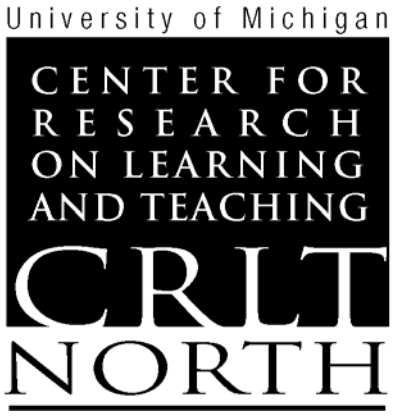

CRLT NORTH

Report for College of Engineering 2005-2006

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CRLT North
Report for College of Engineering
July 1, 2005 – June 30, 2006

During the 2005-2006 academic year, CRLT North (in conjunction with the central CRLT office) provided a number of services for the College of Engineering (CoE). This report provides a summary of those services.

Report Overview

The Center for Research on Learning and Teaching (CRLT) has a more than 40-year history of partnering with faculty and graduate student instructors (GSIs) at U-M to enhance student learning across campus. In January 2004, in partnership with the College of Engineering (CoE), CRLT established CRLT North to better serve the engineering community. The office is located on North Campus, and it is coordinated by an experienced engineering educator in close collaboration with CoE faculty and administrators. Engineering services provided by CRLT North and the central CRLT office include

- College-wide programs to promote a culture of teaching and learning in engineering;
- A comprehensive range of services (including orientation programs, classroom interventions, and consultations) for engineering faculty and GSIs at all levels of their career;
- National leadership to enhance the visibility of U-M in engineering education; and
- Research in engineering education to explore issues related to teaching and learning in engineering.

During 2005-2006, Cynthia Finelli and Tershia Pinder served as primary professional staff of CRLT North. Additional programming and consultations were provided by staff from the central CRLT office including Chad Hershock, Matthew Kaplan, Christopher O'Neal, Mary Piontek, and Erping Zhu. Program support was provided by Natalie Taliaferro. Staff biographies are included at the end of this report.

Advisory Group for CRLT North

The Engineering Teaching Academy (ETA) is a select group of engineering faculty who have been recognized for outstanding teaching accomplishments and whose mission is to foster the achievement of excellence in teaching and learning in CoE. A subgroup of the ETA provides guidance and advice in planning activities for CRLT North. Members of the ETA/CRLT North subgroup include

- Scott Fogler, *Professor of Chemical Engineering*;
- James Holloway, *Professor of Nuclear Engineering and Radiological Sciences*;
- J. Wayne Jones, *Professor of Materials Science and Engineering*;
- Tresa Pollock, *Professor of Materials Science and Engineering*;
- Kenneth Powell, *Professor of Aerospace Engineering*; and
- Alan Wineman, *Professor of Mechanical Engineering*.

Statistical Summary of CRLT North Services

Staff at CRLT North and the central CRLT office has had more than 2,000 CoE client contacts:

- Approximately 1,132 CoE participants[*] in attendance at programs
  - 325 at orientation sessions for faculty or GSIs
  - 440 at seminars or workshops about teaching and learning
  - 314 at engineering performances by the CRLT Players Theatre Troupe
  - 53 at Preparing Future Faculty events
- Approximately 874 CoE client services via individual consultations[*]
  - 45 midterm student feedback sessions (MSFs) or other classroom interventions for faculty
  - 57 MSFs or other classroom interventions for GSIs
  - 772 other consultations or services (some brief, some intensive) for faculty, GSIs, staff, and administrators

Other statistics about engineering services provided by CRLT North and the central CRLT office include

- 28,658 page views at the CRLT North Web site and more than 1,300 distributed copies of the CRLT North Newsletter;
- More than 2,500 total U-M students served by MSFs or other classroom interventions; and
- $23,930 in grants administered by CRLT.

[*] Note that these are not unique individuals since some persons may have had more than one consultation.

College-Wide Programs

Both CRLT North and the central CRLT office provide several college-wide programs to promote a culture of teaching and learning in engineering. During 2005–2006, these programs included a seminar series for engineering faculty, GSIs, administrators, and staff; performances by the CRLT Players Theatre Troupe; assistance with a new online midterm student ratings project; service on CoE Committees; and publicity for teaching and learning initiatives.

Workshops and Seminars

During fall 2005 and winter 2006, CRLT North offered 15 engineering-focused seminars and programs for faculty and GSIs. These programs brought instructors together to share ideas across disciplines, develop and improve their teaching skills, expand their repertoire of teaching methods, and gain new perspectives on teaching in CoE. There were 256 participants at the sessions (95 distinct faculty and 95 distinct GSIs attended), and the average overall rating of satisfaction with the quality of the workshops/seminars was 4.2/5.0. The following sessions were offered on north campus:

- For faculty
  - *Supporting Undergraduates in Learning: Theory and Tips*. Elliot Soloway, Electrical Engineering and Computer Science Department.
  - *First Year Math Courses for Engineering Students.* Robert Krasny and Karen Rhea, Math Department.
  - *Enhancing Engineering Classes with Active and Cooperative Learning.* Karl Smith, University of Minnesota.
  - *Mentoring Graduate Students*. CRLT Players Theatre Troupe.
  - *Faculty Research on Retention.* James Holloway, Nuclear Engineering and Radiological Sciences Department, and Lorelle Meadows, Naval Architecture and Marine Engineering Department.
  - *The Teaching Portfolio.* Cynthia Finelli, CRLT North, and Matthew Kaplan, CRLT.
- For faculty and GSIs
  - *Applying the Science of Learning to Engineering*. Milt Hakel, Bowling Green State University.
- For GSIs
  - *Managing Student Teams*. Sarah Root and Warren Sutton, Engineering GSI Mentors.
  - *Conversations about Teaching. Session 1: One-on-One Teaching*. Peter Hamlington, Sean Holleran, and Damon Williams, Engineering GSI Mentors.
  - *Conversations about Teaching. Session 2: Academic Integrity*. David Lorch, Sarah Root, and Warren Sutton, Engineering GSI Mentors.
  - *Conversations about Teaching. Session 3: Classroom Incivility*. Shankara Kuppa and Mike Geiger, Engineering GSI Mentors.
  - *Conducting an Effective Class Session.* Emine Cagine, Jessica Frazier, and David Lorch, Engineering GSI Mentors.
  - *Developing a Productive Faculty Relationship.* Michael Moffitt, Warren Sutton, and Damon Williams, Engineering GSI Mentors.
  - *Writing a Teaching Philosophy Statement for Engineering.* Nicole Gardner Neblett, Postdoctoral Fellow, and Sarah Root, Engineering GSI Mentor.
  - *Teaching Problem-Solving Skills.* Shankara Kuppa, Daniel Georgiev, and Alireza Tabatabajaneed, Engineering GSI Mentors.

In addition, 31 faculty and 63 GSIs from CoE participated in activities sponsored by CRLT Central Campus: 14 CoE faculty and 63 CoE GSIs participated in CRLT seminars; 11 engineering faculty (out of

130) participated in the winter 2006 Provost's Seminar on Teaching titled "How Do Research and Creative Work Converge with Teaching?"; one engineering faculty participated (out of ten) in the Teaching with Technology Institute during May 2006; and five engineering faculty (out of 135) participated in the Enriching Scholarship program during spring 2006.

CRLT Players Theatre Troupe

The CRLT Players Theatre Troupe is comprised of local professionals and student actors who enact performances to explore pedagogical practices, enhance teaching and learning, and support diversity at the U-M. The program is primarily funded by the Office of the Provost; CoE; the College of Literature, Science, and the Arts; and the NSF ADVANCE program at U-M. The CRLT Players perform stimulating, interactive sketches based on scripts that reflect research on: (1) the experiences of students in the classroom, especially students of color and women in the sciences and engineering, and (2) ways gender affects the hiring and retention of women faculty in the sciences and engineering. Following the presentation of a scenario, the audience members dialogue with the characters about the issues raised. A trained facilitator guides the discussion and provides research-based information relevant to the particular performance. The CRLT Players often perform a revised scenario incorporating audience suggestions for improvement. This use of theatre has a powerful impact on instructors, helping them to gain insights and ideas for improving classroom practices or institutional climate.

For CoE in 2005-2006, the CRLT Players performed the *Gender in the Classroom* sketch (exemplifying the "chilly" climate that women students may encounter in science and engineering classrooms), the *Graduate Student Mentoring* sketch (exploring common dynamics and possible dilemmas in the faculty-graduate student mentoring relationship), and the ADVANCE sketch titled *Tenure: The Fence* (presenting fairness issues and dynamics in tenure discussions and portraying the subtle ways that gender can affect a committee's interpretation of the candidate's scholarship and productivity). Audiences for the performance included engineering faculty, department chairs, GSIs, graduate students in the course ENG 580: Teaching Engineering, and members of the Engineering Teaching Academy. The performances included:

- *Gender in the Classroom*. Three performances with a total audience of 259 GSIs;
- *Tenure: The Fence*. One performance with an audience of 32 department chairs;
- *Graduate Student Mentoring*. One performance with an audience of 18 faculty members; and
- *Groups*. One performance for sketch development with an audience of five individuals.

Online Midterm Student Ratings

Staff at CRLT North collaborated with the Engineering Teaching Academy, the Undergraduate Student Advisory Board, and the CoE Web master to develop the online midterm student ratings project. In the first offering of the project (fall 2005), 2,554 evaluations were submitted, 1,083 students participated, and 438 distinct instructors were evaluated. In winter 2006, 3,999 evaluations were submitted, 1,593 students participated, and 497 distinct instructors were evaluated in 653 distinct class sections. The online student feedback will continue to be routinely offered in all engineering courses.

CoE Committee Service

During the 2005-2006 academic year, the Managing Director of CRLT North served on the following CoE committees:

- Engineering Teaching Academy—including the full academy, a subgroup of the academy that developed the college-wide online midterm student ratings project, and the subgroup that serves as an advisory group for CRLT North; and
- Diversity and Outreach Council—including the executive committee, the full council, the subgroup that is planning a K12 partnership, and the subgroup that is exploring climate issues in engineering.

Publicity for Teaching and Learning Initiatives

Staff has publicized CRLT North and described the office's activities in several ways. The fall 2005 issue of CRLT North Newsletter was distributed to 676 individuals through campus mail in November. The issue featured a summary of an article about enhancing student learning and an overview of a CoE research project in Engineering 101. The winter 2006 newsletter was electronically distributed to 624 individuals in February. The issue featured information about the Engineering Teaching Academy/Undergraduate Student Advisory Board online midterm student ratings Web site, an overview of cooperative learning, an article about service-learning curriculum introduced into ENG 100, and a calendar of events.

In addition, the Web site for CRLT North, www.engin.umich.edu/teaching/crltnorth, includes an up-to-date list of the CRLT workshops and a link to register for them, information about Engineering GSI Mentors and Engineering GSI Teacher Training, and several links to pages at the CRLT Web site. According to CoE Web site statistics, there were 28,658 page views at the CRLT North Web site during the 2005-2006 academic year. These hits included access to the workshop registration page, links to the CRLT North survey site, and other visits.

Services for CoE Faculty

CRLT North provides a comprehensive range of services for CoE faculty at all levels of their career. During 2005–2006, these included programming provided at CoE new faculty orientation, classroom interventions, and consultations on proposal preparation and other issues related to teaching and learning. The central CRLT office also provided engineering services such as the university-wide faculty orientation and grants programs.

Orientation Programs

- Keys to the College Program. The Managing Director of CRLT North participated in the *Keys to the College* (orientation for new faculty in CoE) where she discussed services available through CRLT North and presented faculty feedback on those services. Eleven new faculty participated in the program, and during the academic year, five of them sought consultations through CRLT North.
- New Faculty Orientation. In conjunction with the Provost and Executive Vice President for Academic Affairs, the central CRLT office organized and facilitated the campus-wide New Faculty Orientation in fall to introduce new faculty to the university. The program included interactive sessions where faculty shared experiences and strategies about good teaching principles and techniques. Nine engineering faculty (out of 130) participated in the program.

Classroom Interventions

- Midterm Student Feedback Sessions. CRLT North collects student feedback for individuals who wish to assess and improve their teaching during the term. A CRLT North consultant observes the class and then confers with the students about what is going well and what changes would improve their learning. The consultant later meets with the instructor to report findings and discuss strategies for change. During 2005–2006, CRLT North staff conducted
  - Twenty-four midterm student feedback sessions for 22 distinct faculty. 815 undergraduate and graduate students were served by these sessions; and
  - One unique midterm student feedback session for a research-lab. Twelve graduate students were served by this session.
- Other Classroom Interventions. As an alternative to a formal midterm student feedback session, CRLT North also offers to consult with faculty based on quantitative student feedback collected at midterm or based on a videotaped class session. During 2005–2006, CRLT North staff conducted
  - Eleven consultations based on quantitative midterm student ratings. 721 students were served by these classroom interventions; and

  - Nine consultations based on a videotaped class session. 725 students were served by these classroom interventions.

Consultations

CRLT North professional staff provides individual consultations to faculty, administrators, and staff. During 2005-2006, these consultations served individuals from various departments, programs, and committees, including

  - Academic departments in engineering (Aerospace Engineering, Biomedical Engineering, Civil and Environmental Engineering, Chemical Engineering, Electrical Engineering and Computer Science, Industrial and Operations Engineering, Materials Science Engineering, Mechanical Engineering, Naval Architecture and Marine Engineering, Nuclear Engineering and Radiological Sciences, and Technical Communications);
  - Other units in engineering (ABET Coordinators, ASEE Student Chapter, the course ENG 580: Teaching Engineering, Minority Engineering Programs Office, Undergraduate Management Team, Undergraduate Student Advisory Board, and Women in Engineering); and
  - Units outside of engineering (Department of Mathematics, Department of Sociology, English Language Institute, Ethics in Public Life Task Force, Rackham School of Graduate Studies, School of Education, School of Medicine, and School of Public Health).

- Consultations on Proposal Preparation. CRLT North provides assistance and expertise to help individuals conceptualize, develop, and carry out evaluations related to educational innovation and to assist in all phases of grant design (especially for the NSF CAREER proposal), including planning, implementing, analyzing, and disseminating evaluation research. During 2005–2006, CRLT North staff conducted
  - Five consultations regarding NSF CAREER proposals; and
  - Two consultations regarding other research proposals for NSF.
- Other Consultations on Issues Related to Teaching and Learning. CRLT North provides consultations with individuals or groups on topics that include curricular and instructional matters such as course design, integrating innovative approaches to teaching and learning, interpretation of student ratings, and finding ways to improve teaching and learning in a class as well on issues related to career opportunities for graduate students. During 2005–2006, CRLT North staff conducted
  - 81 consultations with individuals on issues related to teaching and learning (45 consultations with 33 distinct faculty and 15 consultations with 11 distinct administrators); and
  - Eleven miscellaneous consultations for groups.
- Ongoing Consultations with Administrators. The staff of CRLT North met regularly with the Associate and Assistant Deans of CoE to consult about faculty development, teaching-related issues, and GSI training.

CRLT-Administered Grants

Engineering faculty received a total of $23,930 in grants administered by CRLT

- $10,000 Interdisciplinary Faculty Associates grant for “Introductory Synthetic Biology”;
- $9,930 from the Gilbert Whitaker Fund for the Improvement of Teaching to develop a new course on medical design and manufacturing;
- $1,500 Multimedia Teaching Grant for the EECS Major Design Experience course; and
- $2,500 Teaching with Technology Institute award for using tablet PCs in the classroom.

Services for CoE Graduate Student Instructors

CRLT North works closely with the Associate Dean for Graduate Education to provide a wide array of programs for engineering GSIs. During 2005–2006, these programs included the mandatory teacher training program for new engineering GSIs, the Engineering GSI mentor program which pairs every engineering GSI with an experienced mentor, several preparing future faculty events provided through the central CRLT office, and support for the student chapter of the American Society of Engineering Education.

Orientation Programs

- Engineering GSI Teaching Training. Each term, CRLT North staff organizes and facilitates teaching orientation programs for new CoE GSIs. 128 engineering GSIs attended the fall 2005 program, and 72 engineering GSIs attended the winter 2006 program. Attendees at orientation received training in the fundamentals of effective teaching, as well as in teaching labs, handling office hours, and utilizing effective multicultural teaching. The orientations also featured two required practice teaching sessions for every GSI. Evaluations of orientations were positive (90.3% of fall participants and 94.5% of winter participants replied *yes* to the question, "I would recommend this program to other new GSIs," and the average rating on the question, "I have a better understanding of my role and responsibilities as a GSI" was 3.9/5.0 in fall and 4.2/5.0 in winter).
- Other GSI and Tutor Orientation Programs. Staff from CRLT North also provided training for tutors from the EECS Learning Center on six occasions and was present at orientations for Electrical Engineering and Computer Science, Industrial and Operations Engineering, Mechanical Engineering, and "Introduction to Engineering" Departments. Approximately 105 students were in attendance at these events.

Engineering GSI Mentor Program

Staff from CRLT North hires, trains, and manages the Engineering GSI Mentors (EGSMs) group. Through this program, experienced GSIs each mentor 20-30 other GSIs in engineering. During 2005–2006, staff from CRLT North conducted biweekly training sessions for the EGSMs on topics that included academic integrity, consulting in different classroom settings, conducting classroom observations, managing group work, understanding student learning styles, and undergraduate student retention.

CRLT North conducted mid-term review meetings for each EGSM, and the GSIs also evaluated the mentors every term. Evaluations continue to be stellar—according to results of the GSI survey conducted at the end of fall and winter terms, 99% of the GSIs who responded knew of the EGSM program, 90% knew their EGSM by name, and 36% contacted their EGSM for a teaching-related service during the fall and winter terms respectively.

Nine EGSMs served 225 GSIs in fall 2005, and ten EGSMs served 217 GSIs in winter 2006. In all, GSMs provided 729 separate services for those GSIs. Services provided are listed in the table below.

Type of service	Term (Total services provided)		
	Fall 2005 (349)	Winter 2006 (380)	Total (729)
Classroom Interventions	24	33	**57**
Scheduled consultations	53	51	**104**
Other face-to-face consultations	102	97	**199**
E-mail consultations	93	118	**211**
Resource E-mails	77	81	**158**

Highlights of the Engineering GSI Mentor Program include

- Classroom Interventions
  - EGSMs conducted 49 midterm student feedback sessions for 36 distinct GSIs. 1,025 undergraduate and graduate students were served by these sessions; and
  - EGSMs conducted eight classroom observations with follow up consultations. 196 students were served by these classroom interventions.
- Other Consultations
  - CRLT North staff conducted 21 consultations with 14 distinct graduate students;
  - EGSMs conducted 104 scheduled consultations on teaching;
  - EGSMs conducted 199 other face-to-face (or informal) consultations and 211 E-mail consultations; and
  - EGSMs sent 158 resource E-mails to their GSIs.

Preparing Future Faculty Events

- Month-long Seminar. In collaboration with the Horace H. Rackham School of Graduate Studies and with funding provided by the Provost's Office and Rackham, CRLT offered the Seventh Annual Rackham-CRLT Seminar on College Teaching: Preparing Future Faculty in May 2006. The Seminar covered three main topics: (1) preparing for the academic job search, including creating a teaching philosophy and course syllabus; (2) learning about U.S. higher education and faculty worklife, including one-day visits to local colleges and universities; and (3) discussions on effective and reflective teaching. Of the 43 participants in the seminar, eight were engineering graduate students. The seminar was very highly rated and considered an invaluable experience by its participants.
- One-day Conference. CRLT also offered a one-day Preparing Future Faculty Conference in October 2005. This seminar was designed to help graduate students and postdoctoral scholars prepare for the transition to faculty jobs, and it featured sessions about what it means to pursue an academic career, how to prepare for the job search process, faculty work life and expectations at different types of colleges and universities, and compiling a teaching portfolio and developing a curriculum vitae for the job market. A total of 44 engineering graduate students (out of 275 participants) attended the session.
- Mentoring Program. The Rackham-CRLT Graduate Student Mentorship Program brings together U-M graduate students and faculty from nearby colleges and universities to explore faculty worklife and the academic job search. U-M students may work with faculty from Albion College, Eastern Michigan University, Kalamazoo College, Kettering University, Oakland University, Oberlin College, or Wayne State University. One engineering graduate student (out of 32 participants) participated in this program.

Student Chapter of American Society for Engineering Education

The U-M Student Chapter of the American Society for Engineering Education (ASEE) is an organization committed to furthering education in engineering. It offers programs designed to prepare interested graduate students for careers in academia, provide undergraduate students with a better understanding of graduate education, and support the increased involvement of under-represented minority groups in higher education. During the 2005-2006 academic year, CRLT North staff provided feedback for graduate students about presentation style at six sessions of the 2005 Summer Seminar Series (the overall attendance at the series was approximately 90 graduate students) and met with executive officers of the group to assist in planning programs and in strategizing about the ASEE student chapter.

National Leadership

The staff at CRLT North is dedicated to providing national leadership to enhance the visibility of U-M in engineering education. As such, staff from CRLT North participated in several national workshops and conferences, served on national committees and review panels, and provided consultations for individuals outside of the U-M community.

Workshops and Conferences

National workshops and conferences at which staff from CRLT North participated include

- *Engineering Education Research Colloquy 2* (10/18/05–10/19/05);
- *35th Frontiers in Education Conference* (10/19/05–10/22/05);
- *Rigorous Research in Engineering Education Workshop* (08/01/05–08/05/05); and
- *2006 American Society of Engineering Education Annual Conference* (06/18/06–06/21/06).

National Service

The Managing Director provided national service by assuming roles that include

- Educational Research and Methods' Division Program Chair for the 2006 ASEE Annual Conference;
- Reviewer for the *National Science Foundation–Course, Curriculum, and Laboratory Innovations Phase I* Program;
- Reviewer for the *National Science Foundation–Ethics Education in Science and Engineering* Program;
- Reviewer for the *International Journal of Engineering Education*; and
- Reviewer for the *Journal of Engineering Education*.

Consultations with Individuals Outside of U-M

Staff from CRLT North consulted with five individuals outside of U-M on issues related to teaching and learning and participated in a focus group for the Center for the Advancement of Scholarship in Engineering Education to evaluate a new Web site for engineering education research.

Research in Engineering Education

The staff at CRLT North recognizes the importance of its role in reforming engineering education and furthering the mission of CoE to promote excellence in engineering education. Current research efforts of CRLT North staff include a college-wide study of different types of instructional consultations and their effect on faculty teaching practices, a multi-institution project to explore ethical decision-making in engineering and identify curricular approaches to enhance its development, two projects to examine issues related to retention and enrollment of women and underrepresented minority students in engineering, and an assessment of peer evaluation in student teams.

Effects of Different Consultations on Teaching

Staff from CRLT North, with assistance from several instructional consultants from the central CRLT office, conducted research on the effects of different consultations on teaching to address the question, "How are teaching practices of engineering faculty affected by different types of instructional consultations?" The project is sponsored by the Engineering Teaching Academy and funded by the Associate Dean for Undergraduate Education. A total of 57 CoE faculty teaching undergraduate, lecture-based courses volunteered to participate. They were randomly assigned to either a control group that received no feedback and no consultation, a pseudo-control group that received a report summarizing quantitative student feedback from a midterm student ratings of teaching survey but no consultation, or

one of three groups that received a consultation conducted by a trained professional. The consultations were based upon either quantitative student feedback from a midterm student ratings of teaching survey, qualitative student feedback from a small-group instructional diagnosis at midterm, or a self-reflection activity that involved reviewing a class session videotaped at midterm.

Data analysis is still underway, but preliminary results indicate that faculty in the three groups having a consultation demonstrated significant change in student ratings on several items. Qualitative student feedback and follow-up consultation seem to have the most positive impact on student ratings of teaching. Another preliminary trend is that most faculty who received a consultation made changes in their teaching (especially in the way in which they fostered class participation and managed class time).

Ethical Decision-Making in Engineering

The multi-institute project team on ethical decision-making in engineering, which includes the Managing Director of CRLT North as well as engineering faculty from Kettering University and Lawrence Technological University, is developing a model of the student decision-making process in order to identify factors that influence students' decision to cheat or not to cheat. Because research has indicated that (1) engineering students self-report cheating at higher rates than those in most other disciplines and (2) students in humanities self-report cheating at some of the lowest rates, the team is comparing the model for engineering students with that for humanities students. The team is also studying the impacts of year in college on the model and has designed and administered the PACES-2 Survey to test the model.

The team conducted full-scale testing of the survey at three institutions. In total, 1,200 first-year and senior students were invited to complete the one-hour survey, and 349 valid surveys were returned. Though results are still preliminary, the study has confirmed the validity of using the model for mapping out the underlying determinants of a student's decision to engage in unethical behavior–it was successful both at predicting behavior and intention and in discriminating cheaters and non-cheaters as well as engineers and non-engineers. More comprehensive data analysis is underway.

Impact of First Year Experience on Engineering Student Retention

The research team studies the impact of the first year experience on engineering student retention, and it consists of the Managing Director of CRLT North as well as faculty and staff from CoE, the Center for the Education of Women, the Women in Science and Engineering Office, and Lourdes College. The project will establish an inventory of student retention data for women and underrepresented minority students in engineering at U-M. The inventory will be used to model persistence in engineering using student intentions when they enroll in first year courses, deliberateness of course choices, and perceptions of the first year experience. The model will also be used to identify differences between women and underrepresented minority students. 757 students responded (~14% response rate) to a baseline survey in winter 2006, and data analysis is underway. The project is supported through the a Gilbert Whitaker Fund for the Improvement of Teaching grant entitled "An Assessment of the Effect of the First Year Experience on Under-Represented Student Retention in Engineering."

Gender-Related Issues in STEM

The research team is interested in gender issues in science, technology, engineering, and math (STEM), and it consists of the Managing Director of CRLT North as well as faculty and staff from CoE, business, psychology, higher education, the Undergraduate Research Opportunities Program, and the Women in Science and Engineering Office. The team is particularly interested in the development of professional identity and how that influences success in engineering. The team expects to submit a proposal to fund the research within the next year.

Instrument to Assess Team Member Effectiveness

The multi-institution team is developing a simple, reliable peer evaluation instrument that can be used to improve the way that students rate their teammates during cooperative work. The reliability and validity of the instrument will be comparable to or greater than the best instruments currently available, and its simplicity will encourage widespread adoption by faculty who are not ready to make the commitment to more ambitious approaches. The research team includes the Managing Director of CRLT North as well as engineering faculty from Clemson University, Loyola Marymount, North Carolina State University, Rose-

Hulman Institute of Technology, and Western Kentucky University. The project is funded through a National Science Foundation grant entitled "Designing a Peer Evaluation Instrument That is Simple, Reliable, and Valid," which provided $459,877 in NSF funds ($33,591 to U-M; NSF CCLI Grant DUE-0243254).

During fall 2005, the online version of the instrument was launched at U-M in Engineering 100, and more than 100 students rated their own and their teammates' team citizenship at four separate times during the term. One-half of the students used instrument A (a paper version of an established instrument for peer evaluation of teamwork) for the first and third ratings and instrument B (the new online instrument) for the second and fourth rating. The other students alternated the order of the forms–completing B-A-B-A for the four ratings. Data analysis will begin soon.

Key Publications

Relevant research publications by CRLT North staff are listed alphabetically below.

1. Carpenter, D. D., Harding, T. S., & Finelli, C. J. (2006, May). The implications of academic dishonesty in undergraduate engineering on professional ethical behavior. *Proceedings of the 2006 World Environmental and Water Resources Congress, Omaha, NB*.
2. Carpenter, D. D., Harding, T. S., & Finelli, C. J. (2005, October). Work-in-progress: An investigation into the effect of an institutional honor code policy on academic behavior. *Proceedings of the 35th Frontiers in Education Conference, Indianapolis, IN*. (IEEE Catalog Number: 05CH37667C)
3. Carpenter, D. D., Harding, T. S., Finelli, C. J., Montgomery, S. M., & Passow, H. J. (2006). Perceptions and attitudes toward cheating among engineering students (PACES)–Review of initial findings. *Journal of Engineering Education, 95*(3), in press.
4. Finelli, C. J., Gottfried, A. C., Kaplan, M. L., Mesa, V. M., O'Neal, C. M., & Piontek, M. E. (2006, June). Evaluating methods to improve teaching in engineering. *Proceedings of the 2006 ASEE Annual Conference and Exposition, Chicago, IL*. (Available on CD-ROM)
5. Finelli, C. J., Szwalek, J. L., Harding, T. S., & Carpenter, D. D. (2005, October). A case study of research in engineering education: Designing, testing, and administering the PACES-2 Survey on academic integrity. *Proceedings of the 35th Frontiers in Education Conference, Indianapolis, IN*. (IEEE Catalog Number: 05CH37667C)
6. Harding, T. S., Finelli, C. J., & Carpenter, D. D. (2006, June). Cheating in college and its influence on ethical behavior in professional engineering practice. *Proceedings of the 2006 ASEE Annual Conference & Exposition, Chicago, IL.* (Available on CD-ROM)
7. Harding, T. S., Finelli, C. J., Carpenter, D. D., & Mayhew, M. J. (2006, June). Examining the underlying motivations of engineering undergraduates to behave unethically. *Proceedings of the 2006 ASEE Annual Conference & Exposition, Chicago, IL.* (Available on CD-ROM)
8. Passow, H. J., Mayhew, M. J., Finelli, C. J., Harding, T. S., & Carpenter, D. D. (2006). Factors influencing engineering students' decisions to cheat by type of assessment. *Research in Higher Education, 47*(6), 643–684.

CRLT North Staff

- Cynthia Finelli, *Managing Director of CRLT North*
  Cynthia Finelli holds a joint appointment in CoE and CRLT. She earned B.S.E.E., M.S.E.E., and Ph.D. degrees from the U-M in 1988, 1989, and 1993. Prior to joining CRLT in April 2003, she was at Kettering University where she was the Richard L. Terrell Professor of Excellence in Teaching, founding director of the Center for Excellence in Teaching and Learning, and associate professor of electrical engineering. She is a strong advocate of active, team-based learning in the classroom and is engaged in several engineering education research projects. She also holds an appointment as Associate Research Scientist of Engineering Education at U-M.

- Chad Hershock, *Coordinator of STEM GSI Initiatives*
  After receiving a B.S. in Biology from the University Scholars Program at Pennsylvania State University, Chad Hershock earned an M.S. and Ph.D. in Biology and completed a Postdoctoral Fellowship in Ecology and Evolutionary Biology at the U-M. Prior to joining CRLT in 2005, he worked as a research scientist at BioMedware, Inc.; a lecturer at U-M Ann Arbor, U-M Dearborn, and the U-M Biological Station; and an actor in CRLT Players Theatre Troupe. Currently, Chad consults with GSIs and faculty on teaching and curricula, primarily in science, technology, engineering, and math, and he conducts workshops on teaching methods. He also coordinates GSI initiatives, such as CRLT's campus-wide GSI teaching orientations, and he continues to act in the CRLT Players Theatre Troupe.

- Matt Kaplan, *Associate Director of CRLT*
  Matt Kaplan has served as associate director of CRLT since 2001. He received his Ph.D. in comparative literature from the University of North Carolina at Chapel Hill. He worked at UNC's Center for Teaching and Learning for three years before joining CRLT in 1994. Matt currently focuses on external and university-wide initiatives. He is the Principal Investigator on a Ford Foundation's *Difficult Dialogues* grant on the role of religion in a public research university, and he coordinates U-M's Thurnau Professorship and U.S. Professor of the Year competitions. He has published on the use of theater in faculty development, multicultural faculty development, and Teaching Assistant training.

- Christopher O'Neal, *Coordinator of STEM Faculty Development*
  Chris O'Neal earned his Ph.D. in biology from the U-M. Chris has been with CRLT since 1999 and is currently the team leader for the Center's sciences, technology, engineering, and math team. Chris focuses on science instruction and has contributed to the design and development of campus-wide workshops on active learning, teaching problem-solving skills, and engaging students. In his customized services to various departments, Chris has addressed issues such as curriculum revision, the scholarship of teaching and learning, clinical instruction, and implementation of team-based learning. Chris is also a co-coordinator of the Rackham-CRLT Seminar on College Teaching: Preparing Future Faculty.

- Tershia Pinder, *Coordinator of Engineering GSI Initiatives*
  Tershia Pinder earned a B.S. in Fire Protection Engineering from the University of Maryland and an M.S. and Ph.D. in Mechanical Engineering from the U-M. In addition to numerous academic and leadership awards, Tershia received the National Collegiate Engineering Award and the U-M Scholar Power Ph.D. Student Achievement Award. She has been a GSI and an Engineering GSI Mentor, and she joined CRLT North in August 2005. In her role, Tershia is responsible for overseeing the Engineering GSI Mentor Program and planning teacher training for new engineering GSIs.

- Mary Piontek, *Evaluation Researcher*
  Mary Piontek earned a B.A. and M.A. in English Literature and a Ph.D. in measurement, research, and evaluation from Western Michigan University. She has considerable experience doing evaluation research in educational settings and has consulted with foundations, school districts, institutions of higher education, and organizations on program evaluation and educational research issues. In her current role, Mary works with individual faculty members, schools, and departments that need assistance assessing the effectiveness of initiatives to improve teaching and learning. She is the co-

author of *Evaluation Strategies for Communicating and Reporting: Enhancing Learning in Organizations, 2nd Edition* (Sage, 2004).

- Natalie Taliaferro, *Program Assistant for Engineering*
  Natalie Taliaferro earned her B.A. in Spanish from the U-M in 2005. Shortly after, she joined CRLT as a Program Assistant. In this role, Natalie is responsible for coordinating the Seminar Series, teacher training for new engineering GSIs, and other events. Natalie has a joint appointment in CRLT and CoE. She works closely with the Managing Director of CRLT North to organize the multiple workshops and seminars specifically geared towards engineering faculty and GSIs.

- Erping Zhu, *Instructional Technology Specialist and Instructional Consultant*
  Erping Zhu earned a Ph.D. in instructional systems technology from Indiana University. Prior to joining CRLT, Erping was an instructional designer at Florida Gulf Coast University. She consults with faculty about integrating technology into their teaching and developing courses that incorporate instructional technology. Erping also collaborates with colleagues from U-M technology units to provide services and programs to faculty, such as the new Teaching with Technology Institute. She recently co-authored a chapter, “Technology and Teaching,” for W. McKeachie’s Teaching Tips (Houghton Mifflin, 2002) and a monograph entitled “Technology and Teaching: Characteristics and Implications of an Integrated Approach” (Global Learning Center, University of Michigan Business School, 2001).