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Through a research effort led by C.N. Chinnasamy, of the Center for Microwave Magnetic Materials and Integrated Circuits, Northeastern scientists believe they have discovered a process that could revolutionize the production of jets, hybrid automobiles and other technology that depends on super-strong magnets.

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Blogging brings 'passion' to coursework

While teaching service-learning classes, biology faculty member Gail Begley discovered that blogging engages students in classroom learning, improves the quality of discussions, encourages students to pursue independent research and eases the application of course concepts to real-world experiences.



In the media

• The Center for Research on Globalization quoted Joseph Giglio, senior academic specialist of International Business and Strategy, <u>in an article</u> about alternatives to taxes to improve infrastructure in the United States.

• Lynne Sarikas, director of the Career Center, <u>was featured</u> on National Public Radio's Talk of the Nation about a new interviewing method employers are beginning to use.

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Laura Lewis, professor and chair of chemical engineering; Vince Harris, William Lincoln Smith Chair and director of the Center for Microwave Magnetic Materials and Integrated Circuits; and lead scientist C.N. Chinnasamy, seated, have been involved in research leading to the discovery of a new method for making ultra-strong magnets.

Northeastern University scientists believe they have discovered a process that could revolutionize the production of jets, hybrid automobiles and other technology that depends on super-strong magnets.

Through a research effort led by Dr. C.N. Chinnasamy of Northeastern's Center for Microwave Magnetic Materials and Integrated Circuits, a method to significantly lower the cost of ultra-strong magnet production was discovered recently, and word is spreading among industry leaders and media officials.

"The potential for what was discovered in (lead scientist) Chinnasamy's wet chemistry experiment is enormous," said Vince Harris, William Lincoln Smith chair professor, and director of the Center for Microwave Magnetic Materials and Integrated Circuits.

Harris explains that Chinnasamy discovered a way to produce a rare-earth material (Samarium Cobalt), a key ingredient in expensive, ultra-strong magnets used in a wide array of technologies. With the discovery, researchers predict production costs of strong magnets will drop significantly.

"This holds great promise for the automobile industry where these magnets are commonly found in motors used in hybrid and electric vehicles," Harris said.

"We are very hopeful at this point that we have found the answer that

so many scientists have been looking for," Harris said. "The ability to reduce the cost of rare-earth, high-strength magnets in an environmentally friendly way would have a major impact in many sectors of technology. With so many things, the push is to create lighter, smaller, less expensive components."

The "breakthrough discovery" was announced in an article in Applied Physics Letters on July 28, and news of the research continues to garner attention in major scientific journals and mainstream press, Harris said, noting that his phone has been ringing steadily with inquiries from the media and industry leaders.

At the same time, the process to obtain an international patent has been started by researchers to safeguard the intellectual property.

The research team credited with the discovery includes professor Laura Lewis, professor and chair, chemical engineering, and Carmine Vittoria, distinguished professor of electrical and computer engineering.

Chinnasamy said the results of the chemistry experiment were extremely promising.

Ordinarily, production of the rare-earth element involves a complicated, multi-step process to control the size and shape of the magnetic particles needed for optimal performance. But his experiment, a "one-step" method, automatically produced the desired result.

"Such unusually-shaped particles ... are highly sought in many ... applications," he stated in a press release, adding that the result will lead to the development of lighter, more energy-efficient products in commercial and military applications.

The discovery, said Harris, will open up a "new path" in everything from jet engine development to manufacture of hybrid cars.

— Susan Salk

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Blogging brings 'passion' to coursework



Gail Begley is an associate academic specialist in the biology department.

By Jason Kornwitz

Blogging engages students in classroom learning, improves the quality of discussions, encourages students to pursue independent research and eases the application of course concepts to real-world experiences, said Gail Begley, associate academic specialist in Northeastern University's Biology Department.

Begley and undergraduate student Candice Calhoun made this discovery while teaching service-learning classes, which encourage students to apply concepts they learn in the classroom to situations they experience while serving with community groups.

Begley and Calhoun recently presented their findings at the American Society for Microbiology's 15th Annual Conference for Undergraduate Educators in a workshop titled Bringing the Science Home with Service-Learning: blogging our way to engagement and understanding.

The workshop followed the success of Begley's freshman honors service-learning-based course, Inquiries in Science and Technology: the Microbial World for non-biology majors.

Throughout Begley's course, students learned how infectious diseases spread and discussed the impact of microbes on individual health, the environment and food production. Perhaps more importantly, they served with organizations dealing with these issues.

Many students partnered with the Fenway Community Health Center to help its Virus and Infection Prevention (VIP) crew support HIV/AIDS safer sex outreach. After attending a 12-hour orientation, students spoke with and members of underserved communities (e.g., the lesbian, gay, bisexual and transgender community) in area nightclubs and other gathering places on HIV/AIDS prevention, testing and treatment.

Some students prepared educational and outreach materials and provided support at the health center. Others served with the AIDS Action Committee to supply individual's living with HIV/AIDS and their families with nutritious and safe food.

"Service learning allows students to move outside of the classroom and engage actively in community work that informs their thinking about course concepts," Begley said. "They bring that new understanding, as well as questions that arise from it, back into the classroom. The challenges lie in making the connections clear and in stimulating productive engagement and reflection."

To promote an engaging classroom environment, students were required to write a blog on their service-learning experiences each week and relate it to lectures and discussions, readings or independent research. In addition, each student had to respond to at least one classmates' blog.

"A key component to service-learning," Begley said, "is concurrent reflection," adding that she often led a class discussion on topics raised in the entries.

In previous years, students reflected on their Service-Learning experiences through journal entries that only Begley reviewed and commented upon. The idea for blogs arose out of her desire to encourage a more student-facilitated learning process.

"Students' perceptions of the value of the service-learning component were overwhelmingly positive, which had not been the case in earlier iterations of the course in which student reflection was primarily individual," Begley said, adding that blogging had a major impact on passion for course material, lent a voice to the more quiet students, whom she mentioned often had the most insightful comments and provided an opportunity to learn not only from personal experience, but from other students' experiences as well.

Calhoun, the course's Service-Learning Teaching Assistant (S-L TA), served as a liaison among community organizations, the university Center of Community Service, students and Begley. In the classroom, Calhoun, a senior studying biology and psychology, helped guide the students in areas related to the course as well as their personal lives, lending valuable peer-to-peer advice, allowed Begley to focus more broadly on the connections between learning and service goals while Calhoun paid more attention to the logistics of maintaining partnerships with the Fenway Health Center and the AIDS Action Committee and ensured that students met their service obligations.

Calhoun said her experience as a teaching assistant and working with Begley taught her leadership skills and enabled her to become a more effective speaker in front of large groups.

"I learned to articulate ideas in a way that everyone can understand," she said.

"I've always enjoyed Dr. Begley's classes, which is why I've taken three of them, and enthusiastically volunteered to be her S-L TA," Calhoun

added. "I really enjoyed working closely @i2007photessatethathlvesiblect and being in a position, as a teaching assistant, to enhance a class that so closely relates course content and real-life experiences."

Kristen Simonelli, associate director and service learning coordinator for the Center of Community Service, hired Calhoun to be part of the service learning teaching assistant program. Simonelli said Calhoun and all of the other teaching assistants underwent three days of training before the beginning of the semester and met with her every other week for the entire semester to discuss course progress and the challenges involving students, faculty or community partners. Simonelli trained them on how to manage such relationships and offered advice when teaching assistants brought up problems they were unsure how to handle.

Simonelli said Calhoun connected with her students and offered them encouragement to explore the world around them.

"Calhoun was not traditionally involved in service," Simonelli said. "She brought a great perspective as a biology major and could relate to students entering into service for the first time. She told the students that she regretted not leaving Northeastern's campus much freshman year and how much she ventured around the city and became more comfortable."

On Begley's course, Simonelli said, "By understanding how infectious disease spread in a local community, students were able to understand how it spreads in other communities around the world. It was an eye-opening experience for students to be exposed to and educated on a new population of people they might never have met."

Begley's students agreed with Simonelli's assessment of the course and spoke of the importance of combining classroom learning with field experience.

"Now that I've put my outreach skills to use, I understand how important this is and it puts everything we have learned in class into perspective," said sophomore Margaret Crawford. "I don't think most people understand that simply providing someone with a condom can save someone's life. I know I didn't really think about that before." 716 Columbus Ave., Suite 598, Boston, Massachusetts 02115 • 617.373.7225 • TTY 617.373.3768