fewer entry-level positions for new MBAs, and many companies wanted candidates who completed an internship

while earning their degrees. This has led students to choose Katz's two-year MBA, created in 2003, which enables them to accept internships between their first and second years of study.



John C. Camillus

Katz wants students to graduate with real-world experience as well as an MBA. "The goal is that students who come from our school will be ready to contribute from day one."

—John C. Camillus



Ravi Madhavan, a Katz professor of business administration (left), talks with Ying Nee Yap (center) and Gina Zdanowicz. Madhavan is a faculty advisor in Katz's project courses, which give students hands-on experience in handling real-life business problems. Yap is a second-year MBA student in Katz and Zdanowicz recently completed the school's part-time MBA program.

"Recruiters are looking for candidates who can hit the ground running," says Terri Gregos (KGSB '90), vice president and director of college relations at Bank of New York Mellon Corp. Few companies are now able or willing to pay for training and development of new employees, Gregos says: "They are really looking for folks with demonstrable skills."

Ready at the Get-Go

Playing on the just-in-time delivery model that corporations use to maximize revenue and minimize inventory costs, John C. Camillus, the Donald R. Beall Professor of Strategic Management and Katz executive associate dean, says the school has to deliver a just-in-time MBA. "The goal is that students who come from our school will be ready to contribute from day one," he says.

That's why experiential learning has become such a big part of the Katz curriculum. Project courses are one way to immerse students in real-life situations; another way is through highly accurate simulators like the new \$2.3 million, 3,000-square-foot trading room under construction in Mervis Hall, the home of the Katz School. A laboratory for running financial simulations, the room will include tote display boards, stock tickers, 58 computer stations, classroom space, and other infrastructure; it also will provide students with continual access to data and to faculty who are very experienced in world financial markets.

Katz also has created what it calls the MBA Transformation Framework, a program to help students plot their career objectives and set educational benchmarks in five key areas: personal development, personnel management,

professional networking, experiential learning, and acquiring technical competence.

Developed through faculty input and shaped by the school's Offices of admissions, career services, and student services, the framework is designed to encourage students to take ownership of their education and visualize their future career paths. Incoming MBA students now complete computerized self-assessments that match interests, strengths, and personality types with specific courses and workshops that develop strategies that they need for success.

Created during the summer of 2007, the transformation framework was introduced to incoming students in the fall. Camillus calls the speed of the process remarkable. "Usually, something like this takes about two years to develop," he says. "We did it in three months. It hooks in with John's idea of entrepreneurship—if we waited two or three years, the world would have changed, and some elements would have been obsolete."

Entrepreneurship

Entrepreneurship is one of the key values that Katz is trying to instill in graduates,

and that doesn't just mean starting a new business, Delaney says. "It means agility and resourcefulness that allow people to succeed in any context," he says. "Entrepreneurship can occur in large corporations. It can occur in government and the nonprofit sector."

And while students have been conditioned to measure their success against standardized tests like the MCAT or SAT, Delaney says, strategies that enable students to score well on tests don't reward initiative or creative thinking.

"The world is not a multiple-choice test," Delaney says. "Students have to learn that they need not be afraid of failure. Failure is how you learn to become more resourceful and more successful. We need to teach students what risks are wise risks to take, and what risks are worth taking."

Dennis Slevin, Katz professor of business administration, argues that while some people are born entrepreneurs, others can be trained. Entrepreneurship is an "organizational behavior," he says, "and we think you can encourage it by compensating people and encouraging them to take risks."

Katz's curriculum teaches students how to evaluate risks through rigorous analysis of statistics and other data, he says. Risk-taking "is not mindless, and it's not like going to a casino," Slevin says, but Katz graduates should be willing to take "high risks with high returns."

Katz's lessons in entrepreneurship extend beyond the borders of the Pittsburgh campus.

Slevin is a member of the advisory board of Pitt's Institute for Entrepreneurial Excellence (IEE), which provides educational and consulting services to local businesses through four different centers. IEE also provides experiential learning through internships for students interested in entrepreneurship.

Recognized nationally for its work with entrepreneurs in Southwestern Pennsylvania, the University wants to bring entrepreneurship into its classrooms. Pitt is devising an entrepreneurship curriculum for graduate and undergraduate students, seeking to integrate its strong academics with its top-notch IEE outreach

program. The Katz faculty will develop the curriculum, which may include options such as dual majors in entrepreneurship and other business school concentrations (such as finance), a certificate program in entrepreneurship, and even cross-school dual majors (such as engineering and business.)

Katz is currently conducting a national search for a senior professor to fill the new Olofson Chair in Entrepreneurial Studies,

"The school has to distinguish itself from hundreds of other business schools and can't adopt a me-too, cookie-cutter mentality. This is a tremendously challenging time, but we're in a world with greater competition, and it's clear to me that we have to change what we do to be successful."

—John T. Delaney



Bill Besselman (center), associate principal at McKinsey & Company, works with Katz graduate students in a workshop that supports the school's project courses. The courses require students to solve real-life business problems.

funded by a \$1.5 million gift from Tom W. Olofson (CBA '63) and his wife, Jeanne. The inaugural holder of the Olofson chair will provide academic leadership for this dynamic model of entrepreneurship.

Learning to Solve Problems

Slevin says that all future managers—even those who have no intention of starting their own businesses—need to understand the principles of entrepreneurship. “We live in a world where there’s so much change that you really have to be entrepreneurial just to cope with the dynamic environment,” he says.

At its core, Madhavan says, entrepreneurship is often about problem solving. “Solving the problem could be as simple as looking around the company, finding other divisions that face the same problem, making the connections, and bringing people into the process,” he says.

Because it’s important for students to develop “the right reflexes” for evaluating and accepting risks, Madhavan says entrepreneurship and experiential learning go hand in hand. Experiential learning motivates students to act as entrepreneurs, “syndicating various parts of the solution, bringing together the people who have the money with the people who have the technical skill,” he says.

Second-year MBA student Charlie Fox says that solving real-world problems allowed him to put classroom lessons into action. He was part of a five-person team that studied the financial structure of Westinghouse Electric

Co. after the company’s acquisition by Japanese industrial giant Toshiba Corp.

Because Westinghouse is no longer a publicly traded corporation, it had a more challenging time evaluating its risk profile and capital structure. Fox’s team developed a model that Westinghouse can use to help decide whether it should acquire other companies or assets. “It was one of the most valuable experiences of my MBA education,” he says.

Supply Chain Management

Project courses pay dividends for companies and organizations that partner with Katz as well, says Bob Auray Jr., president and CEO of the Genco Marketplace division of Genco Inc.

Genco, a privately held corporation headquartered in Pittsburgh, describes its own business as supply chain management, the discipline of managing materials or inventory efficiently by choosing the right suppliers, acquiring special skills or technologies from third-party vendors, delivering goods to customers, and collecting and reselling items that are returned as damaged or obsolete.

In the fall of 2007, Katz students studied the different outlets that Genco Marketplace uses to divest surplus and recommended that

the company maximize its profits by shortening some sales windows and keeping others open longer.

“They found some pretty profound differences,” Auray says. “It was a really nice, valuable piece of work they did.”

Supply chain management “started in manufacturing, but it also has a strong place in health care and other industries,” Delaney says. “You’re trying to ration demands so that you don’t leave anything to chance.”

Delena Spencer (KGSB '92), a vice president of finance and operations in the High Volume Analog business unit of Dallas-based Texas Instruments (TI), one of the world’s largest manufacturers of computer chips and other semiconductors, says Katz’s expertise in supply chain management has been a critical factor in her company’s decision to recruit at Katz, including the hiring of six Katz graduates who have become senior finance managers. In addition, two of the corporation’s newest hires are from Katz’s class of 2007.

TI appreciates Katz’s new emphasis on entrepreneurship, Spencer says. “We want people who are willing to look at new ways of doing things, especially from a supply chain aspect,” she says. “People who are innovators are people willing to question the status quo.”

International Expertise

Because of the global nature of the electronics business, Spencer’s company also needs people with international experience, she says—and that gives Katz another edge. “The Katz School offers a great opportunity for (students) to interact with people from other cultures,” she says. “We’re looking for people who are willing to get up and leave home for a bit, because we do a lot of overseas travel, and we’re looking for people who are comfortable spending time overseas.”

A commitment to international business education is embedded in the Katz structure, says Camillus, who notes that the school was one of the first five within American universities to establish a Center for International Business Education and Research, or CIBER. The Katz CIBER, known as the International Business Center (IBC), is funded by a U.S. Department of Education grant and is a joint venture of Katz and Pitt’s University Center for International Studies.

The IBC connects students, faculty, and local businesses to resources ranging from language education to information technology and provides networking opportunities with other business schools around the world. IBC Director Josephine Olson says the center is aggressively looking for other opportunities to add more international content to the curriculum.

“We already offer a master’s degree in international business, and we’re trying to



Josephine Olson

develop some (MBA) project courses that would involve an international component,” says Olson, Katz professor of business administration and economics. This year, for example, four Katz MBA students are working on group research consulting projects with four different “virtual teams” comprising students at other U.S. business schools. Each team will spend two weeks in May in China, Japan, or Brazil as part of its consulting project, Olson says.

“We have a history of institution-building abroad that’s resulted in our faculty getting international exposure and knowledge,” Camillus says, adding that close to 40 percent of Katz faculty members obtained at least one degree at a non-U.S. institution. “Our students develop international contacts, and our domestic (U.S.) students benefit the most, I think. Not too many business schools are able to do all of this.”

Value Chain Management

Delaney says the next step for Katz is a leap ahead from supply chain management into international value chain management, which optimizes an organization’s use of knowledge and skills as well as its physical assets and inventory.

“Every business has certain core competencies related to its expertise,” Delaney says. “Companies have to decide what competencies are critical to their survival. If you let them go, you cripple your business and risk losing your ability to compete.”

As business moves increasingly from the manufacture of physical goods to the delivery of intangible services like information, value chain management will emerge as the most important challenge facing businesses around the world in the next 40 to 50 years, Delaney says. “If we were surfers, we could see this wave coming,” he says. “I want us to ride this wave.”

Katz has formed a faculty task force to look at issues fundamentally addressed in value chain (as well as supply chain) management. The panel also is designing field-related graduate certificates that will debut later this year.

Most of the changes at Katz have focused on the MBA programs, which constitute the bulk of the school’s enrollment and drive its ultimate reputation. But Delaney says that Katz’s highly selective doctoral program continues to be a critical component within the school. “The program is important because it contributes greatly to the intellectual environment of the school,” he says. “It gives a vibrancy to the whole atmosphere here by encouraging the type of thinking that develops new ideas.”

John Prescott, the Thomas O’Brien Chair of Strategy and director of Katz’s doctoral program, calls it the school’s “research and development lab.” Doctoral students bring fresh perspectives and a willingness to strike out in new directions, using leading-edge theoretical and statistical techniques, he says.



Internal renovations at Mervis Hall continue as part of a long-term improvement plan.

Providing Value, Offering Choices

During 2007, Pitt’s Joseph M. Katz Graduate School of Business enrolled more than 500 part-time students and nearly 400 full-time students; awarded 300 master’s degrees; conferred 11 doctorates; and provided nondegree, postgraduate courses and certificates to more than 1,600 people. Options include:

- **A doctorate (PhD)** for students who intend to become a professor at a leading research university, or to direct research and development at a corporation or government agency;
- **A full-time, two-year Master of Business Administration (MBA) program**, which includes a summer internship, additional project courses, community service opportunities, and as many as 30 electives in a variety of specialized areas;
- **A one-year, full-time MBA program** for self-directed students who want to hone their management skills and then quickly return to their careers;
- **A part-time MBA program**, which allows students to continue to work in the field while pursuing their degrees over a three-year period;
- **Six dual-degree options**, which combine an MBA with master’s degrees in management information science, engineering, international business, or with a Juris Doctor from Pitt’s School of Law; Katz also partners with Pitt’s Graduate School of Public and International Affairs to offer MBAs and master’s degrees in public and international affairs and international development;
- **An Executive MBA (EMBA) program** designed for experienced business professionals who want to enhance their careers; offered in Pittsburgh, Czech Republic, and Brazil, the EMBA program takes about 19 months, including three weeklong “immersion” sessions with students from the other sites; and
- **Certificates and nondegree, open-enrollment courses through Pitt’s Center for Executive Education (CEE)** for professionals seeking additional development in such categories as project management, leadership, personnel skills, and innovation and creativity. CEE also creates customized training programs for corporations, government agencies, and nonprofit organizations.

Sources: University of Pittsburgh Office of Institutional Research, Joseph M. Katz Graduate School of Business.



Charlie Fox, a second-year Katz MBA student, has accepted a position in GE's Commercial Finance division and will join the company's Experienced Commercial Leadership Program, a training program for promising young executives.

“We recruit individuals who desire jobs in a research-oriented university like Pitt and who want to publish in top-tier journals,” Prescott says, “and we spend a lot of time mentoring them in the craft of research.”

Selective Doctoral Program

Katz's highly competitive doctoral program accepts only 10 to 12 PhD candidates per year and has about 60 doctoral students at any one time, he says. The ratio of mentors to doctoral students is roughly one-to-one, Prescott says, adding that the intense faculty monitoring is a major benefit to students and faculty alike.

And unlike some universities, where doctoral students often are relegated to supporting research projects conducted by faculty, Katz encourages its faculty to treat doctoral students as full collaborators and to share credit. As a result, most Katz PhDs have developed a solid research portfolio by the time they graduate, Prescott says.

“The faculty have done very well by mentoring a small group of PhD students,” Delaney says, adding that within the next two years, Katz will be actively exploring additional funding to enlarge the number of positions available for PhD candidates.

The school also is considering extending the funding for doctoral students from four

years to five, Prescott says. “It gives them an extra year to work on publishing, and to develop an understanding of what the business of being an academic is all about,” he says. Just as with the MBA program, the goal is for newly minted PhDs to arrive at their first teaching or research jobs ready to contribute from day one, he says.

Pitt Connection

Perhaps one of Katz's most compelling advantages over other business schools, Delaney argues, is that it's part of the University of Pittsburgh, which offers a wide range of internationally recognized graduate programs in life sciences, engineering, law, and the humanities. To that end, Katz now offers dual degrees that allow students to earn their MBA

while simultaneously working on another graduate degree, including a juris doctor from

to create joint programs that leverage the school with Pitt's other strengths,” Delaney says. “It gives Katz a competitive advantage that will help us in all directions. It also adds value for students. It's the combination that makes the difference.”

Collaborative efforts also reach off campus: In the doctoral program, for instance, Prescott notes that Katz students work and study with students and faculty at Carnegie Mellon University's Tepper School of Business and H. John Heinz III of Public Policy and Management. “We have several good cooperative relationships with them. I can't think of too many locations where two world-class universities are next to each other and complement

each other's research thrusts, rather than compete,” he says.

Pitt's School of Law, a master's degree in information sciences, or a Master of Science degree in engineering.

In January, Katz and Pitt's School of Pharmacy announced a partnership to offer a course on the business of medicines in health care. It's the first step toward a possible dual-degree program that would provide students with the opportunity to earn an MBA and a Doctor of Pharmacy degree at the same time.

In addition, Katz positions its accelerated one-year MBA program as an opportunity for students already at Pitt who are pursuing full-time graduate study in one of the University's other schools to add another master's degree while they are at the University.

“It makes tremendous sense for us

“I knew that Katz had an excellent reputation in the Pittsburgh region, but it also has a strong network of alumni that extends across the nation. It's an excellent value. When I consider the cost of my tuition versus where this degree is going to take me, it was the best investment I've ever made.”

—Charlie Fox

Prescott says the diverse makeup of the Katz student body provides another advantage for the students and faculty. Katz has a strong reputation for recruiting underrepresented students: Three of the 12 doctoral students accepted this year are from underrepresented groups and, in the full-time MBA program, about 47 percent of students are from countries other than the United States.

“Different people bring different capabilities, different resources, different competencies,” says Camillus, and the diversity of cultural backgrounds forces students out of their comfort zones. “Sometimes it’s difficult initially to work in a diverse team, but the results are much richer.”

“Excellent Value”

Diversity, teamwork, and a global outlook makes Katz’s graduates a valuable addition to corporate culture, says Texas Instruments’ Spencer. “The majority of our manufacturing operations are overseas, and the majority of our customers are overseas,” she says. “We’re clearly looking for ‘teaming’ skills—the ability to both lead and follow. We also look for people with broad educational experience, who have shown that they have excitement or enthusiasm to learn.”

In other words, people like Ying Nee Yap, who plans to become a healthcare industry consultant in Asia upon her graduation in April. “At other schools, they do projects on paper in class,” she says. “They miss out on a lot. They don’t know what’s going on in real life and the mindset of people in real companies.”

Or people like Charlie Fox, who interned this year with the accounting and financial advising firm Deloitte & Touche. He has accepted a position in GE’s Commercial Finance division and will join the corporation’s Experienced Commercial Leadership Program, a training program for promising young executives, later this year.

“I knew that Katz had an excellent reputation in the Pittsburgh region, but it also has a strong network of alumni that extends across the nation,” says Fox, who holds an undergraduate degree in management from Grove City College. “It’s an excellent value. When I consider the cost of my tuition versus where this degree is going to take me, it was the best investment I’ve ever made.”



Dennis Meteny (KGSB '88) is president and CEO of Cygnus Manufacturing Co. in Saxonburg, Pa.

Making a Difference

Alumni of Pitt’s Joseph M. Katz Graduate School of Business are more than 19,000 strong and represent nearly 90 nations. The network includes prominent leaders in both business and education:

- **880 Katz alumni are board chairs, chief executive officers, or presidents of their businesses or organizations**, including James Broadhurst (KGSB '66), chair and CEO of Eat’n Park Hospitality Group Inc.; Stephen Tritch (KGSB '77, ENGR '71), president and CEO of Westinghouse Electric Co.; Kevin Sharer (KGSB '92), chair and CEO of Amgen Inc.; Charlotte A. Zuschlag (KGSB '71), president and CEO of ESB Financial Corp.; Connie Cibrone (KGSB '83), president and CEO of Pittsburgh’s Allegheny General Hospital; Paul Saville (KGSB '79), CEO of NVR; Joe Muscari (KGSB '69), CEO of Mineral Technologies; Paul Stecko (KGSB '73), chair and CEO of Packaging Corporation of America; and Ray Smith (KGSB '69), chair of Rothschild North America and former chair and CEO of Bell Atlantic;

- **195 alumni own their own companies;**

- **72 alumni are partners in their companies or firms;**

- **26 alumni are entrepreneurs or cofounders of their companies**, including Jackie Johnson (KGSB '86), founder and CEO of Corazon Inc., who received the Ernst & Young Entrepreneur of the Year award in 2003 and was named one of Pennsylvania’s Best 50 Women in Business in 2005 by the Pennsylvania Department of Community and Economic Development; and Mary Del Brady (KGSB '91), president and CEO of Red Path Integrated Pathology Inc. and a member of the National Women’s Hall of Fame;

- **115 alumni are chief financial officers;**

- **Two alumni are college presidents**, including Eddie N. Moore Jr. (KGSB '75), president of Virginia State University and winner of the Dr. Martin Luther King Jr. Legacy Award and the Thurgood Marshall Scholarship Fund’s Leadership Award;

- **Five alumni are business school deans**, including Daniel C. Smith (KGSB '89), dean, professor, and Clare W. Barker Endowed Chair in Marketing in the Kelley School of Business at Indiana University, and a three-time recipient of a four-star rating from Business Week magazine’s Guide to Leading Business Schools;

- **Seven alumni are associate deans; and**

- **30 alumni hold professorial chairs.**

Source: Joseph M. Katz Graduate School of Business

The Next Great Thinkers

What does it take to create a new generation of the professoriate?



JIM BURKE/CIDE

Distinguished Professor of Philosophy Robert Brandom talks with philosophy doctoral students Gregory Strom and Kathryn Lindeman about their dissertation research topics.

They come to Pitt hungry, eager to read, write, and debate. They train with professors who have spent their careers pushing the boundaries of human understanding. They live on Indian food and coffee and spend copious amounts of time in the library. And when it is over, they are ready to train the next generation of scholars.

They are Pitt's PhD students, a group whose achievements and sheer numbers have grown in recent years, as Pitt has surfaced near the top of the 400-plus schools in the nation that offer doctoral education.

Across the nation, PhD education has received increased attention, including a recent study by the Carnegie Foundation for the Advancement of Teaching, an independent policy and research center. Three Pitt entities—the Departments of Chemistry and English, and the Center for Neuroscience—were among 84 nationwide asked to participate in the study because of their achievements in doctoral education.

“We were really impressed by the energy at Pitt,” says Chris Golde, associate vice provost for graduate education at Stanford University and research director for the study. “The faculty we worked with showed a lot of energy and enthusiasm in doing the really hard work at looking at their own practices.

“Doctoral education is vitally important,” adds Golde. “It’s the crown jewel of all higher education systems. It’s where the best minds are honed and trained and prepared. It’s these folks who advance societies and civilizations.”

A Leader in Doctoral Education

At Pitt, the numbers of PhDs bestowed by the University have risen by 30 percent since 1995, to more than 400 per year. That ranks Pitt 18th among public institutions and 29th among all universities and colleges in the number of PhDs it produces.

Perhaps more impressive is where those PhDs end up—more than half obtain faculty

positions at other colleges and universities and most of the others receive postdoctoral fellowships, often the initial step on a path toward tenure or key positions in government or industry.

“The University is clearly a major player on the national stage in terms of doctoral education, and I see only continued improvement in the years to come,” says Pitt Provost and Senior Vice Chancellor James V. Maher. “That’s what great universities do: They produce the next generation of the professoriate for other universities, and, as a great institution, Pitt is committed to producing the next generation of thinkers and scholars.”

To make it all work, University officials say, Pitt adopts a stem-to-stern approach to attracting and training young scholars. “This doesn’t happen by accident,” says Maher. “We begin by recruiting the best students in the country and setting the bar high. Then we give our students the chance to work closely with some of the best faculty in their

fields and make sure the students have all the support they need to become strong, independent thinkers.”

“Good mentorship isn’t just holding students’ hands and walking them through the process,” says Nicole Constable, associate dean of graduate studies for the School of Arts and Sciences, the school that produces the largest number of the University’s PhDs. “It’s teaching them to be independent scholars, individuals who, when they’re finished, are prepared to be full-fledged academics.”

Supporting PhD education is expensive, but Pitt provides competitive support packages to its doctoral students because it’s fundamental to the University’s mission, says Constable. “We are investing in the future of the professoriate. Getting a PhD is a full-time, all-consuming pursuit. You’re basically saying, ‘I’m going to fully understand my discipline.’ It’s academia as a way of life.”

Two areas where the University has consistently excelled in doctoral education are the Department of Philosophy and its sibling program, the Department of History and Philosophy of Science (HPS). Their faculties are consistently given “Top Five” rankings by rating services like *The Philosophical Gourmet Report*, and both departments attract some of the best students in the country. Their approach to recruiting and training as well as placing PhD students are good examples of best practices in doctoral education at Pitt.

Looking for a Special Imagination

The excellence of the graduate program in the Department of Philosophy starts with finding and attracting the best students. But how do you find hidden talent amidst the sea of applications every year?

Robert Brandom, Pitt Distinguished Professor of Philosophy and a Fellow of the American Academy of Arts and Sciences, says he and his colleagues look for students with “a special imagination” when deciding which of the 250 applicants will fill the department’s six to eight slots annually.

“You’ve got to be able to ask a question other people won’t ask, and find a productive way to pursue an answer. That’s not the same thing as intellectual candlepower,” Brandom says. “You’ve got to be able to read something that hundreds of other people have read and think something no one else has thought about it. That’s what we’re looking for.”

Very often these applicants will be fielding offers from other “Top Five” programs like those at the Massachusetts Institute of

Technology and Harvard, Princeton, and New York universities. So showcasing the department’s strengths go a long way in convincing students to come to Pitt, says Laura Ruetsche, a Pitt philosophy professor and the director of graduate studies for the department.



James V. Maher

Joining a Community of Scholars

When Shawn Standefer was finishing up an undergraduate degree in philosophy at Stanford, he paid a visit to Pitt to see firsthand one of the PhD programs he was considering for graduate school. His Stanford professors had told him about Pitt’s excellent reputation for producing original, high-quality scholars.

Standefer was not disappointed by what he found. “One of the other grad students put it well,” says Standefer. “When you’re looking at graduate programs, it’s kind of like looking at different families and deciding which one you want to be born into. You get a sense from visiting different schools that each program has a different personality. There was something about Pitt’s atmosphere that meshed with my own interests.”



Nicole Constable

Standefer, now in his second year of the PhD program, has taken courses on Wittgenstein, Kant, and Aristotle with some of the most highly regarded scholars in the country. He’s also become involved in the University’s philosophical community: This spring, he helped organize a graduate student conference run by students in philosophy, HPS, and Carnegie Mellon University’s philosophy department.

Pitt’s philosophy department hosts a prospective students’ weekend—a kind of show-and-tell where faculty interact with the applicants who’ve been accepted. Students also get to hear a faculty member give a work-in-progress talk. This year’s presenter was University Professor of Philosophy John McDowell, whose work in linking the analytic and humanistic strains of philosophy has made him a major figure in contemporary scholarship.

“Having the work-in-progress lecture goes a long way in building a

“We were really impressed by the energy at Pitt. The faculty we worked with showed a lot of energy and enthusiasm in doing the really hard work at looking at their own practices. Doctoral education is vitally important, and it’s the crown jewel of all higher education systems. It’s where the best minds are honed and trained and prepared. It’s these folks who advance societies and civilizations.”

—Chris Golde

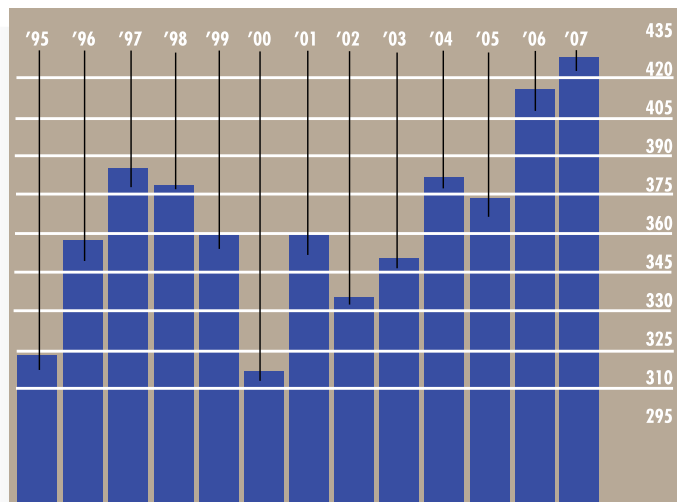
philosophy community here,” says Standefer.

Matthew Boyle, one of three Pitt philosophy alumni now on the faculty at Harvard, says he first became attracted to Pitt while reading McDowell’s work. Boyle, who received his doctorate from Pitt in 2005 and accepted a position as an assistant professor at Harvard, says his own work focuses on the role of the self-conscious in rational thought. For his dissertation, Boyle studied the philosophy of mind and the work of Immanuel Kant, both strengths of the department’s faculty.

Once he arrived at Pitt, Boyle found a fertile milieu for philosophical thought. Conversations that began in seminars, on topics like ethics or the essence of knowledge, lasted well past the classroom. “The place seemed like a real community to me,” says Boyle. “After night seminars, we’d often go out for a drink and continue the conversation. There was a lot of talk about philosophy in a

Pitt PhDs Awarded Since 1995

Pitt ranks 18th among U. S. public schools in the number of PhDs it produces





In the quest to know why experiments are important to science, HPS professor Paolo Palmieri (center) and HPS doctoral students Eric Hatleback (left) and Elay Shech recreate Galileo's inclined plane experiment.

communal way. It wasn't just a job that ended for people at 5 o'clock."

This kind of running dialogue between students and faculty is key in any intellectual enterprise, says Sasha Newton, a fifth-year PhD student in the program. "It's very difficult to do philosophy alone. You need counterarguments; you need other points of view. It's helpful to have other people with different areas of expertise to talk to. In philosophy, you can't just specialize in one area. You need to know it all because it's all interconnected."

In addition to seminars and research, teaching is an important element in getting students ready to become faculty. Newton says teaching has helped her distill complicated subjects into concise lessons, a skill she will need once she joins a faculty. "I like the challenge of having to present things very clearly for beginners."

The Job's Not Over Until Students Get Jobs

Once students complete their course work, they move on to writing a dissertation prospectus. Brandom likens the prospectus to applying for a hunting license: "We ask, 'What kind of game are you going to be hunting? Where are you going to look for it? What makes you

each student has a job,'" Brandom says.

For alums like Boyle, the intellectual voyage launched at Pitt will last a lifetime. "My own feeling is that philosophy satisfies some fundamental human impulse. We're rational animals. We have this power to think about things, and philosophy is the purest expression of that power."

Making the Scholarly Life

Most PhD programs at the University of Pittsburgh have the same recipe for success: highly competitive screening, rigorous training, access to great faculty thinkers and researchers, participation in an intellectual community, and detailed preparation for the academic job market. But it all starts with having great students.

As in the philosophy department, this

think it's going to be where you're looking? How will we know when you've bagged it?"

The student's prospectus is so important because of its impact on the quality of the dissertation he or she will write, says Ruetsche. This, in turn, has a direct impact on students' job prospects after graduate school.

"In academia, people don't ask in a job interview about a paper you wrote for a seminar your second year in graduate school. They ask about your dissertation," Ruetsche says. "It's the credential that's most central to your appointment on a faculty."

As they finish their dissertations, students begin looking for a job. To support that effort, Pitt faculty put the students through mock interviews and mock job presentations. "The faculty's job isn't over until

approach is embodied in Pitt's Department of the History and Philosophy of Science's PhD program, which attracts some of the country's top young scholars.

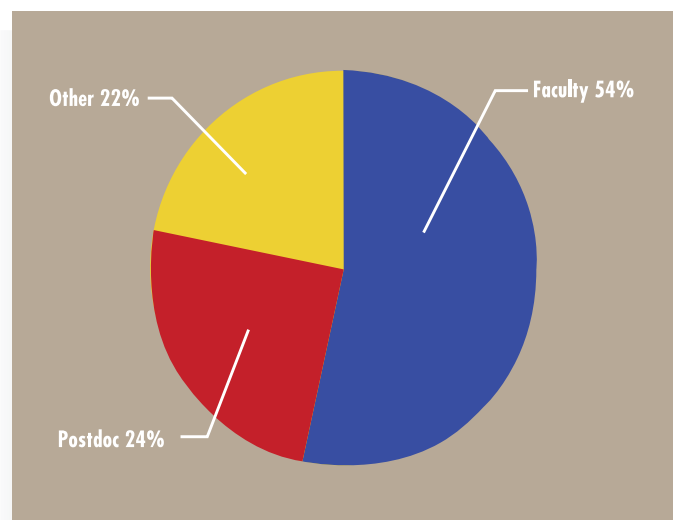
When Bryan Roberts was deciding on a possible school for obtaining a PhD degree in philosophy of science, he knew Pitt's HPS department had an excellent reputation. It wasn't until his campus visit, though, that he knew he'd choose Pitt over the other schools on his shortlist, which included Oxford University.

"Everybody knows the department has a world-renowned faculty, but the thing that really convinced me, having visited different places, was the intellectual community. They were people I wanted to work with," says Roberts, who completed bachelor's degrees in math and philosophy at the University of Washington-Seattle and is now a second-year PhD student at Pitt. "Here you're surrounded by people thinking hard about really interesting questions."

HPS is regarded as one of the best of its kind in the English-speaking world, says Sandra Mitchell, chair of HPS. In 2006, the program had an unprecedented "10 for 10"—all 10 of its graduating students received either a tenure-track faculty position or a prestigious fellowship. "When you have 10 people on the market, getting all 10 into jobs is a dream. It's an acknowledgement of the quality of the students coming out of this program," says Mitchell. And like Pitt's philosophy department, HPS boasts some of the finest faculty in the field, not just names in a catalogue or on a Web site, but active participants in the intellectual life of the program.

Students also help each other, says Holly Andersen, a sixth-year HPS student who is writing a dissertation in the philosophy of science. During her first month in the program, Andersen participated in the student retreat at a nearby state park. Over bonfires and games of Frisbee®, the more senior students explained to the newcomers what would be expected

Pitt's Placement of Recent PhDs



of them, says Andersen. “It’s nothing the upper-level students officially have to do, but it’s very helpful having someone walking you through every step.”

Andersen, who received a master’s degree from The London School of Economics in philosophy of science before coming to Pitt, says the energy students bring to the program is palpable. “I’ve never had as stimulating and interesting conversations as I’ve had in this program,” she says. “The day-to-day life of the philosopher is the life I’ve always wanted to live.”

A good place to find these kinds of conversations is the weekly grad student lunch inside the Center for Philosophy of Science on the eighth floor of the Cathedral of Learning, a kind of magnet for visiting scholars from around the world. Over cans of soda and sandwich plates, students and faculty chat about quantum mechanics, the possibility of time travel (“Actually, it’s possible,” as one student asserted at a recent lunch), and the role of probability in scientific reasoning.

Setting the Bar High

HPS students in their third year must write two comprehensive papers in both the history and philosophy of science. Each paper must be given a pass from two professors. The goal is to simulate the publication process of peer-reviewed journals, but it’s a process that evokes wincing from those who have gone through it.

“It can be brutal,” says Jim Tabery, who received his PhD degree from Pitt last year. Tabery, whose dissertation focused on the ‘nature vs. nurture’ debate, eventually had both of his comprehensive papers published in peer-reviewed journals.

“I have this memory of my professors saying, ‘What’s your contribution to the field? How is it different from what other people have said?’” says Tabery. “I realize now they were pushing me for a reason, so that I would become not just an adequate philosopher of science, but someone whose writings other people in the field are expected to read.”

“Comps” are probably the main reason why some HPS students don’t finish their degrees, says Mitchell. In the “publish or perish” world of academia, the process ensures each graduate of the program is ready for what lies ahead.

“Comprehensive exams are big hurdles,”

Return on Investment

A Snapshot of Alumni From Pitt’s Graduate and Professional Programs

- 3 Nobel Laureates
- 2 Fellows of the National Academy of Sciences
- 5 Fellows of the American Academy of Arts and Sciences
- 7 Guggenheim Fellows
- 1 John Fritz Medal Awardee
- 75 Named University Professorships
- 15 Current and Former University Presidents
- 32 Current and Former University Deans

says Mitchell, whose own work focuses on the growing field of the philosophy of biology. “If they pass those, that’s a training for what it’s like to be in the profession. You need to show you have the ability to do independent work and that you can work through an argument. It’s better for them to find out sooner rather than later whether they have what it takes to make it in the profession.”

Like their counterparts in the philosophy department, HPS students finishing their dissertations prepare to “hit the market” by participating in mock interviews and giving mock job talks.

“The practice interview is designed to be much more brutal than the actual job interview ever will be,” says Tabery, who is now an assistant professor in the University of Utah’s Department of Philosophy.

Tabery says he uses some of the same techniques that helped him land a position to prepare his students for entering the job market. “They’re training you to look for a job from the time you walk in the door. Publishing papers and teaching courses puts you in a position to hit the ground running when you’re finished. By the time that sixth or seventh year rolls around, you’re already doing what professional philosophers do.”

Proof of the University’s accomplishments in doctoral education lies in what alumni like Tabery and others do every day, says Maher. Pitt PhDs include a Nobel Laureate, Guggenheim fellows, members of the National Academy of Sciences and the American Academy of Arts and Sciences, and dozens of university presidents, deans, and named professors.

“When we produce PhDs,” Maher says, “we want them to generate the new ideas that will drive the contributions of that discipline or profession. These are people we’re counting on to further human understanding.”



HPS Department Chair Sandra Mitchell, (center) outside her Cathedral of Learning office, with a group of HPS doctoral students (from left): Jonathan Livengood, fourth year; Holly Andersen, sixth year; Yoichi Ishida, first year; Balazs Gyenis, fifth year; Eric Hatleback, third year; and Bryan Roberts, second year.

The Art of Mentoring

Training tomorrow's professors requires passion, people skills, and time



BRADEN WOLFE/CODE

Kenneth Jordan, Pitt Distinguished Professor of Computational Chemistry, talks with a former mentee, Jan Steckel, at the Provost's Awards for Excellence in Mentoring reception April 15. Steckel, who earned her doctoral degree in 2001 at Pitt, is a research scientist in the Department of Energy's National Energy Technology Laboratory.

By the time Andrea Cuéllar received her bachelor's degree in anthropology from the Universidad de Los Andes in Colombia, she knew her next stop would be graduate work at the University of Pittsburgh. Hers was an easy decision based upon the prominence and reputation of one faculty member: Robert Drennan, a Distinguished Professor in the Department of Anthropology within Pitt's School of Arts and Sciences.

It wasn't only that Drennan, a member of the National Academy of Sciences, is internationally renowned for his archeological work and findings in China, Mesoamerica, and northern South America, it was also because Drennan has a stellar reputation as a mentor of doctoral candidates.

"As for what propelled me to ... Pittsburgh, it was Professor Drennan himself. My under-

graduate mentor had been his student, and by the time I got my undergraduate degree, I was already familiar with his work. The depth of his influence on generations of students is remarkable," said Cuéllar, who is now a professor of anthropology at the University of Lethbridge in Alberta, Canada. Cuéllar's dissertation focused on the role of economic specialization in the development of complex societies. Her fieldwork was done in eastern Ecuador.

A Balancing Act

In his 30 years at Pitt, Drennan has served as either principal advisor or co-advisor to 30 doctoral students. His students have been extremely successful in landing prestigious grants, including many from the National Science Foundation, to fund their dissertation

research. Many of his former students, or "mentees," rave about him, but Drennan makes no claims of having perfected the mentoring process. Far from it.

"Mentoring is a continual process of trial and error, a balancing act. When you sit down and talk about mentoring, it's really easy to start pontificating and sound like God up there, tweaking a puppet's strings. None of us are God, and you hardly ever know if you're doing the right thing," said Drennan, a winner of the 2007 Provost's Award for Excellence in Mentoring.

The most effective mentor-doctoral student relationships involve a healthy amount of tension between what the student needs and how much the mentor should give. Students begin a doctoral program and face a bevy of challenges: defining a thesis, learning how to write grant



Nancy Day, head of the psychiatric epidemiology program in the Graduate School of Public Health, has mentored about 30 Pitt students since 1980. “I tell my students, ‘I know you have facts, but I want to know if you can think,’” she says.

doctorate in psychiatric epidemiology within Pitt’s Graduate School of Public Health. Brent suggested that he talk with Nancy Day, head of the psychiatric epidemiology program. A winner of the 2007 Provost’s Award for Excellence in Mentoring, Day has mentored about 30 Pitt students since 1980. She is a national expert on the long-term effects of fetal alcohol exposure.

“I knew someone else who had started in the psychiatric epidemiology training program before me, and I asked him some questions about Dr. Day. He said, ‘Just be prepared. She will get the most out of you, but she can be intimidating until you know her. She does not suffer fools gladly,’” recalled Bridge with amusement. Bridge’s doctoral dissertation focused on the risk of major depressive disorder in teens exposed to a friend’s suicide. He

proposals to fund research, and fine-tuning their critical thinking, to name a few.

The mentors walk a tightrope between pushing their students to overcome hurdles independently, and, at the same time, ensuring that those hurdles don’t derail a project. They must strike a balance between too-gentle encouragement and setting the research bar too high.

Doctoral mentoring at Pitt varies from school to school, department to department, professor to professor, and student to student. To the outsider, it is very much behind the scenes. But to the doctoral student, the relationship with a mentor is very much at the forefront of his or her agenda. The nature of that relationship can make all the difference between academic success or failure, personal happiness or agony.

“I honestly believe that (mentoring) is the most crucial element to graduate studies,” said Mikael Haller, another Drennan mentee, who earned his PhD degree in archaeology/anthropology at Pitt in 2004. He now holds a tenure-track position in the Department of Anthropology at St. Francis Xavier University in Nova Scotia. In addition, the Canadian government has funded his archeological investigations for the next three years.

Coming in Green

There is a common misperception among nonacademics that doctoral students hit the ground running, armed with their dissertation topics and the research skills to complete them.

That is not, however, generally the case. In fact, probably most doctoral students enter a program with only a vague idea of dissertation topics, little insight into how much work the doctoral process requires, and little experience with original thinking and designing research projects.

Jeff Bridge acknowledged his inexperience in many of those areas when he began pursuing his doctorate in psychiatric epidemiology at Pitt in 1993. While earning bachelor’s degrees in psychology and English literature at Pitt, he also worked at Western Psychiatric Institute & Clinic (WPIC). Bridge researched risk factors for teen suicide and worked closely with David A. Brent, academic chief of child and adolescent psychiatry at WPIC and a professor of psychiatry, pediatrics, and epidemiology in Pitt’s School of Medicine.

The experience “piqued my interest in doing research as a career,” he said. When Bridge decided to explore earning a

is now an investigator in the Center for Innovation in Pediatric Practice, part of The

Research Institute at Nationwide Children’s Hospital in Columbus, Ohio, and continues to research teen suicide.

He said that while he believed his previous experience at WPIC had trained him to do research and original thinking, he quickly learned that wasn’t true. “I was very much ‘a newbie.’ ... Most of us got into the program because we were good students and someone recognized our potential. But we were just clay molds, and we needed years—and years after our dissertation—to develop a shape.”

The most effective mentor-doctoral student relationships involve a healthy amount of tension between what the student needs and how much the mentor should give. Students begin a doctoral program and face a bevy of challenges: defining a thesis, learning how to write grant proposals to fund research, and fine-tuning their critical thinking, to name a few.

A Mentor’s Mission

The mentoring relationship is key to that molding.

The mentor’s role is to teach the inexperienced graduate student how to think originally, how to design research projects, and how to implement that research. “I tell my students that ‘I know you have facts, but I want to know

if you can think,” Day said. “I could assign them a (dissertation) topic, and it would be helping me with *my* research. But that’s not what it’s all about.”

Mentors train their students how to ask the right questions—and how to answer them—so that the students move their respective fields of study forward. In other words, the mentoring process is crucial to creating the next generation of scholars and professors.

Bridge remembers Day telling him exactly that during their first meeting. “Initially, she told me what her expectations were, and that they were very high,” he said. “She made it very clear that she didn’t want her students to be ‘lifers.’ ‘Make your mark in the field,’ she said. ‘Sure, do well in the classroom, too, but go out in the field and make an impact.’”

Tools of the Trade

Successful mentoring requires the mentor to have fine-tuned people skills, a considerable amount of time available for consults, an open mind, a nurturing instinct, and a passion for training the next generation’s scholars.

Leon Gleser, professor of statistics in the School of Arts and Sciences, said he—like most mentors—works hard to find the delicate balance between helping a student too much and too little.

One of the easiest mistakes to make as a mentor, he said, is to overdirect students. “This is easy to do with some students, because they want you to tell them what to do at every step, and some are so timid that you feel like you’re taking over. But real growth comes with making your own mistakes, so I try to suggest steps to try and then let them choose what they will do,” said Gleser, a winner of the 2008 Provost’s Award for Excellence in Mentoring. Gleser is graduate director for the Department of Statistics and has supervised a total of 23 doctoral dissertations, including 10 at Pitt. His students have received tenure-track or post-doctorate positions at Harvard University, the Cleveland Clinic, and Vanderbilt University, among others.

“On the other hand, it is also easy to neglect the students who seem to know what they’re doing and makes advising too easy for you. Sometimes they have problems that they don’t tell you about until it is almost too late to fix them,” he added.

To determine the difference, Professor Kenneth Jordan is known for walking casually past students’ desks to check in with them. Jordan, a winner of the 2008 Provost’s Award for Excellence in Mentoring, is Distinguished Professor of Computational Chemistry at Pitt. He also is codirector of the University’s Center for Molecular and Materials Simulations as well as a member of Pitt’s Petersen Institute for Nanoscience and Engineering. He has mentored 23 doctoral students at Pitt and is currently advising six others.

Jan Steckel, a mentee of Jordan’s, said if her work was going well when Jordan would make a walk-by, “our interaction was limited to a quick greeting or perhaps a short progress report. If I happened to be having some kind

of difficulty, his casual visit or short e-mail provided an easy opportunity for me to mention the problem to him,” she said.

She added that Jordan would also encourage students to form study groups. “If I or another student expressed frustration or confusion about anything, he would often reappear a few minutes later with a book or an article. ... If more than one student was interested in the concept, he often suggested that we form a study group. He would suggest an introductory-level problem that we could all work on and then meet to discuss.”

Steckel is currently a research scientist working in the U.S. Department of Energy’s National Energy Technology Laboratory.

Another key role for the mentor is to introduce students to professional contacts and to encourage them to publish their research. Katheryn M. Linduff, who holds a joint appointment in the Department of the History of Art and Architecture and the Department of Anthropology, has helped a number of her doctoral students win fellowships and internationally competitive grants. She is an expert on ancient Chinese art and archaeology, and her doctoral students have a record

of obtaining fellowships, including from the Andrew W. Mellon Foundation, National Science Foundation, and National Gallery of Art and 10 Chancellor’s fellowships in Chinese studies.

To help her students obtain grant funding and land field-research positions, Linduff taps her extensive network of peers, which she has developed over the past 25 years. She said that placing a doctoral student in a field-research position, for example, more often than not requires that she personally know the person in charge and visit the site. It takes years to solidify such academic relationships—

something that Linduff concentrates on to the benefit of her students.

In addition, Linduff is praised by a number of mentees for encouraging students to publish research papers and then to present them at various national conferences she chairs.

Finally, another key tool for mentors is the simple red pen. Mentors use it in the seemingly endless revisions of students’ dissertation descriptions, grant proposals, job applications, and other documents. Linduff’s red pen is legendary. It is not uncommon for her to critique six or more drafts of students’ papers and grant proposals.

Mentors train their students how to ask the right questions—and how to answer them—so that the students move their respective fields of study forward. In other words, the mentoring process is crucial to creating the next generation of scholars and professors.



A Pitt team traveled to Inner Mongolia in 2001 to do fieldwork. Standing, from left, are Richard Drennan, Pitt Distinguished Professor in the Department of Anthropology; Christian Peterson, who earned a PhD degree in anthropology at Pitt in 2007; and four of the research team’s Chinese colleagues. Sitting, from left, are Katheryn M. Linduff, a Pitt professor of anthropology as well as the history of art and architecture, and Gideon Shelach, who received a PhD in anthropology from Pitt in 1996.

When It Doesn't Work

Not every mentoring relationship is successful, of course.

"It's not terribly uncommon for the relationship to not work out effectively," Drennan said. "If it's not working or it looks like the student would work better with other people, then the student needs to shift. Students have shifted both to and from working with me when it seems someone else might guide them better. It often coincides with a student's shift in academic interest ... or it's related to the personal relationship."

Sometimes, it's just a difference of approach.

Gleser said he has had "difficulty diplomatically telling students that they are not succeeding at what they are trying to do, and then helping them to find a different path."

He recalled a situation before he came to Pitt where his mentee "had a fixed idea of what a 'successful' research solution must be, but the problem he was attempting was not suitable for a solution of this kind. I could not get him to change his outlook, and he thought I should help him find a solution of the type he was seeking."

The student eventually completed his doctorate with another advisor.

"I'm glad he achieved his goal, but I know that I could have handled the situation better," Gleser said.

The Personal Side

But when the relationships do work, they often result in lifelong academic and personal relationships. Networking and grant proposal revisions aside, mentors also play key roles in students' and their families' personal lives. Linduff, for example, recalled the story of one of her students, a young, pregnant woman from the People's Republic of China whose family was restricted by the U.S. government from entering the United States to help with the delivery. Linduff remembered coaching the young student on breathing exercises in her office and then sending one of the student's classmates as her coach into the delivery room.

Many of Linduff's students are from China, and a number of them face language struggles as well as daily life struggles once they arrive in Pittsburgh. Linduff frequently picks these students up at the airport upon their arrival in the United States; helps them find apartments and roommates; aids them in establishing both social and academic networks; and holds an annual Thanksgiving dinner that all current and former mentees, called "Thanksgiving Alums," can attend.

Christian Peterson, whose coadvisors

were Linduff and Drennan, recalled how, after he was injured during field work in Eastern Inner Mongolia, Drennan allowed him to recover in his home.

Learning Goes Both Ways

Doctoral students aren't the only ones who gain something from the mentoring relationship. The professors do, too, and they cite their continued learning as one of the reasons they love to mentor.

Jordan recalled talking with a former doctoral student about potential dissertation topics. "He proposed a problem very different from anything that I was working on at that time. Fortunately, I agreed to let him pursue this project rather than trying to convince him to work on a project already under way in the group. This now has evolved into one of the main areas of research in my group," he said.

Linduff said she, too, finds it exciting to watch a student develop into a researcher. She also enjoys the learning she does as part of getting up to speed on the specifics of a doctoral student's dissertation topic.

"The process is very stimulating

intellectually, and I like learning new ways to think or to solve a problem," Linduff said.

It's not surprising that mentors and their students develop close personal and professional friendships that literally last a lifetime. After the students receive their doctorates and begin their careers, the phone calls go both ways—they call their mentors for advice and their mentors call them with questions. Finally, they have become peers—and friends—at the same time.

The doctoral process "was a long one, and I am still amazed at how much I matured as an investigator and a person during my time at Pitt," said Haller, who completed his doctorate in archaeology under the guidance of Drennan.

"Overall, the best testament to how influential Dr. Drennan's mentoring is the fact that I have implemented the same strategies in my own teaching, research, and mentoring. ... Therefore, not only did Dr. Drennan have a great impact on my academic life, he has indirectly influenced the success of students here at St. Francis Xavier University, and many more to come in the future," Haller said.

Provost's Award for Excellence in Mentoring

2008 Winners

Louise Comfort, professor of public and urban affairs in the Graduate School of Public and International Affairs

Donald DeFranco, professor of pharmacology and chemical biology in the School of Medicine, member of the Pittsburgh Institute for Neurodegenerative Diseases

Leon Gleser, professor of statistics in the School of Arts and Sciences

Kenneth Jordan, Distinguished Professor of Computational Chemistry in the School of Arts and Sciences, director of the Center for Molecular and Materials Simulations

2007 Winners

Kathleen M. Blee, Distinguished Professor of Sociology in the School of Arts and Sciences

Nancy Day, professor of psychiatry in the School of Medicine

Robert Drennan, Distinguished Professor of Anthropology in the School of Arts and Sciences

Noreen Garman, professor of administrative and policy studies in the School of Education

2006 Winners

Celia Brownell, professor of psychology in the School of Arts and Sciences

Katheryn Linduff, professor in the Department of the History of Art and Architecture in the School of Arts and Sciences

Esther Sales, professor in the School of Social Work

Alan Sved, professor of neuroscience in the School of Arts and Sciences, codirector of the Center for Neuroscience



BRADEN WOLFE/COOPE

The winners of the 2008 Provost's Award for Excellence in Mentoring were recognized at an April 15 reception in the William Pitt Union. From left, Pitt Provost and Senior Vice Chancellor James V. Maher, Louise Comfort, Leon Gleser, Donald DeFranco, Kenneth Jordan, and Vice Provost for Graduate and Undergraduate Studies Patricia Beeson.

Four Pitt Faculty Members Win 2008 Provost's Award for Excellence in Mentoring

Four members of the University of Pittsburgh faculty are recipients of the 2008 Provost's Award for Excellence in Mentoring, an honor that recognizes faculty for their mentoring of doctoral students. This is the third year the awards have been granted.

The awardees were selected from 31 nominations made by Pitt doctoral students and faculty.

The honorees are Louise Comfort, professor of public and urban affairs in the Graduate School of Public and International Affairs; Donald DeFranco, professor of pharmacology in the School of Medicine; Leon Gleser, professor of statistics in the School of Arts and Sciences; and Kenneth Jordan, Distinguished Professor of Computational Chemistry in the School of Arts and Sciences. Each of the four winners will receive a cash prize of \$2,500.

"Fundamental to the success of our doctoral training programs are the faculty members who serve as mentors to our graduate students," said Pitt Provost and Senior Vice Chancellor James V. Maher. "Our faculty mentors provide intellectual and professional guidance that helps support, encourage, and promote the growth of our students. The faculty selected for

these awards exemplify our commitment to the excellence of graduate education at the University of Pittsburgh."

Brief biographies of the recipients follow.

Louise Comfort is a fellow of the National Academy of Public Administration and a Fulbright Senior Scholar. Comfort has chaired 16 doctoral dissertations, served on 22 doctoral dissertation committees, and is currently advising 11 additional students. Her students have participated in a variety of research projects, including the Interactive, Intelligent Spatial Information System (IISIS), which is computational software that helps community leaders manage risk during disasters and better link communities together when public safety is at risk. Comfort, who directs the operation, and the IISIS team have spent several years researching and compiling data and are now conducting field demonstrations in the Pittsburgh metropolitan region. Alumni who have studied under Comfort have gone on to hold both academic positions and high-level policy-setting administrative positions throughout the world.

Donald DeFranco has made significant contributions to the graduate experience of

all pharmacology students as the current graduate director. A number of projects in his laboratory are focused on examining the molecular basis of neuronal cell death. He has implemented a student journal club where students sponsor the presentation of a paper by the weekly invited visiting seminar speaker and later meet with the visiting scientist to discuss the paper. Throughout the past 23 years, DeFranco has advised 17 doctoral students and is currently advising three others. His students have been very successful in securing tenure-stream or postdoctoral positions at distinguished medical schools.

Leon Gleser has, since the inception of the Department of Statistics in 1997, advised all incoming students in his role as graduate director. He has enjoyed a distinguished research career and was the executive editor of *Statistical Science*. Gleser has supervised a total of 23 doctoral dissertations, 10 of which have been at Pitt. He is currently advising three other students. His students have been placed in tenure-stream or postdoctoral positions at Harvard University, the Cleveland Clinic, and Vanderbilt University, among others.

Kenneth Jordan is the director of the University's Center for Molecular and Materials Simulations and a Fellow of the American Association for the Advancement of Science. He also is a member of Pitt's Petersen Institute for Nanoscience and Engineering and an associate faculty member in the Department of Computational Biology. Jordan is an expert in the use of theoretical and computational methods for understanding the properties of molecules, clusters, and surfaces. In recent years, he has been especially interested in hydrogen bonding and how excess electrons and protons localize in clusters of water. Jordan's research on water was included in *Science* magazine's top 10 scientific breakthroughs of 2004. During the past 30 years at Pitt, Jordan has advised 23 doctoral students and is currently advising six others. His former students maintain successful research careers at both research universities and national laboratories.

Pitt Chronicle May 27, 2008

The Explorers

Humanities and social sciences PhD students cross traditional boundaries, break new ground



David Bartholomae (standing), professor and chair of Pitt's English department, says the department's expanded vision has helped transform the field of English. Pitt graduate students in the Department of English pictured with Bartholomae are (from left) Katherine Kidd, Anna Redcay, and Helen Gerhardt.

Jen Waldron, an assistant professor in Pitt's English department, recently taught a graduate seminar called "Word and Image." Waldron, director of Pitt's Medieval and Renaissance Studies Program, is a scholar of Elizabethan and Jacobean drama. But the enrollment sheet for the seminar included students doing graduate work in creative writing, art history, French, English literature, and film studies. They were all interested in similar questions: How are words and images produced and received? What do they say about the world in which they were created?

"We are all interested in how a message changes when it's translated into a different medium and how various modes of representation interact with one another in particular cultural contexts," Waldron says.

Waldron's colleague in the English department, Susan Z. Andrade, is a scholar

of African and Caribbean literature, with a special interest in the African novel. Andrade sits on the dissertation committee of a PhD candidate in Pitt's Department of Germanic Languages and Literatures who is writing about Romanian émigré literature in Germany. In Andrade's work on the African novel, she asks a question similar to the PhD candidate on whose committee she sits: What do the content and form of these literatures tell us about the society that created them?

For his PhD dissertation in history, Niklas Frykman spent much of the past two years traveling throughout Europe and visiting naval archives. He visited six countries and six national archives looking for information on late-18th-century mutinies. Scouring source material written in five different languages—Danish, Dutch, Swedish, English, and French—he was trying to illuminate the

relationship between the egalitarian ideals of the French Revolution and the sudden rash of mutinies in the Atlantic.

None of these scenarios would have been likely a generation ago, when graduate students were expected to master a more narrowly defined discipline. English students needed to know the prescribed canon of literary works and, generally speaking, didn't have much to do with religious studies, political science, or anthropology. History PhDs wrote dissertations on one country or another. Not six.

Pitt's graduate programs in the humanities and social sciences now allow—even encourage—students to pursue broader interests. They take more seminars outside their own departments and are learning to straddle the boundaries of disciplines, fields, and specialties in an effort to chart new scholarly terrain.



MARY JANE BENTY/CODE

Evelyn Rawski, University Professor of History and the department chair, and history professor Alejandro de la Fuente, director of the department's graduate studies, helped institute deep changes in the department's graduate program to provide a more rounded education. As of 2003, graduate students in history are required to study one of several thematic, transnational fields.

Beyond a Particular Time and Space

The turn toward cross-fertilizing initiatives is happening on a number of different levels. Within individual departments, some graduate programs have been revamped to incorporate these initiatives.

“The best programs are those in which academic leadership is always rethinking the direction of scholarship,” says Pitt Provost and Senior Vice Chancellor James V. Maher. “Department chairs and faculty are trying to broaden their students’ exposure in a systematic way. Today they see their work in a broader discourse.”

Scholarship in the humanities, for example, has traditionally been defined by time and space—say, the Victorian novel or antebellum plantation life. Doctoral students will always be expected to master their subfields, but departments are increasingly interested in producing scholars who can address a broader array of questions.

As a result, the study of a particular time and place is being enriched by an awareness of what’s going on in other times and places. Graduate programs are not abandoning the traditional time-and-place model of scholarship, Maher and others say, but rather expanding it so that when students graduate, they are able to place their own areas of study within a much broader context.

In addition, Pitt’s Universitywide certificate programs—Women’s Studies, Film Studies, and component programs within the University Center for International Studies—help PhD students explore intellec-

tual frameworks outside their “home” departments. Thus, the natural intellectual curiosity of individual students and scholars serves as a constant source of innovation within the humanities.

Rethinking and Reconfiguring Programs

Two examples of this kind of cross-curricular thinking can be found in Pitt’s English and history departments, both of which were selected to participate in the Carnegie Initiative on the Doctorate, a national program that seeks to improve doctoral education.

“We were asked to evaluate what we do and, more importantly, why we do it,” says Evelyn Rawski, University Professor of History and the department chair. “The initiative asked us why we’re requiring students to do the things we do and then to simplify the process, to better define the academic mission.”

As a result of this introspection, the history department began initiating deep changes in its graduate program. In 2003, it began requiring graduate

students to study one of a handful of thematic, transnational fields. A good example of this is Atlantic History. Now, instead of just studying 17th-century New England history, for instance, students would also be expected to understand important political and social changes in Western Europe at that time, the rise of the West African slave trade and the settlement of the West Indies.

Pitt’s graduate programs in the humanities and social sciences now allow—even encourage—students to pursue broader interests. They take more seminars outside their own departments and are learning to straddle the boundaries of disciplines, fields, and specialties in an effort to chart new scholarly terrain.

Racism provides an excellent example of this, says history professor Alejandro de la Fuente, director of the department’s graduate studies. “As a corpus of ideas and policies, racism can be studied from the framework of the nation-state. But if you look at it outside of one region or nation-state, you discover many of these ideas have traveled around the world and have been used and applied in different areas. They become part of a larger trend.”

The department paired up professors from different subdisciplines to design and teach courses in thematic topics. In the course Text and Context, for instance, a scholar specializing in Asian studies and one specializing

in European studies devised a syllabus that showed the evolution of words and ideas from Ancient Greece to early China, Imperial Japan, and 17th-century Europe.

The English department was no stranger to self-examination when it took part in the Carnegie Initiative. The PhD program had already undergone a transformation in the 1990s that included a name change. Doctoral students now earn PhDs in critical and cultural studies, not English. The name change reflected a shift that included the study of nontraditional texts, like films, as well as a different way of thinking about literature.

“No one can imagine that film hasn’t had an effect on the way people think of narrative,” says David Bartholomae, professor and chair of the English department. “When you change the focus to critical and cultural studies, you begin to acknowledge that text works in places that extend beyond the page. You can ask questions like, ‘What do people see, read, watch? What’s the cultural work of the novel with respect to 9/11?’”

Still, participating in the Carnegie Initiative on the Doctorate helped show some of the program’s shortcomings, Bartholomae says. Faculty worried students were becoming too specialized. The department wanted to make sure students had a more balanced training. So the department expanded students’ reading and project lists to give them a more comprehensive background.

“If a student entering the job market was writing a dissertation on, say, [20th-century American novelist] Thomas Pynchon and the theory of the nation or American imperialism, we would want someone looking at that student’s CV to say, ‘Oh, this person can teach our 20th-Century Novel course or our Survey of American Literature,’” Bartholomae says.

The changes over the past 15 years have catapulted the program into national prominence. Pitt’s English department now ranks in the top fifth of all doctoral programs, according to the National Research Council.

“This was a radical change,” says Bartholomae. “We were doing the kinds of work in a number of different areas that were catching people’s attention. The thinking was, if the field of English was changing, we were leading the change.”

Pitt’s Department of the History of Art and Architecture also encourages its students to become proficient in areas outside of their traditional focus—in this case, regional.

“The key is to situate your research within a question that is of interest outside the

particular region or area you’re studying, but also across cultures and times,” says Katheryn Linduff, a professor of East Asian art history and chair of the department. “We want to be able to think about the really big questions: What’s the function of a portrait? How do architectural movements travel to other countries? We’re positioning our students to do more broadly based cross-cultural work.”

Students in the history of art and architecture program are researching a wide array of materials, from Chinese mortuary art and German churches in Poland and Jerusalem to 19th-century French photography. According to Linduff, the increasingly global nature of daily life with the advent of the Internet and instant worldwide communication makes the interdisciplinary approach crucial to understanding any field. In addition, the discipline is undergoing a transformation that necessitates a better understanding of other disciplines and connections between cultures.

“We’re moving away from the notion that everything important happens only in one place. We’re moving past just looking at Paris in the 19th century,” Linduff says. “There’s an increasing awareness that creativity can happen anywhere, and that interconnectedness isn’t just possible—it’s likely. It’s part of a way of looking at art that’s not just focused on a single individual ‘great artist’ but on the process of creativity.”

Illuminating the Questions

Changes in Pitt’s English and history departments have attracted a diverse group of young scholars. English PhD students study everything from Arthurian texts to war movies to multiplayer online video games. The essential questions of the disciplines unite the research: How are narratives constructed? What impact do these works have on an audience? What can the texts tell us about the world in which they were created?

The interdisciplinary nature of the Pitt English department attracted Richard Parent to the University. “When I was looking at PhD programs, I made a list of all the classes I could take at the places that accepted me and gave me funding,” says Parent, who received his Pitt PhD in 2005 and is now an assistant professor at the University of Vermont. “The list at Pitt was about five times longer than the lists at other schools.” Parent

“We have the ability to apply a range of interests and follow theoretical hunches into directions that haven’t already been cordoned off. We’re building a field from the ground up.”
—*Jamie Bono*



Eric Kimball, a doctoral student in the Department of History, is finishing his dissertation on trade between the New England colonies and the Caribbean. Setting early America within the context of Atlantic history makes for a richer understanding of the discipline, he says. Kimball is photographed in the microfilms section of the Hillman Library, which has collections he used in his research, including naval office shipping records that record trade entering and leaving the colonies, Parliamentary reports and testimony, the American slave trade collection, and West Indian slave plantation records.



Jamie Bono, a PhD student in the English department who studies digital texts and alternate reality games, draws his research from numerous disciplines, including the history of technology, literary criticism, and classic Greek rhetoric. The ability to engineer his own course of study attracted him to Pitt and is what excites him about the work he will do for his dissertation.

took courses in the Departments of Religious Studies, Communication, and Philosophy, and he wrote his dissertation on how online and interactive texts affect the way we read.

Parent feels working with a diverse group of scholars—his committee consisted of an expert each in reading, composition, and interpretation—benefited him, especially when it came to explaining his research to hiring committees with little exposure to “digital studies.” “I was lucky, because my committee kept forcing me to be as clear as possible and make sure that what I was writing was understandable to as many people as possible.”

The history department’s turn toward transnational themes has aided students of American history, Rawski says. “Now our Americanists have expertise in more than just their regional areas.”

Eric Kimball, who is finishing his dissertation on trade between the New England colonies and the Caribbean, says setting early America within the context of Atlantic history makes for a richer understanding of the salient questions of the discipline.

“When you study Atlantic history, you can ask questions like, ‘When the 13 colonies decided to declare their independence, why did the other colonies decide not to?’ ‘Why didn’t Canada and the Caribbean decide to declare their independence, too?’” says Kimball, who will be an assistant professor of colonial American and Atlantic history at Utah State University in the fall. “You can actually illuminate the questions of why those 13 decided to break away when they did by looking at the

era from a transnational perspective.”

A Network of Bridges

Abetting this multidisciplinary approach are the University’s certificate programs, which provide training in areas that straddle the domains of different disciplines—women’s studies, film studies, and international studies, among others.

Getting a certificate in women’s studies exposed Julie Hakim Azzam—an English department student who finished her critical and cultural studies PhD on postcolonial literature and gender in fall 2007—to works of sociology, anthropology, political science, and history.

“Women’s studies gave me a vocabulary to talk about politics or history in literature—something I’d always been interested in but didn’t know how to bring within the scope of literary analysis,” says Hakim Azzam, who teaches women’s studies and literature at Chatham University. “I’d read articles about how political upheavals affected women or the way that culture creates gender and gendered forms of oppression,” she says. “I saw that happening in the novels I was reading but didn’t know how to discuss it. Women’s studies gave me a way to discuss those topics.”

Helping doctoral students understand the regions they are studying is the primary purpose of the University Center for International Studies’ graduate certificate program. Students in the Latin American Studies graduate program, for instance, are required to take courses on Latin America outside of their major. The cross-disciplinary study of a region is crucial,

says Kathleen M. DeWalt, a professor of anthropology and public health and director of Pitt’s Center for Latin American Studies (CLAS).

“One of the ways to deepen a student’s understanding of a place is to have a more contextualized view of the region, to place one’s own disciplinary perspective in the context of other disciplines,” says DeWalt. “I encourage all my anthropology students to take Latin American history or politics.”

CLAS is one of five federally designated National Resource Centers at Pitt, and thus among the top few centers of its kind in the nation. The center attracts students from anthropology, business, education, history, Hispanic languages and literatures, and other programs.

In the film studies certificate program, graduate students from different departments study everything from Chinese movie-watching habits in the 1920s to contemporary Black crime

films. The program attracts PhD students from the Departments of English, Communication, Slavic Languages and Literatures, and Germanic Languages and Literatures.

“Film by its very nature is interdisciplinary,” says Lucy Fischer, Distinguished Professor of English and Film Studies and director of the Film Studies Program. “The film object itself draws from many different fields—literature, theater, pictorial arts—and we also study a lot of the economic and business aspects of film.”

“Film is our new national literature,” says Tanine Allison, a doctoral student in English and film studies who is writing her dissertation about World War II films. “Film has a huge cultural impact. We need to be able to step back and learn what kinds of images are coming at us and shaping our opinions. If we don’t study it, we’re missing out on a huge part of how our culture works.”

Choose Your Own Adventure

There is an organic aspect to the interest in an interdisciplinary approach. While departments and certificate programs support a cross-fertilizing approach to graduate education, students are the ones who ultimately push their own research across disciplinary boundaries by following questions or phenomena that can’t be understood by using traditional guidelines.

Jamie Bono’s research provides an excellent example. A PhD student in the English department who studies digital texts and alternate reality games, Bono first became



Lucy Fischer (left), Distinguished Professor of English and Film Studies and director of Pitt's Film Studies Program, says film draws from many fields, including literature, theater, pictorial arts, and even economics and business. Tanine Allison (right), a doctoral student in English and film studies who is writing her dissertation about World War II films, believes that film is our new national literature.

interested in the subject while playing the interactive game *Majestic*, which is a cross between role-playing and a scavenger hunt. Played over the Internet, it uses text messaging and other media. (*The Da Vinci Code*'s author, Dan Brown, derived some of his ideas for this novel from *Majestic*). The field of electronic media studies (referred to by some as the New Humanities) is so new there is no canon of texts for Bono to master. He's had to design much of his course of study, taking classes in the Departments of the History and Philosophy of Science, Communication, and English.

There is one drawback, says Bono: "I get option paralysis."

There are numerous disciplines for Bono to draw from, including the history of technology, literary criticism, and classic Greek rhetoric (His reading list includes Aristotle and Marshall McLuhan, who predicted the rise of digital culture and penned the

phrase "global village" in 1962). To navigate all this, institutional support is key, he says.

"It's great to have professors who are willing to go along with this and give me a long leash," says Bono. "The great thing is that working with people who don't do what I do forces me to talk with people outside of my field about my research."

The ability to engineer his own course of study is what attracted him to Pitt, and it's what excites him about the work he will do for his dissertation.

"We have the ability to apply a range of interests and follow theoretical hunches into directions that haven't already been cordoned off," Bono says. "We're building a field from the ground up."

Making Progress

The results of the revamped programs in the English and history departments have been largely positive. Many entry-level tenure-

stream positions require the ability to teach at least two or three different fields, so having that kind of comprehensive knowledge comes in handy for students entering the job market.

The placement rate for history PhDs into tenure-stream positions has increased rapidly, from 45 percent in 2000 (which Professor de la Fuente points out is the average rate for top-30 programs) to 60–70 percent for the last two years. In English, placement of PhDs into tenure-stream positions has increased in the past 10 years along with a dramatic increase in the program's national profile.

For Rawski, better placement numbers are a reflection of how well these new methods anticipated broader changes in the field. The American

Historical Association (AHA), the field's leading scholarly organization, recently endorsed the cross-disciplinary approach in its report *The Education of Historians for the 21st Century*. AHA scholars discovered, among their findings in the report, that today's graduate students "must be prepared to work at the intersection of disciplines, where more and more of the important scholarship and teaching [are] likely to take place in the years to come."

For Rawski and others, a finding like this is proof that the innovations are keeping Pitt at the leading edge of doctoral education in the humanities and social sciences.

"In the historical scholarship of the next 20 years, people will be looking at broader questions and must have the ability to look at many different sources," Rawski says. "This is where the field is going. This is where scholarship is going."

Pitt Law Is Building Momentum for Its Future

Law school leverages its strengths, draws students from across the country



Law professor Ronald Brand, who is director of Pitt's Center for International Legal Education, works with three students in the law school's Teplitz Memorial Courtroom. From left, Dawn Patterson and Chan Braithwaite, both second-year law students, and Emilie Hammerstein, a third-year student.

Ravi Reddy (LAW '06) received a surprise just before beginning his post as a legal officer at the United Nations Mission in Kosovo. It was late 2006, and Reddy learned that his future employer, the director's office of the UN's Department of Justice in Pristina, the capital of Kosovo, was woefully short-staffed because of illnesses, injuries, and the holidays. So instead of serving as a judicial inspector in Kosovo, the 25-year-old Reddy would be covering for a couple of his superiors for his first few months. Reddy was told to brace himself: "They

basically said, 'Try to relax while you can, because when you get here, you're not going to have any time,'" says Reddy, now 27.

Fresh out of the University of Pittsburgh's School of Law, which he chose for its strong reputation in international law, Reddy found himself immersed in global issues for the next five weeks. He worked 14-hour days and most weekends, handling information requests from New York, The Hague, and Kosovo's government. He compiled briefing packets for the UN Security Council, met with war crimes

prosecutors, and helped smooth legal wrinkles for the UN in a country whose legal system was being rebuilt from scratch.

"A lot of times my answer would be, 'Let me get back to you on that,'" Reddy says. His trial by fire in Pristina resulted in the director bringing Reddy onto his staff permanently, instead of placing him in the Judicial Inspection Unit. "I guess they thought if I could handle those five weeks, I could handle other things as well," Reddy says.



PATRICIA MAGLE

Allen Black (LAW '03) was a professor of immunology in Pitt's School of Medicine when he switched careers and enrolled in the University's law school. He is now a biotech patent lawyer in the Pittsburgh office of Pepper Hamilton LLP, which is a multipractice law firm with more than 500 lawyers in 11 offices.

Allen Black (LAW '03), meanwhile, experienced an unexpected turn in his own career before he attended Pitt's law school. A resident immunologist at Magee Women's Hospital and a professor in Pitt's School of Medicine, Black had been working to obtain a patent for a cancer and HIV drug he had discovered in graduate school. His own patent lawyer suggested that Black explore a legal career in biotech patent law. Black did just that and committed to switching careers when he applied to Pitt's law school. The school "had a faculty dedicated to teaching intellectual property law and seminars specifically for patent law. Those were the two factors that really influenced my decision," says Black, who holds a PhD in immunology.

Now an associate in the Pittsburgh office of the Philadelphia-based law firm of Pepper Hamilton LLP, Black writes patents for innovations such as bacteria-resistant catfish, RNA drugs, and HIV vaccines. He attributes his success to the real-time experience and specialized training he received at Pitt.

Competitive Edge

Black and Reddy, though different types of lawyers, were both attracted to Pitt's law school for two of its signature strengths: international and comparative law and intellectual property and technology law. The latter has been named in *U.S. News and World Report* as one of the top 30 programs of its kind for each of the past three years. In addition, Pitt's law school is well known for health law, which consistently has been recognized in *U.S. News* as being among the top 15 programs of its kind in the nation.

Mary Crossley, dean of Pitt's law school, says the experiences of Reddy and Black highlight the school's strategy: "While continuing

to offer a broad-based curriculum, we are building on the school's distinctive strengths to attract students from across the country to come to Pitt Law."

These and other strengths have drawn more out-of-state students to apply to the law school than ever before; for example, in the fall of 2008, more than 42 percent of incoming students are from outside of Pennsylvania. At the same time, out-of-state placements for program graduates are rising—at almost 40 percent for the class of 2007—and the law school is gaining a reputation for training lawyers in the highest echelons of private practice, business, government, and the nonprofit world. In more ways than one, the school is becoming a launching pad for students hoping to meet the changing demands of today's legal profession.

Crossley says much is required for students to be prepared for today's legal careers. Students need to develop "the foundational skills of analysis and communications" and to have "the awareness of the central role that law plays in the political, economic, and social structure. Here at Pitt, the opportunity to interact closely with world-class faculty in a variety of different fields is a strong point of the school," says Crossley. The law faculty ranks among the top 25 in the nation, according to a respected

2007 study by the University of Texas that was based on a standard objective measure of scholarly impact: the number of publication citations for all tenure-stream academic faculty members from 2000 to the present. The Pitt Law faculty's blog (<http://pittlawfaculty.net>) highlights the faculty's scholarly writing and research and service activities.

"We have faculty who are engaged in high-impact service as well," says Crossley, "including those who are testifying before Congress, who have argued before the U. S. Supreme Court, and who influence the law in various other ways. Those same faculty are working with students from their first year in law school."

Those law school faculty members include Professor Jules Lobel, vice president for the U.S. Center for Constitutional Rights, who has argued before the U. S. Supreme Court; Professor Arthur Hellman, a leading national expert on the federal court system, who has been invited to testify before the U.S. House and Senate judiciary committees; Professor John Burkoff, a national expert on criminal law and legal ethics; and Professor Deborah Brake, who has testified before Congress on employment discrimination issues.

Value-Added Certificate Programs

The law school was a pioneer in specialization when it started a certificate program in health law in the 1990s. Now, almost half of all law schools offer some type of certificate. To help students tailor their studies to their interests, Pitt's law school now offers certificates in civil litigation and environmental law in addition to health, intellectual property, and international law.

Professor Alan Meisel, who began the health law program at Pitt in 1996, says the programs give students focus. "Even students who knew what they wanted didn't necessarily have the structure to be able to do that," says Meisel, the Dickie, McCamey, and Chilcote Professor of Bioethics and founder and director of Pitt's Center for Bioethics and Health Law. "This was a way to provide some focus for them as they began their careers. Most

law school graduates are generalists. These students can bring something to an employer that other students can't."

A health law certificate was a logical offering for the law school, Meisel says, because of the growing need for lawyers in the field and the role of Pitt as one of the country's leading medical research institutions. Health law students can take advantage of the University's expansive medical infrastructure

The law faculty ranks among the top 25 in the nation, according to a respected 2007 study by the University of Texas that was based on a standard objective measure of scholarly impact: the number of publication citations for all tenure-stream academic faculty members from 2000 to the present.



MIKE DRAZDZINSKI/CORBIS

Pitt law professor Martha Mannix meets with Carly LaBuff, a third-year law student who is a certified legal intern in the law school's Elder Law Clinic. The law school operates six clinics, which pair students with clients unable to afford legal representation. Mannix is codirector of clinical programs and director of the John P. Gismondi Civil Litigation Certificate Program.

through internships, summer placements, and guest lectures.

"We have a huge health system here; it's a great place to get your feet wet," says Valarie Blake, a third-year law student who interned this past summer as counsel in UPMC's legal office. Blake, 25, was a premed major as a Pitt undergraduate, but she changed to health law after a hospital volunteer stint made her realize she wanted the ability to influence how the health care system was run. Blake says the Pitt program has given her a firm grasp of contemporary issues in health care that should be helpful in her career.

The law school's certificate in intellectual property law capitalizes on another local specialty: the region's growing high-tech sector. "If I want to know what's going on in computer science, bioengineering, or robotics, I have a lot of smart people in Oakland to talk to. That makes my job a lot easier," says Michael Madison, the law school's associate dean for research and professor of intellectual property law. Madison worked for a decade in the San

Francisco Bay area and Silicon Valley as a business and technology lawyer, specializing in the business and science issues surrounding intellectual property law. He joined the Pitt faculty in 1998 and says he wants his students "to

get engaged in building value and making stuff that people will want to buy. They need to understand the business issues because their counterparts in Silicon Valley are going to understand the business issues."

Black, the patent lawyer, is one of many intellectual property students who came to the school with science and engineering backgrounds. Legal writing is an area that Madison and other professors emphasized, Black says, adding that "99.9

percent of us are never going to stand before a judge or jury. What differentiates you as an attorney is how well you can communicate with a pen and paper."

A Global View

As is the case in many other disciplines, legal education now requires an international perspective. Pitt's Center for International

Pitt's Center for International Legal Education gives students a broad entrée into the world of international law. "I don't think there's a student in law school who, in his or her lifetime, won't encounter something that crosses borders, and students are going to encounter this more and more."

—Ronald Brand

Legal Education gives students a broad entrée into the world of international law.

"I don't think there's a student in law school who, in his or her lifetime, won't encounter something that crosses borders, and students are going to encounter this more and more," says Ronald Brand, professor of law and director of the center. "Borders are porous, and with the Internet there are no borders in international transactions. All the traditional practices of law that were aimed at people across the street are now aimed at people across the globe."

The center offers an LLM (Master of Laws) degree for graduates of foreign law schools. "One of the United States' most important exports is the rule of law," says Crossley. "By immersing foreign-trained lawyers in the American legal system for a year and then

sending them back home, we see the LLM as a way of exporting the rule of law to developing democracies."

Because of the center's extensive international connections, Pitt law students find work across the globe, including in the UN, the U.S. Department of State, and some of the world's biggest international law firms.

Reddy, the UN legal officer in Kosovo, exemplifies how a student's opportunities in Pitt's law school can jump-start a young career. While at Pitt, Reddy participated in internships, legal programs, and legal competitions overseas. With the school's blessing, he earned an LLM from the University of Nottingham in England. In his third year, he was chosen to join an international moot team (a type of legal debate practiced before a mock tribunal of judges), where he researched and drafted legal memoranda, and presented oral arguments in Vienna. That same year, he traveled to Haiti as part of a team of law students researching the independence of Haiti's judiciary. He also landed an internship in Serbia with the UN. Three years, five countries, and a foot in the door. Reddy says his professors gave him not only the legal skills for his demanding UN job, but also pushed him to build connections and aim high in his career: "I never would have been in this position if it weren't for the skills that Pitt law taught me."

The Human Touch

In addition to teaching students the theoretical skills needed for law, the law school also

offers students real-world experience through its clinical programs. These clinics—in tax, environmental law, family law, community economic development, health law, and elder law—pair students with clients unable to afford representation. The students, under the supervision of Pitt faculty, meet with clients and file legal pleadings in actual cases.

“The clinics are a huge asset to the law school because they really help give students a way to practice what they’ve learned in courses with actual clients,” says Crossley. “They also provide an invaluable public service to the community by providing pro bono legal representation to those who need it.”

The clinics are a valuable bridge between the classroom and the courtroom, says Norma Scales Schmidt (LAW ’07), who took the elder law clinic and now focuses on special needs and elder law in private practice.

“Reading about a situation is different from actually sitting down with someone who is telling you about a situation,” says Schmidt. Her clinical experience, working on a guardianship case before the Allegheny County Orphans’ Court, helped her form the techniques she uses today. “You learn things that you’ll use, such as how to conduct an initial client meeting and the techniques that can make those meetings more effective,” she says. Elder law comprises many functions—preparing wills, powers of attorney, and living wills—that involve coaxing clients to divulge details about their private lives. “We’re talking about something that’s not always easy to talk

“We have faculty who are engaged in high-impact service as well, including those who are testifying before Congress, who have argued before the U. S. Supreme Court, and who influence the law in various other ways. Those same faculty are working with students from their first year in law school.”

—Mary Crossley



Mary Crossley

about: end-of-life issues, how much money they have, how much debt they have. We learned how to delicately ask personal information from people,” Schmidt adds.

Martha Mannix, a clinical professor of law and codirector of the school’s clinical programs, says the clinics teach students the basics of “lawyering”—meeting with clients, taking depositions, handling expert witnesses, and representing clients at hearings. In

2006, students from Pitt’s health law clinic, who were representing a client with severe brittle diabetes, succeeded in convincing the Medicare program to change its national policy and agree to cover solitary pancreas transplants for such patients under certain circumstances.

“Here they have to sift through facts that may be irrelevant or contradictory and figure out which ones are relevant, then frame all this in a narrative that can make a legal case for their client,” Mannix says. Perhaps most importantly, by linking students with people in need of their professional help, Mannix says “the clinics remind them of why they went to law school in the first place.”

Broadband Spreads the Word

JURIST (jurist.law.pitt.edu), a unique online legal news service written and edited by Pitt law student volunteers, is another valuable learning experience that serves a vital public service. Millions of readers around the world connect to the Web site to get current reports and expert analysis of breaking legal developments. Pitt law students research, write, and edit JURIST, which provides brief legal news articles and links to pertinent documents, as well as commentary by leading scholars.

JURIST was started by Pitt law professor Bernard



Pitt law professor Bernard Hibbitts (far left), publisher and editor in chief of JURIST, the school’s online legal news service, stands with (from left) acting news director Joe Shaulis (LAW ’08) and senior editors Michael Sung and Caitlin Price, both third-year law students.

Hibbitts in 1996 as a digital archive targeted at law professors. It has evolved into a legal news and research database that eschews sensationalism and has covered such breaking stories of wide-ranging jurisprudential import as the Clinton impeachment, the 2000 presidential recount, and the passage of terrorism laws after 9/11. The Web site ramped up in 2005, hiring a full-time professional staffer to oversee the work of the 40 or so students who research, write, and edit the site. JURIST won a “Webby” Award in 2006 and has been named among the “Top 100 Web Sites for Lawyers,” by the *ABA Journal*, the magazine of the American Bar Association. It was flooded with readers after the execution of Saddam Hussein, and this year it took a leading role in providing in-depth coverage of demonstrations by Pakistani lawyers against the government.

Hibbitts says in addition to providing balanced, scholarly coverage of important legal events, JURIST is a useful teaching tool. “It teaches our students how to research effectively and to write clearly and succinctly under real-time pressure. When they’re attorneys, they’re going to be faced with mountains of information which they’ll have to explain in plain English to a client or a judge.”

Jeannie Shawl (LAW ’05), the Web site’s executive director from 2005 to 2008, said she initially joined JURIST to improve her writing skills. The unpredictable nature of writing for JURIST—on a given day, a student may write about Nigerian corruption laws, a UN war crimes tribunal, or Chinese intellectual property law—taught her how to think on her feet, she says. “You not only learn how to write quickly and concisely, but also how to handle unfamiliar material,” says Shawl, who now works in the Office of General Counsel at the Pittsburgh office of

K&L Gates, an international firm with more than 1,700 lawyers.

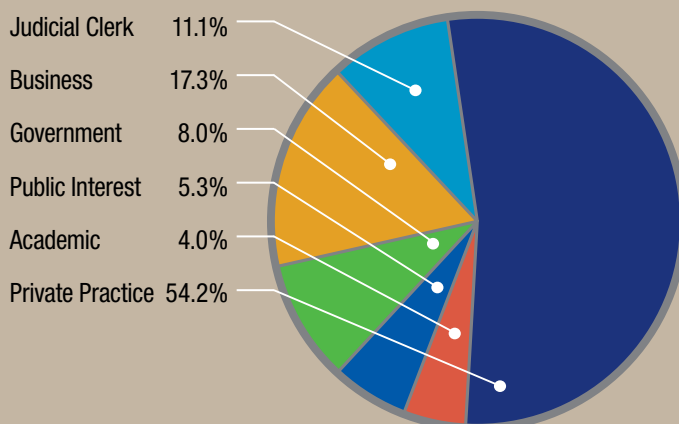
Making Key Connections

“More and more, the law interacts with economics, public policy and management, health policy, and international affairs, and attorneys who develop a multidisciplinary perspective have a crucial edge,” says Crossley.

Because of the exemplary resources that are available on Pitt’s campus, the law school is able to connect its students to other disciplines by offering joint degrees with the University’s

Pitt Law Employment Categories: Class of 2007

[as reported by the National Association for Legal Career Professionals and measured nine months postgraduation]



The law school links graduates to an extensive professional network through its more than 8,500 alumni, who represent every state in the United States and 40 foreign countries and work for corporations, law firms, nonprofit organizations, and the government.

PITT AT THE AMERICAN BAR ASSOCIATION ANNUAL MEETING



The Steven Spielberg Gallery in New York City’s Paley Center for Media was the setting for an Aug. 8 Pitt School of Law reception, held in conjunction with the American Bar Association (ABA) annual meeting. Alumni and other practitioners joined Pitt law school Dean Mary Crossley in congratulating Pitt law professor William V. Luneburg Jr. on being appointed chair-elect of the ABA Section of Administrative Law and Regulatory Practice. Clockwise from top left are Pitt adjunct professors Rodney Akers (left), deputy general counsel in Pennsylvania’s Office of General Counsel, and Jack Young of Sandler, Reiff & Young P.C., Washington, D.C.; (top right photo, from right) Gerald T. Hathaway of Littler Mendelson P.C. in New York City, Pitt professor Bernard Hibbitts, and Bruce Lord Wilder (LAW ’86) of Wilder & Mahood, Pittsburgh; (middle right photo) Mark A. Nadeau of PLA Piper in Phoenix speaking with Dean Mary Crossley; and (bottom right photo) Luneburg (left).



Degree Programs Offered by the University of Pittsburgh School of Law

- **Juris Doctor (JD)**
- **Master of Laws for Foreign Law Graduates (LLM)**—The program provides lawyers who have obtained law degrees outside of the United States with an opportunity to study common law in a U.S. context.
- **Doctor of Jurisprudence (JSD)**—The law school's most advanced law degree, the JSD is designed for aspiring legal academics who want to pursue advanced independent study, research, and writing.
- **Master of Studies in Law (MSL)**—The program educates students who use law—or who will use law—in their careers and who want to learn more about legal studies but who do not want to become lawyers.

Joint-degree Programs

Graduate School of Public and International Affairs

- JD/Master of Public Administration
- JD/Master of Public and International Affairs
- JD/Master of International Development

Joseph M. Katz Graduate School of Business

- JD/Master of Business Administration

Graduate School of Public Health

- JD/Master of Public Health

School of Social Work

- JD/Master of Social Work

The Center for Bioethics and Health Law

- JD/Master of Arts in Bioethics

Tepper School of Business at Carnegie Mellon University

- JD/Master of Business Administration

The Heinz School of Public Policy and

Management at Carnegie Mellon University

- JD/Master of Science in Public Policy and Management
- JD/Master of Arts Management

Certificate Programs

The John P. Gismondi Civil Litigation

Certificate Program

Environmental Law, Science, and Policy

Health Law

Intellectual Property and

Technology Law

International and Comparative Law

Clinics

Civil Practice Clinic—Elder Law or Health Law

Community Economic Development Clinic

Environmental Law Clinic

Family Law Clinic

Tax Clinic

Graduate School of Public and International Affairs, Joseph M. Katz Graduate School of Business, School of Social Work, Graduate School of Public Health, and Center for Bioethics and Health Law. Joint degrees also are offered with two schools at Carnegie Mellon University.

The law school connects students in other ways as well, often by providing unique global opportunities that stem from the school's relationships with an array of faculty, alumni, and business and organizational contacts. Through the Center for International Legal Education, for example, Corin Stone (LAW '98), while still a student, obtained an internship at the Private International Law Conference in The Hague, the Netherlands, where she made connections with U.S. Department of State lawyers. Subsequently, she was hired by the

Department of State and volunteered to go to Baghdad in 2004 to serve as a legal advisor to Ambassador John Negroponte at the U.S. Embassy. Now the deputy general counsel for the Office of the Director of National Intelligence, Stone says she might never have been in Baghdad had it not been for her experience in Pitt's law school.

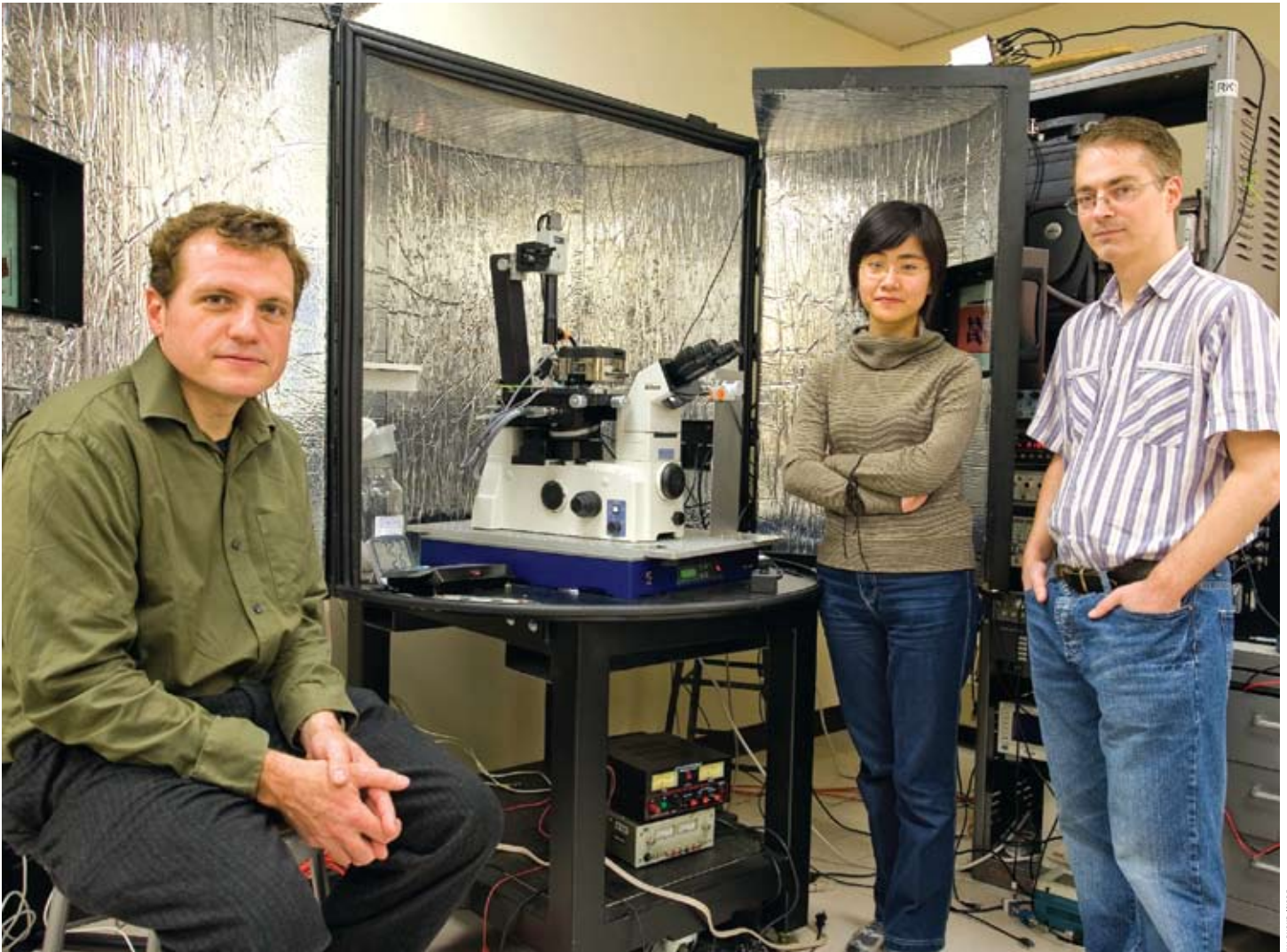
The law school links graduates to an extensive professional network through its more than 8,500 alumni, who represent every state in the United States and 40 foreign countries and work for corporations, law firms, nonprofit organizations, and the government. The links span a wide breadth of categories and expertise, according to Crossley. "These connections are one of the important strengths we are re-emphasizing. We want to be able to help support our students' pursuit of opportunities, no matter where in the world they go or what area of practice they choose when they graduate."

The law school is gaining a reputation for training lawyers in the highest echelons of private practice, business, government, and the nonprofit world. In more ways than one, the school is becoming a launching pad for students hoping to meet the changing demands of today's legal profession.



Creative Problem Solving Across Disciplines

Physical sciences and engineering graduate programs approach research from multiple perspectives



From left, John Leonard, an assistant professor of mechanical engineering and materials science; Cheng Cen, a fourth-year physics doctoral student; and Pitt physics professor Jeremy Levy are researching oxide nanowires that are only two nanometers wide, created with an atomic-force microscope. Scientists believe nanowires could lead to increasingly smaller computers. "When you're working with experts from other disciplines, you don't have to be an expert in their fields, but you do have to know a little bit about what they do," Levy says.

Veronica Miller has spent the past few years as a University of Pittsburgh graduate student learning the intricacies of fluid dynamics, gaining expertise in concepts such as fluid flow and how turbulence is measured.

But Miller, who is pursuing a PhD in mechanical engineering, wasn't content to simply learn the concepts—she wanted to put

her new knowledge to good use. So she also is studying renewable energy at Pitt's Center for Energy, focusing in particular on hydroelectric turbines that can be dropped onto a riverbed or ocean floor to harness electricity from underwater currents. An expert-in-training in mechanical engineering, Miller is wading into other fields—environmental economics,

ecology, electrical engineering, computer modeling—in an effort to make her research connect to real-world energy needs.

"If I want to tackle something as big as clean energy, I can't just focus on mechanical engineering. In real cases, you have to be more than an expert in just one area," she says.

Miller is one of more than 500 Pitt PhD students who are gaining expertise in the rapidly changing fields that have grown up in the physical sciences and engineering during the 20th and early 21st centuries. Pitt PhD students are very well grounded in the fundamentals of their chosen fields—chemistry, biology, physics, or a number of engineering specialties—but they are also oriented to addressing problems that are outside of their fields. Their mission to be creative in other areas forces them to master things at the boundaries of their fields and others, to work or consult with experts in other fields, and to synthesize new solutions to problems with an amalgam of all these resources.

The examples that follow explore the rich variety of questions that current Pitt science and engineering PhD students are addressing.

The Creative Spark

A key component of a Pitt doctoral program—in any field—is the opportunity for students to look at problems creatively, from various vantage points. “Research isn’t just about answering problems at the back of the textbook,” says Provost and Senior Vice Chancellor James V. Maher. “You have to be able to study a problem, look for holes in the data, and wonder from where you might be able to draw a solution. It’s essentially a creative process.”

Peter Koehler, professor and director of graduate studies in physics at Pitt, says research requires scientists to have a certain intellectual fitness to approach a problem from multiple perspectives. For instance, a physicist looks

at a CO₂ molecule or cancer cell differently than a chemist does. But both approaches can help advance research on the topic.

“Research isn’t just about answering problems at the back of the textbook. You have to be able to study a problem, look for holes in the data, and wonder from where you might be able to draw a solution. It’s essentially a creative process.”
—James V. Maher

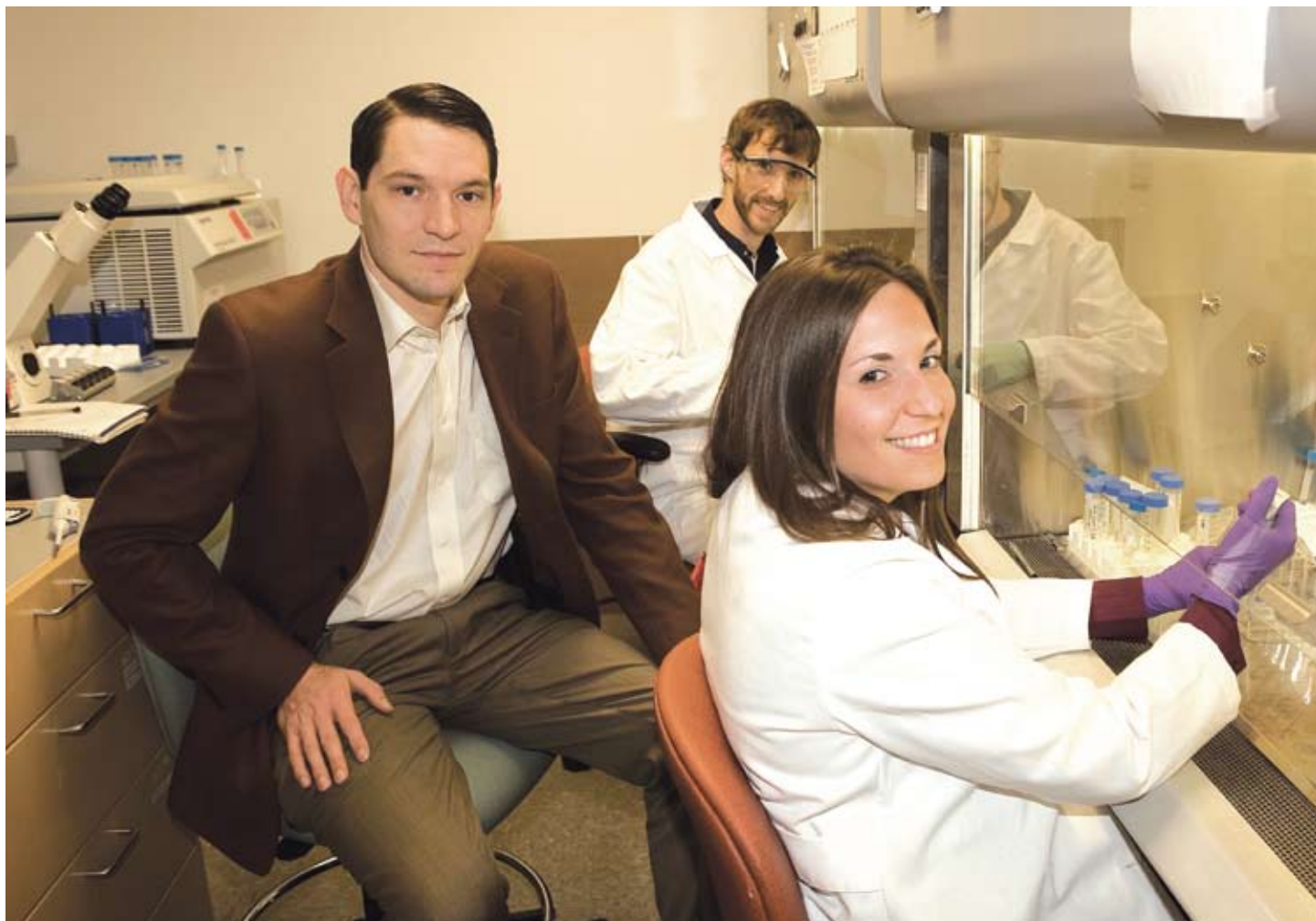
“A real skill that needs to be developed is how you define a problem,” says Koehler. “You don’t want to be too narrow in your training. You always want to keep an eye out for new horizons in research that may not have even been possible when you started.”

Quite often, the path to becoming a successful researcher will lead to other fields and disciplines, says Mark Redfern, a professor of bioengineering and associate dean for research in the Swanson School of Engineering. The reason is that many of the most-pressing problems don’t fit neatly into intellectual categories.

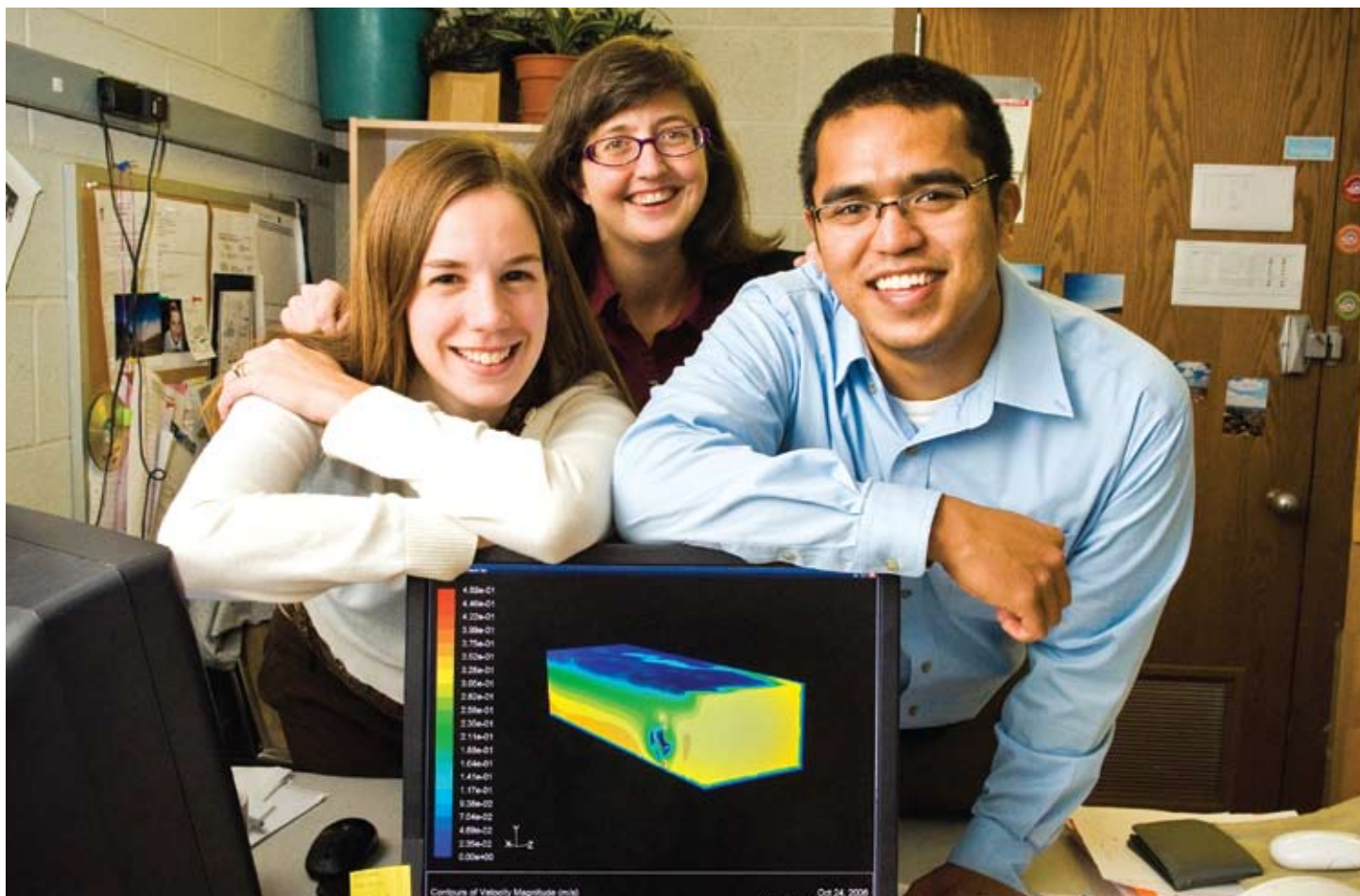
“Research now often requires combining information and techniques from different fields,” says Redfern. “The problems we’re dealing with are complex and require new and innovative approaches.”

Going Outside a Comfort Zone

Training PhD students to cross disciplinary boundaries is part and parcel of scientific tradition, says David Waldeck, professor and chair in Pitt’s Department of Chemistry. “Chemists have often called chemistry the ‘central science’ because it links physics and math to fields like biology and related sciences.”



From left, Steven Little, a chemical engineering professor, works with Sam Rothstein, a fourth-year chemical engineering doctoral student, and Jillian Tengood, a fifth-year bioengineering doctoral student. The team is using computer modeling and hands-on experiments to test new ways to deliver drugs for vaccines or healing battlefield wounds.



Designing hydroelectric turbines that can harness electricity from underwater currents is the focus of research being done by Veronica Miller, (left) a third-year doctoral student in mechanical engineering; Laura Schaefer, (center) professor of mechanical engineering; and David Sanchez, a third-year graduate student in civil and environmental engineering. Computer modeling and simulation assists them in their research.

In recent years, emerging fields like nanoscience and engineering, biophysics, structural biology, and green chemistry have spurred collaboration, offering novel and different ways for scientists to address problems.

To prepare chemistry PhD students for interfacing with these fields, the program requires them to complete a research proposal outside their areas of concentration. "It's a way of learning how to be an independent researcher in a controlled environment," Waldeck says. "How do we know the program works? Because students initially say they hate it. But after they've finished, they say they're glad they did it."

Stephen Weber, a Pitt professor and director of graduate studies for the chemistry department, says being prepared to move into an alternate research field is critical for research PhDs.

"That's what a true PhD scientist is—someone who can go into a new field, read about it, learn about it, ask cogent questions about it. That's what we're training our students to do," Weber says. "Being a scientist isn't like joining a guild, where you acquire a set of skills and go out and repeat those skills over and over again. You have to be able to go out and digest someone else's scientific understanding and incorporate it into your own line of inquiry."

In physics, students are encouraged to take courses in related disciplines. In engineering, students should have at least a basic understanding of other disciplines with which they interact, says Laura Schaefer, codirector of the Center for Energy and a professor of mechanical engineering. That means they must know the language of other disciplines: a 'parameter' in engineering could be a 'variable' in chemistry.

"I'll encourage students to take a course in other departments or schools; even the same course could be taught totally differently," Schaefer says.

This type of cross-fertilization is a critical component of graduate education. While a student still needs to be an expert in a specific field to get a PhD, each student realizes that no branch of science exists in a vacuum. Increasingly, students need to work outside

their disciplines to find new lines of inquiry and stay on the leading edge of discovery.

"Being a scientist isn't like joining a guild, where you acquire a set of skills and go out and repeat those skills over and over again. You have to be able to go out and digest someone else's scientific understanding and incorporate it into your own line of inquiry."
—Stephen Weber

The Search for Energy Solutions

The emergence of research centers in energy, nanoscience, and computer simulation and modeling has accelerated this trend. Gerald Holder, the U.S. Steel Dean of the Swanson School of Engineering, says one of the Center for Energy's purposes is to encourage collaboration between faculty and their graduate students

from a variety of disciplines, schools, and departments. The energy question permeates all levels of global society, Holder says, adding that it makes sense to pull as many bright minds into energy research as possible.

"Society's interested in this, and so are the students. What we're trying to do with the center is to focus on creating new technologies by bringing people from around the University

together to tackle the big issues,” Holder says.

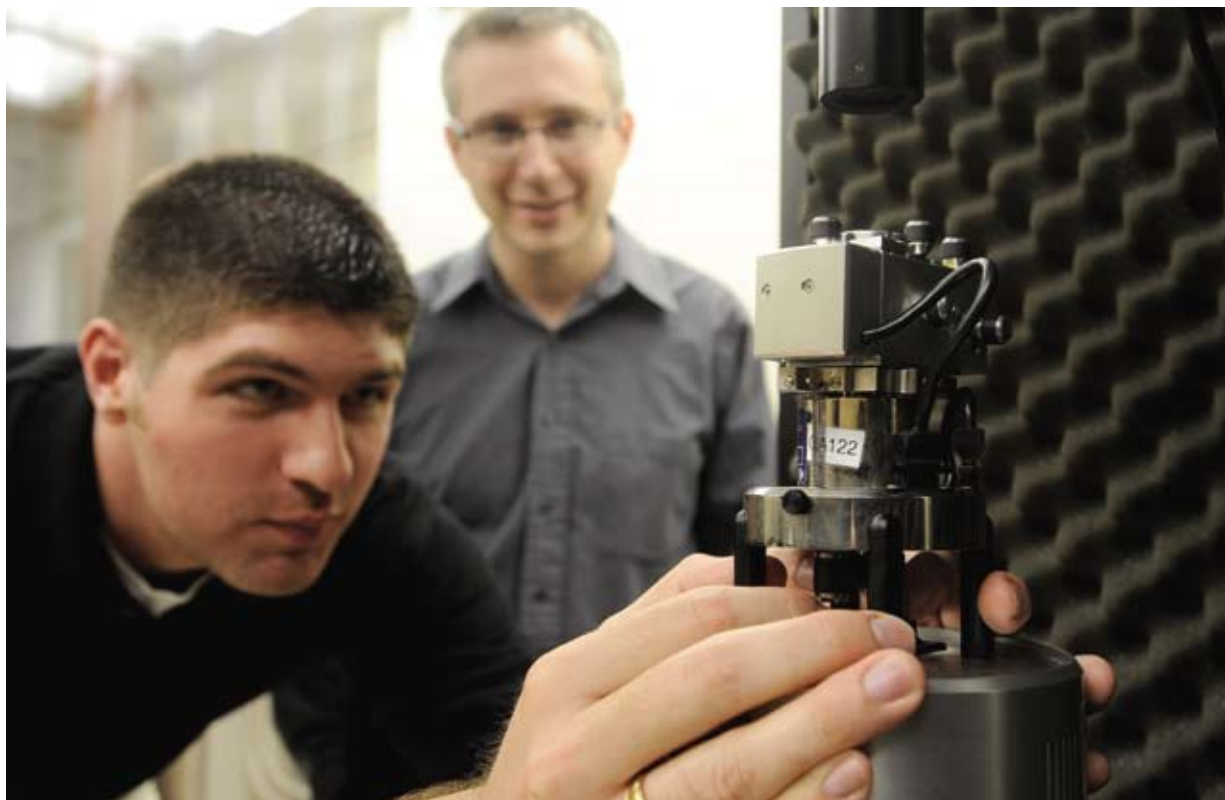
The prospect of working in the alternative energy field attracted Miller to Pitt, where she is trying to determine which turbine designs can harvest the most energy with the least impact on the aquatic environment. The devices work a lot like submerged water wheels or windmills. Because the devices are in water, they are propelled by drag or lift, the same forces that make airplanes fly. The flow of water propels the turbine’s blades, which turn a shaft that generates electricity. Using computer-modeling software, Miller is analyzing how a series of turbine designs would impact the aquatic environment.

“If we know how water flows through the turbine device, we can estimate how fish will swim around them, and whether they’ll get stuck in the turbine blades,” says Miller, whose research could also lead to the development of a tidal turbine that would generate electricity from currents at the bottom of the ocean floor or tidal estuary.

She’s also working on a research proposal with David Sanchez, a graduate student in Pitt’s civil and environmental engineering department, to create a remote sensor for pollution in rivers that would measure electrical current fluctuations caused by certain kinds of pollutants. In addition, Miller is working with a Pitt mechanical engineering grad student on a project to install river turbines in Ghana.

“Pitt really fosters an environment where we’re thinking about working with people in other fields: I’m not a civil engineer or an electrical engineer, but in order to solve some of these energy problems, I need to be able to work with these kinds of researchers.”

Miller enjoys working on a problem that



Brett Lee Allen (left), a third-year doctoral student in analytical chemistry, works with an atomic-force microscope, which allows researchers to visualize carbon nanotubes—tiny wires with diameters 100,000 times smaller than a human hair. Allen is working with Alexander Star (right), a Pitt assistant professor of chemistry, to use carbon nanomaterials for medical and energy applications, including sensors for greenhouse gases.

BRADEN WOLFE/CODE

“One of the Center for Energy’s purposes is to encourage collaboration between faculty and their graduate students from a variety of disciplines, schools, and departments.”
—Gerald Holder

has a solution with an immediate real-world impact. “It’s one thing to do all these things on paper; it’s another to be able to generate clean, renewable electricity for people who really need it.”

Florian Zink, another mechanical engineering PhD student, is researching thermoacoustic refrigeration—using sound waves as a component of cooling systems. Zink needs to understand the physics of acoustic waves in addition to the intricate science of heat transfer and fluid thermodynamics. Zink says his research at Pitt has opened his eyes to the possibilities for research in alternative energy, a rapidly developing field that is attracting experts in engineering, chemistry, physics, and ecology.

Solutions From the Nano Toolbox

Interdisciplinary research also is prominent in nanoscience at Pitt. The Petersen Institute for NanoScience and Engineering involves dozens of faculty members from various Pitt schools, including the Schools of Arts and Sciences, Engineering, Medicine, Public Health, and Pharmacy. Students from those schools have been able to tap a wide array of tools and

faculty collaborations through the center.

Among these faculty members is Jeremy Levy, a professor of physics, who studies “nanostructures at the interface between insulating materials”—popularly termed “nanowires.” These are thin layers of materials one molecule wide that can conduct electricity. Scientists think these structures could lead to increasingly smaller computers that can be implanted in a variety of places or devices. Levy, who collaborates with materials scientists and chemists, thinks his research is an example of how interdisciplinary approaches are needed in emerging fields like nanoscience.

“These nanomaterials are an area I didn’t know anything about two years ago,” Levy says. “Because I’m collaborating with other people, I don’t know how to make these materials, but I don’t have to. I still have to understand what they’re doing, but I can concentrate on another side of the equation.”

Physics PhD students are still expected to have expertise in their field—they must know advanced electromagnetism, classical mechanics, and condensed matter physics. But when they go into fields like nanoscience, they’ll also need to know how to cover ground in chemistry, biology, medicine, and materials science, Levy says.

“It’s important to be an expert in your own domain: The core task of training students in physics is still important. But you also have to learn how to learn, to

learn what is needed to interface with collaborators in other disciplines. It's a matter of becoming aware of what the possibilities are in research. When you're working with experts in other disciplines, you don't have to be the expert in their fields, but you do have to know a little bit about what they do."

One of Levy's students, Cheng Cen, is studying the electronic characteristics of these nanowires, specifically how electrical charges influence how nanowires behave. She says the research shows the nanowires have the potential to be manipulated into "single-electron transistors"—the tiniest of computing devices. "It's like you're writing on a canvas the width of a couple of nanometers," says Cen, a fourth-year student. Though she's in the physics department, Cen uses techniques and tools from chemistry and engineering labs. "We have to learn to use a variety of techniques: If it's learning a new chemical process, you have to learn it; if it's using a machine from engineering, you have to do it."

Like Cen, Matt Kofke studies nanomaterials, but from the perspective of a chemist. Kofke, a second-year chemistry PhD student, is researching the optical transmission capabilities of some nanomaterials. Researchers in the field think the interaction of light on nanomaterials could be the key to developing sophisticated biosensors for certain antibodies, the development of more efficient solar cells, and improved fiber-optic communications.

Kofke has had to learn concepts of wave physics, materials science, and engineering along the way. The research has involved reading a lot of textbooks in other fields, and, when he's stumped, asking someone for help. "That's generally the best way to learn, and it's worked pretty well for me," he says. "The most important thing to learn in graduate school is how to independently direct your own research, to solve your own problems without relying on someone else doing it for you."

Brett Allen is studying carbon nanotubes—tiny straw-like structures largely made up of carbon atoms. Scientists think these structures could have widespread use in medicine and energy. Allen, a third-year chemistry PhD student at Pitt, has studied nanotubes' possible use as a biosensor for a gas that is common in the breath of asthmatics. This could be used as a diagnostic tool. He also is studying the possibilities for nanotubes to be used in

carbon sequestration—the process of taking CO₂, the most abundant greenhouse gas, out of the atmosphere, to slow the effects of global climate change. The ability to look at a research problem like nanotubes from various disciplines—chemistry, biophysics, materials science—is critical in being ready to follow the research wherever it leads, Allen says.

"Graduate school really focuses you on critical thinking—you're taught to not just memorize things but to understand all the variables that can go into a problem," Allen says. "A lot of the research in my field is brand-new. If you don't have the ability to think through what's going on, you're never going to be able to understand what's happening when you stumble on something new."

Computer Simulation for Complex Phenomena

In another nascent area of scientific research—computer modeling and simulation—Pitt students also are taking an interdisciplinary approach to solving big scientific questions.

Sam Rothstein, a fourth-year PhD chemical engineering student, is using computer modeling to test ways to deliver drugs to AIDS patients and people with osteoporosis. Currently, many of these drugs require daily or even twice-daily injections. Researchers want to make drugs that require only weekly or monthly injections. Rothstein designed a model that predicts how quickly drugs are released in the body with different types of delivery systems ("vehicles"). Having developed a model that works in the lab, he will soon test the system in a real-world setting.

With computer modeling, Rothstein says, he can make progress solving problems faster than he would using only a lab. "The two problems I'm working on, a sustained-release medication and a single-injection vaccine, have a combined 50 years of research, and no one has come close to creating a better delivery system," Rothstein says. "Computer modeling is a way to examine more parameters, more possibilities, than the normal benchtop approach."

Rothstein has taken an interdisciplinary approach to his research—a full semester of medical school courses and sessions with computer-modeling faculty to develop his simulations. The approach works because it allows researchers like Rothstein to make faster progress on the question they're addressing. Instead of working on one part of

"You look at the societal problems we're facing—energy, the environment, health care, and medicine. These are large, complex problems. The teams that tackle them have to be interdisciplinary because we're working on problems that are all over the map. We have to find expertise and opportunities at every turn. And for grad students at Pitt, that opportunity can be found throughout the University."

—Larry Shuman

the problem, like modeling a drug-delivery system, Rothstein can also take the results from his model and perform an experiment in the lab to take the research to the next level.

"I can talk to people who are experts in modeling, and I can talk to people who are experts in application. Being an interdisciplinary researcher means I can move the project forward," Rothstein says.

Looking to the Future

The goal for students like Rothstein, Miller, Cen, and others is to help solve the big scientific problems of the 21st-century. To accomplish this, they have to master the tools and logic of their own disciplines while maintaining the intellectual acuity to understand and collaborate with scientists in other fields. That is what has fueled the great scientific discoveries of the past, and it is what funders like the National Science Foundation are looking for, says Larry Shuman, professor and senior associate dean for academic affairs in Pitt's Swanson School.

And it's what Pitt is instilling in its PhD students in the physical sciences and engineering, Shuman says: "You look at the societal problems we're facing—energy, the environment, health care, and medicine. These are large, complex problems. The teams that tackle them have to be interdisciplinary, because we're working on problems that are all over the map. We have to find expertise and opportunities at every turn. And for grad students at Pitt, that opportunity can be found throughout the University."

"Pitt really fosters an environment where we're thinking about working with people in other fields: I'm not a civil engineer or an electrical engineer, but in order to solve some of these energy problems, I need to be able to work with these kinds of researchers."

—Veronica Miller

Pitt Chronicle January 20, 2009

School of Social Work Reimagines Its PhD Program

School is embarking upon a no-holds-barred effort to secure top doctoral students and train them in leading-edge research



Valire Carr Copeland, a professor of social work and director of Pitt's School of Social Work doctoral program, says PhD-level social workers need to know how to conduct research and appreciate the value of science-based practices. From left, Eun Hee Choi, a second-year doctoral student; Copeland; Monique Constance-Huggins, a second-year master's/doctoral student; Il Sung Nam, a first-year doctoral student; and Addie Weaver, a second-year master's/doctoral student.

Michael Lindsey met many children like 12-year-old Lionel when he worked at a community-based mental health center in Washington, D.C., in the mid-1990s. Lionel, one of Lindsey's clients, was depressed and antisocial, and he resisted treatment. Eventually, Lindsey could see that the clinical methods he was using to help Lionel weren't working.

"If Lionel didn't receive the mental health attention he needed to address his depression, anger, and oppositional behavior, he would have a short time to live on this Earth," Lindsey says he remembers thinking.

Lindsey came up empty-handed in his search for scholarly research on other interventions that might help Lionel, so Lindsey, already armed with a master's degree in social work, decided to pursue his doctorate and do some of the research himself. "I was compelled to pursue an advanced degree to help me better understand and address these kinds of issues," says Lindsey, who received his PhD degree at Pitt in 2002 and is now an assistant professor in social work and psychiatry at the University of Maryland, Baltimore.

Lindsey chose the University of Pittsburgh

on the recommendation of a mentor. Pitt has one of the nation's oldest schools of social work and a reputation for training academic leaders, says Lindsey. It also had resources tailored to his academics interest: The school was then in the midst of creating a center for mental health services research, funded by the National Institutes of Health (NIH). His dissertation, which examined the impact social networks have on how young African Americans with depression access mental health services, was funded by an NIH grant.

“I had an incredible experience at Pitt, and it was a great launch-pad for my career,” says Lindsey. He had come to Pitt with a desire to address a glaring problem and graduated with a set of tools that could help kids like Lionel.

Long History, New Initiatives

The Pitt School of Social Work and its doctoral program turned 60 this year. The fifth-oldest school of social work in the nation, it is a trailblazer in the study of how to address some of society’s greatest issues: poverty, mental illness, drug and alcohol abuse, and racial disparities in health, education, and employment. It also has a long and distinguished history of educating academic leaders in social work.

And the school continues to forge ahead with an ambitious retooling in its effort to remain one of the top social work programs in the country. The school still offers a wide range of training for social work practitioners through its bachelor’s and master’s programs, but its PhD program is undergoing a historic transformation.

Under the stewardship of Dean Larry E. Davis, the school has recruited faculty with an impressive record of conducting research.

“Social work is now very empirically based,” says Davis, who also is the Donald M. Henderson Professor of Social Work and founding director of Pitt’s Center on Race and Social Problems (CRSP). “You need scholarship, and you need faculty skilled at bringing in funding. That’s the name of the game if you want to be competitive with the very top programs in the country.”

Davis holds a Bachelor of Science degree in psychology from Michigan State University and a master’s degree and doctorate in both social work and psychology from the University of Michigan. He was the first African American to graduate, in 1977, from this U-M dual-degree program. He taught at Washington University in St. Louis for more than 20 years before coming to Pitt in 2001. Both Michigan and Washington University are among the top-ranked social work programs in the country, and Davis came to Pitt with significant expertise in developing social work research programs.

Under Davis, Pitt’s School of Social Work has embarked upon a no-holds-barred effort to recruit top doctoral students, train them in the leading-edge areas of research, and mentor

them as they pursue career opportunities upon graduation.

The University has placed a high priority on doctoral education in social work, committing to provide enough money to fully fund doctoral students for four years instead of two. The added funding allows the program to recruit and enroll the best and brightest students, says Gary Koeske, a Pitt professor of social work and former director of doctoral studies. “That’s making us more competitive with students whom we see as having potential to develop into research scholars. This new funding, combined with curriculum changes over the years, has resulted in making our students’ PhD dissertations comparable to the best at any other top school in social work and in the allied disciplines of sociology and psychology.”

Davis also has recruited faculty from the country’s top research programs to raise the school’s academic research profile. “With the faculty we’ve brought in, I feel like I’ve brought in the Marines. They all know what it takes to develop a robust research and writing program,” Davis says.



Larry E. Davis

A Balancing Act

In some respects, developing a strong school of social work is an elaborate balancing act: The school and its social programs are visible in the broader community, yet the school is not a social service agency. Since its inception in 1948, the Pitt School of Social Work has been a crucial link between the University and the more than 400 social service agencies around Allegheny County—in prisons, hospitals, cancer centers, and group homes.

That is one reason why the school is so critical to the University’s overall mission, says Pitt Provost and Senior Vice Chancellor James V. Maher. “The School of Social Work is probably one of the most visible faces of the University in Pittsburgh and in Allegheny County,” says Maher. “In a very real sense, it is making Pittsburgh a better place to live, and it is improving the lives of the thousands of people who rely on the services of the cooperating agencies.”

The PhD program in the School of Social Work educates social work practitioners and scholars by immersing students in the field’s most up-to-date research and ensuring that intellectual rigor is applied to the discipline. Another aspect of a thriving program is the training of scholars to assess the effectiveness of what social workers do.



Michael Lindsey

In many ways, social work is perhaps the most applied of all academic disciplines, according to Davis.

“Social work is real-world based; it asks questions in a real-world setting,” Davis says. “In social work research, you always have to be able to answer the question, ‘So what?’ The effectiveness of a program is measured by its real-world application.”

Historically, the social work field was so “applied” that for years many of its practitioners, including faculty in Pitt’s School of Social Work, shied away from research. Leaders in the field worried that too much scholarship made social work too much a part of the “ivory tower” and too removed from the front lines. Gradually, academics like Joseph Eaton, a Pitt emeritus professor of social work and a former director of Pitt’s doctoral education program, prevailed, and social work professionals came to understand that scholarly research improved the practice of social work.

“Now more than ever, we need top-flight researchers in social work to navigate the best practices in the field for practitioners,” Maher says. “These are the people who will be making the field better and improving outcomes for the people who need its services. We all benefit from strong social work research, and Pitt is committed to training the scholars and leaders who can ensure this work will get carried on to future generations.”

Training Researchers

In academia, doctoral students are considered the stewards of a discipline, and the core of a doctoral program is providing those students with the skills needed to conduct research and teach. Valire Carr Copeland, a professor of social work and director of the Pitt School of Social Work doctoral program, says learning how to do research will help Pitt PhDs in whatever facet of social work



JIM BURKE/CODE

Shaun Eack (left) and Kyaiei O. Conner were drawn to Pitt's School of Social Work by its interdisciplinary approach and its emphasis on research. Conner, a postdoctoral scholar at Western Psychiatric Institute and Clinic at UPMC, is conducting research on barriers to mental health care among older African Americans. Eack recently defended his doctoral dissertation about a treatment for schizophrenia involving brain exercises.

they pursue—whether as a researcher, social work educator, or administrator at a social service agency. In these roles, doctoral graduates will guide social work practitioners, Copeland says.

“One of the many roles of social work practitioners is to facilitate the problem-solving process with their clients,” says Copeland, who earned her PhD at Pitt in 1989. “We can’t help individuals change their behaviors unless we understand why people engage in behaviors that are detrimental to them.”

Whether working with individuals and families, administering a program, or developing social policy, PhD-level social workers need to know how to conduct research and appreciate the value of science-based practices, Copeland says.

“Our research should inform our practice, and our practice should inform our research,” says Copeland. “We’re training Pitt doctoral students to engage in the rigors of research that will help them address the questions and problems that people bring to the social services agencies.”

The social work world is not neat and tidy, Copeland says. Being a social worker often means being a client’s safety net while at the same time understanding that client’s strengths. Clients may be poor, incarcerated, elderly, or disabled; what might work for one client might not work for another. So being able to digest research and apply it to various situations is key to improving outcomes.

“I have to find therapeutic strategies that are helpful to you. I have to understand what’s

going to make a difference for you. I have to understand what your beliefs are, recognize where you are developmentally, know something about your demographics (race, gender, class, etc.),” Copeland says.

“Each client is unique,” she continues. “We don’t always know where to start unless

we read and use research that allows us to make inferences that will answer these questions.”

Paying Dividends

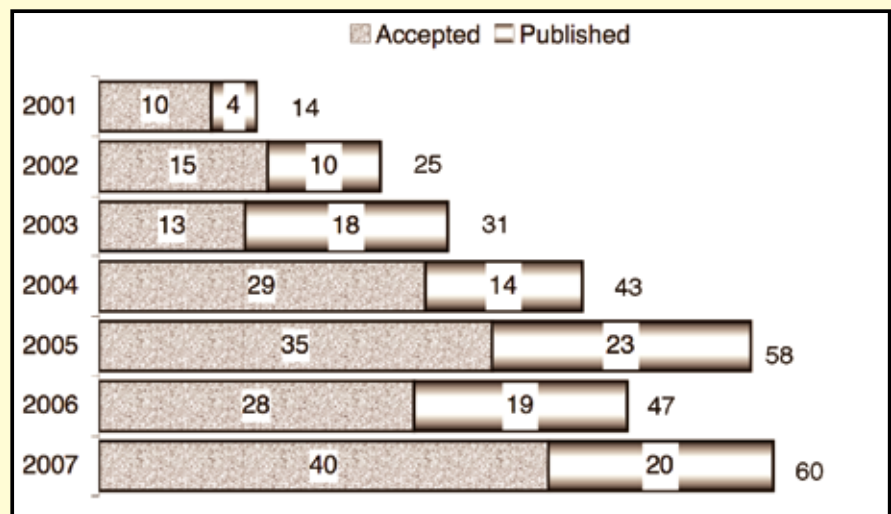
These new initiatives are paying off in doctoral graduates like Kyaiei O. Conner, who received her PhD in social work earlier this year and is a postdoctoral scholar at Western Psychiatric Institute and Clinic (WPIC) at the University of Pittsburgh Medical Center. She is currently conducting research on barriers to mental health care among older African Americans.

The study is a continuation of research she did for her doctorate, in which she surveyed 248 older African American and White adults with depression. Conner went back to the study’s original participants and interviewed 37 African Americans on their views of the health care system. “We found older African Americans have more negative attitudes toward the mental health care system than Whites,” Conner says.

“There is a belief among many Blacks that struggling is just a part of life, so what’s a psychiatrist going to be able to do?” she says. Understanding these cultural barriers, Conner adds, will help mental health practitioners provide better care to people who might normally stay away from the system.

Like Lindsey, Conner was drawn to the Pitt School of Social Work’s joint-degree program with Pitt’s Graduate School of Public Health. While at Pitt, Conner was first author on three articles published in peer-reviewed scholarly journals, and she gave 10 presentations on her research at national conferences. In addition to assisting in her search for an academic position, these experiences also helped Conner achieve a better understanding

Increasing Number of SSW Faculty Publications



Among benchmark schools, Pitt's School of Social Work now ranks 5th in abstracted social work articles, 5th in total number of articles published, and 6th in the average number of articles published per faculty member.

Source: Hidenori Yamatani, associate dean for research, Pitt School of Social Work



Audrey Murrell (above) recently delivered a lecture titled “Unfinished Business: The Impact of Race on Understanding Mentoring Relationships” as part of the Center on Race and Social Problems’ Buchanan Ingersoll & Rooney Fall 2008 Speaker Series. Murrell is director of the David Berg Center for Ethics and Leadership at Pitt’s Joseph M. Katz Graduate School of Business and a professor of business administration, psychology, and public and international affairs.



MARY JANE BENT/ODDE

Center on Race and Social Problems MAKING A DIFFERENCE

The University of Pittsburgh’s School of Social Work created the Center on Race and Social Problems (CRSP) in 2002 to address an issue—race—that has plagued society for centuries. CRSP was the first such center at a school of social work in the country.

CRSP has provided a forum for students, faculty, and the community to discuss race and a means to support faculty who research race. The center offers lectures, courses, summer institutes and, to students, the opportunity to work as research assistants on race-related projects. In addition to writing scholarly publications, the center’s researchers compiled the 2007 report

Pittsburgh’s Racial Demographics, a comprehensive quality-of-life survey for different racial groups in the Pittsburgh region.

The summer institutes have already made an impact on the local community. David M. Kennedy, director of the Center for Crime Prevention and Control and professor of anthropology at John Jay College of Criminal Justice in New York City, was so effective in outlining his method of youth-crime reduction during his CRSP talk last summer, city of Pittsburgh leaders asked him to help implement his plan here. A similar method has helped drive down

violent crime in Boston, Cincinnati, and Chicago.

The center also serves as a magnet for students interested in race.

“The fact that there is a center here really adds importance to studying issues like racial disparities. It makes race the focus of study, rather than something added on at the end. In the world of social work, paying attention to subtle differences in how racial groups behave can mean the difference between the success and failure of a given intervention.”

—Monique Constance-Huggins

“A number of students come here in part because CRSP is unique. It’s a great advantage to have this expertise and focus on race through classes, summer institutes, and lectures,” says Ralph Bangs, the center’s associate director. “Social work and other students know that race is very important in the settings they’ll work in.”

Among those students drawn to the center is Monique Constance-Huggins, who is pursuing a joint master’s-doctoral degree in social work. She is working on one CRSP project aimed at learning how businesses owned by women and other underrepresented groups in Chicago and Boston are awarded contracts by local governments.

“The fact that there is a center here really adds importance to studying issues like racial disparities. It makes race the focus of study, rather than something added on at the end,” Constance-Huggins says.

In the world of social work, paying attention to subtle differences in how racial groups behave can mean the difference between the success and failure of a given intervention, she says.

“It’s important to have culturally sensitive research in order to advance African Americans’ social outcomes,” Constance-Huggins adds.



JOE KAPLEWSKI/CODE

John Wallace, a Pitt professor of social work, takes his courses and projects to the greater Pittsburgh community. Wallace is directing a pilot project in Homewood-Brushton aimed at helping children in an at-risk neighborhood. The pilot is based on New York City's "Harlem's Children's Zone," a partnership of community organizations, government, and local residents that provides a comprehensive social services safety net for children from birth through college.

Comm-Univer-City of Pittsburgh, a pilot project in Homewood directed by Pitt professor John Wallace, exemplifies the School of Social Work faculty's commitment to the community. The project, still in its formative stages, is a comprehensive community initiative designed to help children in an at-risk neighborhood.

Eack learned how to be a researcher while doing his PhD work—everything from developing a research topic to testing a hypothesis, collecting data, and publishing in major social work and interdisciplinary journals.

"They don't let you leave this program until they know you can do all these things, until they know you can stand on your own," Eack says.

of the critical role research plays in the human services field.

"Social workers ask the question, 'How can we apply this intervention to different populations? Can it be applied to African Americans as well as to Whites?' It's incredibly important for social workers to develop our own research," Conner says. "We're training people to go out and provide interventions. It's important that the information we're providing them with is accurate and up-to-date, culturally competent, and backed by evidence."

While chemists work in laboratories, social work scholars do their research in schools, shelters, hospitals, prisons, and other "frontline" locales. It is there that doctoral students reap the benefit of the School of Social Work's deep roots in the Pittsburgh community.

Pitt's rich research emphasis attracted Shaun Eack, who came to the University after completing his Master of Social Work degree at the University of Illinois at Urbana-Champaign. Eack was interested in studying mental health and intrigued by the prospect of collaborating with faculty at WPIC on projects led by social workers.

"It seemed like a great environment to learn all the things you need to know to become a researcher," Eack says. He recently defended his dissertation about a form of treatment that involves brain exercises for patients suffering from schizophrenia.

Expanding Opportunities

In addition to taking classes and pursuing their own research, social work doctoral students can tap into a rich academic life by taking advantage of guest lectures and other special events. The school runs a speaker series in which top researchers from around the country share their work with students, faculty, and community partners. These researchers also have breakfast with the doctoral students beforehand, and during one of these breakfasts, Conner had the opportunity to discuss her research on cultural barriers to mental health services with Arthur Whaley, one of the leading experts in that field. "I know my work was improved by this," Conner says.

The school also houses CRSP, a valuable asset in attracting students interested in working in the area of race. Created in 2002, the center is the first race research center in the country housed in a school of social work and brings visiting scholars on race to discuss their research.

Ties That Bind

While chemists work in laboratories, social work scholars do their research in schools, shelters, hospitals, prisons, and other “frontline” locales. It is there that doctoral students reap the benefit of the School of Social Work’s deep roots in the Pittsburgh community.

Comm-Univer-City of Pittsburgh, a pilot project in Homewood directed by Pitt professor John Wallace, exemplifies the School of Social Work faculty’s commitment to the community. The project, still in its formative stages, is a comprehensive community initiative designed to help children in an at-risk neighborhood.

Wallace, working in partnership with numerous community organizations, government, and local residents, will apply the methods of a similar project in New York City, Harlem’s Children’s Zone, in which a comprehensive social services “cradle-to-college” program helped improve the lives of almost 10,000 young people. “Basically we take the best of what we know and ask, ‘Can we replicate it here?’ Or is it idiosyncratic to New York?” Wallace says. Ultimately, Wallace envisions a project that helps the community while providing rich avenues for research, as well as hands-on training for Pitt social work students. It’s one of many community projects where students can study real-world problems and find solutions. That’s the unique element of social work research—every question must have a real-world, applied answer. “Social work is beyond the lab, it’s beyond the office,” Wallace says. “It’s ‘out there.’”

Looking Into the Future

Several years ago, Lindsey was watching the news on TV and recognized a young man charged with murder and armed robbery. It was Lionel, his former client from Washington, D.C. “I said, ‘That’s the kid I said needed help, and if he didn’t get it, he would hurt someone or be hurt himself.’ It just reinforces the fact that there’s a great need out there,” Lindsey says.

Lindsey, who has continued the research he began at Pitt, is currently conducting an NIH-funded study to help kids with depression get into treatment.

He knows that his research has one aim: to help the next Lionel before it’s too late.

Stories like these are what drive doctoral education at the University of Pittsburgh, Davis says. There will always be problems—for individuals, families, and communities. Pitt trains those who assume the mantle of societal problem-solver.

“With social work, you’re never going to arrive,” Davis says. “It’s always a work in progress. You’re never done.”

SAMPLING OF SUCCESSFUL ALUMNI FROM PITT’S SCHOOL OF SOCIAL WORK

Parris Baker ('07),
Program Director, Social Work,
Gannon University

Deborah Rubin ('99),
Director, Department of Social Work,
Chatham University

Matilda Casler ('95),
Chair, Division of Social Work,
Roberts Wesleyan College

Terry J. Russell ('95),
Chair, Department of Social Work,
Frostburg State University

Pamela Twiss ('93),
Chair, Department of Social Work,
California University of Pennsylvania

Donna F. Hixon ('92),
Chair, Department of Social Work,
Edinboro University of Pennsylvania

Edward J. Saunders ('85),
Director, School of Social Work,
University of Iowa

Anita Bryce ('82),
Dean, Clinical Social Work Institute,
Washington, D.C.

Stanley Battle ('80),
Chancellor, North Carolina A&T University

Ronald E. Marks ('80),
Dean, School of Social Work, Tulane University

Michael A. Patchner ('80),
Dean, School of Social Work, Indiana University

Rita Takahashi ('80),
Director, School of Social Work, San Francisco
State University

Robert J. Wineburg ('80),
*Chair, Department of Social Work, University of
North Carolina, Greensboro

Brian Segal ('71),
*President and Vice Chancellor,
University of Guelph

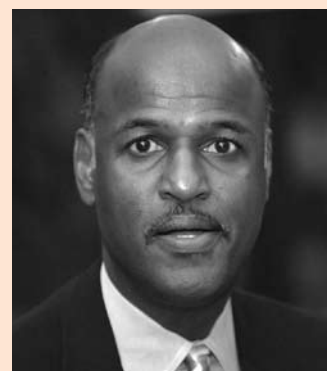
Edmund M. Burke ('65),
*Dean, Graduate School of Social Work,
Boston College

Ruth Elizabeth Smalley ('49),
*Dean, School of Social Work,
University of Pennsylvania

*Former



Parris Baker



Stanley Battle



Donna F. Hixon



Brian Segal

Pitt Chronicle March 16, 2009

Pitt Doctoral Students Learn the Art of Teaching

Research and teaching are intertwined and the best among us are skilled at both



BRADEN WOLFE/CODE

Peter Bell, a Pitt doctoral student in chemistry, conducts an experiment for his organic chemistry class, while George Bandik, a senior lecturer and director of undergraduate studies for Pitt's Department of Chemistry, looks on. From left are Bell, sophomore Vanessa Cole, junior Jason Zlotnicki, Bandik, and sophomore Kaitlyn Musco.

Laura Macia, a Pitt graduate teaching assistant in anthropology, faced a pedagogical problem: how to engage contemporary undergraduates in learning about kinship, a cornerstone of anthropology. Knowing that kinship can be heavy going—even for the most devoted anthropology undergraduate—Macia made a teaching decision. She recast the examination of kinship from one of dry theory and diagrams into a lively class discussion that delved into how different cultures define familial relationships.

Macia turned to something her students knew—the social dating site Match.com.

Macia, who also is a Pitt doctoral candidate in anthropology, compared the ways Americans choose potential partners on the popular dating Web site—using categories such as physical characteristics, lifestyle, and background—to the ways people on a similar site in India choose a mate, basing their matches on religion, caste, mother tongue, and even profession. (In India, such matches are made with an eye toward marriage, not simply dating.)

“I wanted them to understand the emphasis that different cultures make in building their families and how people in other

cultures think about these issues differently than we do,” Macia says about the technique she used with her Introduction to Cultural Anthropology students. “I think a lot of the students felt like the kinship material in the book didn’t have a lot of real-life implications. I wanted to translate it into something tangible, something they’d be able to relate to.”

Finding ways to engage students in academic learning is a task shared by hundreds of Pitt graduate teaching assistants (TAs) and teaching fellows (TFs) who, like Macia, are honing their skills in the classroom, under the guidance of faculty, while pursuing a PhD



MIKE BRADZINSKY/CUDE

Pitt doctoral student Jessica Ghilani confers with Ronald Zboray, a professor of communication and director of graduate studies for Pitt's Department of Communication. Ghilani, who is working on her doctorate in communication, had just finished teaching a discussion class for the Advertising History and Criticism course to 22 undergraduate students in the Cathedral of Learning's German Nationality Room.

The intellectual exchange that takes place in the classroom is by no means a one-way street, graduate TAs and TFs say. The curiosity of undergraduates continuously challenges them to reappraise their ways of seeing the world and understanding their own disciplines. "It's a really good way to learn your own biases and defend your opinions—your way of thinking about the world—because students will test you," says Octavia Graham, a PhD student in communication.

degrees. The doctoral students help faculty craft course syllabi, evaluate student work, run labs, and lead discussions and teaching recitations. In doing so, Pitt TAs and TFs receive hands-on experience in teaching and mentoring from seasoned faculty.

"We want to develop our PhD students as scholars in the fullest sense of the word," says Pitt Vice Provost for Graduate and Undergraduate Studies Patricia Beeson, "scholars who study, who learn, and who share what they learn with the broader community, through writing and publishing, through lectures given to colleagues throughout the world, and through their teaching.

"Research and teaching are intertwined," continues Beeson, who also is a professor of economics and public policy, "and the best among us are skilled at both. We are as proud of our reputation and accomplishments as educators as we are of our research and scholarship."

The excitement that many graduate students have for what they are learning in their dissertation research often carries over into the classroom, according to Nicole Constable, associate dean of graduate studies and research in the School of Arts and Sciences and a professor of anthropology.

"When you are first working on a PhD and you are teaching, it's like you are learning things again for the first time," says Constable.

"There is nothing like the enthusiasm of anthropology students back from their first field research trips. They can talk about how hard it is to do fieldwork and really convey a sense of excitement to the undergraduates because it's still fresh in their minds. For the undergrads, they can get a real sense of what the field is like that they wouldn't necessarily get from reading about it in a book."

Introduction to the Profession

For a majority of Pitt's PhD candidates, the graduate school teaching experience is vital preparation for their future. In the School of Arts and Sciences, 55 percent of PhD graduates move directly into academic teaching positions, while another 20 percent land academic fellowships, which lead to teaching posts in many cases.

That is why most doctoral candidates in Arts and Sciences—between 80 and 90 percent of the 1,500 or so graduate students in the school—receive training as teachers, says

Constable. "Once they hit the job market, having teaching experience is really valuable."

Many TAs gradually work their way into a classroom by helping professors with such administrative duties as grading papers or setting up labs. Over time, they gain more exposure by leading discussions or lab sections, giving lectures, and, as their knowledge and expertise increases, some even teaching classes of their own.

Even if PhD students choose not to go into academia, teaching helps them become better communicators, according to George Bandik, senior lecturer and director of undergraduate studies in Pitt's Department of Chemistry. "There are two aspects of science," says Bandik. "One is finding new information, and the other is getting that information across to other people so it can be used in the world. No matter what graduate students end up doing, this is their chance to learn how to get that information across."

Many chemistry PhD students move on to work as researchers in private industry. They,

"Research and teaching are intertwined, and the best among us are skilled at both. We are as proud of our reputation and accomplishments as educators as we are of our research and scholarship."
—Patricia Beeson

too, will benefit from learning how to teach, says Bandik. “If they’re going into a research position, they’ll have to know how to share their research with different kinds of people.

Bridging the Generational Gap

Graduate TAs and TFs also can serve as a bridge between undergraduates and faculty. Graduate students might relate to the undergraduates they teach because, for the most part, they are just a few years older than their students. They also can bring a certain freshness to the classroom because of their generational connection.

That freshness can be seen in the teaching methods doctoral students employ, many of which use or reference popular media forms.

At 25 years old, art history PhD candidate Robert Bailey is only a few years older than his students. “There are things I have in common with them that I can use to make a point,” says Bailey.

In one course, he cited channel surfing as a way of characterizing the work of American painter David Salle, whose paintings include images from different sources and contexts. “His paintings have a character similar to the random juxtaposition of images that channel surfing produces,” says Bailey. “Salle came to prominence in the 1980s when a lot of Americans began subscribing to cable, so it makes sense that an artist would create a painting that appeals to the haphazard, distracted viewer surfing through a hundred or more channels. It’s a way to show students how one aspect of their visual culture relates to the study of art history.”

Many graduate student teachers use movies, television, and Internet references to make their topics relevant and to reach their media-savvy undergraduates. Using these references as teaching tools comes easily to this generation of PhD students because they also grew up using these media forms. In teaching cultural identity, for example, anthropologist Macia used profile pages on Facebook.com to show her students how people construct and then manage their own identities.

Peter Bell, a PhD candidate in chemistry, likes to share his love of chemistry with his students, many of whom are intimidated by their first organic chemistry lab. So Bell orchestrates a hands-on activity to teach polymer chemistry—how two different substances combine to make a third, totally different substance. The class is asked to mix two liquids—polyvinyl alcohol and borate. The result: slime. “We make slime—it’s this goo that will ooze between your fingers. Everybody ends up having a good time,” says Bell, a self-described science geek whose favorite TV show as a child was *Mr. Wizard*. “There are

serious applications to polymer chemistry, of course, but this is a way to show way to show them that we can have fun with chemistry.”

Coaching New Teachers

Pitt helps its graduate students meet the requirements for classroom teaching by providing an array of courses, workshops, and a form of “boot camp” that immerses them in the art and science of teaching. Some departments provide the training themselves, while all graduate students have access to Pitt’s Center for Instructional Development and Distance Education (CIDDE), which serves the teaching and learning mission of the University by providing support for instructional excellence and innovation.

The center offers a new-TA orientation course each semester, and almost 300 graduate students participate. They receive instruction in everything from ethical issues to student evaluation. The TAs also learn how to effectively assess whether their students are grasping the course material.

CIDDE also offers a teaching practicum course and in-depth workshops throughout the semester on various subjects, among them incorporating diversity into the classroom, leading discussions, and creating a teaching portfolio.

Graduate TAs also have the opportunity to receive one-on-one video consultations at the center, in which a seasoned teacher evaluates various segments of video footage from a class. It can be painful for some students to watch themselves, but it is a valuable tool, says Joann Nicoll, associate director of CIDDE. “They’ll look at the video of themselves and ask, ‘Am I asking the right questions? Am I keeping the students engaged? Is my class organized well?’”

Among those who answer these questions is Brenda Henry, a TF who helps organize the CIDDE consultations. “We’ll talk to them about how they stand in front of a classroom and write on a blackboard—do they stand with their backs to the class? We’ll talk about their tone of voice—are they modulating their voices or are they using a monotone?” says Henry, who

is herself a graduate student in a joint master’s-PhD program in Pitt’s Graduate School of Public Health and School of Social Work.

Some departments offer specialized teaching courses tailored to their particular disciplines. In the Department of the History of Art and Architecture, for example, the pedagogy course is partly designed to provide discipline-specific instruction, such as teaching with images, says Kirk Savage, a professor and chair of the department. But Savage says there’s another benefit: “That course helps us get a conversation about teaching going within the department, so you get graduate students talking with professors and their fellow graduate students about teaching.”

In yet another approach, chemistry department TAs spend a week before each semester preparing to lead lab sections. They learn safety precautions, perform all the lab experiments ahead of time, and practice giving lessons to mock classes.

Jumping in the Deep End

While graduate TAs in most departments gradually become acclimated to the classroom, communication PhD students experience total immersion. First-semester PhD students teach stand-alone courses in public speaking, under the supervision of a faculty member. The idea, says Ron Zboray, professor of communication and director of graduate studies for the department, is to immerse students in the classroom environment from the beginning of their doctoral education.

While they are teaching their first courses, the TAs also are enrolled in a pedagogic course that “walks them through what they can expect during their first semester teaching,” Zboray says. In the pedagogic course, they learn everything from the history of the communication field to how to address different kinds of audiences. The new TAs pick up pointers

from senior faculty and from each other. The crash course helps them later on, Zboray says, when they look for jobs as junior faculty.

“During the interview process, they’re often asked about how they would handle course development; they usually have a pretty good story to tell because, for them, it begins right away,” Zboray says.

By the end of the pedagogic course, the students will have crafted course syllabi and

teaching statements that describe their teaching philosophies and strategies for implementing those philosophies. Zboray says the emphasis on teaching is part of the

By the end of the pedagogic course, the students will have crafted course syllabi and teaching statements that describe their teaching philosophies and strategies for implementing those philosophies.

“When you teach, you are giving your students something extra they can carry with them for the rest of their lives—whether they become nurses or engineers or go into business, you can teach them something about chemistry that they can take away. You get the opportunity to spark that interest in them. And that’s special.”

—Thomas Stringfield



MIKE DRZDZINSKY/CODE

Brenda N. Henry (left), a teaching fellow in Pitt's Center for Instructional Development and Distance Education (CIDDE), and Sarah Taylor (right) review a video of Taylor teaching a Pitt anthropology class. CIDDE offers graduate teaching assistants like Taylor, a fourth-year doctoral student in anthropology, one-on-one video consultations during which a seasoned teacher critiques the teaching assistant's pedagogic techniques. Henry is a student in a joint master's-PhD program in Pitt's Graduate School of Public Health and School of Social Work. She and Taylor are gaining experience in the classroom as part of their doctoral programs.

reason why the department has an exceptional 90-percent placement rate for PhDs into tenure-track positions.

Among those PhD students who have benefited from their training at Pitt is Erika Molloseau Pryor, an assistant professor of communication at Denison University who received her PhD degree from Pitt last year. "Being at Pitt really prepared me for the mechanics of teaching, in terms of constructing a syllabus, conducting a class, and interacting with students," she says.

At Pitt, Molloseau Pryor was a TA in several communication courses and, as she advanced in her degree program and began to master subject-specific information, she taught courses. Teaching these courses helped her to gain the required teaching background she needed to successfully compete for tenure-track positions at universities around the country.

"Especially after teaching those stand-alone courses, where you are responsible for students learning, I felt like it prepared me to step into the role of faculty member," she says.

Inevitably, being a TA presents difficult challenges for PhD students, says Molloseau Pryor— such as handling a case of cheating or

plagiarism. But, as she points out, almost every experience prepares them for what lies ahead.

Testing the Teacher

The intellectual exchange that takes place in the classroom is by no means a one-way street, graduate TAs and TFs say. The curiosity of undergraduates continuously challenges them to reappraise their ways of seeing the world and understanding their own disciplines.

"It's a really good way to learn your own biases and defend your opinions—your way of thinking about the world—because students will test you," says Octavia Graham, a PhD student in communication whose students have grilled her on everything from race to religion to human sexuality. "They'll ask you, 'Why do you think this? Why are you assigning this kind of reading over other kinds?'"

These types of questions can cause some PhD candidates to rethink their core assumptions about their own fields. The give and take that occurs between teachers and students has the potential to enliven the PhD candidates' own research and deepen their understanding of their discipline.

It's okay when students sometimes ask questions that go beyond a TA's knowledge

base, says Julia Finch, a PhD candidate in the Department of History of Art and Architecture, because it forces TAs to learn something they might not know.

"There's nothing like having a student ask you a question and having to say, 'Hey, I don't know the answer, but let's do some more research on it and we'll figure it out,'" says Finch.

History of Art and Architecture Chair Kirk Savage, now a seasoned teacher, cites one particular teaching moment from his own graduate teaching experience. During a lecture on the lack of African American representation in 19th-century monuments, a student asked then-graduate student Savage a simple question: If Blacks could cobble together enough money, why couldn't they just build their own monuments?

"I realized I hadn't really explained the power structure behind building monuments in this country," Savage said. The simple question had a big impact on one of Savage's projects. "I realized if I'm going to go write a book on that, I'm going to have to go right to the heart of that question, and explain how public space works." In his 1997 book on the topic, *Standing Soldiers, Kneeling Slaves: Race, War, and Monument in Nineteenth-Century America*



Pitt History of Art and Architecture Chair Kirk Savage (left) works with Robert Bailey (middle), a fourth-year doctoral student studying contemporary art, and Julia Finch, a fifth-year doctoral student studying medieval art. They are discussing ways to teach Michael Baxandall's classic art text *The Limewood Sculptors of Renaissance Germany*.

MARY JANE EBERT/CIDE

(Princeton University Press), Savage devoted part of a chapter to the question initially posed by his undergraduate student.

A Lasting Bond

Thomas Stringfield, who earned his PhD in chemistry at Pitt in 2002, caught the teaching bug during his doctoral program. Stringfield was a TA for several semesters, eventually becoming TA coordinator, a position usually occupied by a senior graduate student interested in teaching. He created course syllabi, coordinated labs, helped revise the department's organic chemistry lab manual and Web site, and, eventually, lectured.

Stringfield reveled in the creativity he was able to bring to his classrooms. For his end-of-semester review sessions, he used a game-show format to help students review such concepts as gas chromatography or covalent bonds. Stringfield played a version of *Who Wants to Be a Millionaire?* with undergraduate supervisor George Bandik close at hand. "In addition to the traditional 'lifeline,' where you could

ask a friend in the audience for help, we had a lifeline called 'Bother Bandik,' in which the students could ask Bandik a question if they were stumped," he says. In using a familiar media format, Stringfield was able to help students review key concepts from the material and to think on their feet about chemistry.

Stringfield was hired in 2002 as a full-time instructor at Washington and Jefferson College and, four years later, as a tenure-track assistant professor in the University of Cincinnati's Raymond Walters College. He credits his teaching experience at Pitt with helping him to land both positions—and with helping him find his calling.

"When you teach, you are giving your students something extra they can carry with them for the rest of their lives," says Stringfield. "Whether they become nurses or engineers or go into business, you can teach them something about chemistry that they can take away. You get the opportunity to spark that interest in them. And that's special."

Even if PhD students choose not to go into academia, teaching helps them become better communicators, according to George Bandik, senior lecturer and director of undergraduate studies in Pitt's Department of Chemistry. "There are two aspects of science," says Bandik. "One is finding new information, and the other is getting that information across to other people so it can be used in the world. No matter what graduate students end up doing, this is their chance to learn how to get that information across."

Acknowledgements

The Office of the Provost created and developed this series to showcase excellence in graduate and professional education across the University. The series draws from the experiences of members of the University community who mentor graduate students every day. We would like to acknowledge the contributions of the faculty, deans, and graduate students who provided important insights into their programs and schools. Contributing writers for the series were Reid Frazier, Jason Togyer, and Amanda Leff. We also would like to recognize the contributions of Linda Schmitmeyer, Jane-Ellen Robinet, and Gary Cravener of the *Pitt Chronicle* who provided editorial and design support.



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