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THE TRADITIONAL EXPERIENCE

DC undergraduate students find themselves conducting research alongside their professors

by Kathy Punches '96, Director of Public Relations and Marketing

From researching the coloration of broadbills at Midwestern zoos to studying a rare gene mutation that affects diagnosis of tuberculosis for Cambodians, Defiance College students are finding endless research opportunities that often elude undergraduates at most colleges and universities.

Whether through direct contact with faculty in their fields of study or through the expanded opportunities offered through the McMaster School for Advancing Humanity, DC students have opportunities that transcend the traditional academic experience by conducting graduate-level research as undergraduates.

From on-campus and local projects to research conducted in international locations, Defiance College students find themselves working alongside their professors to delve more deeply into their fields of study.

Many students are required to conduct research projects through their senior capstone courses. There are numerous on-campus opportunities for undergraduate research through the Carolyn M. Small Honors Symposium held each semester. Students also present their work at conferences around the country.

During the 2009 fall semester, senior health and physical education majors Nate Cline and Ryan Nusbaum presented at the 80th annual convention of the Ohio Association for Health, Physical Education, Recreation and Dance held in Columbus. The topic of their presentation was "Using Assessment Data to Inform Future Instruction."

Arts and humanities students have similar opportunities. During the 2008-09 academic year, English major Jared Erickson gave a presentation at the Study of Midwestern Literature Conference in East Lansing, Mich.

Students majoring in the natural sciences are required to conduct a research project as part of their senior capstone. Science students also have the rare opportunity to have access to the department's equipment, something not typically open to undergraduates. The 200-

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acre Thoreau Wildlife Sanctuary also offers countless research opportunities including study of bird migration, development of wetlands and woodlots, study of meadow species establishment, and butterfly population restoration.

Under the tutelage of instructor Dean Flightner, recent graduate Kaitlyn Studer researched the coloration of plumage on broadbills, trying to equate color with age. Working with a curator at the Toledo Zoo, Studer studied broadbills from the Toledo and Lincoln Park (Chicago) zoos. She used a revolutionary method of assessment, GIS (geographic information system), to map the

birds' wings and then studied pixel count for coloration. As part of the study, the birds were photographed every week for more than a year.

Restoration ecology major Andy Kohls is conducting his senior research project to determine water quality in the Maumee River and its tributaries using its benthic macroinvertebrate community. He is also working to determine if land use in the watersheds surrounding the river has an effect on the benthic macroinvertebrate community.

Mary Ann Studer, assistant professor of physical science, notes that the high level of undergraduate study was one of the factors that drew her to Defiance College. "Every senior has to do a capstone project," she notes. "They have access to all of the equipment that we have. They get one-on-one mentoring from faculty. And they have ownership of the project, which is incredible."

Studer also appreciates those opportunities that allow access to community resources as well as faculty members from other disciplines. "What is unique about Defiance is that undergraduate students have access that other institutions only give to professors and graduate students," she says.

Forensic science major Mike Rosticil researched blood back spatter for his senior capstone, drawing on expertise from the campus and community as he worked with Professor Steve Smith of the college's art department to cast heads and then with deputies of the Defiance County Sheriff's Office to fire bullets into the forms. Rosticil is currently enrolled in graduate school at the University of New Haven, one of the nation's premier graduate programs for forensic science.

International research opportunities through the McMaster School are the result



Top right, Dr. Doug Kane, assistant professor of biology, helps student Dalton Gordon conduct stream quality monitoring studies in the Maumee River for a senior research project. Above, senior Andy Kohls conducts research on water quality in the Maumee. At right, recent graduate Kelsey Huff shares her research on tuberculosis vaccine testing with Cambodian doctors.

of relationships established in Belize and Cambodia over the past several years. Studer notes that many of the McMaster projects are prime examples of community-based research, that is to involve multiple partners working together to identify research objectives with the goal of improving a community.

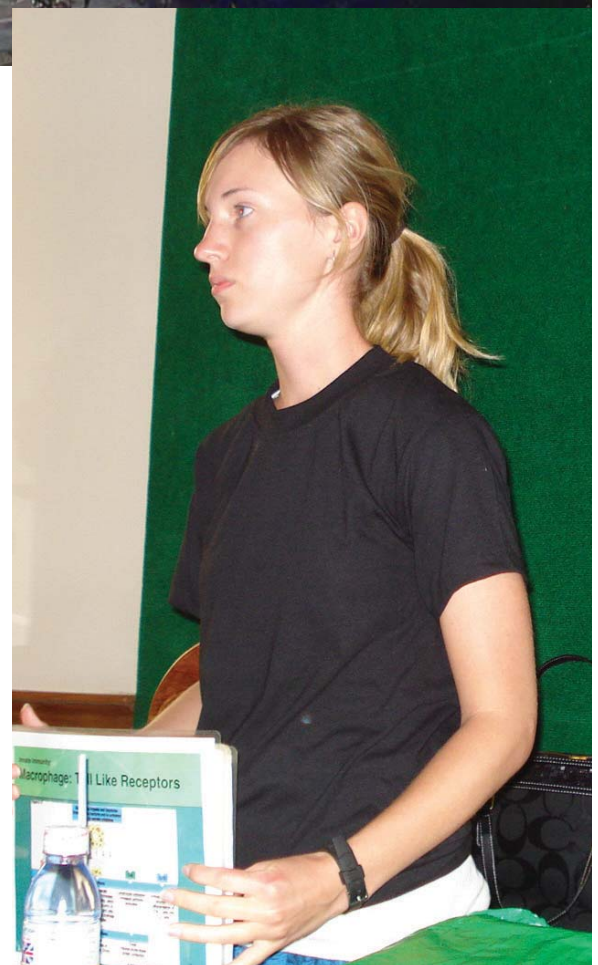
The learning community model used by the McMaster School places students on the same playing field as their faculty mentors.

In Belize, water quality analysis has been ongoing since 2005. Defiance College's McMaster learning community is currently the only entity providing baseline water numbers for the New River Lagoon, the largest freshwater body in the country. "That is the heart of our projects there," says Studer. Water quality analysis has been expanded to community water sources where

they are testing wells and cisterns. There has also been two years of study of intestinal parasites.

Kaitlyn Studer researched biological controls for Belizean farmers, assessing which insects are harming crops and looking for biological methods of control rather than using pesticides. She discovered that pulp from the mammee apple has been used to eliminate crop pests in Florida. Studer, and now current student Greg McNutt, have been able to pass this information along to a Belizean farming cooperative. Biological controls such as this can reduce costs to the farmers and benefit the environment.

Addressing health concerns has been a high priority for work in



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Cambodia, with students identifying ways to address natural birth control, identifying and avoiding sexually transmitted diseases, and researching traditional medicine practices. During the 2008-09 year, students tested levels of arsenic in drinking water, and now senior Rachel Flad will be providing filtration options for clean water based on her research. Projects in Cambodia have also addressed teaching strategies, micro-lending for women and rural families, and strengthening programs for disabled athletes.

In both Belize and Cambodia, students have identified and addressed a need for basic first aid and CPR training which has been met with great interest and cooperation. Communications major Ashton Judis used research in her discipline to be effective in conducting first aid and water safety training in Belize. Social work and psychology major

Amanda Johnson will conduct similar work at the Cambodian Women's Crisis Center later this year.

For recent graduate Kelsey Huff, participation in the Cambodia learning community brought some valuable, potentially lifesaving information to the forefront for doctors in Cambodia. Her research project, which originally intended to address the problem of tuberculosis in Cambodia by collecting new vaccine development and methods of testing, disseminated exciting medical information that had been recorded on T cell energy, a genetic mutation that affects almost 40 percent of the Cambodian population and makes the usual PPD test for tuberculosis ineffective.

Cambodians who get a negative response on this skin test are often sent away without treatment even though they have symptoms of tuberculosis. According to the World Health Organization,

each person that remains untreated will go on to infect 10 to 15 more individuals each year. Huff collected medical journals that explained this phenomenon and created a booklet to give to doctors in Cambodia. She also presented the information to doctors and pulmonary physicians in Phnom Penh and in the rural area of Baah Prey.

New Orleans was added as a McMaster site in 2007, and since then Defiance faculty and students have established ongoing relationships with the Amistad Research Center, local school districts, the Southeastern Louisiana State University Turtle Cove Environmental Research Station, and the University of New Orleans Pontchartrain Institute for Environmental Sciences.

Students are working with faculty members to research and address issues of water quality, literacy, historical archiving, and teaching strategies. ♦

Below, student Ashton Judis shows a young girl in Belize some basic lifesaving measures.

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