

Expanding the Global Classroom



CALS has long been renowned for extensive international engagement. A new program enriches global opportunities for undergrads by making international perspectives, skills and applications part and parcel of the science curriculum.

By **Masarah Van Eyck**



A LITTLE MORE than two years ago I started cold-calling CALS faculty and instructional staff requesting no more than 25 minutes of their time. The first thing I asked the dozens of respondents who agreed to my conversational survey was: "What do you already do to introduce your students to the international aspects of your field?" Then I asked: "What would you do?" And then: "What would you need to do it?"

Their answers were as varied as the sometimes spontaneous, often revisited and always generous conversations I enjoyed over the next few months. Some wanted technical support to connect their classrooms with equivalent courses in other countries. Many were eager to host their international colleagues as guest lecturers. Some envisioned podcasts and websites designed to share relevant teaching resources. Still others conjured up entirely new majors, or a renewed system for rewarding teaching engagement across campus more generally. All of them were eager to tackle the challenge.

In the end, three common needs stood out: more opportunities to collaborate with partners abroad; time to put new teaching projects together; and graduate student assistance to pull it off.

The CALS International Programs Office was prepared to meet those needs with a small awards program under the auspices of the campus-wide Madison Initiative for Undergraduates. International Programs director John Ferrick and undergraduate program development director Laura Van Toll conceived of the program to support science faculty interested in further introducing their students to the international aspects of their fields; I was brought on to help carry it out. We asked for "global learning outcomes" in the awards application so that we could learn the skills and perspectives instructors wanted their students to gain. And we gathered a group of faculty to evaluate and lend insight into the feasibility of their colleagues' projects.

Global science exploration: (left) A landscape architecture student maps streams in Costa Rica for conservation planning; (center) Students learn about amaranth, a crop high in protein, from a program partner in Guatemala; (above) Dairy science professor Michel Wattiaux (standing, far right) and his students get an up-close look at dairy production in Mexico.

(below) In Guatemala, a student takes a close look at microbes as part of a class examining international food security and environmental conservation. Agronomy professor Pablo Prado, of the University of San Carlos, looks on.

From case studies to field studies, from podcasts to research abroad, instructors proposed an array of novel projects, all of them designed to introduce a global perspective into undergraduate science courses. In the roughly two years since the program's inception, these three dozen or so teaching innovations have reached approximately 2,000 students in more than 50 courses each year.

Equally important, they are showing us why—and in what way—infusing international content into undergraduate science education is of value.



SHARED CLASSROOMS, SHARED BENEFITS

LAST FALL, plant pathology professor Caitlyn Allen and botany professor Don Waller connected their class on the fifth floor of Russell Labs with an equivalent course at the University of San Carlos in Guatemala, taught by agronomy professor Pablo Prado. Comparing agricultural and conservation practices in the tropics and the American Midwest, students shared lecture content throughout the semester and communicated via videoconference technology and social media.

And in January they embarked together on a two-week field study through Guatemala, observing industrial and traditional agricultural practices and new conservation efforts. The students helped harvest seed corn in a mountainside milpa plot, interviewed former orchid poachers

Global concerns on campus:
Undergrads in a lab at the Wisconsin Institutes for Discovery attempt to make biodiesel from waste cooking oil straight from Steenbock's on Orchard, the restaurant downstairs.

FOOD SECURITY, global health and nutrition, renewable energy, environmental sustainability—our 21st-century challenges are not referred to as “complex, global problems” simply because they transcend geographical regions. They are both complex and global because they are embedded in an array of languages, religions, measurements, legal systems, trade policies,

and deeply held beliefs about one's personal well-being and relationship to the land.

CALS students know they are entering professions that are profoundly interconnected economically, politically—and daily. Whether searching for a means to feed a world population expected to reach 9 billion people by 2050 or the best way to brand Wisconsin's products to India's emerging middle class, they are eager for the



skills not just to navigate in this new environment, but also to lead. They may be studying a seemingly value-free subject like biochemistry, but they are keenly aware that effectively applying that knowledge requires a nuanced understanding of the world around them. As one nutritional scientist told me in an early meeting: the spleen may work the same way around the world, but people's diets are very different.

“Awareness of other cultures and awareness of what's going on around the world has huge implications [for how we conduct our work],” a junior majoring

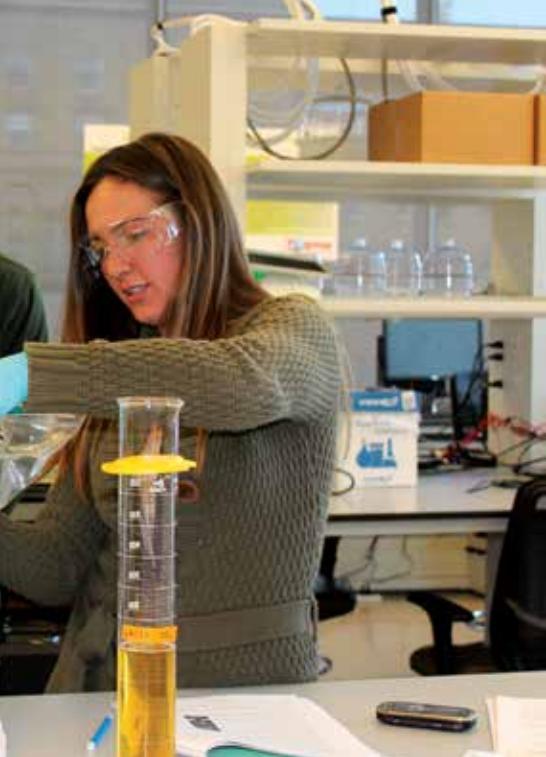
who have learned to grow their own orchids, compared organic and conventional coffee farms, and lunched with Mayan sheep and potato farmers on a bare and windswept highland plateau.

For many of the Guatemalan students, the trip was their first opportunity to see firsthand those aspects of their country. Prado later wrote that it helped at least one of his students discover “how fun a profession in agriculture could be.”

According to Allen, CALS students are hungry for the opportunity to contribute to—and not just “tour”—a region, whether through service learning, volunteer work or shared

experiences like these. “Our students are deeply idealistic,” she says. “They want to know that the lessons they learn in and about other countries also benefit the people they see there. They know that what we do here matters.”





in horticulture told us in a focus group earlier this year.

Enrollment trends echo this sentiment. Take the Undergraduate Certificate in Global Health, a cross-campus offering administered through CALS. Earning the certificate requires students to complete at least two core courses in global, public and environmental health and earn a handful of elective credits. They also must embark upon either a domestic or international field experience designed to expose them to global, intersecting issues of human, animal and environmental health. Launched less than two years ago, it is easily one of the most sought-after certificates on campus. As of the spring 2013 semester, it had 316 current students and 75 alumni.

For other students, the growing market demand for food, technology and biofuels in other parts of the world inspire them to gain international experience. "We live in a global marketplace, and science breeds products that get fed into that marketplace," a microbiology major who also is earning a Certificate in Business told us.

Whether in the name of global competition or collaboration, the next generation of scientists will work in international, multidisciplinary teams. And their success will depend upon how well they apply their scientific knowledge to real-world challenges on the ground.

WANTED: MOBILE SCIENTISTS

TODAY, junior scientists from foreign countries training in the U.S. are less inclined to make their careers here, given the growing support and resources for scientific research closer to home. In response, the head of the National Science Foundation recently advised that budding North American and European scientists see to it that they gain experience abroad to learn how science is conducted in these emerging epicenters of discovery.

Yet, given the intense credit load and lockstep course sequence of our science majors, carving out time to study abroad can feel insurmountable. With the help of CALS faculty, the International Programs Office has developed more than a dozen new study and internship opportunities with overseas partners that accommodate the needs of science students by taking place over summer or winter breaks.

Last summer, for example, nearly three dozen students from across Wisconsin completed a course on social entrepreneurship at Oxford University developed and taught by CALS' Brad Barham, a professor of agricultural and applied economics, and professor John Hoffmire of the Wisconsin School of Business. Students learned from their professors and from practitioners in the field about social entrepreneurship, which harnesses market-oriented activities to address social, economic and environmental problems. They also collaborated in small groups on a number of hands-on assignments, most notably a week-long internship project in which they offered their assistance to—and learned from—a diverse range of entrepreneurial nongovernment organizations (NGOs).

Barham says the combination of engaged, active learning in the classroom with hands-on experience working with NGOs was transformative for the students.

"The key is taking students out of their comfort zones and concentrating their attention on a core theme so they can see how the education they are getting can be applied," says Barham. "Without a doubt, some of our most innovative entrepreneurship comes from those experiences."

Participant Caroline Collins, a double major in agricultural business and environmental studies, completed a long-distance internship with an entrepreneur in India who is working on micro-grid technology. He hopes that his innovation will bring reliable, safe power to India's most impoverished rural populations. Collins' group contributed both a market analysis and a business plan for his work.

"I was interviewing for summer internships this past fall and almost every employer asked me about my time at Oxford," says Collins. "They all wanted to know what projects I worked on, what I learned and how I grew from the experience."

The course, she says, "opened my eyes to how new methods and ideas regarding sustainable development can benefit both industry and the environment."

Her experience abroad also made her feel more independent and confident in her ability to "conquer unfamiliar challenges and situations," she notes. "I also gained better group work skills by completing projects with people from different cultures. All of these skills help me with everyday scenarios on campus and better prepare me for life after graduation."



Emi Kihslinger BS'13 contributed to this story.



Bringing global scholars here: Professor Pavel Krasilnikov (standing in pit), of Lomonosov Moscow University, conducting field work with CALS soil science students in Platteville.

MAYBE IT'S NOT so surprising that in the world of higher education, CALS has been a leading force in the internationalization of science education. Our scholars have long been global citizens, collaborating with international research partners and taking care to see that their discoveries benefit us all.

In 1951, CALS faculty hosted agricultural delegates from nearly 40 developing nations for a conference on land tenure problems. In the following years CALS launched an annual International Farm Youth Educational Exchange Conference and by 1963 had matriculated more than 230 foreign students.

Cold War politics also sent an impressive number of CALS faculty abroad. Bolstered by external and federal funds made available after World War II, faculty from across campus, including those in agriculture, education and engineering, returned from working in countries like India, Brazil and Nigeria

eager to share their insights with their students.

Recognizing that our deeply local roots had become the foundation of our institution's undeniably global reach, in 1961 the University Board of Regents published a policy resolution that in effect "internationalized" their land grant vision:

"With the passing years, the welfare of the people of Wisconsin has become increasingly tied to national and international developments. It is logical, therefore, that the scope of the

Wisconsin Idea should be broadened [...]. We recognize that the university's first responsibility is to Wisconsin and its residents. But the university must look outward if this obligation is to be fulfilled."

Today CALS requires every one of its students to earn three credits of international studies coursework. Scores of CALS graduates have served in the Peace Corps. And nearly every one of the college's instructors engages in international work of some kind.

In this light, of course our faculty and instructors accepted my request for an interview—and embraced the opportunity to further expose their



The young teaching the younger: UW students leading science activities at an elementary school in Tabuga, Ecuador.

THE WORLD AT THEIR KEYBOARDS

IN RECENT YEARS, UW-Madison has bolstered its commitment to offering high quality online education that harnesses the most cutting-edge technology and provides students with a more efficient and accessible learning experience. Faculty in the sciences have welcomed the opportunity to explore what online learning can bring to their classrooms.

Much like a “create your own adventure” story, online case studies ask students to tackle real-world problems as actors in a simulated scenario. With media-rich international content, instructors are now more able than ever to bring the world to their students’ fingertips—literally. Thanks to a partnership between CALS International Programs and UW-Madison’s Engage Program, students in dairy science, botany, pharmacy and plant pathology classes have experienced some of the most innovative products available.

Dairy science professor Michel Wattiaux, for example, collaborated with his partners in Mexico to produce an online case that asks students to evaluate the likelihood that smallholder farmers in Central Mexico would adopt a new milking technology.

And plant pathology professor Jeri Barak designed a program that asks students in her Global Food Security class to play the role of an intern to Ethiopia’s commerce minister. Tasked with evaluating the possible benefits and consequences of leasing out land to a foreign firm, each student must ultimately recommend which (if any) land proposal to accept.

Online scenarios allow students to simulate making decisions in the context of other countries.

most junior students to the real-world, collaborative challenges they grapple with every day. We’re pleased to present miniprofiles of some of these efforts as part of this story (see photos and sidebars).

Our next step will be to support our instructors’ more strategic and measurable approaches to curricular internationalization—an inventory and assessment of the “international

content” in their departments, for example, or of an entire major. That will be tough to do for a moving target like global change—and that’s the point.

Even if we take it at its broadest definition—to put more global content into the university experience—the urgency to further “internationalize” CALS curricula has only gained traction.

And our students know it. 

At their best, such scenarios prompt students to tackle complex issues within real-world contexts, challenging them to come up with viable solutions to problems that often have no clear right or wrong answer. Just as important, these assignments—unlike, say, essays or class presentations—allow instructors to “watch” students’ decision-making processes as they click through the exercise, providing further insight into the best ways to teach the complex issues they are presenting.

An early study of the impact of these products found that a whopping 68 percent of students agreed or strongly agreed that classes with these online products increased their appreciation for understanding science in international contexts.

Big Decisions in Small-Scale Dairy Farming 

You arrive at the farm

Jose Juan, who is about 40 years old, welcomes you to his farm and immediately begins showing you around. You see that he has about 15 dairy cows in a corral adjacent to the house.

Jose tells you he uses the milk from his cows to produce cheese. The family sells about 3 kg. each day at the local market for 60 pesos / kg. The remainder he sells to a middle-man for 40 pesos / kg. who ships it east to Mexico City which is about 150 km. away from the farm.

Jose tells you that sometimes his customers complain about the quality of the cheese. He also mentions that he has been thinking about adopting mechanical milking and is receptive to your recommendations.

Next: Ask questions



Home



Jose's herd



Cheese

VISIT THE FOLLOWING WEBSITE to learn more about the program and projects described in this article: <http://ip.cals.wisc.edu/for-faculty-staff/globalizing-the-sciences/>

Want to take part in the CALS Science Internationalization Project? Contact author Masaiah Van Eyck at mvaneyck@wisc.edu, or tel. (608) 890-4196.