



Undergraduate Research: Springboard to Insight and Discovery
Vice Provost Patricia Beeson talks about how Pitt professors as well as students benefit from undergraduates participating in research

April 3, 2006 Issue
By Bruce Steele

Pitt has long had a fairly active undergraduate research program, Patricia Beeson points out, but such activity hasn't been very visible because it usually involves students working with professors in laboratories or one-on-one through independent-study arrangement

"One of the things that we are trying to do is raise the visibility of undergraduate research on campus, so that faculty, students, and prospective students become more aware of this very important and rewarding aspect of a Pitt education," says Beeson, the University's vice provost for graduate studies and interim vice provost for undergraduate studies.

To showcase its undergraduates' research and creativity, Pitt this month is sponsoring "Springboard to Insight and Discovery," which will include an undergraduate research fair as well as exhibitions, presentations, poster sessions, and symposia. Click [here](#) for schedule.

Increasingly, Beeson says, students at Pitt are expressing interest in doing research as undergraduates.

"For example, 83 percent of Pitt students who matriculated in fall 2005 said they planned to get advanced degrees, and 75 percent of our graduating seniors last spring said they planned to attend graduate and professional school within five years of graduation," she reports. "For many of these students, engagement in the research and other scholarly endeavors of our faculty is an important component of their education."

Most undergraduate participation in Pitt research occurs during the academic year, and students working on research projects earn academic credit. However, many Pitt students receive summer stipends that enable them to fully immerse themselves in their research during summer-long undergraduate research experiences.

Over the years, Pitt has cultivated a substantial undergraduate research community on campus during the summer through the University Honors College's Brackenridge Fellowship program and the efforts of individual faculty members who support summer research experiences for undergraduates. In recent years, Joseph Grabowski, director of undergraduate research in Pitt's School of Arts and Sciences (A&S) and an associate professor of chemistry, has coordinated these individual faculty programs to create a sense of community for undergraduate researchers at Pitt during the summer.

During the academic year, undergraduates participate in research fairs and symposia such as



Vice Provost Patricia Beeson (second from right) with undergraduates John Knox (far left), a junior majoring in computer science and linguistics; Jeremiah McKain, a senior majoring in Japanese and political science; and Lindsay Gialloreto, a junior English major.

this month's "Springboard to Insight and Discovery" celebration. A new and innovative program is the A&S First Experiences in Research, which sponsors second-term freshmen as research assistants. In addition, many Pitt departments and programs now require capstone experiences, which for many students take the form of undergraduate research projects. The new Pitt residence hall opening in fall 2006 will include an undergraduate research living-learning community.

Some financial support for undergraduate research is provided through the Brackenridge Fellowship, the University Center for International Studies' (UCIS) Research Abroad Program (RAP), and the Chancellor's Research Assistant Program. In addition, Pitt deans have raised money through the University's "Discover a World of Possibilities" capital campaign to sponsor summer research experiences for students. For example, A&S Dean N. John Cooper has raised endowment funds from USX and an individual donor, Christine Torretti, to sponsor students for summerlong research projects.

"However," Beeson adds, "the main source of funding for undergraduate research is our faculty, who attract funding for these research experiences from federal agencies such as the National Science Foundation and National Institutes of Health, as well as from private foundations.

"And, let's not lose sight of the fact that the primary support for undergraduate research at Pitt is the time, energy, expertise, and encouragement provided by our faculty."

Beeson talked with the Pitt Chronicle last week about undergraduate research at Pitt.

PITT CHRONICLE: When many people think of "university research," they think only of science and technology. To what extent do Pitt undergraduates have the opportunity to do research in the humanities and social sciences?

BEESON: In a survey of Pitt graduating seniors last spring, more than a third who reported having worked with a faculty member on a research project outside of a standard course were from disciplines outside the sciences and engineering, such as history, social work, and political science.

A few years ago, through the UCIS-sponsored RAP program, [Associate Professor] Dennis Looney of the A&S Department of French and Italian took three undergraduates to Italy with him to work as research assistants. The students transcribed letters and helped Dennis make sense of them in their historical context. Their work is now part of a book Dennis has under review at the University of Notre Dame Press.

In the Department of History, Michael Sechler started working as a research assistant with Professor Janelle Greenberg when he was a second-semester sophomore. This term, Michael completed his B.Phil. with Professor Greenberg, writing about the famous medieval jurist Henry de Bracton. They plan to continue working together over the summer, and by the end of the summer expect to have submitted two papers to top history journals.

Cynthia Kinnan is another undergraduate researcher who comes to mind. She wrote about China's Three Gorges Dam project through the Brackenridge Fellowship program, working with Professor Tom Rawski in the A&S Department of Economics. Cynthia went on to earn an M.A. at the London School of Economics as a Marshall Scholar and is currently a doctoral student in economics at M.I.T.

So, you can see there really are many opportunities for undergraduates to become engaged in the full spectrum of research conducted at the University.

It seems obvious what a Pitt undergraduate might gain from participating in a faculty-led research project—everything from intellectual enrichment to a good job reference from a professor. But what do Pitt faculty members themselves get out of including undergraduates on their research teams?

It's interesting—we recently surveyed some students about their undergraduate research experiences, and I was struck by their responses to the question, "What was the best part of your research experience?" What struck me was how similar their answers were to those of my faculty colleagues. Among the things that students cited were "the feeling you get when you sit

back and realize that you're delving into the unknown, and what you find could be something that no one's ever even thought of before," and the "satisfaction that comes from knowing that you have contributed to a larger academic community."

This is what academics is all about. This is why most of us are here. We love learning, we love doing research, and we love sharing what we learn and discover with others. It is really a thrill to work with students, see them develop, see them start to go off on their own intellectually, and then to hear them say, "Wow, this is really cool" for exactly the same reasons we would say, "This is really cool."

Faculty also work with undergraduates because of what those students can contribute to the research effort: They provide another set of hands and eyes, and they help move projects forward. Some faculty members assign undergraduates to explore new endeavors and new twists and test new directions. Others employ undergraduates to get additional data.

But undergraduates can contribute a lot more than that to research. There is a great video in the A&S "Classic Clips" series about innovative teaching styles and methods (www.cas.pitt.edu/pitt/index.php) in which Daniel Shaw, a professor in the A&S psychology department, talks about how he engages undergraduates in his research projects. He has a terrific line where he says something to the effect that "undergraduates sometimes ask great questions because they are untainted by theoretical models." He talks about how undergraduates can raise a question that he himself thought about years ago, only to toss it aside—and how, 15 years later, his students will ask it again and he will see that the question is still there, and still interesting.

How does Pitt compare with other universities in terms of involving undergraduates in research? Are we ahead of, behind, or riding the curve on this?

There are several dimensions to that question.

Because Pitt is a major research university, the research experiences we can offer our students are fundamentally different from those offered at primarily undergraduate institutions. Our students have access to some of the top researchers in their fields, and get to work with scholars who truly are on the cutting edge of their disciplines. Pitt students also have greater access to medical research because the University's medical school and the UPMC medical complex are adjacent to the undergraduate campus. That is not the case at some other research universities, and it means that our students can, and do, walk down the street and work with faculty and researchers in medical labs.

Our students also have access to the research materials found in the city of Pittsburgh; for example, students in our Department of History of Art and Architecture have access to the resources of the Carnegie, the Warhol, the Mattress Factory, etc.

As to the extent to which our undergraduates are engaged in research compared with undergraduates at other universities, this is very difficult to assess because there are no comparative data. Nationally, and locally, there are ongoing debates about what constitutes undergraduate research, particularly outside the sciences. That having been said, my very unscientific assessment, based on talking with colleagues here and at other universities, is that we are probably one of the top 10-15 public AAU [Association of American Universities] research universities in terms of undergraduate research. And on this margin we compete with the very best public universities. The University of Michigan is recognized as one of the top universities for undergraduate research, but we have had undergraduates choose Pitt over Michigan because they felt Pitt would offer more opportunities to do research.

Undergraduate research is something we are good at. It is something that distinguishes our undergraduate programs from those at other universities. And, with the changing interests and aspirations of our undergraduates, I expect undergraduate research will continue to grow at Pitt.

What would you say to a skeptic who argued that most undergraduates are still too immature—intellectually and otherwise—to contribute to high-quality research projects except as coffee-fetchers and lab-rat attendants?

First, I would say: Don't underestimate the value of lab-rat attendants! As you know, research isn't all the glamour and glory that it might appear from magazine articles. There is a lot of grunt work, a lot of digging through the stacks to find the obscure reference, a lot of glassware to be washed and experiments to be timed. We all have done those sorts of things. In some disciplines, it's part of learning the trade. A freshman might start out washing glassware, attending team meetings, and learning a little about how the lab works. Then, because she is so reliable and interested, she is asked to make gel plates, and maybe she helps a graduate student run an experiment. By the middle of her sophomore year, she has her own project to work on. By the end of her senior year, she has ownership of the project: She designs and runs the experiment, gathers and analyzes the data, and drafts the paper. She has become the expert, the one who answers the questions.

Second, I would say: Don't underestimate our undergraduates! They are bright, enthusiastic, and curious, and increasingly our faculty are recognizing the contributions they can make. The winter issue of Pitt Magazine includes several examples of undergraduates who are contributing to important research. Rhodes Scholar Justin Chalker is developing a new low-cost substitute for prostaglandin that may hasten the process of finding cures for diabetes and cancer. Chancellor's Scholar Anna Quider's research promises to lead to a better understanding of how gases form into galaxies and, in turn, how galaxies structure the universe. Another Pitt undergraduate, Chris Berger, spent last summer researching public health in Mexico where he worked with local midwives educating expectant mothers on nutrition.

Third, I would tell skeptics: Talk to Graham Hatfull, who is the Eberly Family Professor and Chair in the A&S biological sciences department. Graham is a big advocate of engaging students in research early in their educational careers. He and his colleagues even have high school students in their labs. Two years ago, when we started the First Experiences in Research program in the Arts and Sciences, we placed 32 second-term freshmen as research assistants. Last year, 62 freshmen were placed, and this year it's 99. So, we are increasingly seeing younger and younger students working on research with faculty.

Undergraduate research isn't really a hard sell for our faculty. We have great students and great faculty at Pitt, and both find working together on research projects to be very rewarding.

Is it necessary that every Pitt undergraduate participate in faculty-led research?

I think it is important for every Pitt student to have some intense academic experience outside the traditional classroom setting that helps them integrate skills and knowledge they've acquired in classrooms and to apply them to some new, less-familiar setting—be it undergraduate research, an internship, or a study abroad experience.

For many of our students, working on a research project with a faculty member contributes greatly to their success both at Pitt and after they graduate. The experience not only helps them develop skills as researchers, it draws them into the academic community; it helps them to clarify their goals and aspirations, and it helps them achieve those goals.

For others students—for example, in business or civil engineering—internships or co-ops are more appropriate in helping them achieve their academic and career goals.

Currently, about 75 percent of our graduating seniors report having had either an internship or undergraduate research experience. Of course, I would like to see that be closer to 100 percent.

