Cause and Effect

The results speak for themselves.

By numerous measures, the college’s decades-long emphasis on student-faculty collaborative research as a teaching tool in the natural and applied sciences has earned national distinction.

Every student who is majoring in one of the division’s eight departments—biology, chemistry, computer science, engineering, geological and environmental sciences, mathematics, nursing and physics—who wishes to participate in research has the chance to do so, and many take advantage of the opportunity. Some 130 students conduct research with faculty mentors during the school year, the figure growing to 160 working full-time with the faculty for eight to 10 weeks each summer, making it one of the largest summer research programs among predominantly undergraduate institutions nationwide. The activity complements classroom instruction that itself regularly includes laboratory work and exploration of original research topics.

“For many years science at Hope has been guided by a defining theme, which is that scientific learning is best achieved by doing science,” said Dr. Moses Lee, professor of chemistry and dean for the natural and applied sciences. “We are committed to delivering an excellent undergraduate program of study as well as providing an opportunity for cutting-edge research in all scientific disciplines.”

In addition, the division has been working to extend its acclaimed research-based teaching model to students traditionally underrepresented in the sciences. The “REACH” (Research Experiences Across Cultures at Hope) program, which began in 2006 and is now funded through the college’s recent multi-faceted grant in the biomedical sciences from the Howard Hughes Medical Institute, involves area minority high school students in research during the summer to help encourage them to pursue careers in the sciences. A grant to Hope from the National Science Foundation (NSF) is supporting graduates of community colleges, primarily in Michigan, who wish to complete a four-year degree in the sciences, and Hope is also partnered with the City Colleges of Chicago to involve the system’s two-year students in summer research at the college.

Active learning in the sciences through collaborative research with faculty members is a hallmark of the Hope experience. Here physics students Brianna Wynne and Sharenne Alger visit the laboratory of Dr. Stephen Ramilland.

With Recognized Excellence

Hope has five grants through the NSF’s “Research Experiences for Undergraduates” program, the largest total held by primarily-undergraduate institutions nationwide. Hope is the only college or university in the country to have received “Beckman Scholar Award” support for student research from the Arnold and Mabel Beckman Foundation since the foundation began the program in 1998. Since the category debuted, the “America’s Best Colleges” guide published by U.S. News and World Report has included Hope on its list of institutions—only 33 currently—that are exceptional for their emphasis on undergraduate research and creative projects. The research program is extensively supported through competitive grants from external sources such as the NSF, National Institutes of Health, Department of Homeland Security, private foundations and corporations—some $3.5 million during 2007-08.
With Recognized Excellence

Hopes students regularly co-authors on published research and make presentations at major national professional conferences. The 10-year medical school acceptance rate is 85 percent, and computer science and nursing have found that every graduating senior who wanted a job in their field found one. Last spring, three chemistry majors (Kristin Dittenhafer, Jonathan Moerdyk and Amy Speelman) received prestigious Goldwater Scholarships, out of only 321 recognized by the National Science Foundation. Another five students were selected for the Goldwater Scholars "Outstanding in Their Field." The college’s six chemistry majors, 11 computer science majors and 46 nursing students were honored with a total of 56 honors that the college, Hope faculty and Hope students is reflected by the major external recognition that Hope has received for the quality of its programs.

"HISTORIC CHRISTIAN FAITH"

In the sciences at Hope, the college’s longstanding faith tradition manifests with a particular emphasis on how and why students choose to act as professionals and people based on their values as shaped by their faith. Dr. Dunn said of the nursing program. "It’s woven into everything we do, including our relationship to discussing medical ethics. It’s woven into our culture, it’s woven into our missions. It’s woven into our medical ethics. It’s woven into every part of who we are."

"Not every student is a Christian, but every student graduates from Hope with an understanding of what it means to provide care from a Christian perspective. In addition, because we use nurses care for people of all faiths, the other component of that is how from a Christian context we care for people of other faiths. That’s a real learning experience for our students."

"The college’s tradition similarly facilitates and enriches discussions of ethics within other disciplines. The summer research programs in engineering and physics, for example, include joint seminars facilitated by guest speakers who may explore issues ranging from how to credit colleagues to co-authors on publications to what to do with data that don’t support one’s hypotheses. "We talk about it, we have case studies," Dr. Dunn said.

Beyond such seminars, such discussions take place in venues ranging from the "Science and Math Colloquium," to seminars, to classroom discussions, to informal conversations between faculty and students. "I think we have the opportunity to delve into these questions—to explore mathematics and philosophy, and mathematics and faith," Dr. Stephenson said.

The college’s faith tradition also shapes the very character of the place itself. Ultimately, it’s the students and faculty’s commitment to live out their personal faith in a meaningful way that shapes the priority that the people of Hope place on being of service through the work that they do and how they do it—not only through programs and projects, but through day-to-day interaction, every day, all the time. "Certainly we have tried to role model a Christian life for our students," Dr. Jipping said. "Sometimes it comes through in how you use examples in class, or how you introduce projects to students."

"The college’s commitment to service environment. It’s a very supportive environment, which is unusual," Dr. Pauley said. "We don’t wish students out. We want them to stay here, and the students help each other."

Faculty member Vicky Slot meets with students in the nursing skills laboratory. Instruction in nursing on campus runs in tandem with field placements that provide students with the opportunity to practice what they are learning.