



Riordan To Visit Cain Project in Spring



Dr. Dan Riordan

Dan Riordan, Professor of Technical Communication and Director of the University of Wisconsin-Stout teaching and learning center, will be

a visiting professor with the Cain Project this spring. During the final three semesters of its life, the Project will focus on materials development and preparing faculty to take over communication instruction in their own courses. Dr. Riordan will be an enormous help to science and engineering faculty who want to examine their teaching, integrate communication instruction into their courses, and imagine how course outcomes can be captured and assessed in students' written work and oral presentations.

Dr. Riordan's philosophy emphasizes student engagement and independent problem solving. He argues that with many topics, student action produces more permanent understanding than faculty lecturing. Naturally, team problem solving ranks high in both industry and academia. As a result, collaborative writing and presenting also help science and engineering students prepare for the transition to professional careers or graduate school.

Dr. Riordan is the author of a well-established technical communication textbook, *Technical Report Writing*

Today, now in its 8th edition. He has won awards from the Council for Programs in Technical and Scientific Communication and the Association of Teachers of Technical Writing.

During the semester Dr. Riordan is expected to offer several workshops for faculty and for graduate students and post-docs. Be on the lookout for a topic that could enrich your teaching and your students' learning.

Cain Project Welcomes Dr. Eich



Dr. Elizabeth Eich

Dr. Elizabeth Eich (formerly McCormack), joined the Cain Project as a communication coach this fall. She provides communication support for the BIOS courses. She also has an appointment as an Assistant Lab Coordinator for Biochemistry and Cell Biology.

Dr. Eich received her Ph.D. in Biochemistry and Cell Biology from Rice in 2005. During her graduate studies, she voluntarily mentored students in both the practice of laboratory techniques and communication of scientific

results. She was honored by the department in 2004 for her teaching contribution.

She enters the Cain Project with a full appreciation of the value of the support provided by her new peers. As a graduate student at Rice, she attended Cain Project workshops, met with presentation mentors, and participated in a thesis writing group. This gives her a unique double-sided perspective when working with students.

After meeting with Dr. Eich, Rice University's first iGEM (international Genetically Engineered Machines) team traveled to MIT for oral and poster presentations. "I saw the team make huge improvements in their presentation visuals that led to confidence in their delivery. I am very proud of their accomplishments," Dr. Eich commented as the team prepared for the trip to MIT. Despite being a new team with only a few months to design and complete their research project, the professionalism the Rice iGEM team displayed during their presentation was commented on by respected professionals at the conference.

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Preparing Bioscience Undergraduates to Write and Speak Biology

Bioscience graduates at Rice may pursue careers in medicine, patent law, or biological research. They may become product managers, environmental consultants, pharmaceutical representatives, technical writers, or biotech entrepreneurs. Their education in finding and evaluating sources, critical thinking and analysis, and designing and executing experimental protocols prepares them for a multitude of careers.

Integrating Communication in BIOS 202: 1999–2001

In 1999, faculty in Biochemistry & Cell Biology and Ecology & Evolutionary Biology considered graduates' needs. Although the curriculum strongly emphasized mastery of scientific concepts and technical proficiency, the students had only a handful of opportunities for scientific writing, most of them occurring in sophomore- through senior-level labs. The departments collaborated with the Cain Project to introduce writing into the beginning of most bioscience majors' Rice experience: the yearlong course BIOS 201/202: Introductory Biology.

In Introductory Biology, which enrolls approximately 150 per semester, students read about related research and summarize the research in short reports. To manage the large number of writers and papers involved, the Cain Project trains and supervises a team of talented upper-class BIOS Writing Mentors. Writing Mentors participate in eight hours of rigorous training that helps them prepare for mentoring students and assessing papers. The mentors meet one-on-one with students to help them locate sources, identify articles' main points, structure arguments, improve style, and meet the needs of specific audiences.

When the extra-credit writing assignments were first introduced to BIOS 202 in 1999, newspapers could be used as sources. As students demonstrated their depth of learning about cutting-edge research, faculty began to realize the value of the exercise. The extra-credit papers became required and newspapers could no longer be used as sources—students were expected to find and read primary journal articles. With the help of BIOS Writing Mentors, students began to read, understand, and communicate the scientific literature. It was only a matter of time before writing would make its way into the fall semester of Introductory Biology, BIOS 201.

Writing to Learn in BIOS 201: 2002–2004

In 2002, Dr. Mike Gustin introduced two writing assignments into his fall course. Students read articles on a molecular aspect of a human disease and wrote summaries to two carefully defined audiences—first physicians treating patients with the disease, then grandparents with no background in biology. The assignments were valuable experiences for

“In our small group, we aren't afraid to share our ideas or questions. This allows for more free thought and open discussion, which is always more engaging and exciting.”

-Halle Rasmussen, a member of the BIOS 201 discussion group, the cDNA Librarians.

The student-led BIOS 201 discussion groups in action during the Fall 2006 semester.



students, as reflected by this student comment on an evaluation of the writing assignments: “My thoughts have become more organized, which is extremely important in scientific writing. Also, the assignment to explain the article to a layperson prepares pre-med students for the work they will do with patients.”

Doing It All - Writing, Presenting, and Discussing in 201: 2005–2007

Recently, Dr. Gustin and Dr. Dan Wagner, the new co-instructor for the course, have shaken up the course again—this time with an innovative technique that is rarely used in large lecture science classes. They replaced eight of the regular class meetings with small-group discussion meetings. The class is divided into 16 groups of about a dozen students each; each group selects its own name and meets in a small conference room or lab space. The groups discuss a pre-assigned

topic covered only superficially in lecture. Group members prepare for discussion by referring to lecture notes, reading the textbook, web articles, or other sources, and relating the discussion topics to other courses, personal experiences, or potential research applications.

The groups are student-led, with one student responsible for presenting a short explanation of the topic, while another mediates the discussion as a discussion leader. A trained group leader (who has taken BIOS 201 in the past) observes the process, keeps each group on track by correcting any inaccuracies, and assesses individual participation and group performance. The group leaders are not mini-instructors, however—they let each group work through its own process.

Most students seem to enjoy the discussion process and have reported that it helps them keep up with the material, understand concepts more deeply, and raise interesting questions. The process could become a model for teaching biology elsewhere. As one student wrote on an end-of-semester evaluation, “It was an active form of learning that sets a good example for other courses at Rice as well as other universities around the country.”

Today BIOS 201 discussion groups learn how to research a topic, present information to teammates, and work through problems in a collaborative environment.

BIOS 202 students continue to delve into the scientific literature, reading and summarizing original research. Their experiences in the 201 discussion groups prepare them for independent response to articles. As a result of this year-long communication-intensive course, bioscience majors will be better prepared to solve research problems, work as part of a laboratory team, and contribute to publications and presentations. Introductory Biology is preparing Rice bioscience majors for their bioscience careers at Rice and beyond.

“Traditionally, students of biology memorize what they’re told and answer test questions. A BIOS discussion group allows a student to take Biology to another level. Within a close setting and surrounded by peers, students can look at Biology critically. They can take what facts they know and attempt to explain new processes that they were never lectured on.”

-Steve Xu, group leader of the BIOS 201 discussion group, the Mighty Chondrias.

“Most students seem to enjoy the discussion process and have reported that it helps them keep up with the material...”



Hewitt Letter Addresses Plagiarism Challenge

On August 11 the *Chronicle of Higher Education*'s front page featured a plagiarism scandal at Ohio University at Athens. Dozens of master's theses and dissertations from its Department of Mechanical Engineering were recalled for plagiarism. The article blamed students and faculty for not avoiding plagiarism. Cain Project faculty member Jan Hewitt, responded with a letter calling attention to universities' obligation to help graduate students avoid plagiarism and learn to write for publication and dissertation committees. The letter was selected for the September 22nd issue of the *Chronicle*.

Excerpt From Hewitt's Letter to the *Chronicle of Higher Education*

My work with graduate students in thesis-writing classes and in workshops has convinced me that they are desperate to learn how to avoid plagiarism and its consequences. They need models that show what is or what is not plagiarism; they need practice in paraphrasing and citation.

Even conscientious advisers often underestimate the difficulties of writing a literature review, with its demands for precise delineation, comparison, and attribution. Special problems arise when a student must incorporate a coauthored published paper into a thesis.

To meet those challenges, we must give graduate students opportunities to learn by doing.

CPTSC Posters Shine

The Council for Programs in Technical and Scientific Communication met in San Francisco in October. Linda Driskill, who is a member of the CPTSC Executive Committee, planned the poster portion of the conference program. The organization has been formulating new standards for posters about communication issues. The pattern of organization used in scientific posters often is not relevant for displaying complex connections between curriculum issues or showing evidence/data that is primarily visual in nature, such as diagrams, photos, or examples to generate discussion. Last year's conference participants spent one session working to define the features of this genre, and this year's session proudly displayed excellent examples. Linda Driskill and Rebecca Burnett (Iowa State) presented a poster that demonstrated the new guidelines and featured a sample design. The Cain team provided advice on addressing this complex "poster within a poster" design problem.

Odell Visits from Rensselaer Polytechnic

Professor Lee Odell of RPI spent October 8th with Cain faculty and Rice administrators discussing assessment and research in writing across the curriculum. As a national leader in communication assessment, Odell emphasizes the importance of using assessment methods that provide guidance for both students and faculty. His years of leadership in communication research also make him a valuable resource for Cain Project faculty who are planning a coordinated set of projects during the Project's last two years. To facilitate the program's development Odell has visited the Project periodically since the grant began. His first workshop for graduate students in 1998 filled Physics 212—there was not a single empty seat.

Personal Statement Tips:

- When writing your personal statement, begin with who you are now, not your childhood self. Awards aren't given because a candidate dreamed of being an astronaut.
- Avoid laundry lists of your qualities. Naming a few key qualities and backing them with examples will persuade readers.



The Cain Project in Engineering and Professional Communication helps Rice students become expert speakers and writers. Because of the Gordon and Mary Cain Foundation's generous gift, undergraduate and graduate students in science and engineering are developing the communication skills necessary for successful professional leadership.

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