Dr. Marilyn Hart, associate professor of biological sciences and chair of the Undergraduate Research Conference steering committee from 2003 to 2006, works with an undergraduate student in her research lab. For the past nine years, the Undergraduate Research Conference at Minnesota State Mankato has instilled confidence, inspired curiosity, awakened passion, and transformed students’ views of themselves and the world.
Dr. Bradley Cook, assistant professor of biological sciences, studies the mechanisms and interactions that allow some exotic plants—such as the narrow-leaf cattail pictured—to become invasive. His research provides insight into how wetland communities are organized and helps managers and conservationists control these invaders.

The mission of FRONTIERS is to celebrate the scholarly and creative accomplishments of Minnesota State Mankato faculty and students and inform the campus community of research-related opportunities. FRONTIERS is published three times per year by the College of Graduate Studies and Research and distributed to Minnesota State Mankato faculty, staff, and graduate students. The College of Graduate Studies and Research welcomes ideas for feature stories and other content consistent with the mission of the newsletter. Please e-mail story ideas to cesr@mnsu.edu.

Got Photos?
Faculty who have high-quality digital photographs of recent research or creative projects are encouraged to submit them to the College of Graduate Studies and Research for inclusion in upcoming issues of FRONTIERS or TOMORROW. Photographs should be at least 200 dpi and should be accompanied by a brief caption describing the project and the photo. E-mail photographs (in jpg or tif format) to anne.blackhurst@mnsu.edu.

NURTURING THE PASSION TO ACHIEVE GREAT THINGS
For the past nine years, the Undergraduate Research Conference has instilled confidence, inspired curiosity, awakened passion, and transformed students’ views of themselves and the world.

CREATING A COMMUNITY OF SCHOLARS
Minnesota State Mankato faculty members talk about their vision for the Undergraduate Research Conference from its inception in 1999 to the present—and beyond.

PURSUING THEIR DREAMS AND DEVELOPING A SIGNATURE STYLE
Three undergraduate students reveal what the Undergraduate Research Conference has meant to them.

SPONSORING EXPERIENTIAL LEARNING
Computer and information sciences faculty member Michael Wells has brought in over a million dollars in corporate contracts that allow students to apply their knowledge in real-world settings.

ASSESSING THE OUTCOMES OF STUDENT ENGAGEMENT
With support from federal grants, Minnesota State Mankato faculty members are changing the way they teach and collecting evidence of the outcomes.
When Meghan Turok enrolled at Minnesota State Mankato, the world of research seemed miles away. “I never thought I would participate in undergraduate research,” Meghan says.

But that changed when Dr. Chris Corley, assistant professor of history, approached Meghan and asked her if she would like to investigate the work experiences of single women in 18th century France and present her findings at the Undergraduate Research Conference (URC). Meghan jumped at the chance and has since been examining and translating 250-year old French census records for the first stage of her research.

For those students who are deciding where their lives will lead, having faculty who actively approach them about undergraduate research can be a life changing experience. They may decide to continue on to graduate school, or they may gain valuable insight about whether their chosen field is right for them.

Dr. Michael Bentley, professor of biological sciences, believes that actively approaching students about research is his professional duty. “It’s part of our department philosophy and work ethic to encourage student research,” Dr. Bentley says. “This was one of the main things that attracted me to Minnesota State Mankato eighteen years ago.”

Dr. Bentley began mentoring undergraduates years before the first URC was held on campus in 1999. “Prior to the URC,” he says, “undergraduate research was often open-ended, with no apparent point of closure.” Without a defined end, first-time researchers could become frustrated and lose interest in the process. Dr. Bentley believes the URC changes the undergraduate research experience and helps prevent students from burning out. “At the end of the project, the students have a commitment to present the results at the URC. This presentation is the most important part, not only because it is a committed goal but also because it represents a point of completion.”

By giving students a compelling reason to invest themselves in their projects, the URC directly affects the way students view themselves and their role in the university. Dr. Gina Wenger, associate professor of art and URC co-chair, says that the students’ self-assurance undergoes a dramatic increase as their research progresses.

Undergraduate students Kristy Felske (left) and Julie Millen discuss their research findings at one of four poster sessions during the 2007 Undergraduate Research Conference. Their project, Adherence of Earthworm Coelomic Cells, was advised by Dr. Dorothy Wrigley, professor of biological sciences.
In 1999, a small group of inquisitive Minnesota State Mankato faculty flew to San Diego to attend an undergraduate research conference. At the time, URCS were not commonly held at public universities, but awareness of them was growing. “We went to San Diego to find out what the URC was all about,” says Dr. Mary Visser, associate professor of human performance.

What the group found in California lit a fire under them. Dr. Tony Filipovitch, then dean of the College of Graduate Studies and Research, remembers seeing a great opportunity. “It made sense to me because what makes us a comprehensive university is that we sit at the intersection of research and teaching. The URC is a way to combine our research mission with our teaching mission.”

The group wasted no time after returning from San Diego—they immediately began organizing a homegrown URC on campus. Dr. Visser recalls the early support they received from the administration. “Wayne Quirk [then director of RASP] was absolutely supportive, as was Karen Boubel, who was vice president of academic affairs at the time. They were able to free up some funds that allowed us to award research scholarships to the students.”

After the success of Minnesota State Mankato’s first conference in 1999, Dr. Visser became chair of the URC. Dr. Visser’s enthusiasm for the conference stems from its hands-on, grassroots nature. “One thing that has made the URC so unique is that it is developed by dedicated faculty who serve as mentors for the students,” she says.

According to Dr. Visser, one of the early goals was to develop workshops and resources for students, faculty, and broader communities regarding our students’ research to the public, it is a recruitment tool for attracting students to public universities, but awareness of them was growing. “We went to San Diego to find out what the URC was all about,” says Dr. Mary Visser, associate professor of human performance. What the group found in California lit a fire under them. Dr. Tony Filipovitch, then dean of the College of Graduate Studies and Research, remembers seeing a great opportunity. “It made sense to me because what makes us a comprehensive university is that we sit at the intersection of research and teaching. The URC is a way to combine our research mission with our teaching mission.”

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to teach them how to conduct and present their research. “Faculty come from diverse backgrounds and areas of expertise, but what we can teach as a group is how to write an abstract and prepare a 10-minute presentation,” Dr. Visser says. “This allowed faculty to become better mentors because they did not have to spend as much time on these issues.”

In 2003, Dr. Visser handed over the chair to Dr. Marilyn Hart, associate professor of biology (pictured on the front cover). Dr. Hart had been a member of the URC steering committee for a year prior to becoming chair, and she stresses the tireless work of the committee members as integral to the URC’s strength. “The leader is nothing without the team,” she says. “The steering committee is amazing.”

Like Dr. Visser, Dr. Hart praises the administration for supporting the URC’s mission. “Dr. Olson [provost and vice president for academic affairs] has been so supportive, as well as the dean of the graduate college, the RASP director, and the president of the university,” Dr. Hart also credits the Minnesota State University, Mankato Foundation for taking proactive steps to lend a hand. She fondly recalls how the Foundation came to her, unsolicited, and asked if they could help with funding. (Read more about the Foundation’s support for the URC below.)

As the second chair of the URC, Dr. Hart focused on increasing the representation of the steering committee. “When I started as chair, not every college was represented, and that was a problem because this is a university-wide celebration of scholarship,” she says. “We got every college involved—that was perhaps my biggest joy.”

In 2006, Dr. Hart passed the baton to two co-chairs: Dr. Gina Wenger, associate professor of art, and Dr. Trent Vorlieck, associate professor of chemistry. “Gina, in particular, was pivotal in getting the art department involved,” recalls Dr. Hart. It was Dr. Wenger and Dr. Vorlieck’s active participation on the steering committee that led Dr. Hart to champion for them to replace her when she stepped down.

Sharing the role of URC chair has been a positive experience for both Dr. Vorlieck and Dr. Wenger. “I feel that I can be completely honest with Trent because he has just as much invested as I do,” says Dr. Wenger. Dr. Vorlieck adds that having one chair from the sciences and the other from the arts is a natural extension of the URC’s ongoing mission to expand student participation throughout the university. So far, the idea seems to be working—2007 was the first year that student creative works were exhibited to the public after the conference itself.

But Drs. Wenger and Vorlieck’s plans for the URC don’t end at the campus borders. “Our number one goal [for future conferences] is to draw people from outside the university,” says Dr. Vorlieck. Both co-chairs believe that bringing in student researchers from other colleges and universities would enhance Minnesota State Mankato’s regional profile in undergraduate research and strengthen the overall quality of the conference.

Dr. Visser recalls that acting as the URC chair was “a lot of work.” But she, like the other chairs, knows that the hard work was worth the reward. “When I look back on my career it’s one of the best things I’ve ever done. Having my name associated with this conference makes me very proud.”

A FOUNDATION OF SUPPORT

In the past two years, the Minnesota State University, Mankato Foundation has generously contributed close to $50,000 in grants for URC participants. The grants have ranged from $1,300 to $2,000 and have been awarded to students who have developed exceptional research proposals. To date, twenty-eight URC participants have received funding from the Foundation.

The Foundation’s URC grant program began in 2005 after its board of directors discussed ways of supporting research at the university. Once the board had settled on the URC, Dr. David Williams, vice president for university advancement, approached the URC chair, Dr. Marilyn Hart, and asked how the Foundation could provide assistance.

Since then, the Foundation’s grant committee has worked with the URC chairs to select award recipients, who have represented a broad cross-section of the university’s academic disciplines. The Foundation’s grants account for more than half of the total financial support awarded to URC participants.

PURSUING THEIR DREAMS—AND DEVELOPING A SIGNATURE STYLE

Students Discuss the Impact of their Research

ELEANOR HARPER
Reflections on Campus: Caravaggio and the Development of Optical Style
Curt Germundson, Faculty Mentor
Eleanor Harper researched the use of optical devices by Baroque artist Caravaggio (1571–1610) and his followers in the production of their paintings. A URC grant enabled Eleanor to finance a trip to New York City’s Metropolitan Museum of Art to view several paintings up close. Ultimately, Eleanor’s research led her to uncover connections between the optical distortions introduced into Caravaggio’s paintings through his use of optical aids and similar, intentional distortions in his follower’s paintings.

“Throughout my URC experience I have been overwhelmed by the show of support to undergraduate students. I hope that the URC continues to grow and offer such wonderful opportunities.”

CASEY HOCHHALTER
Merging Glass with Ceramics
Les Laidlaw, Faculty Mentor
Casey Hochhalter’s research explored the relationship between glass and ceramic to create dynamic sculptures that combine both materials. Similarities in the two materials’ chemical structures and reactions to high temperatures prompted Casey to study how glass and ceramic could interact without the use of adhesives. “The experience has already aided in the advancement of my education and in creating a signature style of art making. This in return has opened doors for furthering my education in an MFA program, which will aid in the accomplishment of becoming a professional artist.”

AARON DANBERRY
Fluoroquinolone Antibiotics and Cadmium Mobilities in Soil Environments
Trent Vorlieck, Faculty Mentor
Aaron Danberry studied the fate and transport of livestock antibiotics and potentially toxic metals in soil systems. Building off of previous work showing that several common antibiotics form complexes with metals and that both are commonly leached from animal waste, Aaron’s work explores how these complexes affect the mobility of the metals in the soil.

“I strongly recommend the URC to anyone who is thinking about going on to graduate school. It is great not only for getting experience but also for helping to decide if graduate school and research are right for you.”
The first partnership began in January 2006 with Maverick Software Consulting to be their exclusive intermediary between Thomson West and the university’s information systems students. "The quality of the student interns has been very high, " says Chad Vidden, a BTCC intern and information systems intern who submitted it to Thomson West. "They are eager to get into a real world work environment where they can roll up their sleeves and get the job done."

The high quality of the university’s students not withstanding, neither program would exist if not for the vision of Dr. Wells. "He has been very committed to this project and to providing unique opportunities to students in the computer and information science department to gain valuable skills and experience beyond traditional classroom training, " says Anna Grecco, senior director of technology at Thomson West. "Dr. Wells is an advocate and a champion for experiential learning."

Chad Vidden agrees with Ms. Grecco. "I have worked with Dr. Wells both in the classroom and with the BTCC. In both cases he has been very motivated, helpful, and encouraging."

In addition to providing students with valuable work experience, Dr. Wells is also using the programs to conduct research on university-industry partnerships. In one recent publication, Dr. Wells examined industry preferences for management information systems curricula, and he is using the findings to help develop the curriculum standards of the information systems major in the newly formed Department of Information Systems & Technology.

The two programs and Dr. Wells’s personal research all lead toward providing unique opportunities for faculty research and provide access to data that will support proposals for external funding.

RASP ANNOUNCES A NEW PROPOSAL DEVELOPMENT FUND

Beginning in fall 2007, RASP will establish a proposal development fund to support scholars in their research efforts. Project directors, departments, college deans, and divisional leaders will be able to request funds to support their proposal development activities.

Proposal development funds can be used to cover the costs associated with the following:

- training for novice or first-time grant writers,
- student assistance during proposal development,
- support for preliminary data collection,
- support for peer review and research mentoring initiatives,
- travel to meet with collaborators or CA-PIs,
- travel to meet with program officers, and
- travel to meet with institutions/organizations with which the PI must subcontract.

To apply for proposal development funds, or to obtain more information, please contact RASP Interim Director Michelle Carter.
Funding is currently not available for:

- travel expenses related to thesis research
- computer hardware, computer software, and books that graduate students in specific disciplines are expected to have already obtained
- cameras
- financial compensation for the researcher or for others
- expenses associated with printing and photocopying

Other considerations:

- The student’s advisor must certify that the funding requested is necessary for the thesis research.
- Students must apply during semesters in which they are registered.
- Students must register for thesis credits prior to submitting a funding request.
- Students may not apply for funding during the semester they expect to graduate.
- Receipts will be required before the funding is released.
- An approved thesis proposal must accompany the funding request.

Deadlines to request funding are October 1 and February 1.

• An approved thesis proposal must accompany the funding request.

• Receipts will be required before the funding is released.

• Students may not apply for funding during the semester they register for thesis research.

• Students must apply during semesters in which they are registered.

• Students must register for thesis credits prior to submitting a funding request.

• Students may not apply for funding during the semester they expect to graduate.

• Receipts will be required before the funding is released.

• An approved thesis proposal must accompany the funding request.

Starting this year, the College of Graduate Studies and Research will provide financial assistance to partially reimburse students for expenses related to completing a thesis. Stipends up to $250 will support research related expenses are available each semester; however, funding is available on a limited basis. This financial support is currently available only to students completing a thesis as the program capstone project.

Colleges and the Center for Excellence in Teaching and Learning (CETL) will co-sponsor a community of practice focused on the scholarship of teaching and learning (SoTL) during the 2007–2008 academic year. Co-facilitated by Dr. Jeffrey Pribyl and Dr. Patrick Tebbe, the SoTL community of practice will include a total of fourteen faculty members representing all six colleges (see participant list below).

The primary aim of the SoTL community of practice is to bring together faculty from a range of disciplines to share knowledge about conducting research on teaching and learning. Dr. Stewart Ross, director of CETL, stresses the importance of providing an opportunity for researchers to exchange ideas. “Faculty tend to get isolated, and they have trouble meeting people outside their own departments,” says Dr. Ross. “A lot of powerful things happen when you get people together from different disciplines.”

Dr. Ross believes that SoTL has had a difficult time gaining credibility because much of the research in the field has been anecdotal. The SoTL community of practice will and Minnesota State Mankato faculty in exploring ways to conduct scientifically rigorous research that will add to the field’s body of knowledge and significantly benefit students in their learning experiences.

As added incentives, community of practice members will receive funds to attend these teaching and learning conferences during the academic year, and participants will also receive a $1,000 stipend if they complete their research and submit it to a refereed journal or conference proceedings by June 1, 2008. – See related story on page 13

2007–2008 SoTL Community of Practice Participants:

William Brennan, Economics
James Burnett, Sociology and Corrections
Kristen Cancrana, Speech Communication
Anne Dahlman, Educational Studies
Christopher Danielson, Mathematics and Statistics
Julie Kerr-Berry, Theatre and Dance
Norma Krumwiede, Nursing
Vicki Lustena, Accounting
Angela Monson, Dental Hygiene
Jeffrey Pribyl, Chemistry
Susan Schalge, Anthropology
Marlene Tapp, Health Science
Patrick Tebbe, Mechanical and Civil Engineering
William Wagner, Sociology and Corrections

Dr. Jeffrey Pribyl (center) is one of three faculty members who received an NSF grant to study the use of guided inquiry in the chemistry classroom. The grant focuses on the use of tablet PCs as a medium through which information can be shared between student groups and professors.

Dr. Jeffrey Pribyl and Dr. Mary Hadley’s introductory chemistry classes are noisy, but the two professors don’t try to compete with the commotion. Instead, they stroll around their rooms and let their students talk amongst themselves. “I used to have a bimodal distribution in the grades,” says Dr. Hadley. “Now I have a higher percentage of people getting As and a lower percentage getting Fs.”

So, how does letting their students talk lead to better grades? A close listen in their classes reveals that their students aren’t gossiping or planning parties—they’re developing learning strategies and devising solutions to open-ended problems. These students are active participants in their education, and active participation, though loud, yields results.

“Most people figure that if you don’t tell a student, then the student won’t learn,” says Dr. Hadley. “I am constantly surprised and pleased that the students learn without me telling them what to learn.”

Drs. Hadley and Pribyl have been using team-based and guided inquiry approaches in their classes for the past two years. And while wandering the room while your students talk seems like an easy gig, the opposite is true. “It’s a lot of hard work for faculty members using these methods,” says Dr. Pribyl. “You have to interact much more with the students in each class period.” The two professors constantly monitor their student groups and help guide them when they get stuck or are heading down blind alleys.

Their primary goal is to facilitate students in constructing their own knowledge, which not only helps them learn the subject matter but also helps them learn how to learn. But these professors also have another goal—to conduct scientific research on the efficacy of the teaching methods.

Recently, Drs. Pribyl and Hadley, along with Dr. John Kaliski, assistant professor of management, have been awarded an NSF grant to study the use of guided inquiry in the chemistry classroom. The grant also focuses on the use of tablet PCs as a medium through which information can be shared between the student groups and the professors. Although Drs. Hadley and Pribyl have observed their students’ performance under guided inquiry, the intention of the grant is to go beyond generalities. “Part of what the NSF grant will allow us to do is to quantify some of these anecdotal statements,” says Dr. Pribyl.

Nearby, in the Department of Mechanical and Civil Engineering, Dr. Patrick Tebbe is also using alternative teaching strategies in his classroom. Dr. Tebbe and Dr. Stewart Ross, Director of the Center for Excellence in Teaching and Learning, have been awarded an NSF grant to study ways of increasing student engagement in thermodynamics courses. Like their chemistry counterparts, Drs. Tebbe and Ross aim to advance the field of teaching and learning research through concrete analysis. Dr. Tebbe has introduced real-world problems into his course, and Dr. Ross has developed assessment protocols that track the levels of student engagement as the semester proceeds. They have already produced papers describing their preliminary results, and they recently presented these findings at the American Society for Engineering Education Annual Conference in June.

Dr. Ross says that actively engaging students in class is a difficult challenge that goes beyond being quick on one’s feet. “It’s really hard to find good problems that are going to drive these student groups,” says Dr. Ross. “Coming up with these problems is the challenge.”

And while students are the beneficiaries of these techniques, Dr. Pribyl says it usually takes a little time for them to warm up. “It is very frustrating for the students at first because they often just want the answer,” he says. “But, as the semester progresses, they feel like they learned to think about information rather than just memorizing it.”
In recognition of its expanding workload and in anticipation of the research activity that will accompany the advent of doctoral programs, the IRB has added three additional faculty members: Dr. Rick Auger, Dr. Julie Carlson, and Dr. Kristen Cwicencza. In addition, given increasing concerns about the privacy of electronic data, Kevin Thompson, Information Security Manager at Minnesota State Mankato, was recently invited to join the board. The 2007-2008 IRB membership roster includes the following faculty, staff, and community members:

Dr. Rick Auger  
Department of Counseling and Student Personnel  
Dr. Julie Carlson  
Department of Educational Leadership  
Rachel Collins  
Graduate Student Representative  
Dr. Diane Coursoul  
Department of Counseling and Student Personnel  
Dr. Kristen Cwicencza  
Department of Speech Communication  
Dr. Thomas Drake  
Community Member  
Dr. Mary Hadley, Co-Chair  
Department of Chemistry and Geology  
Dr. Annelies Hagemeister, Co-Chair  
Department of Social Work  
Dr. Patricia Hargrove, IRB Coordinator  
Department of Speech, Hearing, and Rehabilitation Services  
Dr. Randall Hurd  
University Health Services  
Dr. Barry Ries  
Department of Psychology  
Kevin Thompson  
Information and Technology Services  
Dr. Mary Viscar  
Department of Human Performance  
Dr. Stephen Wechale  
Department of Accounting and Business Law  
Dr. Anne Blackhurst  
Interim Dean and IRB Administrator  
College of Graduate Studies and Research

IRB ADDS FOUR NEW MEMBERS

Beginning in fall 2007, Dr. Patricia Hargrove, professor of communication disorders, will assume a new role with the Institutional Review Board (IRB). As IRB Coordinator—a newly created position funded by the College of Graduate Studies and Research—Dr. Hargrove will assume day-to-day responsibility for IRB oversight, including review and approval of Level 1 proposals, coordination of Level 2 reviews, IRB correspondence, and outreach to the university community.


As a member of the Minnesota State Mankato Institutional Review Board since its inception, Dr. Hargrove has witnessed many changes in the form and function of the IRB. She has enjoyed her work with the IRB and has been impressed by the constipation and the concern of its members for the safety of subjects participating in research undertaken at Minnesota State Mankato.

Dr. Hargrove notes that this is an exciting time for the IRB. With the planned conversion to an online submission process in fall 2007, it should be easier for investigators to submit and to revise proposals. “The more accessible we can make the IRB to the campus community, the more likely we are to have good compliance and involvement in the process,” says Dr. Hargrove.

In addition, she plans to assist the IRB in undertaking an educational program describing the IRB to the Minnesota State Mankato community. Dr. Hargrove hopes that eventually all members of the campus community will have a clear understanding of the mission and procedures of the IRB.
When Phase 1 of the Trafton Science Center construction is completed in summer 2008, the University’s largest classroom building will include 70,000 additional square feet. The renovation will also refurbish the building’s infrastructure and bring outdated classrooms and laboratories into ADA and environmental compliance.