CRLT CENTER FOR RESEARCH ON LEARNING AND TEACHING
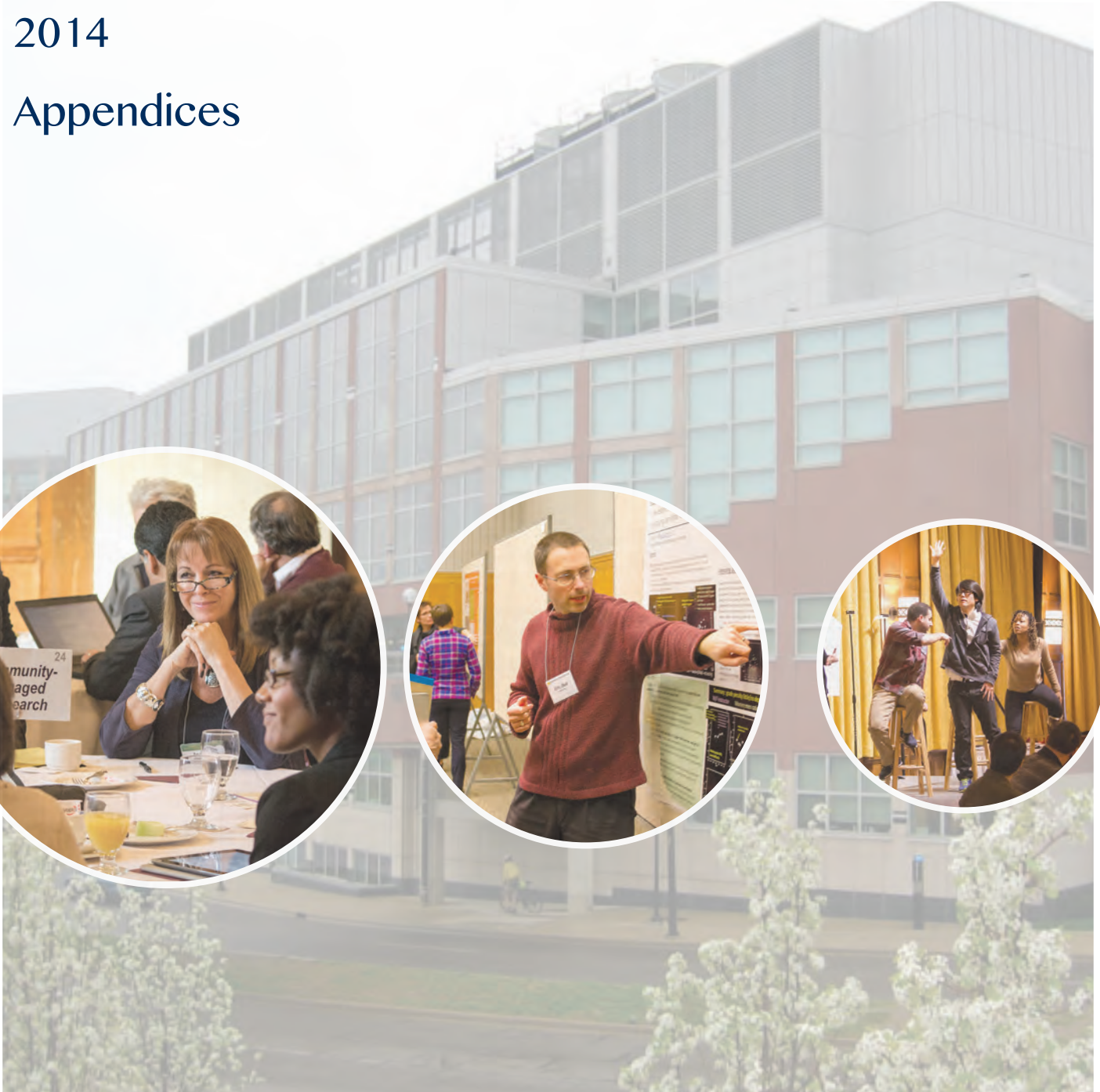UNIVERSITY OF MICHIGAN

Self-Study in Preparation for

CRLT's Internal-External Review
2014

Appendices

Appendices

Appendix A: Matrix Overview of CRLT's Internal Evaluation Practices

	Event sign-ins and service reports from CRLT staff	Website hits	Immediate feedback questionnaires	Follow-up e-mail and online surveys	Participant reports and narratives	Interviews and focus groups	Measurement of teaching outcomes
How many clients (administrative, faculty and graduate students) does CRLT serve?	X (Analyzed by demographics)	X (Analyzed by on- and off-campus hits)					
How valuable/useful do participants find CRLT services?			X (e.g., At all workshops, participants rate the overall value of the session)	X (e.g., New Faculty Orientation and Provost's Seminar on Teaching attendees receive an e-mail, asking them to rate the overall value of the event)	X (e.g., E-mails and conversations)	X (e.g., Campus Leadership Program participants)	
What changes do instructors report they will make or have made in their teaching as a result of a CRLT service/program?			X (e.g., Theatre sketch attendees are asked what they learned that will apply to their work with students)	X (e.g., Midterm Student Feedback clients are asked about changes they made in their course as a result of the service; Pre- and post-test of Teaching Academy participants' sense of preparation for teaching)	X (e.g., Project reports from recipients of larger CRLT grants)	X (e.g., Interviews and focus groups with faculty/administrators about instructional and organizational changes stemming from theatre performances)	X (e.g., Pre- and post-test study of the impact of different feedback services on student ratings; Investigating Student Learning poster analysis)
What has been the long-term impact of CRLT services/programs on participants' attitudes/behaviors?				X (e.g., Survey of Graduate Teaching Consultants about impact of the program on their instructional and mentoring work as faculty)	X (e.g., Teaching with Technology Institute and Teagle presentations)	X (e.g., Interviews in China with Michigan–China University Leadership Forum participants)	
What needs are there at the University of Michigan for new programs and services?				X (e.g., Surveys of graduate students to assess the need for a Preparing Future Faculty Seminar and information technology training)	X (e.g., Attendees at TA mentoring events asked to suggest new initiatives)	X (e.g., Initial needs assessment for Campus Leadership Forum)	

A-1

Publications and Reports Featuring CRLT's Evaluation of Its Own Programs and Services

CRLT Annual Report with data about number of services provided, number of individuals served (by administrative unit and rank), grant projects funded, CRLT website hits, number of students served through midterm student feedback sessions, theatre performance audience members, external organizations served, and types of services.

Cook, C. E. (2008, May/June). Study abroad for Chinese university presidents: How China is reforming higher education. *Change, 40*(3), 32-39.

Cook, C. E. (2001). The role of a teaching center in curricular reform. In D. Lieberman & C. Wehlburg (Eds.), *To improve the academy: Vol. 19. Resources for faculty, instructional, and organizational development* (pp. 217-231). Bolton, MA: Anker Publishing Company, Inc.

Cook, C. E., Kaplan, M., Nidiffer, J., & Wright, M. (2001, November). Preparing Future Faculty – Faster. *AAHE Bulletin*, 3-7.

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).

Kaplan, M., Cook, C. E., & Steiger, J. (2006, May/June). Using theatre to stage instructional and organizational transformation. *Change, 38*(3), 32-39.

Kaplan, M., Meizlish, D. S., O'Neal, C., Wright, M. C. (2008). A research-based rubric for developing statements of teaching philosophy. In D.R. Robertson & L.B. Nilson (Eds.), *To improve the academy: Vol. 26. Resources for faculty, instructional, and organizational development* (pp. 242-262). Hoboken, NJ: John Wiley & Sons Press.

Meizlish, D. M. & Wright, M .C. (2009). Preparing advocates for faculty development: Expanding the meaning of "growing our own." In L.B. Nilson & J.E. Miller (Eds.), *To improve the academy: Vol. 27. Resources for faculty, instructional, and organizational development* (pp. 385-400)*.* San Francisco, CA: Jossey-Bass.

O'Neal, C. & Karlin, J. (2004). Graduate student mentors: meeting the challenges of the ongoing development of graduate student instructors. In C. Wehlburg & S. Chadwick-Blossey (Eds.), *To improve the academy: Vol. 22. Resources for faculty, instructional, and organizational development* (pp. 320-332). Bolton, MA: Anker.

Pinder-Grover, T., Root, S., and Cagin, E. (2008, June). Preparing graduate students to be successful as teaching mentors and as future professionals. *Proceedings of the 2008 ASEE Annual Conference*, Pittsburgh, PA.

Leveraging Student Diversity
Thursday, February 27, 1:00 p.m.-3:00 p.m.

W14

1. Please circle your rating of the overall value of this seminar:

   (Not at all helpful)   1   2   3   4   5   *(Very helpful)*

2. What did you expect to gain from this seminar?

3. What aspects of the seminar did you find most useful?

4. What might you do differently as a result of attending this seminar?

5. Do you have any suggestions for how we could make this program more useful?

6. How did you hear about this seminar? (Please check all that apply.)
   - ☐ Postcard   ☐ Email announcement   ☐ Department
   - ☐ Website   ☐ The *University Record*   ☐ Past Participant
   - ☐ Other (please specify): _____

7. Please check all that apply to you:
   - ☐ Faculty Member   ☐ Graduate Student   ☐ GSI   ☐ Postdoc

8. Was your participation in the seminar required (by College or Dept.)?   ☐ Yes   ☐ No

9. Did you attend this seminar as part of the requirements for the Graduate Teacher Certificate?
   - ☐ Yes   ☐ No

Additional comments and suggestions (please also use the back of this sheet as necessary):

CRLT Service Evaluation

Earlier this term, one of CRLT's teaching consultants conducted a midterm student feedback session in your course. Would you please complete the short questionnaire below about the feedback session? CRLT is interested in continuing to improve our services and in finding out how this service affects teaching and learning. We welcome your comments and suggestions. The information you provide will be shared with the individual consultant who visited your class. If you prefer to respond by campus mail, just print out the survey, write in your responses and return to: Laura Schram, CRLT, 1071 Palmer Commons, 2218. If you have questions, Laura can be reached at lnschram@umich.edu or (734) 647-5676.

Your username (**cwparker@umich.edu**) will be recorded when you submit this form. Not **cwparker**? Sign out

* Required

Who was the teaching consultant that you worked with? *

[Alex Jakle ⇕]

Was the CRLT consultant effective in implementing the process and discussing the feedback?
○ Yes
○ No

Overall, did you feel the service was valuable?
○ Yes
○ No
○ Other: [_____]

If not, please explain why below.

[   ]

If you felt the service was valuable, what made it so (check all that apply)?
○ It enabled me to discuss my teaching with a consultant
○ It confirmed assumptions I had about my teaching/my students
○ It gave me new insights into my teaching/my students
○ It gave me specific strategies to improve my teaching/course
○ The atmosphere in my class improved as a result of the service
○ It gave me more confidence in my teaching
○ It made me aware of resources and programs relevant to my teaching
○ Students appreciated the process
○ Other: [_____]

Did you make any changes in your course/teaching this term as a result of this service?
○ Yes
○ No

Please explain.

[   ]

Do you plan to make changes in future terms as a result of the service?
○ Yes
○ No

Please explain.

[   ]

Would you recommend use of this service for colleagues in your department?
○ Yes
○ No

Why or why not?

[   ]

☐ Send me a copy of my responses.

Never submit passwords through Google Forms.
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New Faculty Programs & the Evaluation of Educational Development Initiatives

Deborah Meizlish, Ph.D.
Assistant Director, CRLT

Matthew Kaplan, Ph.D.
Managing Director, CRLT

Mary C. Wright, Ph.D.
Director of Assessment, Associate Research Scientist, CRLT

Joseph E. Howard
Doctoral Student, Higher Education

As part of its commitment to excellence in teaching, the largest college at the University of Michigan – the College of Literature, Science, and the Arts (LSA) – collaborates with U-M's Center for Research on Learning and Teaching (CRLT) to host a mandatory Teaching Academy for all new assistant professors in the college. The goals of the program include:
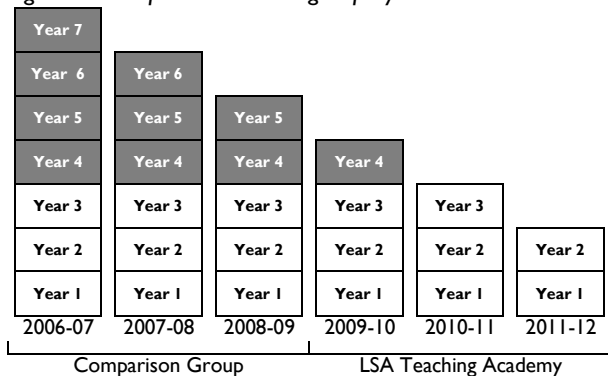
- introducing faculty to U-M students and U-M resources on teaching and learning;
- deepening faculty understanding of how students learn;
- facilitating discussion about effective teaching strategies.

Beginning with a two-day session in August, the program continues throughout a junior faculty member's first year at the university. It includes opportunities for advice about course planning from outstanding teachers in their disciplines, discussion of ways to incorporate technology into courses, and collaboration with CRLT consultants to gather and respond to student feedback during their first semester of teaching at U-M.

Since its inception in the 2009-2010 academic year, 128 tenure-track assistant professors in LSA have participated in the Teaching Academy.

In 2012, CRLT began a year-long effort to evaluate the effectiveness and impact of the LSA Teaching Academy. Data were collected from: 1) pre- and post-surveys of program participants, 2) records of faculty contacts with CRLT, and 3) student course evaluations.
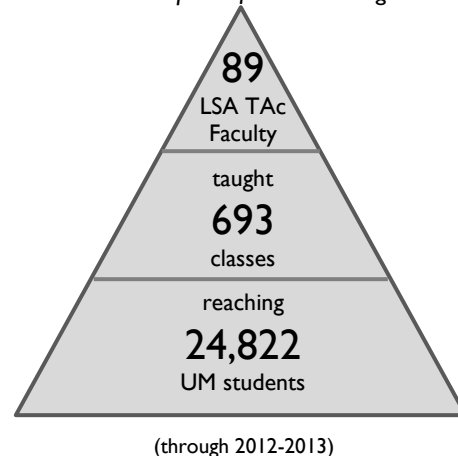
Three cohorts of Teaching Academy participants (faculty entering in 2009, 2010, and 2011) were compared to three preceding cohorts (2006, 2007, and 2008) who joined UM prior to the program's implementation. Key highlights from the analysis include:

- Teaching Academy participants found the program very useful and demonstrated gains in their self-evaluated preparation for teaching.

- Participants were more likely to seek out professional development opportunities around teaching than faculty who joined U-M prior to the program's inception.

- Teaching Academy participants are consistently evaluated more favorably in their course evaluations. Participants had statistically significantly higher student ratings of the course, the instructor, and estimated learning gains, compared to non-participants. These results hold while controlling for other factors that typically affect student evaluations.

The cumulative impact of the Teaching Academy is illustrated in Figure 2. As of May 2013, Teaching Academy faculty had instructed nearly 25,000 undergraduate and graduate students in nearly 700 courses.

For more information about the Teaching Academy and this evaluation, see a recent U-M *University Record* article at *http://bit.ly/LSA-TA*. For information about the program's goals, see *http://bit.ly/TA-Goals*.

Figure 1: Comparison and TA group by cohort

Year 7					
Year 6	Year 6				
Year 5	Year 5	Year 5			
Year 4	Year 4	Year 4	Year 4		
Year 3	Year 3	Year 3	Year 3	Year 3	
Year 2	Year 2	Year 2	Year 2	Year 2	Year 2
Year 1	Year 1	Year 1	Year 1	Year 1	Year 1
2006-07	2007-08	2008-09	2009-10	2010-11	2011-12

Comparison Group | LSA Teaching Academy

Note: Only data from the first three years of teaching (white block) is considered in the evaluation.

Figure 2: Cumulative impact of LSA Teaching Academy

89
LSA TAc Faculty

taught
693
classes

reaching
24,822
UM students

(through 2012-2013)

ADVISORY BOARD
CENTER FOR RESEARCH ON LEARNING AND TEACHING

Charge and Composition

The Advisory Board of the Center for Research on Learning and Teaching
(CRLT) shall be responsible for advising the Director on policies and activities
that enable CRLT to fulfill its mission. Important issues include (but are not
limited to) program and research objectives and priorities, grants and
competitions, resource procurement and allocation, national project
participation, and inter-University relations. Members of the Advisory Board
shall play a key role as liaisons between the Center and the rest of the University
community.

The Advisory Board shall consist of 12-13 members appointed by the Senior Vice
Provost for Academic Affairs and the Provost. There shall be a minimum of
three members chosen from departments in the College of Literature, Science,
and the Arts; a minimum of two members chosen from the College of
Engineering; and a minimum of one member chosen from one of the other
schools and colleges. The Advisory Board shall typically meet once a month, and
the Director of CRLT shall call the meetings and prepare the agenda.

4/96, Updated 8/08

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2013-2014

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  College of Literature, Science, & the Arts

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Uniqname: zintmich Phone: 763-6961

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Steven Wright (05-07)
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 Obstetrics/Gynecology
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 Internal Medicine
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 Internal Medicine

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 Freda Herseth (08-10)
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 Bright Sheng (99-00)
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 Dorceta Taylor (06-08)
 Michaela Zint (12-14)

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 Susan Boehm (95-96)
 Carol Boyd (98-00)
 Lisa Kane Low (06-08)

College of Pharmacy
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 Vicki Ringold (13-15)
 George Garcia (02-04)

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 Cathleen Connell (11-12)
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 (also Medical School and LSA)
 Sherman James (01-02)
 David Mendez (08-10)

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 Susan Waltz (10-12)

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 Srinika D. Jayaratne (03-05)
 Robert Ortega (97-99)
 Michael Spencer (07-09)

TEACHING IN THE CLOUD: LEVERAGING ONLINE COLLABORATION TOOLS TO ENHANCE STUDENT ENGAGEMENT

Chad Hershock
Mika LaVaque-Manty

The rapid proliferation of technology can have profound effects on the evolution of teaching, learning, scholarship, and governance in higher education (Katz, 2008). However, instructors report that simply "keeping up" with new instructional technologies, let alone integrating them productively into one's teaching, can be a significant challenge (Sorcinelli, Austin, Eddy, & Beach, 2006; Zhu, Kaplan, & Dershimer, 2011). This Occasional Paper describes how instructors at the University of Michigan are currently using online collaboration tools (hereafter OCTs) in a variety of disciplines and teaching contexts to enhance student engagement and course management. Based on these cases and faculty interviews, we also outline recommendations for implementing OCTs effectively and efficiently in teaching.

Why Student Collaboration? Why Online?

In a meta-analysis of over 150 studies representing diverse disciplines and class sizes, Johnson, Johnson, and Smith (1998) found that students demonstrated significantly greater learning gains, in terms of recall of basic knowledge and critical thinking, when collaborating than when working independently. Students also reported greater motivation and persistence regarding problem-solving tasks when working collaboratively. More recent studies of large lecture-based courses have found that peer instruction, an active learning strategy in which pairs or small groups of students practice applying concepts or solving problems, leads to higher mastery of course content (Deslauriers, Schelew, & Wieman, 2011; Smith et al., 2009; Crouch & Mazur, 2001). Although research clearly suggests the virtues of collaborative learning, it is worth noting that these impacts depend upon how instructors implement and manage collaborative activities. Key considerations include, but are not limited to, task design, group formation, team management, and the establishment of both individual and group accountability (Finelli, Bergom, & Mesa, 2011; Michaelson, Fink, & Knight, 1997; Oakley, Felder, Brent, & Elhajj, 2004).

CRLT
Occasional
Papers

No. 31

Center for Research
on Learning and Teaching

Chad Hershock is an Assistant Director at the Center for Research on Learning and Teaching. He has a Ph.D. in Biology. Mika LaVaque-Manty is an Arthur F. Thurnau Professor and Associate Professor of Political Science and Philosophy. He is also the 2012 CRLT Faculty Associate for Online Collaboration.

The appropriate use of instructional technology can also significantly enhance student collaboration and learning (Zhu & Kaplan, 2011). For example, OCTs create opportunities for student-student or instructor-student interactions before, during, and after face-to-face class meetings that would be impossible or logistically difficult to achieve otherwise. As a result, instructors can facilitate greater student engagement with course content, as well as more frequent implementation of active learning, low stakes student practice, and formative feedback on student learning—all of which align with research findings on ways to promote student learning (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010; Brandsford, Brown, & Cocking, 2000). Furthermore, OCTs often record and archive the artifacts of learning activities, so that students may revisit and study the core aspects of activities or discussions that may otherwise be ephemeral. Additionally, although many students increasingly use technology such as social networking applications and mobile devices in their daily lives (EDUCAUSE, 2011), they may not be sufficiently skilled in the use of OCTs required by future employers. Consequently, instructors who leverage OCTs to achieve course goals may simultaneously prepare students for a workforce that increasingly depends on OCTs for productivity and collaboration.

How Do U-M Instructors Use Online Collaboration Tools to Enhance Teaching?

In 2011, the University of Michigan selected Google as the primary provider of OCTs for all faculty, staff, and students on the Ann Arbor campus. To explore potential applications of these and other OCTs for teaching and course management, CRLT partnered with U-M's office of Information and Technology Services to sponsor a faculty learning community. We recruited 23 faculty instructors from 14 schools and colleges, representing a wide array of disciplines, teaching contexts, and levels of OCT experience ranging from novices to "power users." The learning community met monthly for seven months. Sessions featured hands-on exploratory activities, demonstrations by early adopters, brainstorming sessions, and dialogues to design and debrief pilot projects enacted by learning community participants. Seventeen faculty pursued pilot projects in their courses or clinical teaching, and CRLT conducted

interviews with them to document their approaches. Below, and in Table 1 (p. 11), we describe applications of OCTs for teaching developed by learning community members and other U-M instructors interviewed by CRLT. These examples are not intended to be exhaustive. However, they illustrate a variety of innovative solutions to common pedagogical challenges that are transferable or adaptable across disciplines and teaching contexts.

Facilitating collaborative authorship, editing, or peer review

When students receive feedback on their writing (whether from peers or experts) and act on it, not only does the quality of their work improve, but their writing and editing skills may also improve significantly (Cho & MacArthur, 2010; MacArthur, 2007; Nelson & Shunn, 2009). By providing feedback to peers on their writing, students may also positively improve their own writing performance (Cho & MacArthur, 2011; Lundstrom & Baker, 2009). The examples below illustrate how OCTs can facilitate collaborative writing and timely, frequent, low-stakes peer feedback.

- **Brandon Respress**, *Nursing*. Respress instructs upper-level undergraduates in the writing of grant proposals in preparation for independent research projects with faculty mentors. Each week, students draft or revise a section of a standard NIH grant proposal, refining the designs of their individual research projects, as well as their scientific inquiry and disciplinary writing skills. Respress creates a Google Doc collection for each weekly assignment, "chunking" portions of the proposal that require different skill sets and degrees of conceptual mastery. As students post drafts to each collection, the entire class automatically receives viewing and commenting privileges. Respress and students then use the Google Doc commenting feature to leave substantive, conceptual feedback on each other's drafts. Respress carefully models and discusses effective feedback practices during the first few weeks of the course online, while continuing to provide weekly feedback during classroom sessions. The revision history feature in Google Docs can be used to gauge the extent of changes in students' writing in response to peer feedback. Respress found that students showed increased confidence in their ability to apply

research skills and develop proposals. More importantly, this approach affected student confidence about their work and their beliefs, the questions they would ask, and, most importantly, their practice as nurses.

- **George Hoffmann**, *Romance Languages and Literatures*. One of Hoffmann's courses explores the controversial literature on the Algerian War. Thirty-two undergraduate students are each required to deliver a PowerPoint presentation on a capstone analytical project. In-class presentations are dynamic, but ephemeral, and their engaging material is lost to students in following course iterations. Therefore, Hoffmann uses Google Sites to create a collaborative course website to document and extend the highly visual capstone projects across courses. Based on his or her PowerPoint presentation, each student creates a media-rich web page, exclusively in French, without having to learn HTML. Hoffmann pairs students to peer review web pages using the commenting feature in Google Sites. Students' grades reflect both the content of their own web page, and the quality of their peer critiques. Through the combined use of PowerPoint and Google Sites, students not only learn valuable communication skills, but also practice disciplinary skills of close reading and critical evaluation.

- **Anne McNeil**, *Chemistry*. McNeil leverages a wiki in her graduate-level chemistry courses to improve students' scientific communication skills. Small groups of students are challenged to collaborate on creating or revising public Wikipedia pages that will clearly communicate challenging concepts to both laypersons and experts. Students with different academic backgrounds are grouped to maximize available skill sets and resources within teams and to foster meaningful interdisciplinary exchanges that would otherwise be absent from the course. Groups nominate topics, and instructors select a subset based on course objectives. At key milestones during wiki page creation, both students and instructors provide critical feedback through the wiki, iteratively vetting content before the final drafts go public on Wikipedia. The public nature of final wiki pages raises student motivation, as well as the overall quality of the work.

Improving teamwork during group projects

Instructional technology can enhance the ability of student teams to collaborate effectively, increasing access and efficiency by reducing spatial and temporal barriers to teamwork. Similarly, OCTs provide novel, efficient, and effective means for instructors to monitor and provide feedback on group projects. The following examples demonstrate how OCTs can improve teamwork and course management of group projects.

- **Robin Fowler**, *Technical Communication, Engineering*. Fowler co-teaches Introduction to Engineering, a course in which student teams design, build, and test products for professional scenarios (e.g., Company X needs a remote-operated vehicle to investigate subglacial life at the Ross Ice Shelf in Antarctica). Teams need to apply course concepts to evaluate competing designs relative to client-generated objectives and constraints. However, teams often pursue suboptimal designs due to poor group process. To enable more equitable and conceptually sound design decisions, Fowler shifted team meetings from face-to-face discussions to synchronous, text-based online discussions, during which team members are geographically dispersed. Fowler creates a Google Doc for each team, including each student's individual project idea and a decision-making matrix to be completed as a team. Students simultaneously access these materials and negotiate decisions at preordained times using the commenting and chat features in Google Docs. Preliminary analyses of chat transcripts and student surveys suggest that this approach increases student engagement and participation in design decisions, particularly for students easily marginalized in such courses (e.g., non-native English speakers, women, and historically underrepresented minorities). Because Google Docs allowed Fowler to monitor group dynamics remotely, she was able to respond to misconceptions and intervene constructively in ways that were not logistically possible when the teams met face-to-face.

- **Melissa Gross**, *Kinesiology*. Gross's students use 3D animation and motion capture technologies to study the biomechanics of human movement in a studio course. Students' group projects are presented as narrated

movies and include animations to illustrate their research findings (e.g., differences between a healthy knee and a reconstructed knee climbing stairs). One major logistical hurdle is the need for students and the instructor to manage, share, and collaborate on many large video files. To overcome this challenge, Gross uses Box.net, a cloud-based file storage and sharing service explicitly designed for collaboration. In addition to solving storage capacity and organization issues, Box.net allows students and instructors to attach comments, tags (to facilitate easy file searches), and editable task lists in the file directory. These features provide easy mechanisms for students to manage and coordinate workflow within teams. Instructors can also use task lists and commenting features to provide feedback or directions to teams and then to monitor what has been implemented or not. Box.net can also generate a single e-mail digest per day to the instructor (site owner), summarizing all activity on the site and facilitating efficient oversight of student projects and instructor-student interactions.

Crowdsourcing learning activities

Crowdsourcing refers to the public outsourcing of specific tasks to an undefined, generally large, and geographically distributed group of people, often online (Howe, 2006). In educational environments, crowdsourcing leverages the skills and resources of an *entire* class of students to complete discrete learning activities collaboratively. The following examples illustrate crowdsourcing via OCTs.

- **Margherita Fontana** and **Carlos González-Cabezas**, *Dentistry*. In intensive clinical courses, dentistry students frequently request study guides to organize and digest the deluge of content. Fontana and González-Cabezas crowdsource this task via Google Docs as a learning activity to prepare students for exams. They assign groups of 10-15 students to each of ten major content areas. Groups create their own Google Docs and work together to write the best possible exam questions (two per student) aligned with the learning objectives in the syllabus. To earn credit, questions must go beyond regurgitation of facts and require the evidence-based application of key concepts. The instructors provide a few questions as models. Groups share Google Docs with instructors, who provide feedback. After students revise their questions, instructors compile them in a new Google Doc that is shared with the entire class. To motivate students, if questions meet the desired criteria, Fontana and González-Cabezas promise to create the majority of the exam from this pool (or slightly edited versions of the questions). However, if the learning objectives are not covered by the students' submissions, they promise to create their own challenging exam questions on those topics. Overall, this approach fosters higher-order learning while also leading to the creation of a pool of potential exam questions for both current and future courses.

- **Chad Hershock** and **Rachel Niemer**, *Center for Research on Learning and Teaching*. Instructors in lab courses often find it difficult to simulate and discuss all phases of scientific inquiry during a single class period. For instance, individual lab groups may not be able to replicate experimental trials sufficiently in the time allotted, requiring instructors to compile data sets across lab groups before students can properly analyze and interpret results. Google Spreadsheets can circumvent this logistical barrier by allowing instructors to crowdsource the data aggregation and "cleaning" during class. For example, Hershock and Niemer teach a short-course for postdocs on college teaching in science and engineering (http://www.crlt.umich.edu/programs/psc). During a unit on converting traditional, "cookbook" lab exercises into inquiry-based activities, postdocs work in pairs to complete a sample lab protocol. All the pairs then enter their data into a single Google Spreadsheet, so that the class compiles a robust class data set in real time, without any cutting and pasting across files. Instructors simply monitor the data as it accumulates, responding to problems as needed. In the same class meeting, each group can analyze the entire data set to test student-generated hypotheses and predictions brainstormed during a brief pre-lab discussion. Students then share and discuss visual representations of their findings within the Google Spreadsheet, connect results to underlying fundamental concepts, and reflect on their inquiry processes. This approach integrates more of the scientific method into a single classroom experience,

rather than leaving the analysis and interpretation for students to complete in isolation after class.

- **Trisha Wittkopp**, *Ecology and Evolutionary Biology*. Wittkopp teaches genetics to hundreds of students in a large lecture. She uses personal response systems (clickers) to increase interactivity, assess student learning, and address student confusion during class. Nevertheless, between classes, questions remain, and many students have similar questions. To avoid responding individually to each student, Wittkopp employs Piazza, a discussion forum designed to crowdsource answers to students' questions. Instead of sending individual e-mails, students post their questions on Piazza, where they can be answered by one of their peers, a graduate student instructor (GSI), or Wittkopp herself. This reduces the number of redundant questions and shortens response time. Students collaboratively edit answers to questions as they would on a wiki, eliminating the need to read through long, threaded discussions or chat transcripts to find the correct answer. Wittkopp can answer questions directly in a separate field, edit the collaborative student response, or, with a click, simply confirm that the student-generated answer is reliable. Tagging contributions with labels such as "lecture," "homework," "quiz," or exam number aids searching and organization. Additionally, Piazza can generate a report of student activity, facilitating relatively easy grading of participation.

Blogging to promote student reflection and critical thinking

The literature critiquing higher education in the U.S. suggests that more effective approaches to teaching critical thinking skills should be among the highest priorities for undergraduate education (Arum & Roksa, 2011; Bok, 2006). Developing students' metacognition, the ability to reflect on one's thinking and learning processes, is also an increasingly important component of the literature on teaching (Ambrose et al., 2010; Dunlosky & Metcalfe, 2009). The examples below show how OCTs can provide opportunities for students to practice and receive feedback on their use of these important skills in various disciplinary contexts.

- **Mary Ruffolo**, *Social Work*. Ruffolo coordinates an advanced course on clinical practice in which 20 graduate students are concurrently placed in field internships. The class meets face-to-face only once per week, so she uses a blog to facilitate continuous learning and exchange among students. For example, students sign up for a number of weeks to post reflections on challenging clinical experiences as they relate to the weekly course readings. Students also exchange and reflect on the resources and tools used in their fieldwork. Due to the blog, students report increased engagement and improved dialogues with peers during their fieldwork and class meetings compared to writing traditional reflection papers. The blog enhances Ruffolo's classroom teaching because she draws from the material to prepare lectures and discussion activities. The blog also facilitates her oversight of the integration of classroom and field internship learning by enhancing student-instructor interactions.

- **Scott Moore**, *Business*. In Moore's course, Business Thought & Action, 55 sophomores are challenged to apply the analytical tools they learn in class to business news articles via a class blog. Students' blog posts include, but are not limited to, analyses of corporate mergers, new business models and practices, and new markets for products and services. Students are required to post once per month and to read and reflect substantively (comment) on the writings of other students at least twice per month, helping the entire class learn about current events in business while practicing the application of key concepts and skills. Moore comments on students' posts, reinforcing desired behaviors, and he also provides guidance on how to write provocative posts that invite comments and responses. The class blog is public to the world, and the fact that some posts receive thousands of visits substantially raises student engagement. To manage course blogging efficiently, Moore sets up the blog to send him an e-mail any time a student posts or comments. He then creates an e-mail filter, so that these blog notifications automatically move to a designated folder, rather than cluttering his inbox. At convenient times in his schedule, Moore checks this blogging folder, accessing, reviewing, and grading blog activity through links in the e-mail notifications.

- **Melanie Yergeau**, *English*. Yergeau teaches in computer labs to help integrate technology into her teaching. The twenty-five students in her disability studies course participate in blogging and commenting activities, both in and out of class, supporting student dialogue and critical engagement with course content. Blog posts contain reading responses composed across a variety of media. For example, during one class, groups of students use digital cameras to create short, impromptu YouTube videos about disability, normalcy, and the built environment on campus and then integrate them into blog posts that are compliant with web accessibility requirements. In another assignment, students synthesize their learning through "carnival" blogging: blog posts that synthesize and link to other blog posts on controversial course topics. Using students' carnival blog entries as a starting point, Yergeau invites authors of external blogs to interact with her students on the class blog, creating a dialogue not possible in the context of the traditional classroom.

Increasing engagement and interactivity in large courses

Although lectures are an effective way to disseminate content efficiently to large numbers of students, to present cutting-edge material not available elsewhere, and to model expert thinking, students can easily become passive, disengaged learners in a traditional lecture setting (Bligh, 2000; Cashin, 1985). And there is increasing evidence that the use of well-structured active-learning approaches results in increased student learning (Deslauriers et al., 2011; Prince, 2004). Consequently, instructors often wish to infuse active learning into their teaching, but find that doing so in large lectures can be logistically challenging. The use of peer instruction and instructional technologies, such as clickers, to overcome these difficulties is well documented (e.g., Bruff, 2009; Smith et al., 2009; Zhu, 2007). Here, we describe how several U-M instructors have used OCTs to increase student interactions and engagement with course content in large lecture courses.

- **Mika LaVaque-Manty**, *Political Science*. LaVaque-Manty teaches lecture courses with 100-300 students and several GSIs. He has used Google Docs to foster and monitor small group discussions during class. Students are divided into groups that are either pre-assigned or based simply on where they happen to sit. Depending on the number of groups and the purpose of the assignment, they may work on a single Google Document or generate one for each group. In either case, only one student in a group serves as a "scribe," although other students may view the shared document. This way, a student's lack of a laptop is not a problem, and the number of documents remains manageable. In cases where the entire class works on a single document, the instructors create it, share it with the students, and divide it into sections so that a manageable number of groups (3-5) works on each section. They can then project the collectively produced document so that the class can debrief it together. At other times, LaVaque-Manty asks each group to create its own Google Document and share it with the instructors. He uses this strategy for brainstorming or for answering specific questions. In addition to standard text-based documents, LaVaque-Manty has used Google Drawings to encourage students to engage in visual brainstorming and concept mapping during class. Instructors can read, comment on, and even grade documents and drawings after class.

- **Robin Queen**, *Linguistics*. Queen lectures to about 150 students in a 300-level linguistics and anthropology course on language and social conflict. To increase student interactions with peers and internet content related to the course, she instituted a blog for each discussion section of 25 students. Queen and her graduate student instructors provided a weekly discussion prompt and seeded blogs with initial posts, to model ways of meeting the desired criteria. Students were randomly assigned two dates when they had to post. Students could either use the prompt to frame their post, or they could post on a topic of their choosing. To earn a "B" grade for blogging, students also had to comment on peers' posts twice a week. More extensive weekly commenting could earn an "A." GSIs monitored and graded blog posts and comments based on content, instead of assigning conventional essays. Like other instructors CRLT interviewed, Queen's GSIs reported that the effort of grading blogs was comparable to grading conventional essays, but that the degree of student interaction and exchange increased dramatically.

GSIs also used blog discussion threads as primers for their weekly discussion section activities.

Efficiently managing courses

Faculty research, teaching, and service workloads can be large and challenging to manage. On average, U-M faculty report working over 58 hours per week, spending over 25 hours per week on teaching alone (Wright, 2011). As described in the examples below, OCTs not only enhance teaching, but can also facilitate effective course management.

- **Joe Bull**, *Biomedical Engineering*. Bull teaches an "old-school, chalk and blackboard" lecture course, introducing biomechanics to 95 sophomores. The course emphasizes quantitative problem-solving techniques to help students learn to think like biomedical engineers. Many students use office hours as a critical support mechanism. During a term with demanding travel obligations, Bull did not want to decrease his accessibility to students or the quality of student-instructor interactions. Thus, on several occasions, he used Google+ Hangouts to hold virtual office hours from another continent. First, Bull added his students to a Google+ "circle," a private group within this social networking application. Circle members can share documents and create and join hangouts of up to ten participants. A Hangout enables video and audio web conferencing, as well as text-based chat, and it also allows participants to share screens and files. Consequently, Bull could create a Hangout and hold office hours at the usual times with any students who wished to join online. As in his traditional office hours, Bull displayed and discussed a copy of the current assignment, answered questions, provided supplemental explanations and resources, and mentored students on problem-solving strategies. The screen-sharing functions were particularly well suited to troubleshooting segments of computer code from students' assignments. Similarly, students could share and discuss documents containing their attempts to solve quantitative problems. Bull also used a drawing application on his iPad to model problem-solving techniques during Hangouts. After handwriting solutions on his iPad, he would e-mail them to himself and then share the .pdf file with students in the Hangout, so that he could illustrate his explanations. Thus, Google+ Hangouts provided an effective means to increase accessibility to students without significantly increasing instructor workload or sacrificing the quality of small group or individual instruction. Links to a Google+ Hangout can also be embedded in the events in one's Google Calendar.

- **James Morrow**, *Political Science*. Morrow teaches a large introductory lecture course that employs a team of GSIs who lead weekly discussion sessions of 20-30 students on assigned readings and lecture content. Training GSIs and coordinating teaching across sections can be challenging in large courses. Likewise, maintaining and sharing institutional memory of successful and unsuccessful teaching practices is difficult, especially given rapid turnover of GSIs across terms. Consequently, Morrow used the wiki within CTools to collect and archive effective instructional materials and lesson plans for GSI discussion sections. Weekly course meetings with GSIs can include group reflections on instructional practices and updates of wiki content. GSIs in physics have used a similar approach to document and share common student problems and effective teaching practices within and across terms in gateway lab courses.

Recommendations for Effectively Implementing Online Collaboration Tools in Teaching

Learning about new technologies can help instructors innovate. Technology can positively impact teaching by: (1) automating or increasing the efficiency of course management activities, and (2) providing opportunities for learning that were otherwise impossible or logistically difficult (Zhu & Kaplan, 2011). If a tool will not tangibly add value to your teaching in at least one of these ways, then it may not make sense to use it. When implementing new instructional technologies, the faculty we interviewed identified the following key considerations.

Carefully select specific instructional technologies

U-M's adoption of the Google suite of applications and other cloud-based tools (e.g., Box and Piazza) has made a large set of OCTs free to instructors and students. Often,

multiple OCTs provide ways to achieve the same goal, each with its own advantages and disadvantages. Ultimately, any choice of instructional technology should be closely aligned with and motivated by one's teaching and learning goals. Nevertheless, when selecting among options, the following aspects are also important.

Start-up costs. Instructors should consider how difficult it is for them (as well as their students) to set up and learn any given tool. For example, if an instructor wishes to make a tool available to an entire course (e.g., grant students permissions as authors on a blog), it may be preferable to use a tool for which U-M provides grade roster import/export options. It can be time-consuming to enter dozens of students as authors on a blog or give an entire course access to a storage site manually, so the ability to share permissions with class rosters significantly reduces start-up times. Currently, such course groups can be created in MCommunity for most Google Apps (for instructions, please see http://www.itcs.umich.edu/itcsdocs/s4390/). For exceptions (e.g., Blogger) one can use the "export memberships" link under the course groups tab in MCommunity to open a spreadsheet with a column of student e-mail addresses that can be copied and pasted to set permissions in OCTs. (Class roster e-mail lists may also be exported from U-M's Wolverine Access.)

In general, most of the current OCTs are very easy to use, but it is always a good idea to test drive a tool, especially from a student's perspective, before making it a part of one's instruction. For example, it takes merely minutes to set up a blog or a Google Sites website, even for a novice, but it may take longer to make one that is easy to navigate. Furthermore, using an OCT's basic functions may be intuitive (e.g., posting text to a blog), but advanced functions critical to particular learning activities may be more difficult to learn or use (e.g., posting and captioning videos on blogs).

IT support. What technical support is available to students and instructors? Before using an OCT that is not supported by U-M or the IT staff in one's academic unit, instructors should carefully consider their comfort level, willingness, and availability to serve in the role of tech support and training. Similarly, it is important to consider whether your classroom has the appropriate infrastructure to support the desired technology use (e.g., power outlets for students' devices, wireless internet with sufficient bandwidth).

Tool overload. Students can be overwhelmed by the diversity of instructional technologies in several ways. First, they may become frustrated if they have to learn how to use many different tools to complete similar tasks across courses. Using common, U-M supported tools may help keep the focus on learning course content, rather than learning how to use a new technology.

Second, managing accounts and passwords for different OCTs can be challenging. Fortunately, U-M supported OCTs, such as Google Apps, Box, and Piazza, allow students to log in using their U-M uniqname and password. To use apps not supported by U-M, students may need to create new accounts and passwords for each tool. The number of accounts and passwords within and across courses can rapidly become unmanageable for students.

Third, leveraging U-M's learning management system (CTools), can ease students' navigation of course materials and multiple online tools. Access to most OCTs can be linked to CTools via the Web Content and/or Resources tools, providing "one-stop shopping" and a common look and feel for students as they engage with courses.

Accessibility. Is the technology accessible to students with disabilities? For example, Google Docs are accessible to some users with disabilities, primarily via keyboard shortcuts, but are not accessible to visually or dexterity impaired users who depend on screen reader or speech input technologies. If instructors select technologies that are not accessible, they should consider employing an additional strategy. For instance, in addition to sharing a Google Doc with students, instructors could upload a .doc version to Resources in CTools, which is accessible to visually impaired students. For more information on the accessibility of OCTs, please see http://www.itcs.umich.edu/atcs/news/google-apps-accessibility.php. For questions or assistance, please contact the Knox Center Adaptive Technology Computing Site (http://www.itcs.umich.edu/atcs/computing-site.php).

Protect students and their privacy

One of the virtues of OCTs is that sharing content is easy. Instructors should, however, think about how widely information from a course or a tool will be shared. A blog

or a course-generated website or wiki, for example, might be a meaningful project for students exactly *because* it is accessible to the public at large: students may feel empowered as knowledge producers or be excited to interact with the public, including experts external to U-M, as part of the learning experience. Students can be *required* to produce publicly available content, if this activity is central to the learning goals of the course. However, this expectation should be clearly stated in one's syllabus. Additionally, to protect students' identities and ensure their safety, instructors *must* provide the option for students to participate anonymously or to use an alias, when content is public.

Public sharing isn't, however, always the best approach or even feasible, for example, in medical settings when sensitive material is being discussed. Even if public access to content is granted, decisions still need to be made about allowing viewing, commenting, and/or editing. An instructor should decide on a policy before using a tool in a course. One's policy depends partly on the nature of the content created and partly on student privacy considerations. Instructors should carefully manage the privacy settings within a tool: it is often easy to make a mistake, particularly because default settings vary across tools.

Whether a student produces content under his or her real name or not, he or she retains the right to be identified as the work's author, and instructors must ask for students' consent to use their content for any purpose beyond the scope of the course. A discussion about intellectual property, copyrights, and other intellectual property regimes (e.g., Creative Commons licensing) may be helpful in a course that produces public content.

Resist the myth of "the tech-savvy student"

This recommendation is slightly counterintuitive given students' increasing use of technology in their lives (EDUCAUSE, 2011). It nevertheless is a mistake to assume that all of our students are extremely sophisticated users of contemporary technologies. Most demonstrate facility with technologies that may be unfamiliar to faculty. However, these applications may be irrelevant to academic work, or students may have only a surface-level familiarity with them. As with academic background and preparation for college, students also vary significantly in technological

proficiency. It is therefore not a good idea to expect one's students to be familiar with any given OCT. At the same time, faculty report that current undergraduates are willing to learn, and in many cases it may be enough to encourage them to play with a tool and, where appropriate, allow individuals to share their knowledge with others, including the instructor.

Members of CRLT's faculty learning community recommended several effective strategies to support the successful use of OCTs by students. Some faculty dedicate time during the first class to teaching students both how to use the tools and how to troubleshoot technical problems. Demonstrations often included a hands-on introductory activity for students (e.g., creating and sharing a Google Doc, commenting on a blog post). Other faculty enlist IT support staff to provide a workshop to train students in the use of a particular OCT. Alternatively, some faculty create video tutorials using screencasting software like Camtasia or Jing that allow students to learn how to use the tools at their own pace, as needed.

Develop guidelines for equitable and inclusive participation

As with all group work, instructors should consider using strategies to foster equitable participation and accountability (see Finelli et al., 2011; Oakley et al., 2004). Faculty also found it helpful to develop guidelines for appropriate etiquette just as they do for in-class discussions. For instance, when online, students might make inappropriate or unprofessional comments, especially from a position of anonymity, that they would not say to someone face to face. Consequently, faculty often invited students to help develop guidelines, building consensus and student ownership around acceptable practices. These practices can help promote respectful, inclusive dialogue (e.g., see http://www.crlt.umich.edu/publinks/discussionguidelines).

Actively foster and sustain desired student engagement

Getting students to use an OCT and then keeping up with what gets produced can be a challenge. Simply making a tool available for students doesn't mean that it will get used; students may need some incentive to use it. For example, a purely voluntary blog is unlikely to get contributions or readers. On the other hand, some incentives may make it difficult for instructors to keep up with student-produced

content. When considering an OCT, asking yourself the following questions can be helpful:

- *How large is my class, and how many students will use this tool?* For example, 300 regular contributors on a blog is too many. A class of 15, on the other hand, will need strong incentives to keep a blog active. Will each section have its own blog/wiki/website, or will it be course-wide?

- *To what extent should I incentivize participation?* Faculty reported learning tremendous amounts from reading students' required contributions to OCTs, but getting students to engage voluntarily and extensively with peers' contributions was difficult. Without compelling incentives, students strategically allocated their limited time to other course activities.

- *Who will keep up with this tool, and how carefully?* The instructor? The GSIs? Will all work be commented on carefully, or will it simply be checked? Will this tool add to the course workload for students and instructors, or will it replace something else?

- *Whom should I credit?* If students are allowed to contribute anonymously or with pseudonyms or avatars, what mechanism will allow the instructor to identify them? How does one disaggregate different students' contributions to, for example, a single essay?

- *How will I optimally sequence activities to promote engagement?* What are the critical milestones, and are they realistic? Is there sufficient time for students to post content and then critically engage with peers? Is there sufficient time for instructors to participate in the online interactions or provide feedback?

- *What are the criteria for successful performance?* The most successful learning community projects clearly delimited expectations regarding the number and timing of contributions and comments. These instructors also explicitly communicated evaluation criteria, "seeded" their OCTs with exemplary contributions or comments, and/or facilitated classroom discussions of what constitutes an effective contribution and how to foster sustained peer engagement (e.g., asking provocative questions of others, linking to other people's content, including multimedia elements).

- *Are there opportunities to integrate student-generated OCT content into face-to-face sessions?* Student-generated content from OCTs can be used to stimulate or deepen face-to-face dialogues, to provide rich examples illustrating fundamental course concepts, or to diagnose and address common misconceptions. Linking online, asynchronous engagement to face-to-face instruction helps to deepen the meaningful integration of technology into a course and minimizes students' perceptions of online activities as tangential or busy work.

None of these concerns are reasons not to use OCTs, nor is there a single correct answer to any of them. Rather, we recommend that an instructor think about them in advance.

Have realistic expectations

This paper highlights a variety of approaches by which OCTs can significantly enhance teaching and learning. Unfortunately, technology can fail mechanically. Therefore, it is always a good idea to have a contingency plan in place, especially if your learning activity depends heavily on a particular technology. Based on faculty experiences, we also recommend starting small. Select one OCT to pilot in one course. Our learning community members were unanimously glad they took a risk on a new pedagogy, but agreed that one may need to be persistent to reap the benefits of one's investment. Implementation did not always go flawlessly, but faculty usually identified minor tweaks that would optimize efficiency or efficacy. Finally, we recommend that instructors avoid operating in isolation. Talking to colleagues, IT support staff, and CRLT instructional consultants can minimize instances of reinventing the wheel and facilitate successful integration of instructional technologies into one's teaching.

Acknowledgements

Table 1. Selected Online Collaboration Tools and Applications for Teaching and Learning

Google Apps	Selected Interesting Features	Sample Applications for Teaching
Blogger	• post text, images, audio, video • respond to posts • private or public	• postings of course notes, materials • forum for student writing and reflection/analysis • space for student dialogue
Calendar	• manage multiple calendars • subscribe to existing calendars • "smart" scheduling by querying availability	• schedule GSI meetings, student team meetings • students sign up for office hour appointments • students subscribe to supplemental events
Docs (Documents, Drawings, Forms, Presentations, Spreadsheets)	• synchronous/asynchronous collaborative authoring/editing • commenting (threaded discussion) • synchronous text chat while editing • document sharing • version control • organized by "collections" for easy search and retrieval (multiple identifying tags possible)	• collaborative authoring by students/instructors • interactive feedback on student work via comments in margins • easy surveys, classroom assessments, scheduling of make-up exams, etc. • collaborative concept mapping or image annotation • collaborative collection and analysis of lab data
Google+ Hangouts	• video conferencing with multiple participants • social networking	• remote collaboration by student teams • interaction with guest lecturers/panelists • remote office hours • workshopping student writing
Moderator	• create backchannels during lectures, seminars, and presentations • audience may submit and vote on questions or ideas	• collect, prioritize, and respond to student questions during a lecture, in real time or during planned intervals, rather than calling on hands • vote on and prioritize ideas or questions submitted by students in response to instructor prompts • use as a "clicker" system to respond to questions/answers
Sites	• collaborative website creation • private or public	• creation of student project websites • documentation of student work • creation of course/curricular materials
Other Online Collaboration Tools Integrated With CTools		
Box	• store, organize, and share large files • tag and search files • comment on files • create editable task lists at the level of files	• students collaborate on video production projects involving many iterations • instructors provide feedback and mentorship on group projects
Piazza	• wiki-style discussion forum to ask and answer questions • instructor can endorse an answer • editor supports equations • tag and search posts • generate report of site activity	• mechanism for crowdsourcing Q&A with students in large courses and reducing course-related e-mail traffic

Chad Hershock, Ph.D., Center for Research on Learning and Teaching (CRLT), University of Michigan, 2012

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STUDENT TEAMS IN THE ENGINEERING CLASSROOM AND BEYOND: SETTING UP STUDENTS FOR SUCCESS

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There is wide demand for engineering graduates to be capable of working well in teams. The National Academy of Engineering's 2004 report *The Engineer of 2020: Visions of Engineering in the New Century* notes that "the engineering profession recognizes that engineers need to work in teams" (p. 43) and that "the challenge of working effectively with multicultural teams will continue to grow" (p. 35). Engineering employers and graduates also see the value of strong teamwork skills, but both observe that the undergraduate experience does not adequately prepare graduates in this regard. Only 39% of employers rated graduates as "very well prepared" for teamwork in a survey conducted on behalf of the Association of American Colleges and Universities (Peter D. Hart Research Associates, 2008). Similarly, results of a 2009-2010 U-M College of Engineering survey found that 72% of recent undergraduate alumni rated "ability to function on a team" as *extremely important* in their professional experience, but only 47% felt that U-M provided *excellent preparation* in this regard (Office of Student Affairs, 2010). Clearly, there is a strong need for higher education to better prepare students for the team interaction they will encounter after graduation.

The engineering accreditation body (ABET, www.abet.org) has responded to this need by requiring engineering programs to demonstrate that their graduates have "an ability to function on multidisciplinary teams" (Haag, Froyd, Coleman, & Caso, n.d.), and many engineering instructors have integrated the use of student teams into their courses. When done well, there are a number of advantages to using teams. Research has demonstrated that regardless of subject matter, students who engage with course material by working in teams tend to learn more of what is taught and to retain it longer than when the same content is presented in other instructional formats, such as lecture (Davis, 1993; Johnson, Johnson, & Smith, 1998a; Springer, Donovan, & Stanne, 1999). There is also plentiful evidence that students who work together on teams outperform even the highest achieving individual students (Hsiung, 2010; Johnson & Johnson, 1999; Johnson, Johnson, & Smith, 1998b; Springer, Donovan, & Stanne, 1999) and are more likely to attain higher-order thinking skills such as analysis, synthesis, evaluation, and problem solving (Johnson & Johnson, 2002; Springer, Donovan, & Stanne, 1999; Wankat & Oreovicz, 1993). Effective use of student teams also has powerful positive impacts on minorities and women in

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terms of achievement and attitudes (Copper & Robinson, 1998; Drane, Smith, Light, Pinto, & Swarat, 2005), and the benefits for students who interact on *diverse* teams are many. For example, problem-solving teams comprised of diverse members consistently perform better than teams of members who approach problems in a similar way (Page, 2007), and students' ability to engage in active thinking, their level of intellectual engagement, and their self-rated academic ability are all enhanced by experiences with diversity (Gurin, Dey, Hurtado, & Gurin, 2002; Watson, Johnson, & Zgourides, 2002).

The characteristics of effective student teams have been widely studied, and there is ample research on what makes student teams succeed. Johnson, Johnson, and Smith (2007), for example, define five traits of effective student teams, and they note that each one is critical for success. The first trait is *positive interdependence*: students work together to accomplish a shared learning goal, and each student can achieve his or her learning goal if and only if the other team members achieve theirs. The sense of accomplishment must come from the knowledge that every person on the team succeeded. Second is *individual accountability*, which suggests that each member should be accountable for his or her learning, and every person must do a fair share of work. This can improve student motivation and improve the overall energy level of the team. The third trait, *face-to-face interaction*, is crucial for building interpersonal skills, as teams work best when members are physically present to interact with the others on the team. Fourth, team members should learn *interpersonal and small-group skills* and should use these skills as the team works together. Last, but not least, the team should periodically *assess its performance* as a team, reflecting on what has been useful or problematic in ensuring effective working relationships and making decisions about what behaviors should continue and which ones should change.

Our purpose in this Occasional Paper is to provide instructors with a framework for ensuring that student teams possess these five traits and are set up for success. The framework consists of four related components shown in Figure 1: designing good team assignments, constructing student teams carefully, teaching teamwork skills, and assessing student teams. We advocate that instructors reflect on this framework and practical aspects related to it as they plan and use student teams in the classroom. In the next sections we separately address each of the four components and offer suggestions for instructors to create environments that are conducive to teamwork and are rewarding for all involved. We emphasize the importance of considering all four components collectively: individually, none of the four

will ensure successful student teams and disregarding one or more of the components may result in an unproductive experience for both students and teachers. We also highlight some of the many U-M faculty who have successfully integrated these components into their teaching. Though the examples come from engineering, the ideas described herein can be applied in a variety of college contexts and can be adopted by instructors with any level of experience.

Figure 1. Four components of using student teams successfully

Design Good Team Assignments

Well-planned team assignments are crucial to using student teams well. Michaelsen, Knight, and Fink (2004) observe that most problems of poor student behavior during teamwork "are the result of bad assignments, not bad groups" (p. 71). As with any class assignment, team assignments should have a clear purpose and function and should align with course goals and grading criteria (e.g., Piontek, 2008; Svinicki & McKeachie, 2011), but they also should require individual accountability as well as positive interdependence (Johnson, Johnson, & Smith, 2007; Michaelsen, Knight, & Fink, 2004). Planning a team activity that fits these characteristics requires the instructor to consider the content of the assignment, the academic expectations for the task, the level of preparation required of the students, the way in which the work will be assessed, and the reasons why a team is needed to accomplish the activity. In order to ensure that activities will be suitable for teamwork and that students will have the tools and time to complete the assignment successfully, instructors should

also think through practical aspects of having students work in teams (e.g., when teamwork will take place, whether students will have time to report to the class, and how and when feedback will be given to students). The list of suggestions that follows expands on some of the key points for developing good team assignments.

Begin with simple, well-defined tasks,
then increase their difficulty

Team assignments early in the term should include relatively simple, well-defined tasks that require a specific product so students can concentrate on the mechanics of teamwork (Michaelson & Sweet, 2008). For example, a good first-time task may require teams to collaboratively complete a table of definitions and reflect on their team interaction during the process, allowing the instructor to award points based on how well the students worked together to accomplish the goal. As the term progresses, the instructor should assign more complex and ambiguous tasks that promote higher-level thinking skills. (Of course, regardless of complexity, assignments should always be relevant, solvable within a reasonable time frame, and intrinsically interesting.) For example, instead of having students make a list or choose among a few alternatives, students could be asked to "make multiple comparisons and discriminations, analyze content information, and verify rule application" (Michaelsen, Knight, & Fink, 2004, p. 65).

Define individual versus team accountability

A common student complaint about team assignments is that unclear instructions about student roles and division of work allow individuals on a team to contribute unequally without penalty, especially if a single assignment is to be submitted by the team. One strategy to overcome these issues is to require students to rotate through well-specified roles (e.g., scribe/note-taker, time-keeper, clarifier, reporter, and manager) during the term to ensure that each student has the opportunity to take on different responsibilities (Hansen, 2006; Stein & Hurd, 2000). Rotating the leadership role has been shown to result in higher levels of cooperation and performance on student teams (Erez, Lepine, & Elms, 2002) by helping students understand expectations, encouraging individuals to contribute fairly, and enabling students to experience group work as more rewarding and productive (Hansen, 2006; Page & Donelan, 2003). The number and types of roles will depend on the number of people on the team, the length of time the team will be together, and the complexity of the task.

In addition, the assignments should define individual versus team accountability (Cooper, 2009) and provide

guidance about expected student contributions to the project. For example, an assignment that does *not* do this might be the following: "Research the impact of the 2010 Gulf Oil Spill on the environment. Then give a presentation based on your findings." Without careful structure, this simple approach to team assignments may result in students completing the task via a divide-and-conquer method. A better example that more clearly defines individual versus team accountability is the following:

As a team, research the impact of the 2010 Gulf Oil Spill on the environment, prepare a 10-page written report, and present your findings to the class. Collectively, your team should identify important areas to study (e.g., biological impact on plants and fish, how oil settles or disperses in the water, impact on shorelines), and then each team member should research a different area, prepare a two-page overview, and describe the impact to the rest of the team. Your written report should include the two-page overviews as well as a cohesive introduction and a summary that describes the overall impact on the environment. Each team member should participate equally in preparing the class presentation, and one member of the team will be chosen randomly to make the presentation. The team will be graded on both

A Note on Academic Integrity: Designing assignments that require interdependence without conveying expectations about student collaboration can be confusing for students. The U-M College of Engineering honor code states, "It is dishonorable for students to receive credit for work that is not the result of their own efforts," yet because team assignments require students to work together, students may feel they are receiving mixed messages when asked to work in teams. Instructors should strive to be explicit—from the beginning of the term—about which types of collaboration are and are not acceptable, and guidelines for balancing teamwork with an honor code should be clearly stated in a syllabus (Meizlish, 2005). This is especially important when the instructor expects some of the class assignments to be completed individually and other assignments to be completed as a team. Helping students understand your expectations will avoid misunderstandings and encourage an appropriate balance between independence and collaboration.

the written report and the presentation, and individual scores will be adjusted based on the quality of the two-page research overview.

This second set of instructions clarifies how the work should be distributed among individuals, and it conveys the expectation that the team should work together to create the final cohesive report and presentation.

Develop assignments that require interdependence

As Michaelsen and Sweet (2008) write, "the most fundamental aspect of designing team assignments that promote both learning and team development is ensuring that they truly require group interaction" (p. 12). That is, assignments should require teams to make complex decisions together and allow all team members to contribute and participate in the decision making process. In the Gulf Oil Spill example described previously, team members must distribute work in a way that will result in a cohesive presentation about the overall impact on the environment. This requires complex reasoning and a lot of teamwork, but because it can result in a relatively simple presentation, it can allow the team to focus on interacting and content-related decision making, thus further promoting interdependence.

Construct Teams Carefully

Creating student teams that will work well is another critical aspect of using student teams in the classroom. Important considerations in this regard include the number of students

> **Steve Skerlos** of Mechanical Engineering regularly uses teams in *ME 450: Capstone Design and Manufacturing*, and he knows that creating diverse student teams and rotating the roles are important for their success. He assigns teams by selecting students with diverse characteristics, assessed at the beginning of the class with a short survey. The team project is complex enough that an individual would be unable to complete it successfully, and students are required to especially focus on a subpart of the project (e.g., the software, the robotic arm control, or the mechanical structure). Team roles such as industry liaison, meeting facilitator, and treasurer rotate during the term (to the extent possible), and he relies on peer assessment to ensure that all students are doing their fair share of the work.

per team, the level of diversity on student teams, and whether or not the instructor determines the membership. Here we present some practical, research-based guidelines for creating effective teams.

Form teams of three to five members

Smaller teams better facilitate individual account-ability and allow for more flexible scheduling when out-of-class activities are required. On the other hand, larger teams have the potential for more resources, ideas, and points of view to be brought to the problem. In general, teams of three to five students work best, with smaller teams recommended for short-term activities or simple tasks and larger teams for long-term, complex activities (Birmingham & McCord, 2004; Johnson, Johnson, & Smith, 1998c).

Form heterogeneous teams

Heterogeneity is an important characteristic for effective teams. Students on heterogeneous teams bring diverse perspectives and problem-solving approaches, but they may require more time and effort to develop strategies to work efficiently as a team (Birmingham & McCord, 2004). The benefits, though, outweigh these issues for long-term teams, and research finds that "although diverse groups typically have more initial difficulties, after forty hours of working together they are typically more effective than homogeneous groups" (p. 75).

What types of diversity are good for teams? First, teams that have a broad range of abilities and problem-solving perspectives among members tend to be more successful than those that are homogeneous in this regard (Brewer & Mendelson, 2003; Heller & Hollabaugh, 1992). Hong and Page (2004) suggest that such *functional* diversity, or "differences in how people represent problems and how they go about solving them" can be an important attribute of high-performing teams (p. 16385). Other researchers have also demonstrated that working with others of different abilities offers benefits to students at all levels—the more capable students become more aware of their thinking processes, while the less capable student learns from an advanced peer (Oakley, Felder, Brent, & Elhajj, 2004; Wankat & Oreovicz, 1993).

Teams should be heterogeneous in other respects as well—they should include men and women, as well as majority students and minority students whenever possible (Tonso, 2006). Research suggests that when women or minorities are outnumbered in engineering teams, their team participation can be negatively affected because their

opinions may not be considered valid by their teammates, or they may be assigned unimportant tasks (Ingram & Parker, 2002; Michaelsen & Sweet, 2008). Therefore, it is critical that whenever possible, teams be formed in ways that avoid isolating individual women or minorities. This is especially important in introductory courses when students are new to the field and have not yet established support mechanisms like study groups or academic networks.

Use instructor-assigned teams

Team membership can be selected by students, determined randomly, or assigned by the instructor based upon individual student characteristics. Of these three methods, teams chosen by students tend to be the most homogeneous, while instructor-assigned teams that are balanced in terms of race, gender, ability, and problem-solving approach are more likely to be heterogeneous (Oakley, Felder, Brent, & Elhajj, 2004). Instructor-assigned teams also offer control over the ways in which resources are distributed among teams and result in a stronger sense of fairness.

Consider practical issues when creating teams

The length of the team project and expectations for meetings outside class should be considered when forming teams, because even the best heterogeneous team is likely to fail if the team cannot find a common meeting time. Thus, when students need to work together outside class, instructors should consider out-of-class availability when forming the teams. One way to do this is to query the students about their schedules and use this information in conjunction with other criteria in forming teams (Oakley, Felder, Brent, & Elhajj, 2004). There are on-line automated systems that simplify this process. For example, Team-Maker© is a free, web-based tool (www.catme.org) that collects data from students and automatically creates teams according to criteria specified by the instructor.

Teach Teamwork Skills

The ability of team members to work effectively together can evolve over time as students acquire important skills. The four stages of forming, storming, norming, and performing are commonly used to describe this evolution. *Forming* is characterized by orientation to the team and dependence on others, while *storming* is often marked by conflict and resistance to group influence (Hansen, 2006). This resistance is overcome in the *norming* stage, during which cohesiveness develops, and new roles are adopted.

Finally, in the *performing* stage the team is focused on the task, and "structure can now become supportive of task performance" (Tuckman, 1965, p. 396). It is important for students to know that their teams are likely to experience conflict as they work together and for instructors to provide students with ways to deal with those conflicts. The suggestions offered in this section highlight good practices for teaching teamwork skills – other resources may also be helpful (e.g., Michaelsen, Knight, & Fink, 2004; Millis, 2009; Stein & Hurd, 2000).

Pauline Khan of the Technical Communications Program in the College of Engineering relies on teamwork in *ENGR 100: Introduction to Engineering* to help first-year students learn to communicate as a team, complete written and oral team reports, and help each other master technical material. From her 22 terms of teaching experience, she knows that creating the right teams is a critical element for success, and she has devised the following system for assigning student teams. She administers a survey to identify certain characteristics, including where students live; availability for out-of-class meetings; self-assessed computer skills, oral presentation skills, writing skills and teamwork skills; gender/ethnicity; and names of classmates with whom students prefer not to work. She then creates teams of four to five students, guided by the following criteria:

- Members of each team have complementary skill sets,
- Minority or women students are paired on a team so those students have social support mechanisms,
- Members of teams do not have conflicting evening schedules,
- First-year students who live off campus are placed on the same team because they often empathize with one another and understand each other's meeting time limitations,
- Students on a given team live near each other for ease of meeting, and
- Students who clearly state a preference to NOT work with a particular class member are not placed on the same team.

She has refined this system over time and has found it to be successful because it reduces the potential for common teamwork problems.

Have students talk about important team behaviors

Students typically have not received specific guidance on how to be a good team member, and they lack strategies for addressing common team dilemmas. It is the instructor's responsibility to explain to students why teamwork is being used in the class and to help students develop the skills needed to be good team contributors. Johnson, Johnson, and Smith (2007) explain that students not only need to learn practical skills for working in a team, but they also need to learn "civic values," including

> commitment to the common good and to the well being of other members, a sense of responsibility to contribute one's fair share of the work, respect for the efforts of others and for them as people, behaving with integrity, caring for other members, compassion when other members are in need, and appreciation of diversity. (p. 21)

To impart these values and offer resources for resolving some of the challenges of working on a diverse team, instructors might devote a portion of the first class meeting to team building activities (see Kapp, 2009, for a description of successful activities) or develop an initial assignment to help the team work together. For example, having students complete a learning style questionnaire and then reflect on their team's results (e.g., by writing a team essay that describes differences in members' learning styles that could affect collaboration, as well as possible ways of using the differences to their advantage) has been shown to increase students' team skills (Finelli, 2001). Similarly, instructors can create simple scripts depicting common team dilemmas and invite students to role play the situation or give a class assignment asking teams to reflect on characteristics of successful teams, discuss challenges they have encountered, and list strategies for resolving conflict.

The College of Engineering has used variations on both of these ideas by introducing an interactive theater sketch in *ENGR 100: Introduction to Engineering* to provide students with strategies for resolving common team dilemmas and to enhance students' perceptions of the value of diversity on student teams. Performed by the U-M Educational Theater Company, the sketch has resulted in statistically significant benefits for first-year engineering students. After seeing the performance, students reported being better able to resolve common team problems than they could at the beginning of the term, and they placed greater value on diversity, compared to students in a control group who did not see the performance (Finelli & Kendall-Brown, 2009). One explanation for these benefits may be the interactive segment of the sketch during which students generate a list of strategies for having a successful teamwork experience. The director of the theater company has compiled the strategies from several performances into the following list of seven suggestions (McKee, 2010):

1. Think about the roles you tend to play within teams, and make a conscious effort to be open-minded about how these roles will play out in teams. For example, if you usually lead, take time to step back and listen.

2. Be aware of how gender, cultural backgrounds, socio-economic status and life experiences could affect your team members' performance.

3. Assume that your team members are doing their best and want the team to succeed.

4. In meetings, communicate clearly, directly, and respectfully. If a team member's behavior is inhibiting progress, address the issue in a timely, professional manner.

5. Communicate expectations, schedules, and goals for the project at the onset of working together.

6. Be prepared to make sacrifices and be considerate of each other's schedules. Team members may have to rearrange their schedules to get everyone in a meeting, and they may have to hand over part of the project or make changes in plans to accommodate everyone's unique situation.

7. Organize and use time carefully. Set agendas for meetings, be clear about the action items for each team member before leaving each meeting, leave time to work as a team, and make use of each team member's skills and interests in order to take advantage of working with a diverse team of students.

Instructors might consider sharing the list with students who will be asked to work in teams.

Have teams develop contracts

Another way to foster teamwork skills is to have each team develop a contract, which involves discussing the team's purpose or mission, defining appropriate roles for each team member, and setting norms for conduct. Having – and using – a contract gives students ways to mediate team conflict and negotiate agreements on their own, enhancing team productivity (Johnson, Johnson, & Smith, 2007). Several faculty who teach *ENGR 100* require the student teams to develop a team charter (i.e., a shared set of team rules) as one of the first course assignments. The charter is intended to help the team plan for managing cases in which

a team member does not do his or her fair share of the work, doesn't attend team meetings or shows up late, exhibits disrespectful or unprofessional behavior, is excessively demanding, or is overly reserved. The team drafts a charter that everyone signs (indicating agreement with the principles) and gives a signed copy to the instructor. Then, when conflicts arise, the instructor can remind students about the contract, asking them to work together to define the source of the conflict, communicate feelings and positions, take the other person's perspective, and reach an agreement that is satisfactory to all team members (Smith & Imbrie, 2007). If the team needs it, the instructor can intervene to address unresolved conflicts.

Observe and guide teams

In some cases, teams need a great deal of support while individuals learn to interact with diverse peers. Observing the teams is fundamental to detecting and correcting problematic dynamics in a timely way (Fredrick, 2008). Instructors should periodically check in with the teams, perhaps by scheduling times to meet with each team during office hours or being present when the team works to-gether. During these meetings, the instructor should determine the extent to which the team is on track and observe the team dynamics. As needed, the instructor can ask refocusing questions such as, "Kathy, please summarize what the team has done thus far," or "Tim, please describe the team's plan for completing the task," and reiterate expectations about both individual accountability and interdependent work.

When monitoring team interaction, it is important for instructors to be mindful that team dynamics may vary based on the backgrounds of team members. For example, teams composed of students from cultural backgrounds that value the *collective* perspective display more cooperative behavior than teams composed of students from *individualistic* backgrounds (Cox, Lobel, & McLeod, 1991). And in traditional U.S. culture, women have often been socialized to develop group rapport and to seek interaction, while men have been socialized to seek independence (Ingram & Parker, 2002). Furthermore, gender-typical dynamics often exhibited by women students on teams (e.g., willingness to admit vulnerabilities or conceding one's own weaknesses in order to help a teammate "save face") also have an impact on perceptions of student ability. As such, coaching students to understand the value of collaboration, take ownership of and speak confidently about their ideas, and accept (or even demand) technical roles on projects might help students of varied backgrounds achieve success in an engineering community (Wolfe & Powell, 2008).

Other student characteristics can also impact dynamics. Students who are outspoken in class, for instance, may dominate their team, while other students may tend to avoid conflict and simply refrain from participating in the team (Heller & Hollabaugh, 1992). Being mindful of these dynamics, coaching the students through common team dilemmas, and intervening in ways that promote team awareness and encourage change (e.g., praising the class for exceptional behaviors or talking about ways to handle a particular situation) can lead to more successful team interaction.

Matt Collette of Naval Architecture and Marine Engineering infuses his team-based class, *NA 570: Advanced Marine Design*, with a variety of team training activities. The activities include a team-based reflection on individual personality characteristics and their impact on team dynamics, class discussions about common team problems and ways to overcome them (such as consensus building and other conflict resolution strategies), and a unit in which the class generates a list of "norms" for how members on teams should operate. Students are required to use a textbook on teamwork for the class (Parker, 2008), and Dr. Collette supplements the text with his personal experience as a practicing engineer and consultant. After students complete the module, he creates teams that include students of varied personality types, academic ability levels, and backgrounds and then assigns them a large team project. He reminds students to draw on their team training throughout the project and suggests they review the team norms from the training module.

Assess Student Teams

The fourth component of successful student teams in the classroom involves assessment, both of overall teamwork and of individual contributions. This section provides guidance on evaluating the success of team interactions and using peer evaluation to assess individual contributions.

Encourage and allow time for team processing

It is important to provide time and guidance for teams to examine how they are working together (Cooper, 2009). Because students may not know how to reflect on their teamwork behaviors, instructors should periodically ask

individual students questions such as, "What are the things that your team is doing that work well and what things would you like to change?" Such questions allow students to reflect on their own and their peers' contributions to the team and, when shared with others, illustrate the kind of responses that are useful. Instructors should build in time for in-class team processing throughout the term, debrief the class afterwards when appropriate, and discuss issues that arise with the whole class so students are informed of potential problems and given opportunities to brainstorm possible solutions. The small time investment required upfront for this has the potential to save time later in the course by preventing the escalation of conflicts or confusion.

Use peer evaluations

Because students have the most knowledge about individual contributions to the team, peer evaluations are an important method of team assessment (Cestone, Levine, & Lane, 2008; Loughry, Ohland, & Moore, 2007; Williams, Foster, Green, Lakey, Lakey, Mills, & Williams, 2002). A simple peer evaluation form commonly used in engineering is shown in the Appendix. This form allows the instructor to solicit self- and peer-evaluations about team contributions. The Comprehensive Assessment of Team Member Effectiveness (Figure 2) is a free, web-based version of the form that produces automatically-generated instructor reports, compiling student ratings and alerting faculty to potential team problems. It was developed through rigorous research and has been shown to be valid

and statistically reliable (Ohland, Layton, Loughry, & Yuhasz, 2005).

When effectively facilitated, the benefits of peer evaluation are many. Soliciting students' perspectives of their peers can help an instructor identify "free riders" who fail to contribute to the team and rely on others to get the work done (Glenn, 2009; Slavin, 1995). Students are challenged to think more critically about the process of teamwork (Fredrick, 2008), they reflect on the goals and objectives of a course (Cestone, Levine, & Lane, 2008), and they are more motivated to produce high-quality work when their peers evaluate them than when their instructor does (Searby & Ewers, 1997). Research also shows that students who participate in peer evaluation have an increased awareness of the quality of their own work and increased

Figure 2. Portion of CATME instrument for peer evaluation (adapted from www.catme.org)

Susan Montgomery of Chemical Engineering builds regular peer evaluations into both *ENGR 100: Introduction to Engineering* and the *Chemical Engineering* courses that she teaches in order to reinforce the message that she believes strongly in the value of teamwork. Using evaluations, students provide valuable feedback in a timely and professional manner, learn to raise and address issues as they emerge, and become skilled at receiving and acting on feedback from their peers. She has found that students take the process seriously when they know their comments will be acted on by others; only rarely has she encountered unprofessional comments.

The peer evaluations also allow Dr. Montgomery to monitor teams, identify problems early, and deal with issues that arise. When they reveal matters requiring her intervention, she meets with the team as a whole to help get them back on track. Though she sometimes meets with individual students before the team meeting to get a better sense of the situation, she stresses the importance of beginning with a "clean slate" during a team discussion and giving everyone a chance to speak their mind. Individual meetings can sometimes uncover other personal issues that are affecting a student's performance (in which case appropriate university resources can be mobilized), but having a team meeting makes the whole team (and not the instructor) responsible for working on the solution, and ensures that everyone will be satisfied with the agreed upon actions.

confidence in their abilities (Dochy, Segers, & Sluijsmans, 1999). On the whole, students find peer evaluation to be a fair method of assessment (Gatfield, 1999) and are generally very satisfied with the process (Cestone, Levine, & Lane, 2008).

Peer evaluation can be useful both to provide feedback to improve team interactions while the teamwork is in progress and to measure individual accountability in students' course grades. To accomplish the first objective, instructors should distribute peer evaluations at multiple points during the term so students can learn how to score their teammates and get used to sharing their (anonymous) ratings with teammates. And at the end of the term, the instructor can factor the students' ratings into the overall grade or adjust each student's team score by a multiplier based on the ratings to reflect their team contributions (Kaufman, Felder, & Fuller, 2000). Though it is important to make peer ratings count, if the course becomes overly dependent on them, students may start to feel as if they have not received appropriate credit for their individual efforts, and the peer feedback may become counterproductive.

Conclusion

Ample research highlights the benefits to students of effective teamwork, including increased retention of material, acquisition of higher-order thinking skills, and the potential to perform at a higher level than students would individually. Coupled with the critically important need for graduates to be able to work well in teams in professional settings, these benefits provide incentive for incorporating effective student teams into the engineering classroom. In this Occasional Paper, we have offered practical suggestions for designing good team assignments, constructing teams carefully, teaching teamwork skills, and assessing student teams. These suggestions are meant to guide instructors who are interested in using student teams in their classrooms so that their students benefit from more powerful learning experiences and become better prepared for careers in an increasingly team-oriented workplace. For further support on student teams, instructors can contact the Center for Research on Learning and Teaching, which offers individual consultations and programs to help improve teaching effectiveness.

Michael Flynn of Electrical Engineering also relies on peer evaluation in his senior- and graduate-level EECS classes, and he uses the automated CATME system. He relies on both the instructor's report, which summarizes student scores and flags potentially problematic ratings (e.g., under/overconfident students, individuals rated poorly by all teammates, and cliques) and the open-ended comments written by students. He finds the overall peer evaluation score to be a useful metric for student contribution to the project, and he uses it to adjust the students' grades. He notes that the system is fairly easy to set up, the students appreciate the safe way to provide feedback to their peers, and the process is valuable both for getting early project feedback to diagnose problems in groups and for assessing team contribution at the end of the term.

Appendix. Sample Peer Evaluation Form

<div style="border: 1px solid #000; padding: 10px;">

Peer Evaluation Form

Please write the names of all of your team members, INCLUDING YOURSELF, and rate the degree to which each member fulfilled his/her responsibilities in completing the team assignments. Use the following rating system:

Excellent — Consistently went above and beyond the call of duty, tutored teammates, carried more than his/her fair share of the load

Very good — Consistently did what he/she was supposed to do, was very well prepared and cooperative

Satisfactory — Usually did what he/she was supposed to do, was acceptably prepared and cooperative

Ordinary — Often did what he/she was supposed to do, was minimally prepared and cooperative

Marginal — Sometimes failed to show up or complete assignments, was rarely prepared

Deficient — Often failed to show up or complete assignments, was rarely prepared

Unsatisfactory — Consistently failed to show up or complete assignments, was unprepared

Superficial — Had practically no participation

No show — Had no participation at all

These ratings should reflect each individual's level of participation and effort and sense of responsibility, not his/her academic ability.

Name of team member	Rating
_____	_____
_____	_____
_____	_____
_____	_____

Your signature _____

</div>

Adapted from Kaufman, Felder, and Fuller (2000).

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CRLT Occasional Paper No. 29

***Center for Research
on Learning and Teaching***

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WRITING A STATEMENT OF TEACHING PHILOSOPHY
FOR THE ACADEMIC JOB SEARCH

Chris O'Neal, Deborah Meizlish, and Matthew Kaplan

*Domestic Environmental Policy and Politics. Lehigh University's year-old Environmental Initiative seeks an Assistant Professor for a tenure track position... To apply, please send a cover letter, current curriculum vitae, syllabi and other evidence of teaching style and effectiveness, a **statement of teaching philosophy**, a sample of scholarship (if available) and three letters of reference.*

*Assistant Professor (tenure track) Specialization in African and Post-Colonial Literatures.... Send letter of application, curriculum vitae, **statement of teaching philosophy**, graduate school transcript, and three letters of recommendation... Northeastern Illinois University is an affirmative action, equal opportunity employer.*

*LSU's Department of Chemistry (chemistry.lsu.edu) anticipates filling one or two tenure-track positions in the fields of NMR Spectroscopy (Ref: Log #0184) and Physical Chemistry (Ref: Log #0186), broadly defined.... Applications should consist of a research proposal, a **statement of teaching philosophy**, and a curriculum vitae (including address). Applicants should arrange for submission of three letters of recommendation.*

Introduction

As these recent job ads illustrate, requests for teaching philosophies are common in the academic market. In fact, a survey of 457 search committee chairs in six disciplines (English, history, political science, psychology, biology, and chemistry) found that 57% requested a teaching statement at some point in a job search (Meizlish & Kaplan, in press). These results differed slightly by institutional type, with master's and bachelor's institutions requesting them more often than doctoral institutions. Results also differed by discipline. Surprisingly, requests for teaching philosophies were most frequent in the natural sciences. But the overall message is clear: job applicants in all fields may be asked to submit a teaching philosophy (see also Bruff, in press; Montell, 2003; Schönwetter, Taylor, & Ellis, 2006).

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CRLT Occasional Papers

Center for Research on Learning and Teaching

University of Michigan

No. 23

Teaching philosophies can serve several purposes (e.g., self-reflection, introduction to a teaching portfolio, communication with students), but we focus here on those written for academic job applications. Such statements communicate a job candidate's approach to teaching and learning to a faculty considering whether to make that candidate one of their colleagues. Since a committee cannot possibly observe the teaching of every applicant, the teaching philosophy helps search committee members imagine themselves in each candidate's classroom. What is it like to be one of this instructor's students? Why does she make the pedagogical decisions she does? As a student in this classroom, how would I spend my fifty minutes on a given day? How does the instructor address the challenges and resources of teaching in his particular discipline? Does her teaching style complement our department's philosophy of instruction?

This Occasional Paper is designed to help experienced graduate students write a statement of teaching philosophy. The paper contains four sections. First, we offer suggestions for making a philosophy of teaching explicit and getting it on paper. Second, we discuss research on characteristics of effective statements. Third, we introduce a rubric that can guide the development and crafting of a teaching statement that search committees will value. Finally, we address questions that job candidates often raise about this sometimes perplexing document.

Advice for Getting Started

Just because you have never written a statement of your teaching philosophy does not mean you do not have a philosophy. If you engage a group of learners who are your responsibility, then your behavior in designing their learning environment must follow from your philosophical orientation.… What you need to do is discover what [your philosophy] is and then make it explicit. (Coppola, 2000, p. 1)

Figure 1. Some general guidelines for writing the teaching philosophy (adapted from Chism, 1998):

- **Keep it brief (1–2 pages).**
- **Use a narrative, first person approach.**
- **Make it reflective and personal.**
- **Discuss your goals for your students, the methods you use to achieve those goals, and the assessments you use to find out if students have met your expectations.**
- **Explain your specific disciplinary context and use specific examples of your practice.**
- **Showcase your strengths and accomplishments.**

Beginning the teaching philosophy is often the hardest part of writing one. The motivations behind the decisions we make in the classroom can be surprisingly elusive when we try to put them on paper. Since there is no single approach that will work for all writers, we offer three strategies for getting started:

1. Goodyear and Allchin (1998) found that thinking about the "big" questions of teaching helped instructors articulate their philosophies:
   - What motivates me to learn about this subject?
   - What do I expect to be the outcomes of my teaching?
   - How do I know when I've taught successfully?

2. In workshops and seminars at U-M, we have found that some graduate students prefer to approach a statement by thinking about more concrete and manageable "fragments" of teaching that can then be assembled into a holistic essay. The following questions are designed to get you started:
   - Why do you teach?
   - What do you believe or value about teaching and student learning?
   - If you had to choose a metaphor for teaching/learning, what would it be?
   - How do your research and disciplinary context influence your teaching?
   - How do your identity/background and your students' identities/backgrounds affect teaching and learning in your classes?
   - How do you take into account differences in student learning styles in your teaching?
   - What is your approach to evaluating and assessing students?

3. Finally, some instructors find it most useful to begin by simply looking at examples of others' philosophies. CRLT has posted sample statements from a variety of disciplines at <http://www.crlt.umich.edu/tstrategies/tstpum.html>. When looking at others' philosophies, you will likely note considerable variation, both in terms of content and format, and you will likely find some approaches that resonate with you. While there is no single approach to a teaching philosophy, Figure 1 provides some general guidelines for those statements written for the academic job market.

Once you've articulated a first draft, you can begin shaping and polishing it for the search committees who will be reading it. In the following section, we discuss characteristics of successful teaching philosophy statements and provide a rubric for evaluating a teaching statement and aiming it at the right audience.

What Constitutes a Good Statement?

In their survey of search committee chairs, Meizlish and Kaplan (in press) found broad agreement on the desirable characteristics of a statement of teaching philosophy. Specifically, chairs described successful teaching statements as having the following characteristics:

- *They offer evidence of practice.* Search committee chairs want to understand how candidates enact their teaching philosophies. In particular, they want to see specific and personal examples and experiences rather than vague references to educational jargon or formulaic statements.

- *They convey reflectiveness.* Search committees want to know that a candidate is a thoughtful instructor. They are interested in candidates who can discuss their approach to instructional challenges and their plans for future pedagogical development.

- *They communicate that teaching is valued.* Search chairs appreciate a tone or language that conveys a candidate's enthusiasm and commitment to teaching. They are wary of candidates who talk about teaching as a burden or a requirement that is less important than research.

- *They are student- or learning-centered, attuned to differences in student abilities, learning styles, or levels.* Search committee chairs want concrete evidence of a candidate's attentiveness to student learning (rather than just content) and awareness of and ability to deal with student differences in the classroom.

- *They are well written, clear, and readable.* Search chairs draw conclusions about candidates from all elements of the application packet. Candidates can be undermined by carelessness in their teaching statements.

A Rubric to Evaluate the Teaching Philosophy

Based on survey responses from search committee chairs, our own experience reading hundreds of teaching philosophies, and research on best practices in teaching and learning, we constructed a rubric to help graduate students write and evaluate statements of teaching philosophy (Figure 2). The rubric can be used as a starting point for revising first drafts of your philosophy. The rubric consists of the following five categories:

1. Goals for student learning
2. Enactment of goals
3. Assessment of goals
4. Creating an inclusive learning environment
5. Structure, rhetoric, and language

The first three categories of the rubric were purposefully framed to encourage instructors to think about the alignment of their goals, methods, and assessments. Research suggests that aligning intended outcomes (goals), instructional methods, and testing can lead to significant gains in student learning. Instructional alignment is more important for tasks involving higher-order thinking skills, and it has a particularly strong impact on the performance of lower aptitude students (Cohen, 1987).

In terms of writing a teaching statement, focusing on alignment raises a number of useful questions about your approach to teaching and student learning: What do you want students to learn (and why)? What approach will you take to help students acquire the desired knowledge, skills, and attitudes, and how can you best test students to determine whether they have reached these goals? Reflecting on these issues in a systematic fashion allows you to develop a clear sense of why you take the approach you do, often one of the most difficult aspects of writing a teaching statement. It also has the potential to reveal areas of misalignment, providing clear direction for future development and ensuring that the teaching statement is not merely a rhetorical exercise, but a useful contribution to your development as a teacher.

The fourth category reflects our belief that pedagogical practices that reach students at the margins of the classroom are beneficial for all students. As Kardia (1998) writes,

Attention to race/ethnicity, gender, sexual orientation, disability, and other student characteristics is consistent

with an improved learning environment for all students. For example, an instructor who provides more lead time with assignments in response to the needs of a student with a physical disability will be appreciated by all students, even though the majority of the students might have been able to find ways to compensate for the lack of lead time. (p. 19)

Research has confirmed the benefits of diversity for promoting student learning and development. For example, studies conducted at U-M on the impact of racial diversity on student learning and attitudes confirm that positive classroom interactions across racial difference can lead to increased student motivation, critical thinking skills, and social engagement. Obviously, it is up to faculty to create positive learning experiences in order to take advantage of diversity. "Students, indeed, acquire a very broad range of skills, motivations, values, and cognitive capacities from diverse peers when provided with the appropriate opportunities to do so" (Gurin, 1999, Conclusion). Future faculty need to demonstrate that they have thought carefully about these issues.

The last category addresses some of the most common complaints search committee chairs voiced about teaching statements. Chairs complained about teaching jargon that alienates many readers and weak thematic structures that make reading difficult. Obviously, search committees are more likely to have a positive view of a well-written teaching philosophy than a poorly written one.

A common component running through all of these categories is a focus on specificity, disciplinary context, and rich, illustrative examples. The importance of this component is based on the finding that search committees want to read about specific examples of how candidates enact their teaching philosophies. What does this mean in practice? Rather than saying, "I use active learning in my teaching," write about a *specific* exercise you use in your class that engages students actively. Why do you use it? How were students different after the activity? Thinking about your students, what do they typically find most challenging about that activity? How do you know that the activity worked?

Below we provide excerpts from teaching philosophies written by U-M graduate students that exemplify each of the rubric's first four categories (the fifth, by necessity, is illustrated by each example).

Goals for student learning

At the heart of most teaching philosophies is a set of goals for what an instructor hopes to accomplish in the classroom. An instructor's goals should describe how students will be different after leaving that instructor's class. What will they be capable of doing that they could not before? What will they know that they did not before? How will they see the world differently? Goals in a teaching philosophy should be clearly written to describe the ways students will develop, as well as to convey the context of the instructor's discipline.

In this description of goals, a social work graduate student instructor (GSI) talks about the transformative nature of social work education. Her goals for her students are lifelong and directly tied to the mission of social work as a discipline. Note the specificity of the skills she hopes students will attain.

Social work education should foster students' critical consciousness – the ability "to perceive social, political, and economic contradictions and to take action against those oppressive elements" (Freire).... Through creative and interactive activities in and outside of my classroom, students learn to recognize, analyze, and work to change dynamics of privilege and oppression when engaging with others in all areas of practice – individual, group, community, or state.

Enactment and assessment of goals

A teaching philosophy cannot rest solely on an instructor's learning goals. For it to be useful in the job search, it must also communicate how instructors will achieve those goals, and how they will know that they have achieved them. Specificity is compelling when talking about teaching methods and assessments. Likewise, the more closely the methods and assessments are grounded in disciplinary pedagogies, the more they will resonate with readers in that field. The first example below describes the teaching methods used by a GSI in Germanic Languages and Literatures. The second describes how an electrical engineering GSI assesses student learning.

While confronting my students with the challenge of learning new languages and cultures, I encourage them to reflect on their own beliefs and try to open their minds to new ways of seeing things. For example, in my

fourth-semester German class that focused on the lives of and work of the Brothers Grimm, we often engaged in discussion of original, European fairy tales, comparing them to their well-known Disney versions. Such comparisons helped my students not only to learn about important aspects of German literature, but also encouraged them to step back and reflect on the values of their own culture.

In order to solve new problems, engineers should be able to think through them. The final solution to a problem is rarely obvious and, as such, the thinking process must be developed and refined with practice. In a term, I assign several individual and group projects that incorporate multiple ideas and first principles. Projects early in a term are broken down with milestones such that students can begin to learn how to approach a multifaceted problem on their own…. In addition to projects, students use their critical thinking skills on a more regular basis during weekly timed quizzes. The quizzes are not designed to test memorization…rather, they are designed to test problem solving, as each quiz cannot be completed if not approached properly.

Creating an inclusive learning environment

This category emphasizes the integration of inclusive teaching and learning throughout the statement, thereby avoiding the isolated "diversity paragraph." In the following quotations, the authors connect inclusive teaching to their goals for their courses and their understandings of their disciplines.

Parallel to the idea of discovering new things as an engineer is the idea of discovering new minds and cultures. Similarly, learning analytical and evaluation skills as an engineer parallels learning to understand and/or tolerate other points of view…. In my classes I try to expose the students to different situations to help them gain these skills, including interacting with classmates with different backgrounds (race, ethnicity, gender, technical knowledge, learning style, etc.), taking different roles when working in teams (leader, note taker, report writer, etc.), and taking different roles when working individually (presenter or evaluator). By doing so, I hope to provide the students the opportunity to learn not only the theory of mechanical engineering and

problem solving skills, but also to realize that around them there is much to learn as well. (GSI in Mechanical Engineering)

My ideal classroom is primarily a safe and comfortable place where students of diverse background and experience are encouraged to clarify their thoughts and expose their assumptions…for mutual examination…. On whichever level I teach, I intend that my courses are enriching to my students of diverse background in various ways that will suit their particular academic and personal needs. Specifically, through the activities discussed above, I hope that those students of general North American cultural background broaden their intellectual and spiritual horizon by critically reflecting upon their own cultural assumptions and beliefs, and the students of Asian ancestry who are curious about their own philosophical and religious traditions can enrich themselves by learning more about their roots. (GSI in Asian Languages and Culture)

A statement need not achieve a rating of "excellent" in each of the categories described in the rubric to be a good teaching statement. We encourage you to seek input on your teaching statement in much the same way you would solicit feedback on a scholarly paper. Faculty in your department can provide feedback based on their own experience serving on search committees and reading application materials. Keep in mind, however, that the qualities that serve a job candidate well at U-M may not match those at a different institution. For a different perspective, you might ask for feedback from peers in your program who have graduated and are now faculty elsewhere or from mentors at your undergraduate institution.

Frequently Asked Questions

1. Do I have to write a new teaching philosophy for every school?

An individual's core teaching philosophy probably will not change based on the school to which he or she is applying for a position. That said, search committees are attentive to the match or mismatch between the priorities of their institution or department and the priorities implied by a job candidate's teaching statement and other application materials. It is worth considering the range of positions to

which you are applying and thinking carefully about whether some degree of customization (based on institutional type, focus of the position, etc.) is appropriate.

2. What should I do if I don't have a lot of teaching experience upon which to base my statement of teaching philosophy?

This is not an uncommon situation, particularly in some disciplines where teaching opportunities for graduates are rare. Regardless of your experience as an instructor, you have years of experience as a student in your discipline that you can draw from. Additionally, you may have some experience mentoring students in the lab, independent study, or elsewhere. Talk about your approach to teaching in these settings and the lessons you would take to your own classroom.

3. Can sending an unsolicited teaching philosophy hurt me when I'm applying for faculty positions?

Meizlish and Kaplan asked search committees this very question. The conclusion was clear: submitting an unsolicited teaching statement is viewed positively by most search committee chairs.

4. Should I reference or include student ratings and comments?

A teaching statement is a brief overview of your approach to teaching supported by rich examples drawn from your practice. As a result, support materials such as student ratings and comments would be out of place in a teaching statement. Consider instead constructing a teaching portfolio to highlight these materials. Teaching portfolios are organized, annotated collections of the "evidence" that supports your philosophy. They can include student evaluations, samples of assignments, letters of recommendation, samples of student work, etc. Note that teaching portfolios are rarely requested by search committees. For more information, see CRLT Occasional Paper No. 11, *The Teaching Portfolio* (available at http://www.crlt.umich.edu/publinks/occasional.html).

5. Are teaching philosophies original work? Couldn't I adopt someone else's philosophy if I completely agree with what they're saying?

Teaching philosophies are original work, just like anything else you or someone else writes. Copying others' philosophies is plagiarism. Besides, a well-written philosophy should be rooted in your own practice and illuminated by specific examples from your own work. No one else has had exactly your experiences in the classroom.

6. Will this be the last time I write a teaching philosophy?

Teaching philosophies are becoming a common component of tenure and promotion packages at colleges and universities. If you continue in academia as a tenured or untenured faculty member, a teaching statement will likely be one of the ways in which your performance is assessed. Fortunately, having written one for the job search, you will have a head start. Remember, however, that the teaching philosophy is an evolving document, changing as you gain more experience as a teacher and your beliefs about effective teaching and learning evolve. Returning to the teaching philosophy statement throughout your career is a useful reflective exercise that can help to make your current teaching practice more explicit and deliberate.

7. Where can I learn more about teaching philosophies?

The CRLT Teaching Strategies website contains a section on teaching statements (http://www.crlt.umich.edu/tstrategies/tstpts.html) with useful articles and sample statements from a variety of disciplines. CRLT offers workshops on writing teaching statements at a one-day Preparing Future Faculty Conference each fall. Graduate students interested in a more intensive experience can apply to participate in a month-long Preparing Future Faculty Seminar that is co-sponsored by Rackham and offered every May. (See http://www.crlt.umich.edu/gsis/pff.html for more information about these programs.) CRLT's Graduate Teaching Consultants are also available to consult one-on-one about teaching philosophies. You can contact CRLT (764-0505, crlt@umich.edu) to set up a consultation.

Figure 2. Rubric for composing and evaluating a statement of teaching philosophy

Categories	Excellent	Needs Some Revision	Unsatisfactory
Goals for student learning: What knowledge, skills, and attitudes are important for student success in your discipline? What are you preparing students for? What are key challenges in the teaching-learning process?	Goals are clearly articulated, specific, and go beyond knowledge level, including skills, attitudes, career goals, etc. Goals are sensitive to the context of the instructor's discipline. They are concise, not exhaustive.	Goals are articulated but may be too broad or not specific to the discipline. Goals focus on basic knowledge, ignoring skills acquisition and affective change.	Articulation of goals is unfocused, incomplete, or missing.
Enactment of goals (teaching methods): What teaching methods do you use? How do these methods contribute to your goals for students? Why are these methods appropriate for use in your discipline?	Enactment of goals is specific and thoughtful. Includes details and rationale for teaching methods. The methods are clearly connected to specific goals and are appropriate for those goals. Specific examples of the methods in use within the disciplinary context are given.	Description of teaching methods not clearly connected to goals, or if connected, not well developed (seems like a list of what is done in the classroom). Methods are described, but generically; no example of the instructor's use of the methods within the discipline is communicated.	Enactment of goals is not articulated. If there is an attempt at articulating teaching methods, it is basic and unreflective.
Assessment of goals (measuring student learning): How do you know your goals for students are being met? What sorts of assessment tools do you use (e.g., tests, papers, portfolios, journals), and why? How do assessments contribute to student learning? How do assessments communicate disciplinary priorities?	Specific examples of assessment tools are clearly described. Assessment tools are aligned with teaching goals and teaching methods. Assessments reinforce the priorities and context of the discipline both in content and type.	Assessments are described, but not connected to goals and teaching methods. Description is too general, with no reference to the motivation behind the assessments. There is no clear connection between the assessments and the priorities of the discipline.	Assessment of goals is not articulated or mentioned only in passing.
Creating an inclusive learning environment, addressing one or more of the following questions: How do your own and your students' identities (e.g., race, gender, class), backgrounds, experiences, and levels of privilege affect the classroom? How do you take into account diverse learning styles? How do you integrate diverse perspectives into your teaching?	Portrays a coherent philosophy of inclusive education that is integrated throughout the statement. Makes space for diverse ways of knowing and/or learning styles. Discussion of roles is sensitive to historically underrepresented students. Demonstrates awareness of issues of equity within the discipline.	Inclusive teaching is addressed but in a cursory manner or in a way that isolates it from the rest of the philosophy. Author briefly connects identity issues to aspects of his/her teaching.	Issues of inclusion are not addressed or addressed in an awkward manner. There is no connection to teaching practices.
Structure, rhetoric and language: How is the reader engaged? Is the language used appropriate to the discipline? How is the statement thematically structured?	The statement has a guiding structure and/or theme that engages the reader and organizes the goals, methods, and assessments articulated in the statement. Jargon is avoided and teaching terms (e.g., critical thinking) are given specific definitions that apply to the instructor's disciplinary context. Grammar and spelling are correct.	The statement has a structure and/or theme that is not connected to the ideas actually discussed in the statement, or, organizing structure is weak and does not resonate within the disciplinary context. The statement contains some jargon.	No overall structure present. Statement is a collection of disconnected statements about teaching. Jargon is used liberally and not supported by specific definitions or examples. Needs much revision.

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CRLT Occasional Paper No. 23

Center for Research
on Learning and Teaching

The University of Michigan
1071 Palmer Commons
100 Washtenaw Avenue
Ann Arbor, MI 48109-2218

Crowdsource Student Q&A AND Improve Discussion Quality with Piazza

Do you see the same student questions over and over on email?
Would you like to extend student discussion beyond the classroom?

CRLT Center for Research on Learning and Teaching

If so, Piazza can help. Read on for a brief overview of Piazza's functions, as well as recommendations for using it effectively.[1] Visit crlt.umich.edu/piazza for more information and videos on how to get started using Piazza.

Features of Piazza

- Piazza is integrated within CTools, supported by ITS, and available to all U–M instructors free of charge.
- Piazza supports organized online discussions and Q&A that students can access 24/7.
- Students can comment on answers or post follow–up inquiries.
- Students can edit questions and answers wiki–style.
- Instructors can respond to questions and endorse a student's answer.
- There's a LaTeX editor for equations and support for multimedia.
- Tags facilitate targeted searches.
- Analytics for student usage help instructors assess participation.

Challenge #1: Handling lots of email Q&A

Amy Gottfried manages large volumes of student questions generated in Chem 230. Says Gottfried, "Piazza streamlines questions, putting them all in one spot and making them easily accessible to students. It also allows students to answer questions, learn from one another, and collaborate on answers." Gottfried organizes content into searchable folders, which makes it easy for students to find answers. And it reduces email traffic: Gottfried redirects questions she receives on email to Piazza, where other students sometimes answer faster than she can.

Challenge #2: Getting students to participate in online discussions

Robin Queen turned to Piazza for Q&A in a large linguistics course and was pleasantly surprised when students quickly turned it into an online discussion board. They found it a particularly satisfying venue to discuss how course material related to their real life experiences. According to Queen, "It provides a forum for students to interact with one another (and with me and GSIs, but mostly one another) and practice agreeing and disagreeing and working out concepts."

Challenge #3: Helping students prepare for exams collaboratively

Prior to each exam, **Michaela Zint** posts a series of questions to Piazza and has students work together in groups to answer them. She agrees to provide feedback as long as they make a good effort to answer, and if they continue to expand on their answer, she continues to provide feedback. Students and instructors can see how questions and answers have been edited through Piazza's history function. Zint has been pleased by the results. "Because they answered as a group, I think the answers are much better than if they had answered individually. Seeing the questions and my comments to their responses also made the students realize, 'Whoa—wait. These are a lot harder than I thought they would be,' motivating them to study more."

Challenge #4: Including all students in class discussion and tracking participation

Seeking a way for students to share ideas in a course on Dante, especially if they were not comfortable doing so in class, **Alison Cornish** started out using Piazza as a discussion forum. She soon appreciated its ability to quantitatively track participation by 50-65 students. Qualitative judgments about the validity and thoughtfulness of students' responses also enter into her calculation of participation grades. "I don't want to attach a grade to the number of times that you need to participate, but I sometimes bring it up in class and look at the graph with the students so they know that I am looking at it. It's eye-opening to them that I can see so clearly who stands out as a good citizen."

[1]Suggestions are based on a winter 2013 study of faculty and student Piazza users conducted by CRLT.

Recommendations for Using Piazza

All of the faculty and over two-thirds of students surveyed recommend Piazza for use by others. Based on their experiences, faculty offer the following advice to colleagues interested in using Piazza.

Getting Started:

- Start using Piazza from the very beginning of the term.
- Take time for an in-class orientation to teach students about notifications, settings, and other preferences.
- Set clear expectations for student participation from the outset.
- Decide (and share) how quickly you will respond to questions, and encourage students to search previous posts for answers to their questions.
- Think carefully about norms for how students should approach editing each others' answers and how you will give feedback, especially in contexts where answers are unlikely to be simply right or wrong.
- While planning implementation, consider how you will organize folders and tags.
- Learn to use the analytics before incorporating Piazza into participation grades.

During the Term:

- If using Piazza for Q&A, refer emailed questions to Piazza.
- Be consistent in your frequency of use and your share of the online exchange.
- When using Piazza as a discussion forum, give students credit for contributing.
- Let Piazza posts inform the emphasis of lectures and in-class discussions.

Key Questions

Will Piazza save time compared to email Q&A?

Not necessarily. Although you'll spend less time answering the same questions over and over, it can be challenging in large courses to keep up with the volume of posts and student expectations for quick responses.

Is Piazza useful for small courses?

It can be valuable as a discussion tool, but for simple Q&A, students in smaller courses, or courses that offer other means of posting questions, were less eager to use Piazza.

Can Piazza be used for open-ended questions when there is no clear right answer?

Yes, it works well for open discussions, but humanities and social science faculty found the option to mark a student answer "good" less useful for open-ended questions.

How does Piazza compare to other online discussion or Q&A tools?

Piazza's features overlap with some other tools available to U-M instructors, such as CTools Forum, CTools Chat and Google Moderator. The ability to use tags to organize content and to endorse student responses with one click are key features that distinguish Piazza. If you'd like to discuss which tool is the best fit for your course, schedule a consultation at crlt.umich.edu/techconsult.

CRLT Center for Research on Learning and Teaching

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UNIVERSITY OF
MICHIGAN

PROVOST'S CAMPUS LEADERSHIP PROGRAM

DINNER FOR NEW CHAIRS AND ASSOCIATE DEANS

MONDAY, SEPTEMBER 30, 2013

ALUMNI CENTER (FOUNDERS ROOM)

5:00 p.m.	Welcoming Reception
5:30 p.m.	Dinner
6:00 p.m.	Leadership in Education
	Martha Pollack, *Provost*

ORIENTATION FOR NEW CHAIRS AND ASSOCIATE DEANS

TUESDAY, OCTOBER 1, 2013

MICHIGAN LEAGUE (KOESSLER AND HENDERSON ROOMS, 3RD FLOOR)

8:30 a.m.	Breakfast	*Koessler Room*
9:00 a.m.	Q&A with the Provost	
	Martha Pollack, *Provost*	
9:30 a.m.	Experienced Leaders Panel: What I Wish I'd Known	*Koessler Room*
	Angela Dillard, *Director, Residential College*	
	Elizabeth Moje, *Associate Dean, School of Education*	
	Marios Papaefthymiou, *Chair, Computer Science and Engineering, College of Engineering*	
10:30 a.m.	Break	
10:45 a.m.	Provost's Office Programs and Services	*Koessler Room*
	Chris Whitman, *Vice Provost for Academic and Faculty Affairs*	
11:00 a.m.	U-M Budget Presentation	*Koessler Room*
	Alfred Franzblau, *Vice Provost for Academic and Budgetary Affairs*	
12:00 p.m.	Lunch	*Henderson Room*
12:30 p.m.	Resources for Chairs and Associate Deans	*Henderson Room*
	Constance Cook, *Associate Vice Provost for Academic Affairs*	
12:45 p.m.	Managing Staff Relations (CRLT Players)	*Koessler Room*
	Sara Armstrong, *Artistic Director, CRLT Theatre Program*	
	Robin Sarris, *Administrative Director, LSA*	
2:00 p.m.	Why All Academic Leaders Should Care About Departmental Climate and What They Can Do About It	*Henderson Room*
	Abby Stewart, *Associate Dean, Rackham, and Director, ADVANCE*	
2:30 p.m.	Working with the General Counsel	*Henderson Room*
	Christine Gerdes, *Associate General Counsel*	
3:15 p.m.	Adjourn	

LSA Teaching Academy
August 20-21, 2013
Michigan League

TEACHING ACADEMY AGENDA

Day 1 (Tuesday, August 20, 2013) – Koessler Room, 3rd Floor, Michigan League

1:00-1:45	Welcome and Overview
2:00-2:45	University of Michigan Student Panel
2:45-3:00	Break
3:00-3:45	Learning About Your Students: The ART System and Wolverine Access
3:45-4:20	Basics of CTools, ISS Resources, and the Library
4:30-5:15	IT Concurrents

- *Google Apps*
- *Clickers*
- *Screencasts*
- *CTools Step by Step*
- *Library Resource Follow-Up*

5:30-7:00	Dinner with Deans and Department Chairs

Day 2 (Wednesday, August 21, 2013) – Vandenberg Room, 2nd Floor, Michigan League

8:30-9:00	Overview and Breakfast
9:00-10:00	Course Planning
10:15 -11:45	Practice Teaching
12:00 -12:30	Lunch
12:30 -1:30	Practical Responses to Student Issues
1:45-2:30	Undergraduate Pedagogies: Concurrent I

- *Teaching with GSIs*
- *Designing Writing Assignments*
- *Active Learning in STEM Classrooms*
- *Open Consultation*

2:40-3:25	Undergraduate Pedagogies: Concurrent II

- *Powerpoint Uses and Abuses*
- *Designing and Grading Tests and Quizzes*
- *Social Diversity in Undergraduate Teaching*
- *Open Consultation*

3:40-4:30	Graduate Teaching

- Teaching and Mentoring Graduate Students in the Lab
- Teaching and Mentoring Graduate Students in Courses and Seminars

4:30	Concluding Remarks and Next Steps

Additional Components of the LSA Teaching Academy:

- Fall Term Meeting: Thursday, November 14, 2013, 5:30-7:30
- Final Dinner: Thursday, March 20, 2014, 5:30-7:30
- Observe a colleague's course during Fall 2013.
- Attend a course observation debriefing session. Choose one:
  - Friday, October 11, 8:30-9:30
  - Tuesday, October 15, 4:00-5:00
  - Thursday, December 5, 8:30-9:30
  - Wednesday, December 11, 4:00-5:00
- Participate in a midterm student feedback session during your first term of U-M teaching.

LSA Teaching Academy
Tuesday, August 20, 2013
Michigan League

DAY 1 AGENDA

1:00-2:00 **Welcome and Overview – Koessler Room, 3rd Floor**
Welcoming Remarks
Susan Gelman – Dean, College of Literature, Science and the Arts
Phil Deloria – Associate Dean for Undergraduate Education, LSA
Overview of the Teaching Academy and Opening Conversation
Matt Kaplan – Managing Director, CRLT
Deborah Meizlish – Assistant Director, CRLT
2:00-2:45 **University of Michigan Student Panel**
Natasha Dabrowski
Kendall Johnson
Sagar Lathia
3:00-3:45 **Learning About Your Students: The ART System and Wolverine Access**
Tim McKay, Physics
3:45-4:20 **Basics of CTools, ISS Resources, and the Library**
CTools Basics
Meg Bakewell, CRLT
Introduction to LSA ISS and the Classroom Database
Sharona Ginsberg, ISS
Chase Masters, ISS
Library
Jamie Vander Broek, University Library
4:30-5:15 **Instructional Technology Concurrents**
Google Apps (Henderson Room)
Mika LaVaque-Manty, Political Science/Philosophy
Clickers (Koessler Room)
Meg Bakewell, CRLT
Sharona Ginsberg, ISS
Chase Masters, ISS
Screencasts (Room D)
Tershia Pinder-Grover, CRLT
CTools Step by Step (Room A)
Erping Zhu, CRLT
Library Resource Follow-Up (Room C)
Jamie Vander Broek, University Library
5:30-7:00 **Dinner with Deans and Department Chairs – Vandenberg Room, 2nd Floor**
Deans, Associate and Assistant Deans

DAY 2 AGENDA

8:30-9:00   **Breakfast and Overview - Vandenberg Room, 2ⁿᵈ Floor**

9:00-10:00   **Course Planning - Vandenberg Room and Hussey Room, 2ⁿᵈ Floor**

10:15-11:45   **Practice Teaching - Various League Rooms**

12:00-12:30   **Lunch - Vandenberg Room**

12:30-1:30   **Practical Responses to Student Issues**

        Phil Deloria, Associate Dean for Undergraduate Education, LSA
        Esrold Nurse, Assistant Dean for Undergraduate Education, LSA
        Tim Dodd, Director, Newnan Academic Advising Center
        David Smith, Deputy Assistant Dean, Student Academic Affairs, LSA

1:45-2:30   **Undergraduate Pedagogies: Concurrent I**

      Teaching with GSIs (Kalamazoo Room)

        Anne Curzan, English Language & Literature/Linguistics
        Jim Morrow, Political Science

      Active Learning in STEM Classrooms (Hussey Room)
        Eric Bell, Astronomy

      Designing Writing Assignments (Michigan Room)
        Naomi Silver, Sweetland Center for Writing

      Open Consultations (Vandenberg Room)
        Phil Deloria, LSA
        Matt Kaplan, CRLT

2:40-3:25   **Undergraduate Pedagogies: Concurrent II**

      Social Diversity in Undergraduate Teaching (Kalamazoo Room)
        Crisca Bierwert, CRLT

      Powerpoint Uses and Abuses (Michigan Room)
        Rachel Niemer, CRLT

      Designing and Grading Tests and Quizzes (Hussey Room)
        Mary Wright, CRLT

      Open Consultations (Vandenberg Room)
        Phil Deloria, LSA
        Matt Kaplan, CRLT
        Deb Meizlish, CRLT

3:40-4:30   **Graduate Teaching**

      Teaching and Mentoring Graduate Students in the Lab (Room D)
        Bart Bartlett, Chemistry
        Matt Chapman, Molecular, Cellular and Developmental Biology

      Teaching and Mentoring Graduate Students in Courses and Seminars (Henderson Room)
        Marlyse Baptista, Afroamerican and African Studies/Linguistics
        Robin Means Coleman, Communication Studies
        Karen Smith, Mathematics

4:30pm   **Concluding Remarks and Next Steps - Koessler Room, 3ʳᵈ Floor**
        Phil Deloria, LSA

AGENDA

Tri-Campus Provosts' Seminar
Tuesday, October 22, 8:30 a.m. – 5:00 p.m.
Rogel Ballroom, Michigan Union
University of Michigan
530 S. State Street, Ann Arbor, MI

Engaged Learning, Community-Based Research and the Community Engagement Corridor

8:30-9:00 **Continental Breakfast** .... *Ballroom*

9:00-9:30 **Plenary Session: Charge from the Provosts** .... *Ballroom*

Welcome and opening remarks
  Provost Martha Pollack – University of Michigan
  Provost Margaret Winters – Wayne State University
  Associate Provost Hiram Fitzgerald
    for Provost June Pierce Youatt – Michigan State University

9:30-10:15 **Discovery Workshop** .... *Ballroom*

This workshop will provide participants with an opportunity to engage with colleagues from other universities with common intellectual and community interests. Facilitators, drawn from members of the inter-campus planning committee, will help to lead affinity-based small group conversations on key themes and questions that we will work through over the course of the day.

10:15-10:30 **Break**

10:30-11:45 **Keynote Address:** Chancellor Nancy Cantor .... *Ballroom*

Nancy Cantor, the eleventh Chancellor and President of Syracuse University, is a national leader in higher education and community engagement. Following her keynote address, the audience will have an opportunity to interact with one another at their tables around key areas Chancellor Cantor focused on during her address.

11:45-12:35 **Lunch** .... *Anderson Room*

12:45-2:15 **Short Talks and Table Discussions in Interest Groups** .... *Ballroom*

This session begins with different speakers providing a breadth of perspective around the following topical areas: student-centered engaged learning, cross-university community-based research, foundation resources, and community-based programs and research. Each perspective will be told through a succinct and informative TED-like talk. Our speakers include:

  Vincent Delgado, Academic Specialist for Civic Engagement, MSU
  Barbara Israel, Director, Detroit Community-Academic Urban Research Center, Professor, School of Public Health, UM
  Jeff Mason, Executive Director of the University Research Corridor
  Angela Reyes, Executive Director of the Detroit Hispanic Development Corporation
  Kelsey Skinner, class of 2015, Candidate for Bachelor of Science in Psychology, WSU

Following the talks, participants will have an opportunity to engage with these different topics discussing specific challenges and opportunities associated with collaborations taking place within their shared fields of interest. These interactions are designed to bring participants together to discuss shared strengths and areas for improvement by critically considering their projects and current collaborations.

2:15-2:30 **Break**

2:30-4:00   **The Community Engagement Corridor – How do we imagine this working?** *… Breakout rooms*

Working together in small groups across fields of interest, participants will assess current needs and assets, and they will explore how a Community Engagement Corridor could respond to these needs and provide support. Following this discussion, small groups will be tasked with considering next steps as part of the process of operationalizing such a corridor. The outcomes from these discussions will be recorded and shared at the closing Synthesis Workshop. After this final session, these deliberations will inform continuing discussions regarding the possibility of developing a Community Engagement Corridor.

4:00-4:15   **Break**

4:15-5:00   **Plenary Session: Immediate Outcomes, Next Steps, Synthesis of the Day's Discussion**   *Ballroom*

The closing plenary will summarize the most salient points that emerged from all of the discussions throughout the day, including ideas for a Community Engagement Corridor explored in the breakout sessions. Then discussion will turn to a preliminary assessment of the value of developing a Community Engagement Corridor.

Next Steps: At the close of the Provosts' Seminar the planning committee will convene into the evening to make sense of the wealth of feedback generated by seminar participants and today's conversations. The goal of this immediate follow-up meeting is to produce a summary draft along with suggestions for next steps in this collaborative process.

Provosts' Seminar website: http://provostseminar-com.webs.com

New Faculty Orientation
2013

August 28, 2013
Michigan League

PROGRAM

8:30 – **Registration**– *Ballroom, Michigan League*
Please pick up orientation packets, help yourself to coffee, and introduce
yourself to new colleagues.

9:00 – **Plenary Session: Welcome to Michigan!** – *Ballroom*
- Constance Cook, Associate Vice Provost; Executive Director, Center for
  Research on Learning and Teaching (CRLT)
- Volker Sick, Associate Vice President for Research; and Arthur F. Thurnau Professor

9:30 – **Break**

9:35 – **CRLT Players present** *7 into 15* – *Ballroom*

10:20 – **Break**

10:30 – **Concurrent Sessions**

Research-Based Practices for College Teaching
Vandenberg Room – 2nd floor

In this interactive session, faculty will learn about and discuss the latest research-based principles to promote learning, such as student intellectual and identity development, motivation, and learning mastery. Throughout the session, participants will identify strategies informed by these principles that they can use to respond to the complexities of student learning in an upcoming course. Examples will be drawn from a wide variety of teaching contexts, including undergraduate, graduate, and clinical teaching.

Using Instructional Technology to Enhance Teaching
Henderson Room – 3rd floor

How can instructional technologies enhance teaching and promote student learning? Attendees at this session will see U-M faculty demonstrate technologies useful in a variety of disciplines and classroom settings, and talk about how they could use technology to improve learning in their own classrooms. Attendees will have the opportunity to learn about 1) CTools, U–M's learning management system, for managing courses; 2) screencasting for enhancing student learning in large courses; and 3) Google Apps for facilitating student collaboration and increasing student engagement.

Student Teams in the STEM Classroom
Hussey Room – 2nd floor

Effective use of teams in the STEM classroom can increase student learning, improve retention of course material, and enhance students' problem-solving ability. It is often difficult, though, to ensure that all students are engaged, included, and successful in teams. In this session, faculty will learn about and practice research-based strategies to create and assess student teams in the STEM classroom.

Facilitating Discussion by Leveraging Student Diversity
Kalamazoo Room – 2nd floor

This session is grounded in research showing that student learning is enhanced when instructors engage student diversity. The workshop reviews strategies for engaging students effectively in discussion, especially in the social sciences and humanities. Participants will discuss how to encourage students to

draw on their backgrounds and experience, while maintaining boundaries appropriate to the analytical goals of their course.

Teaching Critical Thinking in the Clinic
Michigan Room – 2nd floor

In this session, clinical faculty from several health science disciplines will discuss best practices for clinical/bedside teaching. Attendees will hear from faculty about effective time management when teaching in the clinic, best practices for providing feedback to trainees, and facilitating effective small group discussions.

11:45 – **Information Fair** – *Ballroom*
Staff representing various U-M offices (see back panel) will be available to distribute printed materials and answer questions.

12:30 – **Lunch/Welcoming Remarks** – *Ballroom*
- Constance Cook
- Faculty Panel: What It's Like to Work at Michigan
    Tammy Chang, Family Medicine, Medical School
    Clifford Lampe, School of Information
    Tiya Miles, Afroamerican and African Studies
- Martha Pollack, Provost and Executive Vice President for Academic Affairs

1:30 – **Payroll Office** – *Vandenberg Room, 2nd floor*
The Payroll Office will offer information about tax withholding/ allowances, direct deposit, and convenience deductions.

Parking and Transportation – *Vandenberg Room, 2nd floor*
Faculty can purchase a parking permit.

ADDITIONAL PROGRAMS FOR NEW FACULTY

TODAY

2:00-5:00 pm	**College of Engineering**
	Henderson Room, Michigan League (3rd floor)
2:00 pm	**School of Music, Theatre and Dance**
	McIntosh Theatre, E.V. Moore Building

LATER

August 29	**Taubman College of Architecture and Urban Planning**
9:00 am-noon	*Room 2108 Art and Architecture Building*
August 29	**College of Engineering**
8:30 am-4:15 pm	*Johnson Rooms, Lurie Engineering Center*
August 30	**School of Information**
8:30 am-3:00 pm	*4310 North Quadrangle Complex*
September 4	**School of Nursing**
7:30 am-3:30 pm	*1330 School of Nursing Building*
September 13	**School of Dentistry**
noon-1:30 pm	*Faculty Alumni Lounge, 7th floor, Dentistry Building*
(includes lunch)	

Graduate Student Instructor Orientation
Monday, August 26, 2013
Michigan League

1:00 – 1:25   Plenary I, Michigan League Ballroom, 2nd floor

Welcoming Remarks and **U-M Policies**

    Constance Cook, *Associate Vice Provost for Academic Affairs* and *Executive Director, CRLT*

Overview of GSITO

    Karishma Collette, *Postdoctoral Research Associate, CRLT*

1:30 – 2:00   Interactive Theatre Performance, Ballroom

TBD: Welcome to Teaching

    CRLT Players, facilitated by Sara Armstrong, *Artistic Director, CRLT*

2:00 – 2:30   Panel Discussion with Experienced GSIs, Ballroom

Experienced GSI Panelists:

    Melody Pugh, *GSI, English Language and Literature* and *GTC, CRLT*

    George Smith, *GSI, Psychology* and *GTC, CRLT*

    Timeka Williams, *GSI, Communication Studies* and *GTC, CRLT*

2:30 – 2:45   Break (snacks and beverages available in the Concourse, 2nd floor)

2:45 – 4:15   Preparing for the First Week of Teaching*

*Your workshop location is on the label on the front of your blue folder.

This workshop provides information on preparing for the first days of class, whether the class is one that is largely structured for you or one that you have primary responsibility for designing. Discussions will focus on preparing for the first class, making goals explicit during the first class, and creating an inclusive classroom climate. The session on teaching graduate students will also focus on some of the particular challenges facing GSIs who teach fellow graduate students.

Preparing for the First Week of Teaching Undergraduate Students, facilitated by**:**

    Daphna Atias, *GSI, English Language and Literature* and *GTC, CRLT*
    John Wesley Hill, *Ph.D., Theater Studies*
    Dana Jackman, *GSI, School of Natural Resources and Environment* and *GTC, CRLT*
    Kelly McMahon, *GSI, Education Administration and Policy*
    Natalie Sampson, *Postdoctoral Research Fellow, School of Public Health* and *GTC, CRLT*
    Billy Samulak, *Postdoctoral Research Fellow, Chemistry*
    Kristy Stark, *GSI, Psychology*

Preparing for the First Week of Teaching Graduate Students, facilitated by**:**

    Sara Crider, *GSI, Social Work and Sociology* and *GTC, CRLT*
    Alex Fisher, *GSRA, Applied Physics*

8:30 – 9:00   Breakfast, Michigan League Concourse, 2nd floor

9:00 – 9:15   Plenary II, Michigan League Ballroom, 2nd floor

Teaching Matters

Janet Weiss, *Dean, Rackham Graduate School*

9:15 – 10:00   Classroom Communication at U-M, Michigan League Ballroom, 2nd floor

Laura Schram, *Assistant Director, CRLT*

This session focuses on how to develop effective presentation skills to teach diverse students at U-M.

10:00 – 10:15   Break and Travel time to Practice Teaching rooms

10:15 – 12:25 Practice Teaching**

Your workshop location is on the white card you will receive as you exit the ballroom. **If you want feedback on classroom English language skills, do not take a white card; instead, take a blue card.

Practice Teaching sessions will enable you to synthesize the skills you learn at the orientation and get feedback about your teaching. At the beginning of the session, you will have time to prepare a five-minute explanation of a single concept or definition from your field. You may present this lesson either as a mini-lecture or as an interactive exercise (e.g., small group work). You will then receive constructive feedback from other GSIs and CRLT staff, English Language Institute staff, or experienced instructors.

Practice Teaching, facilitated by:

Olivia Anderson, *Postdoctoral Research Associate, CRLT*

Daphna Atias, *GSI, English Language and Literature* and *GTC, CRLT*

Sarah Barbrow, *Assistant Librarian, University Library*

Samuel Beck, *GSI, Industrial and Operations Engineering*

Erica Boldenow, *GSRA, Environmental Health Sciences* and *GTC, CRLT*

Emily Bonem, *GSI, Psychology* and *GTC, CRLT*

Theresa Braunschneider, *Instructional Consultant, CRLT*

Ayse Buyuktur, *GSRA, School of Information*

Jennie Cain, *Doctoral Candidate, Germanic Languages & Literatures*

Emily Clader, *GSI, Mathematics*

Constance Cook, *Executive Director, CRLT*

Sara Crider, *GSI, Social Work and Sociology* and *GTC, CRLT*

Kevin Dahlberg, *GSRA, Chemical Engineering*

Sara Festini, *GSI, Psychology*

Alex Fisher, *GSRA, Applied Physics*

Tim Green, *GSI, English Language Institute* and *English Language and Literature* and *GTC, CRLT*

Anne Greenberg, *Postdoctoral Research Associate, CRLT*

Ronit Greenberg, *GSI, Psychology*

Annie Harmon, *GSI, Health Behavior and Health Education* and *GTC, CRLT*

Paula Hathaway, *Manager of Graduate Education, College of Literature, Science, & the Arts*

John Wesley Hill, *Ph.D., Theater Studies*

Joe Howard, *GSI and GSRA, Higher Education*

Brenda Imber, *Lecturer IV, English Language Institute*

Dana Jackman, *GSI, School of Natural Resources and Environment* and *GTC, CRLT*

Alex Jakle, *GSI, Political Science* and *GTC, CRLT*

Davoud Jamshidi, *GSI, Computer Science*

Susan Juster, *Professor of History, College of Literature, Science, & the Arts*

Corina Kesler, *Lecturer I, Classical Studies, College of Literature, Science, & the Arts*

Trevor Kilgore, *GSI, English Language and Literature* and *History,* and *GTC, CRLT*

Abhishek Kumar, *GSI and GSRA, Aerospace Engineering*

Danielle Lillge, *Doctoral Candidate, Joint Program in English and Education* and *GTC, CRLT*

Adam Lobbestael, *GSRA, Civil and Environmental Engineering*

Jason Martina, *Postdoctoral Research Fellow, School of Natural Resources and Environment*

Adam Mazel, *Doctoral Candidate, English Language and Literature*

Kelly McMahon, *GSI, Education Administration and Policy*

Francesca Minonne, *GSI, Romance Languages and Literatures*

Irosha Nawarathne, *Postdoctoral Research Fellow, College of Pharmacy*

Karen Nielsen, *GSI, Statistics* and *GTC, CRLT*

Rachel Niemer, *Assistant Director, CRLT*

Michael Pifer, *Doctoral Candidate, Comparative Literature*

Amy Pistone, *GSI, Classical Studies*

Melody Pugh, *GSI, English Language and Literature* and *GTC, CRLT*

Adena Rottenstein, *GSI, Psychology* and *Communication Studies*

Natalie Sampson, *Postdoctoral Research Fellow, School of Public Health* and *GTC, CRLT*

Billy Samulak, *Postdoctoral Research Fellow, Chemistry*

Kathryn Sederberg, *Doctoral Candidate, Germanic Languages and Literatures*

Amber Smith, *Instructional Consultant, CRLT*

George Smith, *GSI, Psychology* and *GTC, CRLT*

Kristy Stark, *GSI, Psychology*

Sarah Suhadolnik, *GSI, School of Music, Theatre & Dance*

Claire Whitlinger, *GSI, Sociology*

Timeka Williams, *GSI, Communication Studies* and *GTC, CRLT*

Mary Wright, *Director of Assessment, CRLT*

Erping Zhu, *Assistant Director, CRLT*

12:25 – 1:15   Lunch, Ballroom

Graduate Employees Organization (GEO) Presentation
    Representatives from GEO

1:15 – 2:45   Concurrent Sessions I (Please choose one)

Room 4   **Dealing with Controversy During Classroom Discussion**
(1st floor)   Daphna Atias, *GSI, English Language and Literature* and *GTC, CRLT*

Controversy may emerge in the classroom as instructors expose students to new subjects and points-of-view. How can GSIs ensure that controversy becomes a productive part of the learning process rather than a source of tension and hostility? This workshop will offer GSIs specific techniques for dealing with classroom controversy, as well as tools to discuss social identity and to recognize resistance. We will consider both specific exercises and abstract approaches that will help GSIs make the most of controversy in the classroom. ***Session offered again from 3:00 - 4:30 p.m.***

Founders Rm. **Evaluating Student Writing**
(Alumni Center) Theresa Braunschneider, *Instructional Consultant, CRLT*
Christine Modey, *Lecturer II, Sweetland Center for Writing*

Amber Smith, *Instructional Consultant, CRLT*

Evaluating student writing is one of the most subjective and elusive tasks that we as instructors undertake each semester. In this workshop, we will work to alleviate some of the anxiety surrounding the evaluation process by discussing the use of specific criteria for grading student writing. We will also discuss methods for commenting effectively on writing and for managing time spent on grading. The workshop will include breakout sessions in which GSIs can practice using grading criteria on papers from different fields - humanities, lab sciences, and social sciences. ***Session offered again from 3:00 - 4:30 p.m.***

Henderson **Facilitating Discussions in the Humanities**
(3rd floor) Tim Green, *GSI, English Language Institute* and *English Language and Literature* and *GTC, CRLT*
Melody Pugh, *GSI, English Language and Literature* and *GTC, CRLT*

This workshop will enable participants to reflect on two essential components of leading discussions in the humanities: planning and facilitation. Workshop participants will acquire a toolbox of strategies for planning discussions, such as creating a climate conducive for discussion, framing effective questions, encouraging participation, and responding to students' questions and comments. Workshop participants will also work on facilitation techniques and ways to address problems that arise, even during well-planned class discussions. The facilitators will model selected teaching techniques during the workshop to help participants envision using them in their own courses. ***Session offered again from 3:00 - 4:30 p.m.***

Vandenberg **Facilitating Discussions in the Social Sciences**
(2nd floor) Natalie Sampson, *Postdoctoral Research Fellow, School of Public Health* and *GTC, CRLT*
George Smith, *GSI, Psychology* and *GTC, CRLT*

This workshop will enable participants to reflect on three essential components of leading effective discussions in the social sciences: planning, facilitation, and assessment. Facilitators will begin by describing ways to use course syllabi and ground rules to define student and instructor expectations for interactive, engaging discussions. Participants will then learn, share, and practice ways to facilitate meaningful participation through use of active learning and effective questioning techniques. Finally, to ensure this planning and facilitation are effective, workshop facilitators will review possible strategies for assessing both learning and teaching. The facilitators will model selected teaching techniques during the workshop to help participants envision using them in their own courses. ***Session offered again from 3:00 - 4:30 p.m.***

Hussey **Facilitating Group Work to Maximize Learning in Labs and Discussions**
(2nd floor) Alex Fisher, *GSRA, Applied Physics*
Karen Nielsen, *GSI, Statistics* and *GTC, CRLT*

GSI-led labs and discussion sections often make use of groups to enhance students' learning. Group work is a powerful pedagogical technique, but it is also easy for students to be marginalized and disengaged during group activities. The role of the GSI is to ensure that all students are engaged and included in groups, and that individual learning is maximized. This session will model effective formation and management of student groups, including techniques for conflict resolution. Active learning techniques easily applied to cooperative learning settings will be discussed.

Michigan
(2nd floor)

Leading Problem-Solving Sessions

Annie Harmon, *GSI, Health Behavior and Health Education* and *GTC, CRLT*

One of the most challenging aspects of teaching is getting students to think critically and problem solve independently. In this workshop we will explore a range of problem-solving approaches and practice several strategies for teaching these skills. This session will cover problem solving in a variety of settings, but will be most useful to GSIs teaching in quantitative fields.

Kalamazoo
(2nd floor)

One-to-One Teaching in Music, Art, Dance & Architecture (part I)

Caroline Helton, *Clinical Associate Professor of Music (Performing Arts), School of Music, Theatre & Dance*
This session will focus on teaching skills in the music, art, dance, or architecture studio, including conducting a critique, giving feedback to students, drawing on your own experience as a student, grading performance, and expanding critical awareness. ***Session presented in two parts and continued during Concurrent Sessions II, 3:00 – 4:30 p.m.***

Room A
(3rd floor)

Strategies for Teaching Foreign Language Courses

Yanina Arnold, *GSI, Classical Studies,* and *Slavic Languages and Literatures* and *GTC, CRLT*

In this workshop, we will discuss instructor-student and student-student dynamics in the foreign language classroom and develop strategies for facilitating learning in a multicultural environment. We'll discuss the following questions: What are some of the complex cultural interactions that take place in a foreign language classroom between instructor and students, as well as among the students themselves? What are some of the issues that surround the teaching of a foreign language and the culture(s) it embodies? What strategies could a language instructor develop in order to create a good language-learning climate? During the course of the workshop, participants will be encouraged to reflect on their goals and practices as foreign language teachers and assess the potential impact of the choices they make on students' learning.

Koessler
(3rd floor)

Teaching Effectively with Technology

Emily Bonem, *GSI, Psychology* and *GTC, CRLT*
Dana Jackman, *GSI, School of Natural Resources and Environment* and *GTC, CRLT*
Trevor Kilgore, *GSI, English Language and Literature* and *History,* and *GTC, CRLT*

This workshop will cover several features of CTools, U-M's course management system; Google Apps for Education, U-M's supported collaboration suite; and other technologies GSIs can easily implement to make their teaching more efficient and more effective. Topics will include setting up a CTools site, assessing student learning using technology, facilitating student interactions using technology, and planning technology use. Participants are encouraged to bring a laptop or tablet to the session if possible. ***Session offered again from 3:00 - 4:30 p.m.***

2:45 – 3:00	Break (snacks and beverages available in the Concourse, 2nd floor)

3:00 – 4:30	Concurrent Sessions II (Please choose one)

Room 4
(1st floor)

Dealing with Controversy During Classroom Discussion
Daphna Atias*, GSI, English Language and Literature* and *GTC, CRLT*
Please see "Concurrent Sessions I" above for session description.

Founders Rm.
(Alumni Center)

Evaluating Student Writing
Theresa Braunschneider*, Instructional Consultant, CRLT*
Christine Modey, *Lecturer II, Sweetland Center for Writing*
Amber Smith, *Instructional Consultant, CRLT*
Please see "Concurrent Sessions I" above for session description.

Henderson
(3rd floor)

Facilitating Discussions in the Humanities
Tim Green, *GSI, English Language Institute* and *English Language and Literature* and *GTC, CRLT*
Melody Pugh, *GSI, English Language and Literature* and *GTC, CRLT*
Please see "Concurrent Sessions I" above for session description.

Vandenberg
(2nd floor)

Facilitating Discussions in the Social Sciences
Natalie Sampson, *Postdoctoral Research Fellow, School of Public Health* and *GTC, CRLT*
George Smith, *GSI, Psychology* and *GTC, CRLT*
Please see "Concurrent Sessions I" above for session description.

Hussey
(2nd floor)

Grading in Quantitative Courses and the Sciences
Billy Samulak, *Postdoctoral Research Fellow, Chemistry*
Grading is an important task, but can be a complex aspect of the teaching experience. This session will introduce and explain GSI grading responsibilities. The workshop highlights policy issues (course policies and student privacy), provides suggestions for how to grade, gives attending GSIs an opportunity to create a rubric and practice grading and offers some tips to make the task of grading more enjoyable.

Michigan
(2nd floor)

Identity and Authority in the Classroom
John Wesley Hill, *Ph.D., Theater Studies*
Timeka Williams, *GSI, Communication Studies* and *GTC, CRLT*
Identity and authority are complementary aspects of creating and maintaining a productive atmosphere in the classroom, the lab, and during office hours. This workshop gives GSIs a chance to reflect on how their own social identity may be seen by and impact the learning experiences of their students. There will be

opportunities to explore, share, and discover tips and strategies that work across disciplines.

Kalamazoo
(2nd floor)

One-to-One Teaching in Music, Art, Dance & Architecture (part II)

Caroline Helton, *Clinical Associate Professor of Music (Performing Arts), School of Music, Theatre & Dance*

This session continues from the session described in "Concurrent Sessions I" above.

Koessler
(3rd floor)

Teaching Effectively with Technology

Emily Bonem, *GSI, Psychology* and *GTC, CRLT*

Dana Jackman, *GSI, School of Natural Resources and Environment* and *GTC, CRLT*

Trevor Kilgore, *GSI, English Language and Literature* and *History, and GTC, CRLT*

Please see "Concurrent Sessions I" above for session description.

Engineering GSI Teaching Orientation – Agenda
Thursday, August 29, 2013
8:45 am – 4:00 pm

| **8:45 — 9:00** | Registration | Rackham Assembly Hall (4th floor) |

| **9:00 — 11:30** | Plenary Session | Rackham Amphitheater |

Welcome from the College
Overview of Engineering GSI Teaching Orientation
Climate in the Classroom: A Performance by the CRLT Players
Graduate Employees Organization: Employee Rights and Responsibilities

| **11:30 — 12:00** | Break and lunch pick-up | |

Pick up lunches on the 2nd floor of the Michigan League, Concourse
Go to your Concurrent Session A room to eat your lunch

| **12:00 — 12:55** | Concurrent Session A | Michigan League |

Being a Successful Lab Instructor
Handling Office Hour
Teaching a Discussion

| **1:00 — 1:55** | Concurrent Session B | Michigan League |

Teaching Problem Solving Skills
Handling Office Hours
Grading: Policies, How to, and Tips

| **1:55 — 2:10** | Break and travel time | |

| **2:10 — 4:00** | Practice Teaching Sessions | |

Your session will be held in rooms in the Michigan League, Modern Languages Building (MLB), and Palmer Commons. Find your room location on your nametag.
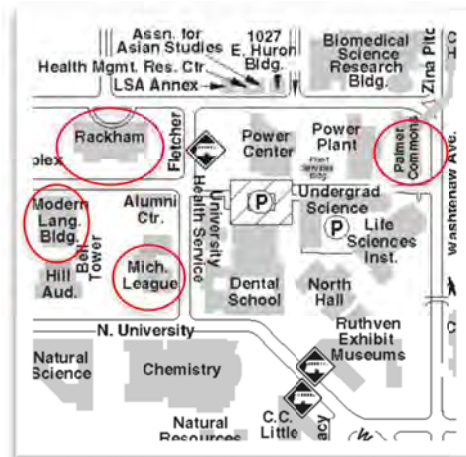
Concurrent session materials will be posted to the following website by September 6, 2013.

http://tiny.cc/CRLTEngin_resources
Select "New GSI Training Workshop Materials"

CRLT-Engin

Description of Concurrent Sessions and Practice Teaching

Being a Successful Lab Instructor
Maintaining a well-organized laboratory or computer section both saves a GSI's time and helps students learn. Presenters at this workshop will share strategies they wished they had known prior to teaching and will focus on ways to better prepare for leading a lab section and efficiently manage student questions. Participants will take away instructional tips for laboratory and computer environments that can be used immediately.

Handling Office Hours….
Participants will discuss ways to make office hours most beneficial to students. Topics such as dealing with common challenges and handling email communication will be discussed. Using role-play and case studies, participants will brainstorm how to efficiently manage office hours and handle "sticky" or puzzling situations they may encounter.

Teaching a Discussion
This session will provide strategies for: establishing authority, creating a lesson plan, running a discussion section, teaching for inclusion, and using active learning teaching methods.

Teaching Problem Solving Skills
In this session, GSIs will learn how to help students acquire problem-solving skills. Strategies to guide students through difficult problems without simply providing the answers will be discussed. Participants will have the opportunity to apply these strategies in mock scenarios.

Handling Office Hours
Participants will discuss ways to make office hours most beneficial to students. Topics such as dealing with common challenges and handling email communication will be discussed. Using role-play and case studies, participants will brainstorm how to efficiently manage office hours and handle "sticky" or puzzling situations they may encounter.

Grading: Policies, How to, and Tips
Grading is an important task, but can be a complex aspect of the teaching experience. At this session, participants will learn about GSI grading issues, both for GSIs who will be responsible for grading work themselves and GSIs who will be working with a student grader. The session highlights policy issues (course policies and student privacy), provides suggestions for how to grade, and offers tips to make the task of grading more enjoyable.

Michigan League

2:10 – 4:00   Practice Teaching

Practice Teaching….. Michigan League, Modern Languages Building, & Palmer Commons
This practice teaching session gives GSIs an opportunity to stand in front of a group of students and deliver a five-minute explanation on a topic of their choice. During the lesson, the audience will take notes as if they were students. After five minutes, the audience will complete a feedback form and the GSI will have a few minutes to reflect on two questions: (1) What went well? and (2) What could you do differently next time?

Engineering Instructional Aide Teaching Orientation – Agenda
September 9, 2013
4:30 pm – 9:30 pm
Michigan League

4:15—4:30	Dinner and Registration	Ballroom (2ND floor)

4:30—5:25	Plenary Session

For IAs only   Ballroom
Overview of Resources and Responsibilities
Welcome from the College
Best Practices Panel: Perspectives from Experienced IAs

For GSIs only   Michigan
Graduate Employees Organization: Employee Rights and Responsibilities
Welcome from the College
Overview of Resources and Responsibilities

5:30—6:25	Concurrent Session A

Teaching a Discussion
Being a Successful Lab Instructor
Handling Office Hours

6:25—6:30	Break

6:30—7:25	Concurrent Session B

Teaching Problem Solving Skills
Grading: Policies, How to, and Tips
Handling Office Hours

7:25—7:40	Break and Travel Time

7:40—9:30	Practice Teaching Sessions

Practice teaching sessions focusing on delivering a five-minute explanation on a concept, problem, or definition from their field of study will occur in various rooms in the Michigan League. You should report promptly at 7:40p.m. to the room for which you registered during dinner.

Concurrent session materials will be posted to the following website:

http://tiny.cc/CRLTEngin_resources

Select "New GSI Training Workshop Materials"

Description of Concurrent Sessions and Practice Teaching

5:30 – 6:25	Concurrent Session A	Michigan League

Being a Successful Lab Instructor
>   Maintaining a well-organized laboratory or computer section both saves a GSI's time and helps students learn. Presenters at this workshop will share strategies they wished they had known prior to teaching and will focus on ways to better prepare for leading a lab section and efficiently manage student questions. Participants will take away instructional tips for laboratory and computer environments that can be used immediately.

Handling Office Hours….
>   Participants will discuss ways to make office hours most beneficial to students. Topics such as dealing with common challenges and handling email communication will be discussed. Using role-play and case studies, participants will brainstorm how to efficiently manage office hours and handle "sticky" or puzzling situations they may encounter.

Teaching a Discussion
>   This session will provide strategies for: establishing authority, creating a lesson plan, running a discussion section, teaching for inclusion, and using active learning teaching methods.

6:30 – 7:25	Concurrent Session B	Michigan League

Teaching Problem Solving Skills
>   In this session, GSIs will learn how to help students acquire problem-solving skills. Strategies to guide students through difficult problems without simply providing the answers will be discussed. Participants will have the opportunity to apply these strategies in mock scenarios.

Handling Office Hours
>   Participants will discuss ways to make office hours most beneficial to students. Topics such as dealing with common challenges and handling email communication will be discussed. Using role-play and case studies, participants will brainstorm how to efficiently manage office hours and handle "sticky" or puzzling situations they may encounter.

Grading: Policies, How to, and Tips
>   Grading is an important task, but can be a complex aspect of the teaching experience. At this session, participants will learn about GSI grading issues, both for GSIs who will be responsible for grading work themselves and GSIs who will be working with a student grader. The session highlights policy issues (course policies and student privacy), provides suggestions for how to grade, and offers tips to make the task of grading more enjoyable.

Michigan League
Concurrent Rooms
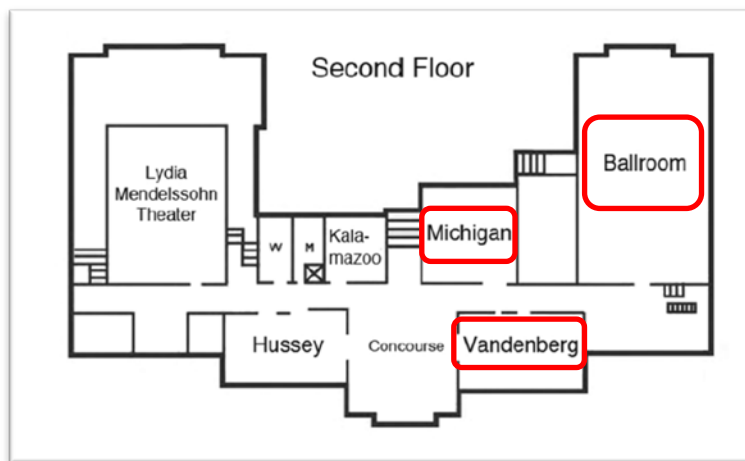
7:40 – 9:30	Practice Teaching	

Practice Teaching……...Michigan League Rooms
>   This practice teaching session gives GSIs an opportunity to stand in front of a group of students and deliver a five-minute explanation on a topic of their choice. During the lesson, the audience will take notes as if they were students. After five minutes, the audience will complete a feedback form and the GSI will have a few minutes to reflect on two questions: (1) What went well? and (2) What could you do differently next time?

Facilitating the Scholarship of Teaching and Learning at a

RESEARCH UNIVERSITY

By Mary C. Wright, Cynthia J. Finelli, Deborah Meizlish, and Inger Bergom

At the University of Michigan's Center for Research on Learning and Teaching (CRLT), Mary C. Wright is assistant director for evaluation; she is also an assistant research scientist. Cynthia J. Finelli is director of the CRLT North (an engineering outpost of CRLT) and a research associate professor in the College of Engineering, and Deborah Meizlish is assistant director and coordinator of social science initiatives at the Center. Inger Bergom is a doctoral student at the University's Center for the Study of Higher and Postsecondary Education.

"I made some changes in my class, but how do I measure their impact?"

"What's an 'IRB'? I never needed to get permission to conduct research in engineering."

"I want to study student learning in my classes, but where can I find the time?"

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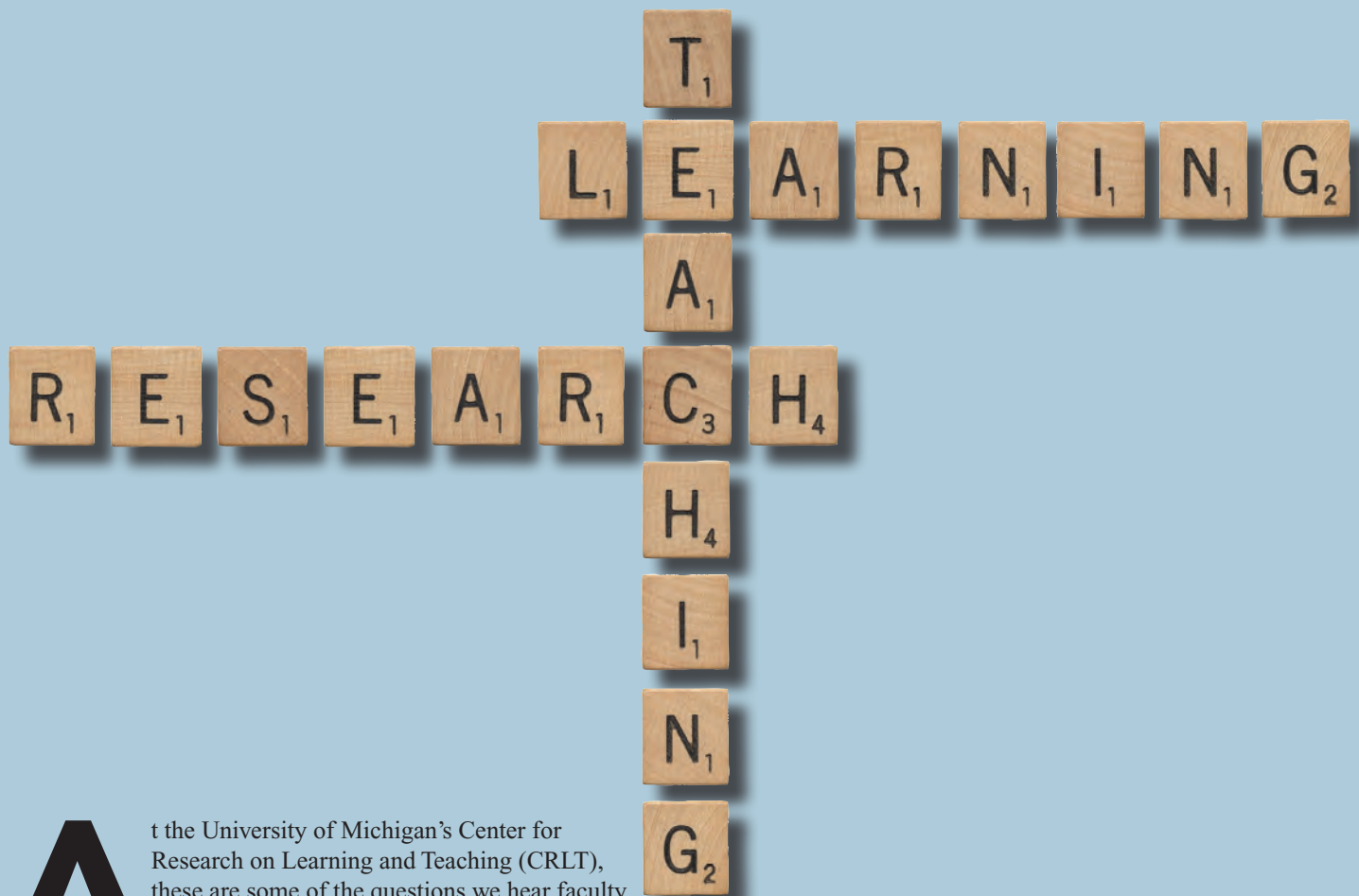
At the University of Michigan's Center for Research on Learning and Teaching (CRLT), these are some of the questions we hear faculty voice about the scholarship of teaching and learning (SoTL). Although faculty have been trained to carry out research and publish in their disciplines, they can get stuck when first embarking on a SoTL project.

Defined as the systematic study of teaching and learning made public, SoTL has drawn increasing attention from faculty members and institutions in recent years, perhaps as a response to rising demands for accountability and evidence-based teaching practices. However, the process of setting up a SoTL project, carrying it out, and converting the resultant data into meaningful findings can keep even the most accomplished faculty from embarking on the task—or, if they do, succeeding at it.

Many have described the reward-based challenges of facilitating SoTL in a research university, "the paradox of creating the conditions for SoTL without the incentives" (Walker, Baepler, & Cohen, 2008, p. 188). However, other challenges are less frequently identified, including some faculty members' difficulties navigating institutional approval processes for human-subjects research, finding others with whom to discuss their research, locating literature on teaching and learning, discovering dissemination outlets, and simply getting assistance to do the work. Because changing a faculty rewards system can be a long-term endeavor, particularly at a research university, what are other ways to encourage instructors to do SoTL in the meantime?

The Investigating Student Learning (ISL) program (<http://www.crlt.umich.edu/grants/islgrant.php>) began at the University of Michigan in 2008 to fund faculty and faculty/postdoc/graduate-student teams to pursue SoTL research on courses and curricula. In designing a comprehensive program to support this activity, we drew on the experiences of other campuses' SoTL initiatives, as we describe below.

The ISL program is coordinated by the University of Michigan's teaching center, the Center for Research on Learning and Teaching; funding is provided by the provost's office and the College of Engineering. The core of the ISL is a competitive grant program. Faculty members apply for grants, which are awarded through a process of peer review; this process resonates with many research university faculty. (See Weblinks for the application process.) Thus far, ISL has funded 33 teams (59 individuals) to carry out their SoTL projects, with grants of $3,000 for individual applicants and $4,000 for faculty/postdoc/graduate student teams. (See Box 1 for examples of projects.)

Box 1
Sample ISL Grant Projects

- Using Screencasts to Enhance Student Learning in a Large-Lecture Material Science and Engineering Course

- Teaching the Central Dogma Using Physical Models in an Active-Learning Biology Classroom

- Policy Students' Experience of Learning by Doing Case-Study Wikis

- Social Work Students' Understanding of Their Future Roles and Functions as Mental Health Service Providers

- Fostering Critical Engagement and Cross-Cultural Comparison in History

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PROGRAM FEATURES

The ISL program has developed a number of structures to facilitate the process for SoTL researchers, adapting practices that have been effective at other institutions and consolidating them into one grant program. Below, we discuss these features, other university models for them, and the reasons they were developed.

A Streamlined Institutional Review Process for Grantees

Institutional approval processes for human-subjects research can present significant barriers to instructors who wish to engage in SoTL projects. Institutional review board (IRB) applications are new for many faculty unaccustomed to this type of research, and Family Educational Rights and Privacy Act (FERPA) guidelines can be daunting as well. Indeed, the Carnegie Academy for the Scholarship of Teaching and Learning (CASTL) groups, which played a major role in the development of the SoTL movement from 2002–2006, included a research universities consortium that called for "policies providing recognizing [sic] SoTL in IRB policies and institutional grant programs."

Indiana University at Bloomington is an example of how one university addresses this issue: its human-subjects committee provides detailed IRB application guidelines to instructors who wish to study their students. Examples of similar guidelines provided by human-subject boards include those at Illinois State University and the University of Wisconsin system. We sought to streamline this process even further, while still engaging investigators in reflection on the possible ethical and FERPA issues embedded in SoTL research.

At the start of the program, the CRLT initiated a campus collaboration with the university's IRB and legal counsel's office that greatly simplified the research-approval process for ISL grantees. To establish this arrangement, a CRLT staff member consulted with the IRB about the best approaches for developing a blanket approval process. Center staff then submitted an IRB proposal that gave faculty broad latitude in research design options and worked with the IRB to resolve outstanding questions. The IRB granted an exemption from further review for all funded projects (assuming that grantees followed certain guidelines). CRLT staff also met with the university counsel's office to resolve any potential issues with FERPA guidelines.

In group and one-on-one meetings, we discuss the IRB agreement and FERPA requirements with grantees, requiring that they follow basic guidelines for their research. (See Box 2 for abbreviated guidelines.) We also invite faculty to consider other ethical issues that might arise in their particular research on student learning.

Once these discussions have taken place and grantees agree to the guidelines, they are free to commence their projects without submission of a lengthy research review. Thus far, discussions of the ethics of student research have been rich, no student issues have been raised, and the university's IRB continues to support this arrangement.

Box 2
Abbreviated Ethical Guidelines for ISL Grantees

- *Interaction with the CRLT:* Research teams will meet at least twice with CRLT staff to learn about the IRB exemption, consult on research approaches, and discuss the presentation of findings.

- *Focus of the Project*: The projects will study postsecondary student learning.

- *Notification and Consent:* Students will be notified (e.g., via a syllabus paragraph) when research is done in the course of "normal work expectations"—that is, using exercises instructors would typically ask them to complete for their courses (regardless of their participation in ISL). Consent will be obtained for research that goes beyond normal work expectations, such as focus groups or surveys.

- *Grades:* Students' participation in the research will be voluntary and have no influence on their grades or their standing in a program.

- *Presentation of Findings and Storage of Records:* In public presentations of the findings in this research, student identifiers will be removed. If records are kept of the research, they will be kept in a secure environment.

> **The ISL grant creates a structured role for graduate students and postdoctoral research fellows as co-applicants and co-investigators with faculty. This participation benefits both the projects and the students.**

Graduate Students and Postdocs as Co-Investigators

In the busy lives of research university faculty, it may be difficult to make time for SoTL, which is just one more thing on a crowded plate. Therefore, the ISL grant creates a structured role for graduate students and postdoctoral research fellows as co-applicants and co-investigators with faculty. This participation benefits both the projects and the students, for as Bernice Pescolido and her colleagues at Indiana University note, to develop future faculty, "no better vehicle exists…than the scholarship of teaching and learning."

Preparing Future Faculty programs at Vanderbilt University and the University of British Columbia support graduate students as they engage in SoTL in individual courses and graduate teacher certification programs; so does the National Science

Foundation-funded Center for the Integration of Research, Teaching and Learning (CIRTL). Additionally, some SoTL grant programs encourage graduate student/faculty teams, such as the one at Indiana University.

Michigan's ISL goes further than other programs in explicitly rewarding intergenerational collaborations with extra funding, an additional $1,000 for a team that includes a graduate student and/or postdoctoral scholar. The Center also helps to connect potential faculty grantees with graduate student/postdoc co-investigators.

Interestingly, the degree of "intergenerational" collaboration has increased over the years. In the ISL's first year (2008–9), only a third of the 12 teams were partnerships, but in the third year (2010–11), all but one of the teams included such collaborations.

A Kick-off Symposium to Bring Resources to Grantees

Another barrier to getting SoTL research done involves the difficulty of locating resources within decentralized universities. For example, consider an actual ISL project that investigates how screencasts enhance student learning in a large-lecture engineering course. An education librarian might offer useful information about background literature, an IT specialist could provide expertise about lecture-capture technologies, and CRLT staff could advise about project design. Yet, like at many universities, all of these people work in different places within the University of Michigan.

Therefore, at the start of each grant year, all grantees are required to attend a one-day ISL symposium to kick off their projects. Many other universities sponsor SoTL-themed events, but we deliberately structure the ISL program to meet the needs of faculty at a busy, decentralized research university.

Half of the session is designed to bring the dispersed university resources—including librarians, IT staff, and CRLT consultants—to the participants. This part of the day's program is tailored according to the project needs of each year's cohort; sessions have included workshops about survey design, using the university's course-management software for research purposes, and doing educational literature searches.

The rest of the day is designed to bring the whole cohort together so they can serve as resources for each other. It features interactive sessions about methodology (how might you measure student learning?) and ethics, including an extended discussion of the CRLT guidelines for classroom research negotiated with the IRB. In addition to helping participants start their projects, these discussions provide an opportunity for networking among participants.

A Concluding Poster Session for Intra-University Dissemination of Key Findings

Most proponents of SoTL stress the importance of sharing findings in order to make projects open to evaluation and to encourage others to build on the findings. However, a research university culture generally does not value pedagogical research for promotion and tenure, so it can be difficult for faculty to justify the time needed to do, never mind publish, SoTL research.

The ISL program encourages the local sharing of ideas through a required poster session at a large university event on teaching. Grantees are asked to design and present posters on their projects and share the findings with an interdisciplinary au-

> ❝ 'My participation in the ISL project has influenced my work as a teacher educator. The project has provided me with stronger skills and deeper understanding of what it means to teach.'

dience. Later, a public online record of these posters is created.

This format combines the advantages of various institutional approaches, namely the scope afforded by virtual poster sessions, such as Georgia Southern University's "SoTL Expo," and the rich dialogue that in-person poster sessions can foster, such as the ones at the graduate student symposia at Howard University and the International Society for the Scholarship of Teaching and Learning (ISSOTL)'s annual meeting.

If needed, CRLT staff can provide assistance with creating the posters. Thus far, all but one of the teams have completed posters at the end of the year-long grant—and the remaining grantee presented his six months later. (A link to the posters can be found in "Useful Weblinks.")

At the most recent poster fair (May 2010), there were over 160 attendees from across the university. The success of this event is probably best described by an attendee who wrote afterwards that he appreciated "the opportunity to talk with others, to view the posters, and to hear about innovative projects. I am always grateful for the chance to meet colleagues across the College. We are too often isolated by disciplinary and other boundaries."

EVALUATION

Another important feature of our ISL program is that it incorporates extensive formative and summative evaluation, including both participant-satisfaction data and analyses of work products. Tools for this evaluation include participant surveys after the kick-off symposium, as well as surveys given at the completion of the year-long grant regarding the perceived impact of the program on the researchers' professional development, instructional practice, and plans for dissemination. (See "Useful Weblinks" to view these survey instruments.)

Currently, two groups (2008–9 and 2009–10) have gone through the year-long ISL cycle, while one cohort (2010–11) is partway through its projects. Of those who have completed the ISL year, nearly all (21 of 23) teams gave feedback on their experience. All respondents agreed that, "overall, the ISL program was valuable for helping me to complete my research on student learning."

Most (17/20) teams agreed that their experience with their project would change their approach to teaching. (Two participants felt it had a neutral impact, and the sole instructor who

disagreed indicated that it "didn't change my teaching but it certainly affirmed it." Three teams did not respond to the question.) One grantee's comment is typical: "My participation in the ISL project has influenced my work as a teacher educator. The project has provided me with stronger skills and deeper understanding of what it means to teach."

Given the success of their posters, nearly all grantees planned to continue their project in some form past the duration of the ISL grant. Some planned to present their work at disciplinary conferences or to publish their findings, and others used the ISL as a "seed grant" to apply for NSF funding. When asked to report on the number of students affected by the grant project in their own courses and departments, grantees estimated the impact at nearly 3,000 undergraduates and about 100 graduate students just over the course of the grant year.

As another metric of the success of the program, we created a rubric for analyzing the posters. Using literature on defining and assessing SoTL, the rubric measures such aspects as engagement with existing knowledge, communication of results to the public for critical review, systematic study of the learning process, and application of the findings.

Analysis of the first cohort's posters indicated that ISL participants successfully communicated their results and developed instructional implications from their findings, but many faculty (58 percent of the posters) struggled to connect their project to existing knowledge (Table 1). We made a more deliberate attempt to point the second cohort toward the literature on teaching and learning.

The 2009–10 posters indicated that this effort paid off, with fewer (45 percent) of the posters demonstrating this difficulty. However, because we would like all posters to have these scholarly linkages, we will continue to focus on this area with grantees.

A second area that the poster evaluation revealed as a challenge was participants' systematic documentation of the learning process and its results. A few grantees' posters documented only the pedagogical techniques used rather than their impacts. More commonly, participants fulfilled the expectation to some extent by describing some findings but provide limited information about their methods.

In the most recent year (2009–10), we disseminated the rubric in advance of the poster-construction process and recommended that participants describe their methods, their research questions, how the questions were answered, and issues remaining for future inquiry. We did see some improvement: only a third of the 2008–9 posters did this effectively, while the vast majority (73 percent) of 2009–10 documents mastered this criterion.

TABLE 1. ANALYSIS OF FINAL ISL PROJECTS: RUBRIC FOR POSTER EVALUATION

Does the poster include evidence of…

	Aggregate (23 posters)			2008-2009 (12 posters)			2009-2010 (11 posters)		
	Yes	Some what	No	Yes	Some what	No	Yes	Some what	No
Engagement with existing knowledge / literature	9	2	12	4	1	7	5	1	5
Communication of results to the public for critical review	22	1	0	11	1*	0	11	0	0
Systematic study / analysis of the learning process	12	8	3	4	6	2	8	2	1
Application and use of findings	23	0	0	12	0	0	11	0	0

*Note: This grantee presented a poster six months later, at another university-wide event.

Rubric developed from Hutchings & Shulman (1999), McKinney (2007) and Theall & Centra (2001).

Institutional Impact

Beyond the effects on individual faculty members and their students and departments, it is also clear that ISL has an institutional impact. In the university's most recent accreditation from the Higher Learning Commission, the ISL and ISL-sponsored projects were mentioned as evidence of effective assessment practices that helped to demonstrate that the University of Michigan is fulfilling its educational mission.

The University's individual schools and colleges offer important support to the ISL program. For example, to signal the importance of engineering-education research, the College of Engineering (one of the university's largest units) doubles the funding for any engineering ISL grant recipient. A dean at the College of Engineering described the impact of the program as follows:

> We've seen increased creativity in how our engineering faculty approach their teaching. Not only are they adopting best practices like active learning, but they are more willing to try novel approaches, like the use of storytelling to enhance engineering lecture classes. These experiments in teaching are occurring because the environment created by faculty engaged in ISL make it "OK" to treat teaching like engineering research — a growing, vibrant field with new techniques validated through measurement, rather than a fixed set of practices treated as received wisdom from the ancients.

In addition to engineering, grant projects have been important components of curricular assessment projects in education, medicine, nursing, social work, dentistry, and fifteen departments in the university's largest unit, the College of Literature, Science and the Arts.

Rethinking the Barriers to SoTL

While it may be true that many postsecondary institutions do not adequately reward SoTL activities, faculty have many other motivations for doing what they do. Indeed, in our surveys of ISL grantees, the most frequent reasons instructors give for pursuing an ISL grant are to answer a "burning question" about teaching and learning, to enhance their teaching, and to get some funding for their projects (Table 2). Relative to other motivations, career advancement is an infrequently named reason for faculty participation, although it does play a role for graduate students and postdocs.

Therefore, to encourage SoTL, it may be more effective to focus on the barriers we can immediately lower: the time it takes to complete a project, the hurdles that have to be cleared in getting approval for research on student learning, isolation, and insufficient expertise in designing SoTL research and getting it done effectively. Drawing from effective practices in other SoTL initiatives, the ISL program at the University of Michigan is one comprehensive model that lowers these barriers for faculty, encourages SoTL, and communicates that

Table 2. Why do Instructors Apply for an ISL Grant? Results from 2008–2010 Grantees

	Faculty (22 respondents)	Graduate Students and Postdoctoral Scholars (17 respondents)
To answer a "burning question" about teaching or learning	14	7
To enhance instructional practice	14	3
To get the funding	11	5
To meet others at the University who share interests	7	6
To build a foundation for future grant applications	7	5
It would be useful for career advancement	5	7

Note: Grantees could select more than one response to the question, "Which factors played a role in your decision to pursue an ISL grant?"
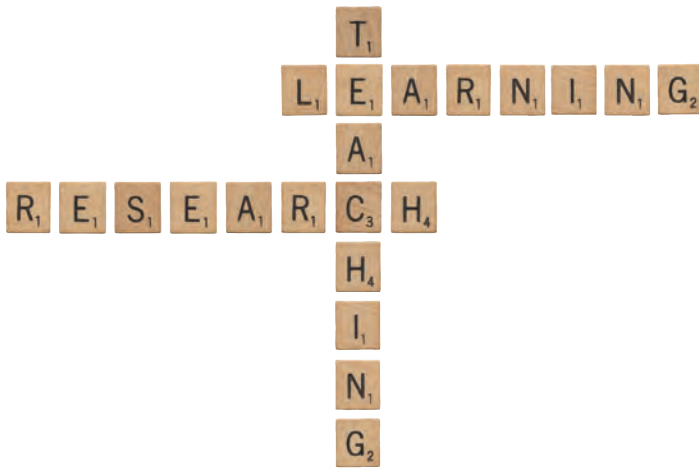
teaching is valued at the university. Of course, this model may require modification at other institutions, based on the particular barriers faculty identify in these contexts. However, as the following ISL grantee describes, this model works well for our research university.

I am sure there are a number of teaching staff at the university who would be interested in investigating their own students' learning but feel reluctant to actually carry it out, since it is seen as something extra and less valuable. Once this "something extra" is presented to them in a more feasible and meaningful way, as CRLT does so very well, I am sure many of them would care to step in, just as I did. It is good to know that teaching, as well as classroom research, is very much valued at this higher education institution. C

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■ Investigating Student Learning Program, Center for Research on Learning and Teaching, University of Michigan.
  • Requests for Proposals and Posters: http://www.crlt.umich.edu/grants/islgrant.php
  • End-of-ISL program participant evaluation: http:// www.surveymonkey.com/s/ISLProgram
  • End-of-symposium participant evaluation: http://www.surveymonkey.com/s/ISLSymposium

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BETTER THAN EXPECTED

Using Learning Analytics to Promote Student Success in Gateway Science

By Mary C. Wright,
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Learning Analytics (LA) has been identified as one of the top technology trends in higher education today (Johnson et al., 2013). LA is based on the idea that datasets generated through normal administrative, teaching, or learning activities—such as registrar data or interactions with learning management systems—can be analyzed to enhance student learning, academic progress, and teaching practice.

Examples of LA projects in colleges and universities include Purdue University's "Course Signals" system, an early-alert notification for struggling students, and Austin Peay State University's "Degree Compass," a course recommender program based on predictive analytics.

Useful Weblinks about Learning Analytics

EDUCAUSE. (2011). *7 things you should know about first-generation learning analytics*. Boulder, CO: Author. Available at http://www.educause.edu/Resources /7ThingsYouShouldKnowAboutFirst/242966

US Department of Education. (2012, October). *Enhancing teaching and learning through educational data mining and learning analytics: An issue brief.* Available at http://www.ed.gov/edblogs/technology/ files/2012/03/edm-la-brief.pdf

Society for Learning Analytics Research (SoLAR): http://www.solaresearch.org/

Sample initiatives:

Purdue Signals Project: http://www.itap.purdue.edu/ learning/tools/signals/

Carnegie Mellon Open Learning Initiative: http://oli. cmu.edu/get-to-know-oli/course-features/

Austin Peay State University's Degree Compass: http://www.apsu.edu/information-technology/degree- compass-what

University of Michigan, Department of Physics, E²Coach: http://sitemaker.umich.edu/ecoach/home

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Although the promise of LA is great, key areas of the approach have been identified as needing to be better realized (Dringus, 2012). The key challenge is utilizing large data analyses for actionable and effective interventions in the classroom—that is, enabling "faculty to more precisely identify student learning needs and tailor instruction appropriately" (Johnson, et al., 2011, p. 28).

Here, we describe one large-scale LA initiative at the University of Michigan (U-M) to improve performance for thousands of students in gateway physics courses. Our goal is not only to describe the development and implementation of this unique initiative in STEM education but also to discuss how the approach we used can help meet some of the challenges to more widespread LA adoption.

To foster student success in gateway physics at U-M, we engaged in a four-step process. The approach involved a large data analysis of course records, exploratory interviews to better understand student performance, surveys of students to gather their narratives, and the development of a personalized learning tool. We wanted to develop a rich, student-centered picture of effective strategies in introductory physics.

The project involved collaboration between multiple units on campus:

- The Department of Physics
- The Center for Research on Learning and Teaching, U-M's teaching center
- The Science Learning Center, an academic study support office
- The Center for Health Communications Research, which develops tailored health-communications strategies.

We needed to call upon many experts to develop E[2]Coach (an Expert Electronic Coach), a computer-tailored student support system for gateway STEM courses.

HELPING STUDENTS SUCCEED IN GATEWAY COURSES

This work first focused on students enrolled in two large introductory physics sequences at U-M. Physics 135 and 235 are intended for life science students, many of whom do not see the need for physics in their programs. Physics 140 and 240 are aimed at physical science and engineering students, who are much more likely to recognize physics as important to their core educational and career goals.

Both sequences are large, enrolling a total of 1900 students per term. Grades in all of these courses are based on online homework, three midterm examinations, in-class peer-instruction questions, and a final.

The challenges to student success in introductory physics are well documented. They include perceptions of the inaccessibility of material, misconceptions that students bring to class, the diversity of student preparation, and a misalignment between student and instructor goals. Failure to thrive in these courses has important implications, including a negative impact on STEM persistence, especially for women and underrepresented minorities.

Physicists have tried hard to improve student learning and retention in physics. They have done pioneering work in active-learning strategies, improved lecture demonstrations, and adopted non-cognitive approaches such as values affirmations (e.g., Mazur, 1996, and Miyake et al., 2010). These interventions are generally employed classroom-wide, with all students receiving identical treatment.

We took on these challenges in a different way. One novel aspect of our project is the development and delivery of highly personalized learning support on large scales. Using interviews and surveys, we collected successful strategies from a diverse array of former students. Current students then receive advice from former students who resemble them in salient ways, including preparation for physics, sense of self-efficacy, gender, and career plans.

Tailoring like this has been found effective in many contexts, since it avoids students' tendency to ignore advice they do not consider personally relevant. Ost (2010) adds that students at risk of abandoning the physical sciences are most influenced by their peers, a finding that is true in other disciplines as well.

Step 1: Predicting Student Performance

To develop a predictive model of student performance, faculty in the Department of Physics first collected administrative data describing the background and progress of 48,579 students through introductory physics courses at U-M over 14 years. These data combine detailed information about each student upon his or her arrival in the class— including standardized test scores, high school and prior U-M GPAs, socioeconomic status, and gender— with a full portrait of the student's progress through the course, including homework grades, classroom participation, exam scores, and final grades. Using methods from the discipline of physics—albeit typically applied to cosmology rather than to registrar data—faculty conducted analyses to better understand key predictors of final course grades.

Rather than rely on an *absolute* approach to measures of student performance, such as the final course grade, this analysis used a *relative* estimate of student performance— whether a student performed *better* or *worse than expected* (BTE or WTE). Expected performance—which has been shown to play a key role in motivation and achievement—is derived from incoming characteristics such as prior GPA and standardized test scores. In this approach, a student receiving a C in physics might be considered BTE if peers with a similar background typically fail. Likewise, a student with a 4.0 GPA receiving her first B+ (which others might consider a good grade) would be considered WTE.

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Not surprisingly, prior U-M GPA was the primary predictor of a student's grade in introductory physics. However, even controlling for background and prior performance, there was a problematic gender dynamic. In general, female students performed worse than expected, falling a quarter of a letter grade below male students after adjusting for all measures of incoming preparation: SAT or ACT math score, high school GPA, and prior GPA (Miller, 2011). Unfortunately, these results are consistent with those seen in other US institutions (Kost, Pollack, & Finkelstein, 2009).

Although this data analysis presented a general picture of student performance in gateway physics, the quantitative learning-analytics model could not tell us what students who performed BTE did differently from those with a WTE final grade. To explore this question, staff in the Center for Research on Learning and Teaching interviewed students who had recently completed the introductory physics courses.

Step 2: Student Interviews

After receiving approval from our university's human subjects review board, grade predictions allowed us to invite students whose performance was at the most extreme ends of the BTE and WTE categories. In our interviews, we focused on understanding students' experiences of the classes, their recommendations for pedagogical changes, and their use of strategies identified by prior literature as conducive to academic success. These included social assistance-seeking; goal setting and planning; reviews of class materials; and the organization/rearrangement of instructional materials by, for instance, making outlines or taking notes.

A key challenge of the project was recruiting students for the interviews – especially given that students' physics grades were generally lower than their performance in other classes. After 170 email interview requests, 19 students participated; over half (58 percent) of the interviewees were female. Nine participants were BTE, and 10 were WTE. Because these interviews were exploratory—primarily to develop a survey—we moved forward with them and did hear some rich narratives.

In nearly all cases (17/19), student perception of expected course performance aligned with our analysis: Most WTE students reported that they had scored "a little worse" or "a little lower" than hoped, while the BTE group noted that they had performed as well or better than they had anticipated. The two exceptions were students whose grades were at the boundary of the BTE/WTE categories, who expressed conflicted self-assessments. For example, a female WTE student who had received a B+ (the highest grade among WTE students) initially said she did "better than I expected." However, later in the interview, she noted that, since she had anticipated being a physics major, she was not "happy with" her performance.

When we analyzed the interviews, we found a few key differences in the strategies used by the students who performed BTE and WTE, which we summarize briefly here:

1. BTE students tended to be more adaptive than WTE ones in their study habits. Interestingly, reported time for non-exam weeks was about the same for both groups of students, but BTE students reported studying 5–10 hours more during exam weeks.

FIGURE 1. SAMPLE STUDENT SURVEY BLOCK

First, we would like to ask you about advice that you would give to a student at the <u>beginning of the term</u>. We are particularly interested in hearing about concrete examples of study strategies that have worked for you or other students you know. If you would like to see examples of the types of advice, we'd like to offer on ECoach, please click <u>here</u>.

2. At the beginning of the term, what advice would you give to a student in Physics 135 or 140 who wants to know:

(Please write a short paragraph for each topic.)

How many hours per week s/he needs to study to do well in the course	
The best study strategies and resources to prepare for exams	
How to learn the most from doing the Mastering Physics homework.	
The best way to learn from the textbook or coursepack.	

2. BTE students also made more adjustments in response to exam feedback. While all students described struggling with the first exam, BTE students reported that afterwards, they increased the number of ways they studied (e.g., doing more practice problems). In contrast, more than half of WTE students reported dropping a resource, most frequently discontinuing the use of the textbook or coursepack.

3. While BTE students more frequently reported studying with other students, WTE students more commonly indicated that they went to the "Physics Help Room," a space in which instructors, graduate students, and undergraduate teaching assistants answer questions from any student in any physics course. It may be that relying too much on expert assistance hindered the WTE students' ability to solve problems on their own. It may also be that Help Room staff (largely graduate students and undergraduates) receive no special training, while the Science Learning Center (SLC) trains the leaders for the nearly 600 peer-led study groups supporting a variety of introductory science courses.

Although these findings are generally consistent with those in the science of learning and science education, the interviews also gave us a more nuanced understanding about how these dynamics played out in the context of U-M physics courses. More importantly, they generated transcripts of student advice about their physics experience, which allowed us to pull quotes that could be relayed to other students and to craft a survey to elicit more student advice.

Step 3: Surveys of Peer Study Group Leaders

To amplify the findings from the BTE/WTE interviews, Center for Research on Learning and Teaching staff created a survey for the larger group of students who had served as study group leaders in the SLC. To be a leader, students must have received at least a B+ in the course in which they serve. In fall 2011 and winter 2012, we invited all SLC study group leaders who had taken Physics 135 or 140 to complete a survey.

The key purpose of these surveys was to elicit quotations about themes identified in the BTE/WTE interviews. For example, adaptive time and resource usage differentiated BTE and WTE students, so open-ended survey questions asked about study-time and resource-use strategies at the beginning and end of the term (see Figure 1).

To allow us to provide tailored advice, survey respondents were asked to report a variety of background characteristics, such as their major, career and educational plans, college math background, and high school physics background. They were also asked whether we should share their advice anonymously or with their first name and a picture, so that students might know the source of their advice. Of the survey respondents, 42 percent wanted their advice used anonymously, 58 percent said we could use their name, and 40 percent said we could use their photograph with the advice.

These surveys generated a rich set of responses to complement the interview data. Although the responses differed slightly, most of the student advice was relatively consistent. For example, one female engineering student who remembered being "very confident" that she would receive the grade she wanted advised her peers to

work with others. It is amazing how someone can approach a problem completely differently. There is more than one right way, and one way may fit your brain better than another. Also, TEACHING is a good way to more thoroughly understand something. ... Join a study group, where you'll be in a peer group situation to implement both of these study strategies.

A male pre-medical student in a life science major who took physics in high school but was only "somewhat confident" that he would receive the grade he wanted recommended, "If you think changing study methods will help, try the new methods out. Practice exams will gauge whether your new methods are working."

Finally, a male math major with plans to work as a business consultant and no high school physics background suggested, "They should talk with their classmates about what their study strategies are. They could also join a study group."

Step 4: E²Coach Development

The knowledge gained from BTE and WTE student interviews, combined with quotes gleaned from study-group leader surveys, provided us with a rich suite of advice for students taking these courses. To deliver tailored advice, Department of Physics faculty and staff developed E²Coach.

E²Coach is based on the Center for Health Communications Research's open-source computer-tailored intervention system, typically used for public-health interventions such as smoking cessation. Through this collaboration between physics and public health faculty and staff, an intervention was developed that offers a tailored study support system, customized by prior course-performance data, students' responses to surveys about their backgrounds and goals, and ongoing physics assessment information.

> " **Open-ended survey questions asked about study-time and resource-use strategies at the beginning and end of the term.**

FIGURE 2. SAMPLE E2COACH PAGE

At the beginning of the term, students enrolled in an introductory physics course receive an email from E²Coach with information about the intent of the project and instructions about how to opt into the system (see Figure 2).

If students choose to utilize E²Coach, they complete a short initial survey about their confidence and goals as related to their upcoming physics course. One week into the course, they receive their first customized message, complete with advice on how to approach the class, quotes from previous students about how best to study, and links to additional resources. Additional tailored messages are delivered every few weeks through the term, preparing them for the first exam, responding to their performance on it, and even responding to their final performance with advice for the future.

Advice offered addresses test-taking skills, motivation, and the need to adapt learning approaches in response to performance. E²Coach suggests how frequently the student should use learning resources and provides detailed feedback about his or her current status, both absolute and in reference to the desired grade. E²Coach also provides normative information, allowing students to see what students who achieved their desired grade in previous terms did to succeed and to understand how well they would have to do on future tests in order to receive that grade.

This multi-pronged approach was informed by research on college learning-skills programs, which recommend a range of "cognitive, metacognitive, and motivational strategies in order that students will have both the 'skill' and the 'will' to use the strategies properly" (Hofer et al., 1998, p. 60).

IMPACT

E²Coach was launched in January 2012 and offered support to over 3,000 students during its first year. Initial data show that students who used the system performed better than expected significantly more often than those who did not.

To evaluate the system, we first computed a "BTE score," comparing expectations based on predictors to actual physics grade and computing the difference. We also measured how frequently students accessed E²Coach, if they did so at all. These frequencies were categorized into the following groups: non-users, low users (who accessed E²Coach two or fewer weeks per term), moderate users (three or four weeks), and high users (five or more weeks).

Then we examined BTE scores for each group, and we found that usage significantly predicted BTE scores for the groups (p < .001). On average, high users had a BTE score

> **Advice offered addresses test-taking skills, motivation, and the need to adapt learning approaches in response to performance.**

FIGURE 3. PERFORMANCE FEEDBACK DISPLAY PROVIDED TO STUDENTS
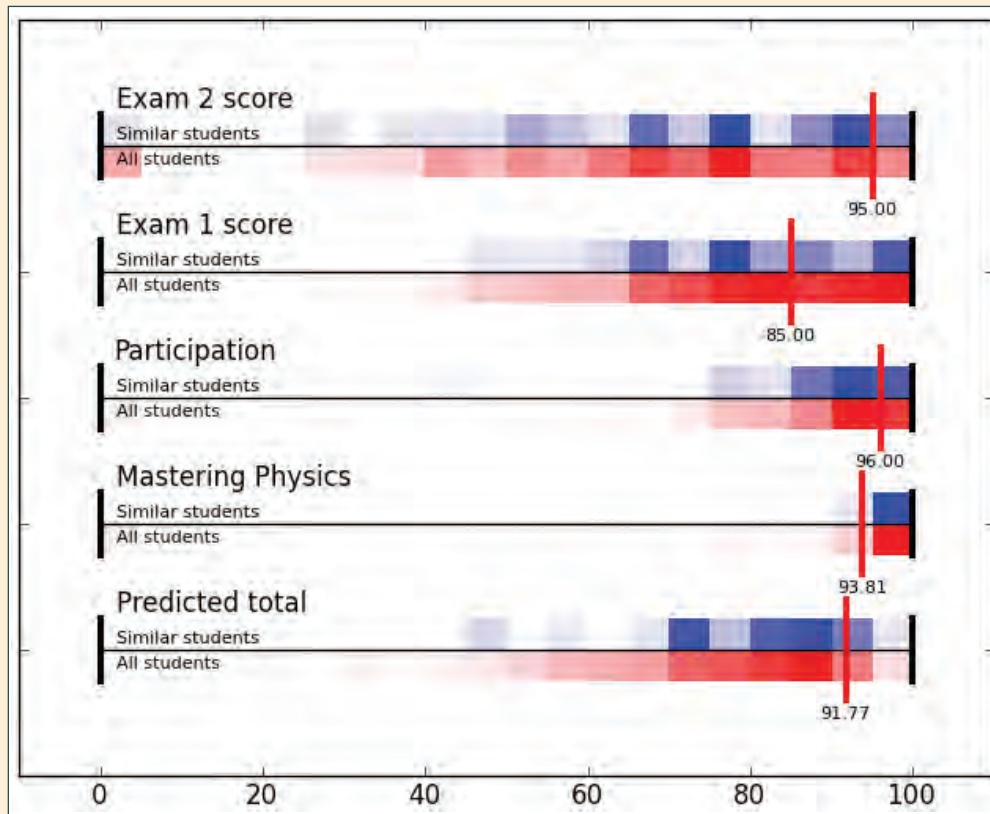
of 0.17 (i.e., 0.17 grade points above their predicted incoming GPA), while non-users showed no difference, with a BTE of 0.0.

Given that gender dynamics was one motivating concern in the development of E²Coach, it is important to note that a majority of high (52.2 percent) and moderate (51.0 percent) users were women, while most low (58.5 percent) and non-users (72.9 percent) were men. However, while female students who were moderate or high users of the system scored significantly higher than non- or low-using female students, they still scored lower than their male peers. This is clearly a finding that we need to pursue in future iterations of E²Coach, but it may be that even good study-support systems have their limits in addressing more profound cultural and structural classroom challenges. It is notable that the university is beginning to engage in an NSF grant project that more broadly addresses gender disparities—i.e., women performing worse than expected—in several introductory STEM courses.

MAKING LEARNING ANALYTICS WORK FOR LEARNING

Learning analytics has great potential to reshape the college classroom and to improve student achievement. However, the enterprise also faces significant challenges. The E²Coach project at U-M may offer some strategies to more fully realize LA's potential to improve college-level learning by using large-scale data analyses to change the student experience.

1. LA work "generally falls within the purview of IT departments" (Johnson, et al., 2011, p. 28). However, the expertise and buy-in of multiple collaborators across campus is critical, as is starting the project from the faculty's learning goals. Initiated because of a faculty teaching concern, the development of E²Coach required multidisciplinary and cross-institutional perspectives on the problem, drawing upon campus-technology, educational-development, learning-center, and evaluation resources.

2. LA projects often are *data driven*, oriented around the possibilities of large datasets to reveal new information (Dyckhoff et al., 2013). But our approach was instead *question-driven*, framed around questions that instructors raised in relation to a practical teaching and learning problem. Large-scale quantitative analyses of the type typically used for LA projects were utilized here, but small-scale qualitative work also was necessary to develop intervention strategies.

3. Student privacy concerns also have been identified as another possible limitation of LA (Greller & Drachsler, 2012). Although human subjects review may not be appropriate or necessary for every LA project, that review was helpful for thinking through ethical issues and led to greater transparency to student participants in this project.

4. Acting on individual LA results for students requires the ability to personalize interactions at scale. E²Coach enabled us to speak individually to students in a manner informed by their backgrounds, status, and goals. It

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> " **It may be that even good study-support systems have their limits in addressing more profound cultural and structural classroom challenges.**

is a good example of the ways in which technology can personalize education but also of the ways in which even good learning-analytics systems may have their limits in addressing more profound teaching and learning challenges.

As of fall 2013, E²Coach will be extended to other gateway STEM courses at U-M, thereby serving over 8,000 students per term. Using LA to improve student performance in class promises to help more students perform better than expected in gateway science courses at U-M. Further, we suggest that through multidisciplinary, cross-institutional collaborations and a question-driven approach, the promise of LA to improve the student experience can be better realized. Ⓒ

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EVALUATION OF THE STAMPS SCHOOL OF ART & DESIGN INTERNATIONAL EXPERIENCE REQUIREMENT
YEAR 3: Fall 2012-Winter 2013
Dr. Mary Wright, Director of Assessment, CRLT
Dr. Kris Gorman, Postdoctoral Research Associate, CRLT
Dr. Karishma Collette, Postdoctoral Research Associate, CRLT
Dr. Monica Huerta, Center for Teaching and Learning, University of Washington

EXECUTIVE SUMMARY

This report presents the results of the penultimate year of the Stamps School of Art and Design's undergraduate international experience requirement evaluation, the original goals of which were to cultivate "*global perspective, new life experiences, creative insights, global connections,… self-confidence, independence, resourcefulness, flexibility, innovation, problem solving, empathy, and stimulated academic discipline*" (http://art-design.umich.edu/international/requirements/undergraduate, 2010). BAs and BFAs in Art & Design who entered in 2010-11 are required to complete one international study experience before graduation, which could include study abroad, a for-credit internship, or an approved three-week reflective trip of the student's own design. To assess the impact of the requirement, we have been engaged in a three-pronged project, using both quantitative and qualitative methods. The full multi-year evaluation plan was designed in collaboration with the 2010 International Council (Appendix 1). Two IRB exemptions were obtained (HUM00033391 for the survey and HUM00073808, for the focus groups).

Key activities this year included the following:
(1) A survey was distributed to all Winter 2013 seniors, with a response rate of 70% (78 respondents out of 112 seniors). This survey promises to provide information about the development of two cohorts' intercultural development over time, comparison of pre-requirement and post-requirement cohorts' gains, and cross-sectional benchmark comparisons with students at other public research universities who also take the Global Perspectives Inventory (GPI). For students who indicated a desire to receive the information, we sent a brief report about their sophomore-to-senior GPI scores. (See Appendix 2 for an example.)
(2) Also through the survey, we collected data about the international experiences students reported completing – both at U-M and in high school – and their understanding of the learning gains they achieved through their university experiences.
(3) Using an intercultural competence rubric, artist statements were analyzed from the Fall 2012 International and Juried Student Exhibitions. The objective of this analysis was to capture students' reflections about international influences, using authentic methods (i.e., with actual work products).
(4) As part of four focus groups, 30 students (across all Stamps concentrations) were asked about their international experiences, barriers to completion, and recommendations for pre-trip preparation and post-trip gatherings or reflection.

Key Findings

1) Although early in its implementation, survey findings suggest that the international experience requirement will have a promising impact.
- Students who reported completion of an international experience were asked if they achieved the School's goals set for the requirement (described above). For all goals originally set by Stamps, a majority of respondents described achieving them. Nearly three-fourths of students who participated in international experiences also described specific applications to their creative or artistic process.
- It is clear that students are also meeting their own goals. In past surveys that asked students what they would like to achieve through an international experience, the most frequently named goal was "gain a global perspective," selected by nearly all respondents. The vast majority of seniors (88%) reported

this as a key outcome of their own experiences. One focus group participant described her international experience as the *"most challenging and exhilarating period of my life thus far."*

- For Fall 2013 seniors, those who reported completion of an international experience had a higher GPI score, compared to those who did not (3.71 vs. 3.67). However, this difference was not statistically significant –perhaps because most commonly, pre-requirement students most frequently reported engaging in less formally structured international experiences, e.g., travelling for three weeks or more, and going to less "culturally different" locations.

(2) Survey findings suggest that the international experience requirement is needed.

- Most graduating seniors are not required to complete an international experience. However, about two-thirds (68%) of respondents indicated that they completed an experience that would have qualified to meet the requirement. Although this is a relatively high proportion, given the desire of the school to promote international experiences among all graduates, it also suggests the need for a requirement.
- Students who did not engage in an international experience had slightly lower GPI scores as sophomores, compared to those who did travel, suggesting that those more in need of study abroad are less likely to participate if not required to do so.

(3) Consistent with other research (Jon & Fry, 2009; Vande Berg, Connor-Linton, & Paige, 2009), cultural similarity/dissimilarity matters in shaping international experience outcomes.

- The most popular area to travel is Europe by far, with Italy being the most frequently named destination. However, students who completed an experience in a location more culturally different from the U.S. (i.e., not Australia, nor countries in Western Europe) had a slightly higher GPI score. In focus groups, students who travelled to Africa and the Middle East described rich and transformative life experiences.
- However, in discussions, students were clear that to encourage more students to travel to a location that would be a "stretch" –i.e., more culturally different or requiring more language training— greater resources would need to be allocated, such as financial aid. Even so, some students noted that this was the first time they or their family had been outside of the U.S., meaning that every travel location was a "stretch."

(4) Analysis of artist statements indicates some growth, but there is room to prompt students for greater reflection on their international experiences.

- Artist statements collected from the International and Juried Student Exhibitions show a modest increase in ratings compared to artist statements gathered in 2010 and 2011. There also was a greater number of students whose work referenced an international experience, accompanied by reflection about the work.
- However, in focus group discussions, students report that they learn about the International Exhibition very late, and therefore their work is neither as good nor as reflective as it could be. They suggest announcing the Exhibition requirements pre-departure.

(5) In focus group discussions across programs, key barriers include access to financial aid, fulfilling curricular requirements, and perceived types of experiences available.

- Clarity about and access to financial aid are still perceived by students as the most important barriers to completion of an international experience. Even students who had received aid noted that while it made their trip possible, they received last-minute notice, which made pre-trip preparations difficult.
- Secondary challenges varied by program, but included difficulty in meeting requirements from multiple plans of study (BA students) and the perceived lack of availability of program foci (Interarts Performance students).

Plans for 2013-14

The next steps for the international experience evaluation are to:

(1) Repeat the survey with Winter 2014 seniors, or those graduating from the first cohort required to complete an international experience requirement. This survey will allow us to assess GPI gains, from the sophomore to the senior year, among all students, not just those who would have completed an international experience anyhow. (This fourth-year Stamps study is particularly important to address a potential self-selection bias in understanding the effect of international experiences.)

(2) Analyze comparative GPA and retention data between pre-requirement and requirement cohorts.

(3) Repeat the artist statement analysis at the Fall 2013 International Exhibit and All-Student Fair or Juried Student Exhibitions. We hope to see both broader participation and more reflective statements over the years.

(4) Begin presentations and publications to disseminate the work of this four-year project.

CRLT PROJECTS ON ENROLLMENT AND PATHWAYS TO THE CONCENTRATION

MARY WRIGHT & MATT KAPLAN, CRLT

Since 2009, CRLT has worked with six LSA departments or programs who seek to increase the numbers of their students, concentrators and minors through changes to their pedagogies, curriculum and publicity. The work in each of these academic units has varied, depending on the key questions faculty and chairs bring to the collaboration, but typically, CRLT helped with one or more of the following:

- Analysis of Registrar data to understand students' course paths
- A survey of students (e.g., a short paper survey is distributed to all students in large lecture classes in the department) informed by research about students' course selection processes.
- Focus groups of students

Across projects, key findings and recommendations from the student surveys (600+ respondents), discussions, and other departments' best practices include:

(1) Source of information about courses: The LSA Course Guide is undergraduates' key source of information for course selection. Other top sources include friends' recommendations and for first- and second-year students, LSA advisors.

- Rather than publicizing courses through posters (which students report do not influence their course-taking decisions), use the online course guide better. Students want to see thorough descriptions of classes and syllabi. Student quotes (i.e., recommendations from peers) also can be used in class publicity.
- Give LSA advisors a brochure about your program and courses in it, so they can recommend a course in your department to students who need one.

(2) Course characteristics: "Class meets a requirement" is reported to be the most important factor in students' selection decisions. The second most important factor is "interesting topic" for the course. Interdisciplinary course titles are perceived as being more relevant and engaging, as are courses that make connections to future professional/educational plans.

- When applicable, link courses to an LSA or concentration/minor requirement.
- Cross-listing and thematic topics help. For example, the Department of History revised its introductory courses to feature cross-cutting topics such as, *"History of Rock and Popular Music"* and *"Climate Change, Nuclear Power, and Energy Futures."*
- A large number of U-M undergraduates indicate they have a pre-professional specialty (e.g., pre-med). Having course offerings that link to those common future educational/career plans is helpful.

(3) Concentration decisions: For concentrations and minors, students indicate that key disincentives for pursuing these plans are (a) not having learned enough to make a decision and (b) perception of a lack of relevance to career possibilities. Students seek department website resources.

- Use the department website to feature resources for students about why they should choose a course/concentration in the area – e.g., alumni videos or common careers that students go on to take. (U-M's School of Information has nice examples of online videos.)

- Invite students to a gathering early in their U-M career. LSA has lists of students who indicate an interest in certain topics/disciplines upon admission to U-M.
- Use introductory courses more deliberately to cultivate concentrators and minors. For example, Latino/a Studies invites faculty to speak in the introductory course, not only about a specific topic but also to invite students to take their upper-level classes.
- For some departments, parents were reported to have a key influence on course/concentration selection. Letters to parents (as is done by math) and events during parents' weekend could be an additional source of outreach.

CRLT Theatre Program Performances at
Universities, Colleges, and National Conferences
*(*Indicates multiple visits)*

Universities

Arizona State University	Purdue University
Auburn University	Purdue University Calumet
Barnard College	Rice University
Case Western Reserve University	Stanford University
Central Michigan University	U-M Dearborn
Columbia University	Union College
Eastern Michigan University	University of Alabama – Birmingham
Emory University	University of California Irvine
Grand Valley State University*	University of Chicago*
Harvard University*	University of Cincinnati
Indiana University - Bloomington	University of Illinois
Indiana University School of Medicine	University of Kentucky*
Indiana University – Purdue University Indianapolis	University of Maryland
Kettering University*	University of Minnesota
Marshall University	University of Missouri*
Madonna University	University of New Hampshire
Michigan State University*	University of North Carolina
Michigan Technological University*	University of North Dakota
Massachusetts Institute of Technology*	University of Oklahoma
Montana State University	University of South Dakota
New Mexico State University	University of Texas El Paso
Northeastern University*	University of Virginia*
Northwestern Michigan College	University of Washington
Northwestern University	Virginia Technological University
Notre Dame University	Wayne State University*
Oxford College of Emory	Wellesley College

Conferences

Association of American Universities (AAU)/Ford Conference
American Association for Higher Education
Association for Theatre in Higher Education*
Association of American Medical Colleges
American Geophysical Union
Center for the Integration of Research, Learning and Teaching Forum
      on Achieving Diversity in STEM Disciplines
Council of Graduate Schools
Council of Independent Colleges Conference
Council on Institutional Cooperation*
Louis Stokes Alliance for Minority Participation
National Conference on Race and Ethnicity
National Science Foundation (NSF)*
NSF ADVANCE Principle Investigators*
NSF ADVANCE iWiN Workshop*
NSF EMERGE Conference
NSF Gender Equity Meeting
Ohio Learning Network
Professional and Organizational Development Network Conference*
RNA Society Meeting
Robert Wood Johnson Clinical Scholars Program
Scholarship of Teaching and Learning: Cognitive Affective Connection
Society for Teaching and Learning in Higher Education
Theatre and Pedagogy of the Oppressed

ANNOTATED LIST OF CRLT THEATRE PROGRAM SKETCHES

PERFORMANCES/WORKSHOPS

The CRLT Players present provocative performances built on a strong foundation of research concerning the experience of faculty, students, and administrators. A typical performance generally lasts 1.5 to 2 hours and involves a short dramatic sketch followed by a facilitated discussion. The discussion offers the audience a chance to engage meaningfully with the issues raised by the sketch and often to interact with the characters or scenario depicted in it. Unlike a video vignette or standalone theatre "skit," this format draws the audience into genuine dialogue with the characters and each other. As a result, CRLT Players performances prompt reflection rather than defensiveness on issues of climate change in classrooms and departments.

7 into 15 is a high energy, interactive performance that can be adapted to address a range of topics. Consisting of short plays presented in rapid succession, this performance format uses a variety of innovative staging techniques to place the challenges of teaching and learning within the academy center stage. Provocative and often humorous, *7 into 15* is perfect for opening up conversations about the different ways individuals engage with and experience higher education. Versions of this sketch have been created to orient new graduate student instructors, to welcome new faculty into a teaching-positive culture, and to address graduate student climate concerns. *This performance can be tailored to meet different objectives in advance of the performance, and it also offers the option of in-the-moment creation of sketch material to explore the specific concerns of the audience in attendance.*

Anxiety in the Clinical Setting examines the challenges students face in determining what kinds of information they should provide to their patients as they enter the clinic for the first time, and how they might best frame and relay that information. After watching a student's less than successful interaction with a postnatal patient, the audience thinks through possible ways that they might, as instructors, help students learn and succeed in this complex, patient-centered environment.

Blurred Lines: Personal and Professional Boundaries explores the challenges graduate students may face in productively managing the diverse roles they inhabit in academic settings. The sketch focuses on the relationship between Paul, an enthusiastic grad student instructor, and Claire, his gifted student. As Claire seeks out Yuri's advice on a class project over the course of the term, a mutually rewarding intellectual relationship develops, and the lines between the academic and the personal become increasingly blurry. The play is followed by a dialogue on professional boundaries, power dynamics, and university policy.

Breaking Bad News is a one-act play that adapts research on the experiences of patients and medical staff into a dynamic performance, exploring tensions and challenges that commonly occur in interactions between health professionals and patients. The story follows Joanne, a new patient at a local cancer center, as she struggles to make sense of and live with her diagnosis. The presentation is designed to create practical and productive dialogue across a wide variety of health professional roles. *Breaking Bad News can be performed in conjunction with a guided role-play experience that allows participants to practice delivering difficult information to patients and their family members in a variety of contexts.*

Climate in the Classroom examines student and instructor behaviors that can negatively affect classroom climate. Focusing on a review session of an introductory science class, the scenario depicted shows simple—often-unintentional—ways students are marginalized in STEM learning environments. Special attention is paid to the experience of female and international students, but the instructional strategies explored in this session can benefit *all* students.

Conflict in the Classroom focuses on a conversation between students that moves quickly from civil dialogue to charged argument. It raises questions about how students' backgrounds affect the way they approach and engage course content, what constitutes subject-appropriate discussion, and what responsibility instructors have for productively dealing with conflicting perspectives that emerge in their classrooms.

Critical Thinking in the Clinic uses a student's problematic presentation of a patient as an entry point for considering the ways that faculty might more effectively foster students' problem-solving skills in clinical settings. *This sketch is particularly useful for introducing and demonstrating the one-minute preceptor model. Versions appropriate to a medical and dental context are available.*

Faculty Advising Faculty explores the ways in which senior faculty members mentor their junior colleagues and considers the differing relationships and professional outcomes that can result from these processes. Highlighting the dissimilar experiences of two assistant professors with the same mentor, it examines the many factors, both individual and institutional, that can hinder or foster effective mentoring at the faculty level. This sketch was commissioned by the U-M ADVANCE Program.

The Faculty Meeting: Navigating Department Politics is a richly layered sketch that can be productively used to focus on two issues important to any university: faculty hiring and departmental climate. It presents a range of interactions between individuals in a department currently seeking a new faculty hire—both within an official discussion of the search in a faculty meeting and in more casual, private conversations. Audiences can engage with the performance by considering what kinds of practices and interactions may negatively impact the recruitment and hiring of a diverse and excellent faculty. Alternately, they may use the sketch as an impetus to think through the challenges of navigating department politics. This sketch was commissioned by the U-M ADVANCE Program.

The Fence invites the audience to observe members of a department's executive committee as they meet to discuss whether one of their junior colleagues should be awarded tenure. The committee is split, and arguments are made both for and against the candidate. Providing a "fly on the wall" perspective, the sketch gives audience members a chance to consider the ways that unconscious bias can affect promotion and tenure decisions. Post-show discussion allows audiences to step inside the meeting and think on their feet about ways they might intervene in the scenario they have just seen to create a fairer tenure process for the candidate. This sketch was commissioned by the U-M ADVANCE Program.

First Class: Teaching and Learning is a stylized, multi-media production that presents diverse student perspectives on a variety of classroom practices and concerns, such as academic integrity, student participation, and group work. In addition to dynamic performances, music, and dance, the production uses instructional technology theatrically to raise questions about the connections and disconnections between course content and student identity.

Great Expectations: Mentoring Graduate Students explores common tensions that can arise between advisors and their advisees. The sketch depicts two different mentoring relationships, allowing a comparison of the strengths and weaknesses of each approach. It also raises questions about the ways in which problems that emerge within a mentoring dyad might affect departmental climate more generally.

The Lab examines the challenges of balancing limited resources and meeting research goals while serving the professional and intellectual needs of a diverse group of students working in a lab setting. It asks audience members to consider how the decisions made by those who run a lab affect those who learn and work there.

Negotiating Race in Humanities Classrooms offers the audience access to the sometimes messy interpersonal dynamics of teaching that can become particularly present in classrooms in which student and instructor identity collide with course content that deals explicitly with race and ethnicity. This sketch is designed to open a dialogue about the role of emotion in the classroom, productive strategies for introducing controversial topics, and the potential pitfalls of adopting a colorblind approach to teaching and learning.

No Offense centers on the relationship between advisor and advisee in a lab setting. Investigating one potential cause of the leaky pipeline, it explores the subtle behaviors that can negatively affect women's experiences of graduate education in STEM disciplines. It asks the audience to consider the range of environmental factors that might undermine the success of female students and to reflect on what is at stake personally and professionally for individuals who find themselves involved in dysfunctional advising relationships. This sketch was developed in collaboration with UM's ADVANCE Program and the College of LSA and is appropriate for faculty or graduate student audiences.

A University Department: The Musical imagines what a department might look like if all its members shared the truth about how they experience their varying roles… through song and dance! Depicting a day in the life of the individuals who make up a department (e.g. faculty, academic administrators, staff, and students), this sketch asks the audience to consider what factors—personal, professional, and structural—may inhibit positive institutional change and limit productive intradepartmental dialogue. Stories are drawn from a variety of sources, including research from the Women of Color Academy Project, national ADVANCE studies, and student interviews.

TRIGGER VIGNETTES

Trigger vignettes are brief (2-5 minutes), customized scenes developed with client input and designed to spark dialogue on difficult issues. Easy to incorporate into workshops, retreats, or faculty meetings, trigger vignettes are perfect for addressing department-specific issues in time-sensitive meetings. Trigger vignettes are created by request as the Players' schedule permits. Representative examples of vignettes that have been created are listed below.

The Chair's Role in Faculty Mentoring — Fashioned as three thematically related vignettes, this performance explores the chair's role in faculty mentoring. In these short scenes, the audience sees a chair discuss a third year review letter with a junior faculty member, welcome a new hire, and check in with a senior faculty mentor. Developed to showcase positive and potentially problematic mentoring behaviors, this interactive performance allows chairs and

other academic leaders to think through the ways that they might create a more positive climate for faculty mentoring, both structurally in their department's policies and procedures and interpersonally in the behaviors they adopt and use with their faculty colleagues.

(dis)Ability in the Classroom — Fashioned as three chronologically related vignettes, these short scenes follow a student as he attempts to productively manage his disability in one of his classes. Beginning with a meeting during office hours in which he asks his instructor for an accommodation, the scene moves back in time to see the classroom practice that prompted the request, and ends with the instructor's well-meaning but flawed attempts at accommodation. These vignettes are designed to aid instructors in thinking critically about the inclusivity of their instructional practices and to encourage the development of an empathetic perspective that respects the experiences of students with a range of abilities.

Faculty/Staff Dynamics — These vignettes open up conversations between faculty and staff about ways relationships between these groups—each so necessary to the success of the university—can be improved. These short scenes allow audience members to consider how power dynamics influence communication, how vocal tone and body language affect perceived intention, and the how the varying demands of different roles influence an individual's approach to accepting and managing work.

Additional topics that have been addressed through vignette creation include:

- Mistreatment in Medicine

- Sexual Harassment

- Staff Diversity

- Providing Effective Feedback in the Clinic

Using Theatre to Stage Instructional and Organizational Transformation

by Matthew Kaplan,
Constance E. Cook,
and Jeffrey Steiger

Editor's Note: The CRLT Theatre Program won the 2006 TIAA-CREF Theodore M. Hesburgh Certificate of Excellence.

Scene I: Conflict in the Statistics Classroom

You thought that you were prepared to teach today's lesson on correlation coefficients. But when you and the students discussed the graph on infant mortality and mothers' income levels, your plans went awry. Within seconds, an interesting classroom conversation escalated into a heated argument among the students about the parenting abilities of low-income mothers—culminating in harsh words that left one student in tears. Disconcerted, you raised your voice to bring the group back to order, thereby eliciting stony silence from the students for the remainder of the

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class. Now you dread the next class meeting, and you know that your students do too.

But magically, you get a chance to replay the conflict and handle it differently, and you can ask your colleagues for advice before the class begins. Now you can look into the minds of your students to discern their thoughts, concerns, and perceptions. You become deeply aware of the subtleties and nuances of the classroom dynamics, and you begin to understand the ways that gender, social class, and race are playing out

in the exchanges between you, the students, and their peers. With these new insights, you collaborate with your colleagues to develop productive responses to the students in the very moment of the heated argument. Essentially, you have the opportunity to transform the classroom conflict into an opportunity for learning.

Scene II: A Tenure Discussion in a Faculty Meeting

You attended the departmental executive committee meeting to participate in a tenure review. But as the meeting unfolded, you felt as if the conversation was getting off track. The candidate's credentials were questioned in ways that seem biased. The discussion shifted from her qualifications to a contentious airing of views about whether good teaching matters, the value of interdisciplinarity, and the future direction of the department. The discussion seemed to be about everything but this candidate. You have the sense that the whole conversation was being influenced by gender. You tried to intervene, but your attempts were rebuffed.

But then you have the opportunity we all long for: the chance to revisit the conversation, think carefully about what was said, decide how and when to intervene effectively, and replay the scene. But it gets better: not only do you have a second chance, you also have a group of colleagues with whom to compare notes and strategize about the most effective interventions. You get to see the impact of your choices as selected parts of the conversation get replayed, this time incorporating the interventions you and your colleagues have devised. In the process, you develop an awareness of what are more and less effective approaches to raising sensitive issues; the unintended consequences of various strategies; and how power, status, and gender can affect one's ability to create change.

Interactive Theatre as Faculty Development

Since 2000, the Center for Research on Learning and Teaching (CRLT) at the University of Michigan (UM) has presented an educational theatre program for the professional development of faculty and graduate student instructors. Through the medium of interactive theatre, faculty can experience the sort of "second chance" described in these scenarios. As they engage with the sketch, the characters, and each other, faculty are drawn into making sense of the issues portrayed, relating them to personal experience and strategizing about how to transform a difficult situation. We have found that the results can have a profound effect on faculty attitudes and behaviors.

Most people think of theatre as a form of entertainment—a diversion from our daily lives that inspires, amuses, or provokes us and that engages our creative imagination. But theatre has long served as a powerful educational tool as well. At colleges and universities, theatre is often used to facilitate student affairs training: sketches on topics like date rape and substance abuse are common now at orientation sessions. The marvel is that we faculty and consultants engaged in professional development have come so late to the idea of theatre as an effective teaching tool.

Faculty development workshops usually present research on teaching improvement focused on problems instructors typically face; consultants then work with faculty to figure out
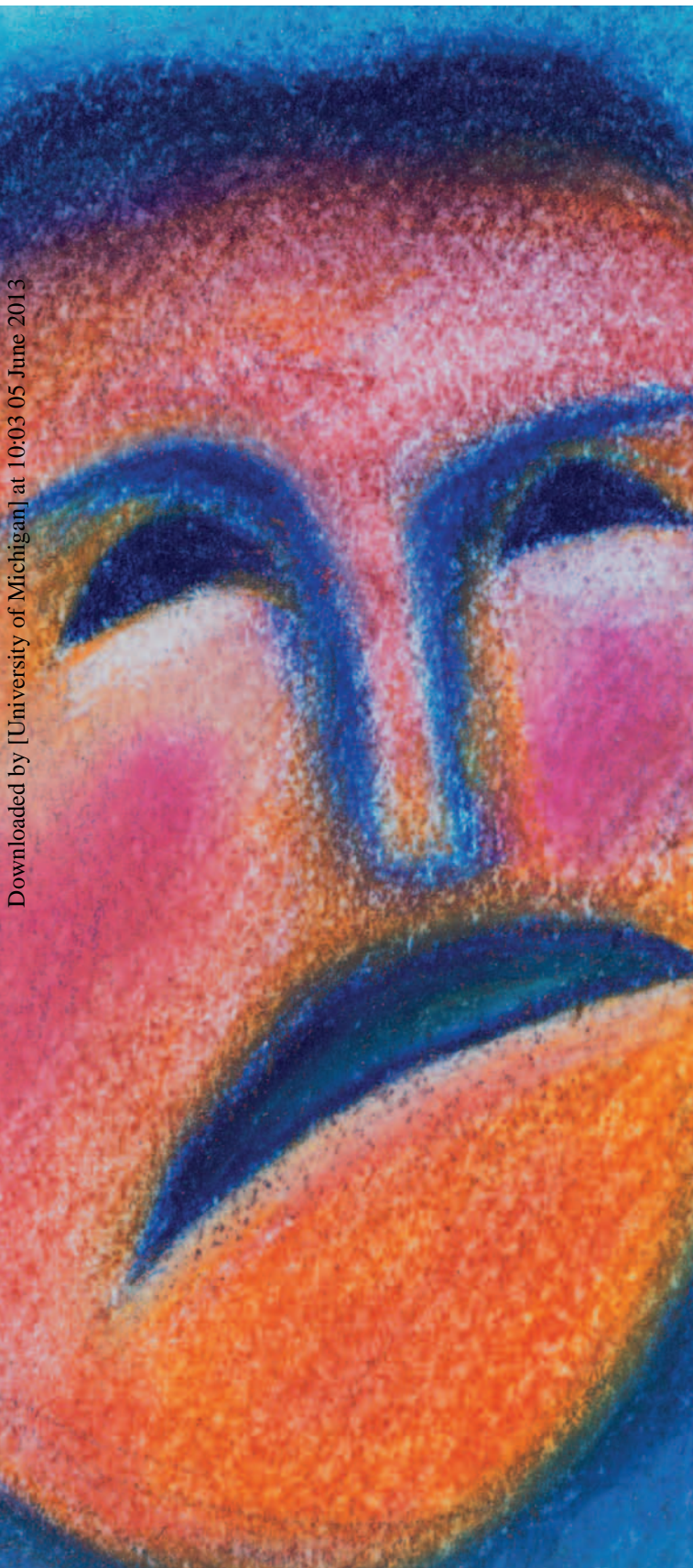
how to apply the material to their own settings. These days, our theatrical productions often replace those kinds of workshops at UM. We have found that interactive sketches can accomplish the same objectives, only better. Consequently, the CRLT Theatre Program is in demand, performing not only at our own programs, but also at the university's departmental retreats and faculty meetings and at other universities and national conferences.

Jeffrey Steiger, the director of the CRLT Theatre Program, has adapted his use of theater from the pioneering work of Augusto Boal, a Brazilian theatre director and politician and the originator in the 1950s of the *Theatre of the Oppressed*. In developing this methodology, called *Forum Theatre*, Boal drew on the work of another Brazilian, Paulo Freire, the educational theorist and author of *Pedagogy of the Oppressed*. A key Freirian thesis is that people learn through doing. Boal's methodology involves engaging the audience by presenting a problem in theatrical form (usually a political problem involving some sort of oppression) and then inviting the audience to advance and discuss solutions to the problem, often with individuals from the audience acting out those solutions on stage.

The CRLT Theatre Program sketches typically focus on diversity issues. While all faculty development workshops can seem didactic if done poorly, faculty often approach multicultural programs with special suspicion. Those who identify multiculturalism as a recognizable and worthy goal generally benefit from these programs. But those who need greater awareness, knowledge, and skill development may not participate in them or, when they do, react defensively or have difficulty seeing the relevance of the sketches to their own situations. This can be particularly problematic in the sciences and engineering, where the subject matter appears "objective" and discussions of identity (gender, race, and disability) or power dynamics can seem irrelevant to faculty and graduate students.

The diversity-related topics in the CRLT sketches typically fall into one of two categories. The first is teaching and learning improvement, especially the ways an instructor can serve underrepresented students and teach better by creating a classroom environment where all students feel safe and can achieve their full potential. The second topic is the transformation of the faculty work world—for instance, faculty meetings, hiring, mentoring, and the tenure and promotion process—so that women and faculty of color, who may be marginalized in their departments, are more likely to succeed. The latter topic has developed out of a collaboration between CRLT and the ADVANCE project at UM, funded by the National Science Foundation, to improve recruitment and retention of women faculty in the sciences. Thus, the Theatre Program is working on both multicultural instructional development and multicultural organizational development—with the ambitious objective of both personal and institutional transformation.

The CRLT Theatre Program currently presents 15 sketches. They have a variety of formats, all of which include some degree of interactivity. For example, some sketches are followed by a workshop at which the audience members discuss the issues in the sketch and may also address questions to the actors (still in their roles) in order to get a better understanding of the personal experiences of each character (for example, the *Conflict* sketch described at the outset). Another format involves a sketch followed by an invitation to some audience members to join the actors on stage and redirect the sketch outcome (for instance, the *Tenure* sketch, also described above). A third format starts with a sketch, then has audience discussion with the actors in their roles, including audience suggestions to the actors for improving their interactions. The actors then replay the scenario, incorporating the audience feedback and demonstrating better outcomes than the original (the sketch called *Gender in the Classroom*, on the chilly climate for women students in the sciences, for example).

All of the CRLT Theatre sketches are based on research done at UM, a synthesis of the literature on a topic, or a combination of the two. Before a sketch begins, a CRLT facilitator briefly presents the research findings on which the sketch is based. After the sketch, the facilitator guides the exchange among the audience and the actors—noting implicit assumptions and helping the audience uncover the subtext behind the characters' comments. At the end, the facilitator underlines key points for the audience and finishes with additional research findings and strategies for using the information presented.

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How Do We Know It Works?

As with any professional development activity for faculty, the primary purpose of the theatrical performances is transformation at both a personal or institutional level. There are a number of models for how such change occurs, but they share several common steps: gaining an awareness of the need for change, devising strategies, changing behavior, and making the change permanent.

We have evaluated our effectiveness by administering surveys directly following performances, following up with additional surveys and focus groups three months to a year after the performances, and interviewing key administrators who use the Theatre Program to effect change at the University of Michigan. Results from these multiple sources indicate that on an individual level, participation in theatre performances affects audience members' awareness and their behavior. On an institutional level, theatre makes a significant contribution as well.

To illustrate: We have collected over 2,000 evaluations of our most commonly performed sketches, *Gender in the Classroom* and *(dis)Ability in the Classroom*. In order to raise

awareness, audience members must see the sketches as useful and relevant. Over 75 percent of the *Gender* audience members and over 90 percent of the *(dis)Ability* audiences thought that the issues raised in the sketch were useful for them as teachers. In addition, nearly three-quarters of the *Gender* audiences and almost 90 percent of the *(dis)Ability* audiences agreed that the interactive discussion enhanced their understanding of difficult issues.

Qualitative comments also consistently indicate an increase in audience awareness of key issues and a gain in instructors' knowledge and sense of self-confidence as teachers, as the following comments from *Gender in the Classroom* reflect:

• "The performance...reminded me how subtle gender discrimination can be. [It] encouraged me to make sure that my [TAs] were very clear on my preferences for classroom conduct and was a good organizer/reminder for me in talking with them before the start of classes."

• "I was amazed [at] how intensely some other people in the audience were moved by the presentation, as if they had never seen represented what they (mostly women in the audience) had experienced."

Similarly, among department chairs who saw the *Tenure* sketch, over 90 percent agreed or strongly agreed that the issues raised by the sketch made them think about familiar interactions and situations in new ways, and over three-quarters agreed or strongly agreed that the interactive discussion enhanced their understanding of difficult issues. Again, the chairs' comments are revealing:

• "Poor leadership leads to confusion and injustice. Not news, but people always think it is the other chair who is doing it. Self-recognition is the most valuable product of the sketches."

• "My main observation was to realize how difficult it is to handle these kinds of situations and how important it is for the chair to be prepared, anticipate issues before the meeting, come to the meeting with all of the information, and not leave it to other faculty."

When instructors' capacities and awareness increase, they can begin to make changes in the classroom. Our follow-up surveys indicate that instructors who attend the Theatre Program presentations pay more attention to the effect of their actions on students and design assignments and make classroom management choices that work more uniformly for the student body. For example, attendees at several TA orientation programs saw the *(dis)Ability* sketch. In surveys three months or more after the performance, close to 80 percent said that seeing the sketch had affected their teaching or their interaction with students in some way. Some typical comments:

• "[I developed an] understanding of what 'sensitivity' to disabilities is really about: it is not feeling compassionate or sorry for disabled students, but treating them as equals and

> **The dialogue**
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> **but it was**
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> **productive in the**
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> **long run.**

understanding the nature of their disabilities and how they are able to handle them. Based on that, the teacher proceeds to interact with the student."

• "I remembered to ask [students] to let me know of any special needs they had when they filled out index cards for me."

• "I became aware of the possibility that I would need to consider a student's disability when arranging the room/office hours."

TAs in the sciences and engineering were surveyed three to 12 months after seeing the *Gender* sketch. Almost 90 percent agreed that the sketch made them aware of classroom experiences of women and minority students; over 80 percent said it led them to reflect on how their actions in the classroom affected students; and about three-quarters said the sketch led them to consider the issues as more important than before, made them proactive about creating a positive climate, and gave them strategies to address classroom dynamics that negatively affect women and minority students. Moreover, close to 40 percent said they changed their behavior as a result of the sketch, a particularly notable number in the sciences and engineering, where many TAs have had no prior teaching experience. Some of their reactions:

• "I attended the CRLT Theatre performance last year before I actually started teaching. When I started, I found out that the class was more difficult for students than I expected. I had more women in the class than men. After a couple of labs, I realized that the men were more enthusiastic, and I kept paying more attention to their answers. *Gender in the Classroom* showed me the real issue. So I decided to pay attention equally to both genders, and also I answered more questions referring to all my students, sometimes using 'random call.'"

• "I teach a lab course. Often I see women being the note-taker in the lab, rather than actively participating in the experiments. In those cases, I now intervene immediately to remind my students that they will all need individual lab skills."

Given the power of the Theatre Program, it can also help create change on an institutional level. CRLT has collaborated since 2002 with the ADVANCE Program at UM on its efforts to improve institutional culture for women faculty in the sciences and engineering. Each ADVANCE sketch is developed with input from key faculty and administrators in the relevant departments—including initial interviews that provide the basis for the script—and then previewed by faculty opinion leaders. In addition to strengthening the sketches, the process also creates an investment in them. Administrators and faculty who have contributed to their creation want to bring them to their departments and use them as tools for making difficult conversations go better. One dean told us that the dialogue sparked by the performances was not always easy or comfortable, often leading to heated discussion and disagreement, but it was productive in the long run:

"We were dealing with tough topics, like gender equity," the dean said. "These were difficult topics, very difficult to move the School forward....[Theatre] raised the level of consciousness so that people were aware of their behaviors. They became aware of themselves and others making comments that make you cringe, behaviors they want to change. Even if it did get some faculty angry, that discussion alone caused other faculty to say, 'Well, wait a second, why is that faculty reacting that way?' and [realize] that there really was a problem. As we hired a more diverse faculty, we did not get the pushback we used to get. The interview process that we were putting faculty through went a lot better."

WHY DOES THEATRE WORK?

Theatre works because it combines the best elements of reflection and exchange characteristic of professional development workshops with the power and creativity of theatre. And the sketches use a set of strategies that allow faculty to open up regarding issues that they would normally resist dealing with. The following section describes four such strategies.

1) *Serious issues are presented with humor.* The topics dealt with in the sketches are serious and sometimes controversial: gender dynamics and how they play out in departments and classrooms, ways that race and class can surface in discussions, the challenges of disabled students. While the sketches do not shy away from the issues they usually contain some humor, which allows the audience to relax and enjoy the sketch and which can come as a welcome release when the sketch focuses on problematic dynamics and tense situations.

As one participant in the Tenure Sketch observed, "Humor is a great way to open people's minds to new ideas."

2) *Sketches are emotionally engaging but allow participants to maintain distance.* The importance of emotional connections in learning has been explored in brain research (see Leamonson in the November/December 2000 issue of *Change*), has been discussed as part of good practice in multicultural pedagogy, and is the subject of current work in the Carnegie Campus Program that is investigating cognitive-affective learning (see the *Journal of Cognitive Affective Learning*, **http://www.jcal.emory.edu/**).

Instructors who are able to create in students an emotional connection with the content they are teaching are able to engage students' imaginations and inspire their interest. Emotional engagement stimulates the learning process.

Theatre condenses the experiences of instructors and the research on those experiences, and it features actors who act like familiar colleagues and students—people with whom faculty identify or for whom they feel empathy. As they act out the scenes and during the interactive discussion, actors experience pain or discomfort, and the audience explores the reasons for it.

The scenarios often call up emotions from previous events in faculty lives, and the interactions with the actors—asking questions and offering suggestions—lead to faculty awareness of the toll that these situations can have on others. Faculty remember the sketches precisely long after the performance because of their emotional impact.

A faculty participant in *Classroom Conflict* recalls, "I vaguely remember being frustrated at the TA. Like I thought it was interesting what was happening between the students, and I just wanted to shake this TA and say, 'are you missing all of

this?' Thinking to myself, it made me frustrated. Do I miss all of this when I'm doing it, or is this guy just bad? Is it me? I mean, why am I so upset?"

At the same time, the sketches do not implicate faculty participants: it is the actors who experience the problems. Audience members are invited to identify the problems and then discuss strategies for solving them without having to reveal whether they experience similar difficulties.

The post-performance activities and interactive components enable the audience to step back and think critically about the scenario and to evaluate their own responses based on what

they hear from others in the audience. Seeing the issues enacted on stage, separate from their own experience, provides a distance from them that lowers audience defenses so they can engage with the subject matter more freely.

According to a participant in the *Tenure Sketch*, "Putting a difficult subject in the context of a dramatic sketch distances the subject from the audience enough to help them take a fresh look."

3) ***Sketches have credibility but take advantage of a willing suspension of disbelief.*** CRLT Theatre sketches seem credible and relevant because they are built on a strong foundation of research concerning the experiences of underrepresented faculty and students. For example, *Classroom Conflict* grows out of the considerable literature on the role of race in classroom dynamics, as well as interviews with students of

color about the impact race has had on their learning experiences and interactions with UM faculty and TAs. The *Tenure Discussion* is based on a series of interviews and focus groups with faculty at UM, as well as the literature concerning how gender informs tenure and other personnel decisions in the academy and the workplace.

The realism and power of the sketches is enhanced by the rigorous process of actor training. For sketches on institutional transformation, the actors must learn about the details of faculty life, everything from what a provost does to what tenure means and how decisions get made in departments. Actors read the research on the sketch's topic and prepare for the types of questions that might arise in interactions with the audience. Then, when the sketch is over, they contribute their own experiences to some of the audience discussions, such as how they have experienced and thought about identity (race, gender, ability) and power dynamics.

"I think they are good actors, and you believe for the moments that you're watching that they are actual students. It's a realistic enough scenario that you get caught up, like when you watch a play, you forget that they're actors," a faculty participant in *Classroom Conflict* remarks.

"You folks must do an incredible amount of research. The sketch was right on the money," says another faculty participant in a customized sketch for a professional school.

While the sketches need to be credible and realistic, the theatrical setting requires some willing suspension of disbelief. Sketches must compress a range of problematic behaviors into a short performance. In the sketch on *(dis)Ability in the Classroom*, for example, two of the five students have disabilities, and in a 10-minute performance the TA makes a whole series of gaffes that are representative of the behaviors with which disabled students must contend.

For example, when the TA finds out about one student's learning disability, he starts a conversation about accommodations in front of the whole class, despite the student's obvious desire to keep it private. The TA also resists giving extra time for a test. While we occasionally get comments from audience members that sketches are overdrawn, theatre's distillation of a problem helps audience members remember what they see and focus on change.

"It seemed a little contrived, at the time. Once we finished the whole discussion, it was obvious that he was playing a bad [TA] so that we could talk about what would make him better. But that works well," concludes a faculty audience member in *Classroom Conflict.*

4) ***Meaning is created through presentation and active learning.*** The literature tells us that if students learn actively, they typically learn more and retain information longer. Active learning, as its name implies, engages students with the instructor and with their fellow students (often in pairs or groups) so that they are sharing perspectives, generating their own ideas, and teaching each other.

The role of the teacher is to facilitate student involvement with the subject matter, to serve as a guide rather than the sole source of knowledge. The challenge that many instructors face is how to balance the presentation of content with interactivity.

Interactive theatre by its nature balances these two approaches. Theatre audiences are often unfamiliar with the research behind sketch topics, and the performance itself functions as the

research presentation. Because theatre works best by "showing" rather than "telling," the research comes through in the characters' actions, interactions, and dialogue, and by means of brief comments by the facilitator. As a result, the sketches are open-ended (there is no single solution to the problem presented) and based on constructivist principles: rather than being told "the answer," audience members are asked to make meaning from what they have seen.

The active learning that follows the sketch continues and deepens the sense-making process. When a sketch ends, the audience interacts with the actors in their roles and then with each other (often in pairs or small groups). They question the actors, brainstorm suggestions to improve the outcome of the sketch, or find ways that an audience member can enter the scene and redirect the action. Discussion usually consumes two-thirds of the program. Through these conversations, each learner takes away understandings that are meaningful in her own context.

"I think that the faculty, just as our students, get more out of experiential learning than the more passive style of learning. And it causes a dialogue to occur, which I think is fruitful," says one dean.

Interactive Theatre and Faculty Career Stages

Faculty go through distinct career stages, and what is appealing and helpful at one stage may not necessarily be so at another. Nonetheless, interactive theatre is a powerful educational medium at all stages of the faculty career.

• *Graduate Students.* New TAs come to the classroom with their own theories about learning based on their many years as students. In their early years, TAs are likely to personalize relationships with their students, and it is not until they have had some time in the classroom that most learn to distance themselves from the relationships and become more analytical, eventually learning to think of students as professional clients.

The interactive theatre experience provides TAs the chance to be more analytical about their relationship with students and see that the challenges they encounter are ones common to the teaching experience and faced by every instructor. Interactive theatre provides them with a practice session, a rehearsal for their classes. It lets them take risks during the discussion and consider solutions and teaching strategies in a safe environment.

• *Junior Faculty.* Junior faculty need to learn the behavioral norms of the institution they have joined. Pre-tenure faculty have many questions about how to behave both in and outside the classroom, but there is a perceived cost to asking too many questions. Though many institutions have mentoring systems to facilitate the candid exchange of institutional information, junior faculty know that the people who are mentoring them, or the colleagues who could answer their questions, are often also those who will judge them when it comes time to make a tenure

> **Theatre's distillation of a problem helps audience members remember what they see and focus on change.**

decision. The simple act of asking questions might create a negative impression (why doesn't she know these things?), new faculty may think, so it is easy to understand why they may be reluctant to air their confusions.

Interactive theatre bypasses the need for junior faculty to initiate inquiries because questions are incorporated into the discussion of the sketches. Faculty can have their challenges addressed without admitting that they face the same ones as the instructor or administrator in the sketch or that they do not understand institutional policies. When there is a mix of junior and senior faculty in an audience, junior faculty find that their more experienced peers share their concerns and have similar questions, and they have an opportunity to listen in as senior colleagues do problem-solving about the challenges they face. It is an ideal way to learn about institutional norms and expectations.

• *Senior Faculty.* Senior faculty become less likely to engage in professional development activities over time. They may not attend teaching improvement programs, for example, because they already consider themselves good teachers. But the playful nature of a theatrical experience can draw them to an event on a topic they would not otherwise address in a public setting. That theatre is typically regarded as entertainment, not education, makes attendance more acceptable—it does not indicate that one is facing a problem or needs assistance. Consequently, a theatre program is less likely than other faculty development programs to be preaching to the converted. Moreover, theatre models the experimentation and creativity that faculty should be bringing to their classroom, giving them ideas for role-playing and other innovative pedagogy.

Conclusion

In June 2005, an NSF-funded summer institute at the University of Michigan brought together theatre professors, faculty developers, and academic administrators from 17 institutions to learn how to create interactive theatre programs on their own campuses. We believe that it will not be long before educational theatre is as common for faculty as it currently is for students. That would bode well for efforts across the country to transform campuses so that faculty and students of all backgrounds can succeed and flourish.

Parker Palmer has written eloquently about how knowledge and the learning process are communal acts; interactive theatre is so useful in part because it creates community among faculty audiences. As they share dismay at the challenges presented by the theatre scenarios, faculty recognize the barriers to being inclusive. As they engage in the group problem-solving sessions that follow the sketch, faculty learn from each other about ways they can transform the climate in their own classrooms and departments. The academy has long wanted to transform our campuses into inclusive learning communities, and interactive theatre is one important step toward that end. ©

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Interactive Theater

RAISING ISSUES ABOUT THE CLIMATE
WITH SCIENCE FACULTY

Danielle LaVaque-Manty, Jeffrey Steiger, & Abigail J. Stewart

INTERACTIVE THEATER can be used to raise political consciousness, provide therapy, even develop legislation (Boal 1997). In a recent pilot study, Chesler and Chesler (2005) found it an effective tool for building community among female faculty in engineering, and Brown and Gillespie have used it to confront what they call (following ethicist Andrew Jameton) "moral distress" in the university—situations in which "we believe we know the right thing to do, [but] feel constrained from doing it because of stultifying demands or practices over which we have little control" (1999, 36).

At the University of Michigan, we have found that interactive theater techniques can offer a surprisingly effective way to raise issues about the climate with science and engineering faculty. Sketches illustrating how faculty interactions shape and reflect the climate—portrayals of discussions of job candidates in department meetings, efforts of senior faculty to advise and mentor junior faculty, and committee meetings evaluating tenure candidates—have been used with a range of audiences to stimulate actor-audience interactions that raise key issues about how gender, rank, ethnicity, and other aspects of power relations influence the climate and faculty morale.

Imagine that you are a fly on the wall at a department's faculty meeting, observing conversations about the relative merit of two candidates

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for an open faculty position: one is an innovative junior woman just finishing a postdoc, the other a man on the verge of tenure, working very successfully in the mainstream of his discipline. The only woman faculty member at the table is suffering repeated interruptions of her well-articulated arguments on behalf of the female candidate while receiving support only from one junior male colleague. Many aspects of the discussion are familiar, some of them perhaps painfully so.

Imagine, now, that you become visible to the people at the table and they invite you to ask them why they did what they did and said what they said during the course of the meeting—a chance, in other words, to bring into the open the personal motivations, group dynamics, and political subtexts that usually remain unexplored and unacknowledged during conflicts among faculty who must work together on a daily basis. Imagine telling the department chair that he isn't doing his job very well when he allows his male colleagues to keep interrupting their female peer. Imagine that you do this without putting your own career or anyone else's at risk.

Interactive theater can simulate such an experience; and, intriguingly, the fact that the faculty meeting is neither "real" nor a traditional dramatic performance that can be passively witnessed may be of great advantage; the audience is asked to be aware of itself observing and participating in a staged conversation for the purpose of thinking about problems that are difficult to engage in the abstract.

In sketches presented by the Center for Research on Learning and Teaching (CRLT) on behalf of ADVANCE at the University of Michigan, brief but complex scenes encompassing common faculty dynamics are enacted for audiences of faculty and administrators. Following the scene, a facilitator invites the audience to ask questions of the actors, who remain in character. At first, the actors respond as they would if they were still in the presence of their colleagues, but "time-outs," during which an actor is invited to respond as if his or her character is the only one at the table, allow for more frankness.

Audience members often disagree with one another's interpretations of the scene. Some regard the climate in the hypothetical department as toxic and sexist, while others may assert that the female faculty member simply needs to be more aggressive. The facilitator keeps the dialogue moving, with certain directions in mind, and may conclude the discussion with some reframing to ensure that audience members have clear ideas to think about later. Audience members are also given folders containing relevant reading material to take home with them.

An example may help illustrate how the process works. Consider the following exchange from the faculty meeting sketch:

MARLENE: Yes . . . there are very different reasons for hiring people of different talents at different places in their career trajectory. Yes, we need to acknowledge that they are in different places. And it is because we are acknowledging this that we need to really think about—

FRANK: *(Speaking over* MARLENE*)* Well, Professor Young is at a place in his career that does make him much more sought after and much more influential. . . . The prestige he will bring to this department is unparalleled. We need to think about how our department will be perceived . . .

(MARLENE *looks at* TERRANCE *as she and* FRANK *overlap. He does nothing.)*

MARLENE: *(To* FRANK*)* Excuse me, I am not done speaking. (Steiger 2004, 5)

In response to this scene, one audience member may ask Marlene (who, the audience knows, is tenured) whether she has ever considered looking for a position elsewhere, while another might ask why she doesn't simply speak up more. Alternatively, someone might ask Frank why he interrupts Marlene so much, or ask Terrance why he doesn't direct the discussion in a way that allows everyone to be fully heard.

If the conversation portrayed in the sketch reveals as many complex social dynamics, power relationships, and apparently "individual" concerns as are embedded in an actual faculty meeting in the real world, it presents a web of problems its audience cannot easily solve or dismiss. Engaging in conversation with actors playing the roles of faculty members may sound childish to many faculty at first, but those who might quickly dismiss certain characters as buffoons or exaggerations are forced to think differently when they address those characters directly and are confronted with intelligent and complex justifications for their behavior. For example, an apparently "unassertive" Marlene may rebuke an audience member who accuses her of passivity and challenge audience perceptions that she just needs to be "more assertive" in order to solve her own problems. The success of the theatrical interaction depends, like most academic exchanges, on argument.

The CRLT Theatre Program

In addition to the faculty meeting sketch described above, the CRLT Players have developed a sketch about faculty mentoring and another about tenure evaluations on behalf of ADVANCE, but work related to ADVANCE and its goals is only part of the group's repertoire. The CRLT Theatre Program has historically focused on classroom dynamics, and most of its sketches were designed to help instructors, whether faculty or graduate students, improve their teaching. Those sketches focus on gender, race, and disability in the classroom, among other topics.

Established in 1962, CRLT was the first teaching center of its kind in the United States. The CRLT Theatre Program began in 2000 with just one sketch. At that time, Jeffrey Steiger served as the director in a full-time position. Its initial budget, contributed by the deans of the College of Engineering and the College of Literature, Science and the Arts (LSA), amounted to forty thousand dollars per year. Today, CRLT Theatre employs not only Steiger but also an assistant director on a full-time basis. The troupe's repertoire includes fourteen sketches and its yearly budget has grown to $250,000.

Because collaboration with the CRLT Theatre Program was part of Michigan's NSF grant proposal, UM's ADVANCE Institutional Transformation project commissioned a set of sketches from CRLT immediately upon receiving its grant in January 2002, and committed funds to support the development and performance of three theater sketches over a five-year period. To date, the theater program has developed four sketches for ADVANCE. The first was discarded, for reasons that will be discussed below. The second and third are being performed regularly, and the fourth was rolled out for regular performances during fall 2005.

The sketches CRLT has developed for ADVANCE have been based on two kinds of research: written academic work and experiential role-play. While ADVANCE and CRLT's own research staff are able to provide Jeffrey Steiger with studies on gender, science, and the academic climate for women faculty, this sort of data serves more as a source for fact checking and revision than as a well of inspiration during the creation of a sketch.

The first sketch Steiger developed, which was later dropped, portrayed a woman faculty member's difficulties in establishing authority in an all-male (or nearly all-male) classroom. This sketch was similar to other sketches the CRLT Players were already performing in that it

focused on the teacher-student relationship. It drew from a campus climate study, and particularly from ADVANCE interviews with women faculty, for its understanding of the problems women might face in such a situation. This sketch also used a specific interactive technique drawn from Forum Theatre (Boal 1997)—one that CRLT often employs—of inviting a member of the audience to replace the actor playing the part of the woman faculty member on stage and play the role differently, in the hope of generating a better outcome.

All CRLT sketches undergo a preview process during which the actors and director receive feedback from knowledgeable audiences. Does the language in the sketch ring true? Are the characters persuasive? Are the facts correct? Do the actors, when they interact with the audience, give appropriate responses to various questions?

Women who previewed the first sketch felt victimized by the way it worked; it was, in effect, set up to "blame" the woman faculty member's character for the difficult dynamics in her classroom and to invite audience members to feel superior to her as they "corrected" her approach during their turn on stage. This revealed a potential drawback to the Forum Theatre approach; most of the later sketches have involved direct interaction between all of the actors and the audience rather than replacement of actors with audience members.

Script Development

Steiger discovered, as he began to develop a new sketch—the faculty meeting, which includes no student characters—that while he and the other actors understood how faculty-student relationships worked because all of them had been (or were still) students, they did not know what life was like for faculty outside the classroom. They did not grasp the spoken and unspoken rules of academia. They did not understand the basic facts of how departments function.

Further, in the classroom sketches, the actors work to understand their characters as individuals in the classroom context, pinballing off of, and connecting to, one another as students involved in a temporary relationship within a climate created by the instructor. In contrast, in the ADVANCE sketches, the performers need to understand the long-term relationships among characters behaving in accord or opposition within the "whole" of not only the department, but the entire university. Each character, connected to both micro and macro levels of the institution, is a personality operating within a hierarchy.

Steiger thus developed a new method for creating the ADVANCE sketches. He now begins by meeting with a group of faculty who can talk to him about what their world is like and help him identify a scene that will resonate with a faculty audience. He then stages a role-play involving actors who know the environment that is the focus of the sketch. (The theater program employs professionals with formal theater training, students, research staff, and others as actors in the troupe.) Not everyone involved in the role-play has to be part of the world portrayed, as long as some of the participants are familiar with the norms and language typical of that setting. The initial role-play used to develop a sketch on faculty mentoring, for example, involved two members of the ADVANCE staff. If the participants have seen moments that are representative of the interactions the sketch will ultimately portray, they will naturally enact the subtleties of their experience of those situations and bring them to life in ways that are both intentional and unintentional. (An additional benefit to using faculty in the role-play is that those involved in the process become allies of the sketch and the program in general. This is one way the CRLT Theatre Program creates a network of supporters for its work.)

Armed with what he has learned from observing the role-play, Steiger is able to give the acting troupe an overview of the story they will portray and the culture in which it takes place. Actors are assigned parts in a script created from a transcript of the original role-play. Steiger also asks his actors to engage in exercises or workshops that Anne Bogart (2001) might call *source work;* a series of activities done at the beginning of the rehearsal process to connect intellectually and emotionally with the script. Actors presenting a scenario on gender dynamics in a science classroom, for example, may participate in an experiential exercise that instructs them to list adjectives that are most associated with or best describe the traditional roles of a man or a woman. Players may be asked to share experiences they had growing up that carried their first "lesson" regarding gender roles.

Actors, like everyone else, have biases and limitations based on their own particular backgrounds and experiences. By engaging in source work with their fellow actors, they become more able to view their own characters in a more three-dimensional way, rather than through the lenses of their own individual presumptions and predilections. They are also better able to understand the forces that prevent change or empathy in an individual character by exploring their own resistance and presumptions, and through this process, better able to push an audience that

may have points of view similar to those the actor held before engaging in the exercises. Doing the source work also improves relationships among the actors—a necessarily diverse group—within the theater troupe itself. Before Steiger began using source work, his troupe suffered a much higher rate of actor turnover, leaving him repeatedly with groups that were all white. Using source work has reduced turnover and enabled the troupe to retain actors of color.

Simply including an actor of color as a cast member changes an audience's reaction to the faculty meeting sketch in more and less subtle ways. When one of the male faculty members in the sketch is African American, for example, race tends to arise as a topic of conversation in the audience interaction, while race is unlikely to be discussed when the same character is played by a white actor. This occurs despite the fact that the scripted lines are the same no matter who is cast in the role. The frequent assumption on the part of a mostly white audience is that the character of color is "selling out" or shirking a race-based responsibility. This perception can initiate an enlightening and contentious discussion regarding assumptions about race, power, and culpability.

The Role of Feedback in Sketch Development and Promotion

Once the characters have been developed and the parts learned, the troupe is ready to collect feedback from carefully selected critics. CRLT staff, ADVANCE staff, and members of a faculty advisory committee now called Strategies and Tactics for Recruiting to Improve Diversity and Excellence (STRIDE), another ADVANCE intervention devoted to improving recruitment and hiring practices in science and engineering at the UM, serve as test audiences. As discussed in another chapter in this volume, the members of STRIDE are all well-respected senior men and women in science and engineering fields who have studied social science literature on gender in academe and who have become activists on behalf of women science and engineering faculty. Because STRIDE members not only thoroughly understand the goals of ADVANCE with respect to these sketches, but also have a well-developed sense of how their science and engineering colleagues are likely to respond to various aspects of the performances, their feedback is particularly valuable during these preview sessions. STRIDE members attend performances of all ADVANCE sketches, if possible, to ask useful questions if discussion is slow in getting started and keep it moving should it lag.

During a preview, the facilitator asks the audience to interact with the characters as a real audience would and to ask specific questions that might be difficult for the performers to answer. This conversation is itself a kind of training for the actors, who discover things they still don't know about their characters' lives when they run up against questions they can't answer. At the end of the preview, the facilitator asks the audience to step back and give feedback about how the sketch might be improved. In addition to providing necessary information to the CRLT Players, this process helps create faculty buy-in, because faculty who see a sketch at this early stage feel like consultants involved in its creation and take ownership of it.

Another key preview audience for the sketches is the Network to Advance Women Scientists and Engineers—an informal network, supported by ADVANCE, that includes all tenured and tenure-track women science and engineering faculty at Michigan. Typically, the network is invited to an informal dinner at which the sketch is performed. Again, this is a key audience for the sketch; it best represents those the sketch is ultimately designed to help, and it is able to point out aspects of the performance that might unintentionally portray women faculty in ways that could be counterproductive or put them at risk, as in the case of the discarded teaching sketch.

All ADVANCE sketches were also previewed by the Academic Program Group (APG), which includes the provost, associate provosts, and deans. University of Michigan president Mary Sue Coleman also attends some APG meetings and came to the one at which the faculty meeting sketch was performed. The sketch was well received at this presentation, which both affirmed the CRLT Players' sense that their performance was convincing and enabled ADVANCE principal investigator (PI) Abby Stewart and CRLT director Connie Cook to promote the sketch by referring later to its positive reception by the University's provost and president. President Coleman, in fact, was quite enthusiastic about the sketch, and has since promoted it at national meetings of educational leaders. The APG preview, then, legitimized the sketch in multiple ways. Finally, during the period in which it was developed and rolled out, the faculty meeting sketch was also previewed for LSA's dean, along with his entire staff; as a result he and the ADVANCE and CRLT staffs strategized about how to use the sketch most effectively in his college.

Preview audiences are also asked for advice about the composition of future audiences. For example, the faculty meeting sketch was deemed to be potentially explosive if performed in a department because of the

likelihood that the issues portrayed on stage could be mapped onto real and ongoing conflicts in the department. Thus, with one exception to date, audiences for this sketch have been drawn from multiple departments. LSA began by having the sketch performed for all of the department chairs in the college, with the idea that chairs might be willing to help promote the sketch to their faculty. This performance raised new issues. First, the importance of setting was underscored by the fact that the sketch was presented (as a result of building renovations) in a room that was uncomfortably small for the group. Even more importantly, despite the facilitator's valiant efforts to engage the chairs in a fruitful discussion of the group dynamics in the meeting, the discussion remained focused on procedural and mechanical issues. In retrospect it seemed clear that the "real" chairs were not willing to point out the crucial inadequacies of the chair's performance in the sketch situation.

Strategies for Framing the Sketch

The experience with the chairs underscored the importance of framing of the sketch, and providing a context in which the discussion could be relaxed and fruitful. The dean of LSA decided personally to invite faculty in the LSA science departments to dinners at which they would view the sketch. Three dinners were held, and forty senior faculty members from natural science departments were invited to each one. Faculty were seated at tables that ensured mixing of faculty across departments, and an effort was made to include at least a couple of women faculty at each table, as well as at least one person familiar with the sketch and associated with ADVANCE efforts within the University.

At the beginning of each dinner, the dean pointed out that tables had been deliberately mixed because faculty so seldom meet those in other departments, and he asked each person to stand up and introduce him- or herself. He framed the dinner as an effort to create more community, and the performance as an effort to pay more attention to the community's climate. He also made concluding comments at the end of each evening, pointing out dynamics he noticed in the sketch that he found particularly illuminating with respect to issues he had encountered in real life. The dean's presence at these events and active engagement with the sketch was extremely validating. LSA faculty responded to these performances with thoughtful and positive comments, often focusing on how convincing the portrayal had been and mentioning issues they had continued to think about afterward, like whether they themselves were

truly "equal opportunity interrupters" or interrupted women more often than men.

In our experience, the sketch has been less well received in settings in which unit leaders did not attend the performances themselves, or when the sketch was performed in a less hospitable setting, absent a meal and an opportunity to interact with colleagues. In such cases, faculty can view their attendance as simply fulfilling another onerous work obligation, and the impact of the sketch is reduced. It should be noted, though, that we have learned that it is important to be open to experiment with the sketches.

Despite the fact that there were concerns about showing the sketch within a single department, one LSA science department chair requested a performance for his department. He believed it might offer his faculty an opportunity to critique both their own group dynamics and his behavior as chair, and he was interested in encouraging that kind of reflection. In fact, when the audience was invited to interact with the actors, he asked the first question, and voiced clear criticism of the chair. His active questioning enabled the women assistant professors who attended the performance to ask many questions of their own. While not every member of the department attended, those who came were very engaged and continued to discuss the issues raised long afterward. The chair also reported later that he received useful feedback from his faculty over the subsequent two weeks. This was perhaps an unusual case, because this particular chair was interested in identifying and addressing his own limitations. This experience also underscored the importance of the form of participation engaged in by the visible leaders at these presentations.

Other ADVANCE Sketches

Two additional sketches are still in a process of being "deployed" on campus, though they are at different stages. The second sketch portrays a male senior faculty member attempting to mentor a junior woman. Understandably busy, the senior faculty member doesn't really clear much time in his day to talk to the junior woman, nor does he read her work or even her vita very carefully before she arrives in his office, despite the fact that she sends it to him well in advance of the meeting. The advice he gives her, though well intentioned, is entirely discouraging, and the meeting is interrupted by a junior male faculty member with whom the senior male clearly has a more cordial relationship.

After very positive receptions from the preview audiences, and a general sense that this sketch evoked much less defensiveness among faculty than the faculty meeting sketch had, an effort was made to collaborate with the LSA dean's office in presenting this sketch as part of a multiyear effort to improve mentoring practices in the College. The sketch was presented in the successful dinner format at multiple dinners for all department chairs in the College. These discussions were intended to lay some groundwork for a more explicit consideration of mentoring policies and practices in the departments. Chairs were provided with copies of a new *Faculty Advising Faculty Handbook* that had been developed by Professor Pamela Smock of Sociology and ADVANCE staff member Robin Stephenson, and they were encouraged to share the handbook with senior and junior faculty members in their departments.

A follow-up workshop was held at which the dean, ADVANCE PI Stewart, and Professor Smock gave presentations on the contents of the handbook, and participants worked in small groups to develop templates for departmental mentoring plans that would maximize good mentoring outcomes and minimize bad ones. This required extensive discussion of what would count as good and bad outcomes, so the participants generated a list that allowed the workshop leaders to develop a template to send back to everyone who attended. Departments were then asked to use the template to generate more specific departmental mentoring plans and given a year to do so. All departments have at this time submitted mentoring plans, and during the upcoming academic year departments will be encouraged to present the mentoring sketch to their faculty as part of an effort to increase awareness of effective mentoring practices. The mentoring sketch, then, was presented in the context of a larger project that gave those who saw it reason to take it seriously and make use of what they learned soon afterward. This kind of framing is critical if the sketches are to be absorbed and used by those who see them, rather than merely watched and forgotten.

Finally, the tenure evaluation sketch was developed to address problems of evaluation bias in the tenure process. Because the faculty meeting sketch and the mentoring sketch had already been so well received, there was widespread agreement among university constituents, including the provost, that the CRLT Theatre Program was the appropriate tool to use, and Jeffrey Steiger readily agreed to develop a script. In order to do so, he asked senior faculty to enact a role-play of a tenure discussion for him, which he observed to gain a sense of how the process works. Members of STRIDE and other supportive senior faculty per-

formed the role-play, and afterward, Steiger asked them what *hadn't* happened in the role-play that usually happens in tenure discussions. All of them agreed that nobody had taken the part of the "bean counter," the person who always wants to tally up numbers of publications, status of publication venues, and citation rates in order to make a decision. Bean counting was thus integrated into the sketch. Steiger also asked follow-up questions about differences in practices between different colleges and at different levels of review, and received extremely detailed answers that worked their way into his script.

At this writing, this sketch has been shown to preview audiences and the rollout has begun; it has been performed for the Academic Program Group, and in two performances for key tenure decision-makers in LSA: the Executive Committee, members of the three divisional review committees, and department chairs. In this way it quickly reached a large number of the people involved in tenure decisions. Subsequent performances will be offered to groups in the College of Engineering, as well as people on department-level tenure committees, perhaps again accompanied by dinners, in order to prompt thinking about relevant issues before this year's tenure cases come up for evaluation. At all presentations a handful of journal articles addressing issues of gender bias in evaluation processes will be distributed.

Intriguingly, this sketch invites the kind of audience participation that was unhelpful in the discarded teaching sketch, but with a twist: rather than replacing any of the faculty members at the table, audience members are invited to add themselves to the table and intervene in the discussion. They are thus invited (in small groups) to think of ways to redirect the conversation without having to decide that any particular person already at the table is responsible for its failings. In the process, they are given an opportunity to practice ways of intervening in a tenure discussion that has gone awry. This strategy helps mobilize audience members' awareness that their actions (and inaction) matter in these situations, while giving them an opportunity to work with the group on identifying strategic interventions that might be effective.

Evaluating the Sketch

Evaluation of the sketches serves at least three goals: providing feedback to the theater program; offering assessments of, and justification for, the theater program; and offering assessments of and justification for the use of theater for purposes of institutional transformation. Both CRLT and

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ADVANCE collect survey data regarding audience responses to each performance. This kind of aggregate data can provide a sense of the immediate impact of a performance—and assessments of performances of the faculty meeting and mentoring sketches to date show that the sketches are generally well received and thought-provoking.

We have quantitative ratings of sixteen performances of the faculty meeting sketch and seven of the faculty advising faculty sketch. Overall, 519 individuals, of whom 322 were from UM, rated the faculty meeting sketch, and 276, of whom 206 were from UM, rated the faculty advising faculty sketch. About half of the audience rated the sketches (53% of UM audiences for faculty meeting and 46% for faculty advising). Three items invite audiences to rate the usefulness of the issues and topics raised in the sketch, in the interactive session, and in the printed materials. The average ratings by sketch of the first two, on a five-point scale, is above 4 (see table 1 for these results). The average rating of the printed material is somewhat lower (about 3.6). None of these six ratings reveals a gender difference in audience members' ratings.

In contrast, the next three questions ask about the degree to which the issues raised reflected audience members' personal experiences, experiences of "my colleagues," and "behaviors/issues I have observed at UM." Ratings of these items average 2.80–3.53 for men, and 3.38–3.91 for women; all of these gender differences are highly significant statistically.

Finally, the last two items ("The audience/actor interactive discussion enhanced my understanding of the issues" and "The balance between giving information and encouraging discussion in the presentation as appropriate") yielded high ratings (averaging 4.0 or higher) for both men and women, with only one significant gender difference.

Before the tenure sketch (called "The Fence") was rolled out, we revised the items in our evaluation questionnaire, and decided to collect more qualitative data. The five closed-ended questions are variants of the previous ones and are also included in table 1. We only have data from ten women and seventeen men (for a 36% response rate), but the ratings are uniformly high (all above 4.15, and the overall effectiveness of the sketch 4.85). There were no gender differences in response, perhaps because the ratings were so high, but also perhaps because of the changes in the item wording.

Overall, then, the quantitative data suggest that the sketches are valued highly by both male and female audience members, but female audience members find two of them more personally resonant. Though

useful for identifying overall responses, these data are not helpful in determining what long-term effects the sketch might have on those who have seen it. Some of the most revealing data we have along these lines were collected by simply asking key informants to respond via nonanonymous email queries about what worked best, what worked least well, and how to make performances more useful in the future. Some examples of responses to email about the faculty meeting sketch will offer some flavor of the responses. One male faculty member wrote,

> What I found myself thinking about most after the skit was the issue of interruptions. I tend to interrupt people a lot—though it's usually to finish their sentences, not to contradict them, and I think I'm an equal opportunity interrupter, interrupting men and women equally. My reason for thinking more about this point [was that] I began to reflect on ways to make the picture "women get interrupted more" more precise. For example, how does status enter the picture? That is, are women interrupted more because they are (at least subconsciously) perceived as having lower status than men even when they have the same academic rank? Are female professors interrupted more by their grad students and postdocs (a situation where the rank differences is big enough to presumably outweigh subconscious biases) than male professors are? . . . I see I'm describing a research project . . . so I'll stop here.

Another male faculty member wrote,

> Our faculty meetings are not like that because none of our female professors can stand to come! I think that the skit raised a number of points about departmental dynamics. Certainly every member of departmental executive committees should see it. It simply helps people be aware of the pitfalls common to interpersonal communication.

A faculty member from a different department raised an interesting issue about the limitations of the cross-unit strategy:

> This play made me immediately reflect on the dynamics among faculty in my own department and of course "my" specific role in all of it. I thought a lot about this play after the evening gathering

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TABLE 1. Average Ratings of ADVANCE Sketches

	Female		Male		Overall		Significance[a]
	N	Mean	N	Mean	N	Mean	
Faculty Advising Faculty							
Scale: Not useful (1) … Highly Useful (5)							
The issue/topics raised in the actors' performance of the sketch	67	4.33	25	4.08	92	4.26	ns
The issue/topics raised in the audience/actor interactive discussion of the sketch	66	4.39	25	4.16	91	4.33	ns
The printed materials provided as resources for this presentation	29	3.55	16	3.69	45	3.60	ns
Scale: Strongly Disagree (1) … Strongly Agree (5)							
The issues raised in the performance reflected my personal experiences	67	3.60	25	2.80	92	3.38	★★
The issues raised in the performance reflected experiences of my colleagues	65	4.09	24	3.42	89	3.91	★★
The issues raised in the performance reflected behaviors/issues I have observed at UM	65	3.78	25	3.24	90	3.63	★
The audience/actor interactive discussion enhanced my understanding of the issues	66	4.09	25	4.04	91	4.08	ns
The balance between giving information and encouraging discussion in the presentation was appropriate	66	4.23	24	4.42	90	4.28	ns

	Female		Male		Overall		Significance[a]
	N	Mean	N	Mean	N	Mean	
Faculty Meeting							
Scale: Not useful (1) … Highly Useful (5)							
The issue/topics raised in the actors' performance of the sketch	52	4.31	117	4.05	169	4.13	ns
The issue/topics raised in the audience/actor interactive discussion of the sketch	52	4.33	118	4.09	170	4.16	ns

	Female		Male		Overall		
	N	Mean	N	Mean	N	Mean	Significance[a]
The printed materials provided as resources for this presentation	32	3.81	58	3.53	90	3.63	ns

Scale: Strongly Disagree (1) … Strongly Agree (5)

	Female		Male		Overall		
The issues raised in the performance reflected my personal experiences	51	3.92	118	3.28	169	3.47	★★★
The issues raised in the performance reflected experiences of my colleagues	48	4.06	110	3.52	158	3.68	★★★
The issues raised in the performance reflected behaviors/issues I have observed at UM	49	3.98	114	3.58	163	3.70	★
The audience/actor interactive discussion enhanced my understanding of the issues	50	4.12	117	3.90	167	3.96	ns
The balance between giving information and encouraging discussion in the presentation was appropriate	50	4.54	117	4.20	167	4.30	★

Tenure: The Fence

	Female		Male		Overall		
	N	Mean	N	Mean	N	Mean	Significance[a]

Scale: Strongly Disagree (1) … Strongly Agree (5)

	Female		Male		Overall		
Please rate the overall effectiveness of the CRLT sketch and interactive presentation	10	4.90	17	4.82	27	4.85	ns
The issues raised in the performance are important	10	4.90	17	4.53	27	4.67	ns
The performance made me think about some familiar interactions and situations in new ways	10	4.20	17	4.29	27	4.26	ns
The issues raised in the performance reflected issues I have observed at UM	10	4.20	17	4.41	27	4.33	ns
The audience/actor interactive discussion enhanced my understanding of the issues	10	4.50	17	4.00	27	4.19	ns

[a] ns = not significant.   ★p = .05,   ★★p = .01,   ★★★p = .001.

but I really didn't have an opportunity to talk about it with any-
one who was there for many days. I think it might be more use-
ful to have this play performed within a department where col-
leagues have more opportunities to reflect informally.

In an interesting confirmation of this point, one female faculty member
wrote,

> I think this presentation is excellent, right to the point, and I find
> it way more effective than any statistics/graphs that I have seen on
> work climate for women/minorities. I can't help noticing that
> among some colleagues I spoke with, male colleagues do not per-
> ceive it in the same way as females. I have come across responses
> from shrugging shoulders to "it's a bit heavy handed, isn't it?' to
> "it was good, but our department is not like that" (not joking).
> Why that is, is probably part of the issue.

Her message was inadvertently directed to the entire group of people
who had been queried, and one of her male colleagues responded,

> I should probably confess that I am likely one of the people who
> said . . . that I found the sketch a bit heavy-handed. . . . I expect
> that the sketch was probably more powerful if you yourself have
> suffered from some (or all) of the injustices portrayed and I
> definitely should have been more sensitive to that.

He concluded his lengthy reflections by wondering about the impact of
his own behavior interrupting female and junior male colleagues:

> I guess it also made me wonder if there is any disparity in my
> behavior or if my interrupting may have a more negative impact
> on female colleagues given the general climate issues.

While it is certainly valuable to collect anonymous, aggregate data,
direct email queries have produced many responses that provide us a
richer understanding of the process of reflection during and following
the presentations.

We have learned that we cannot expect the sketches to have uniform
impact, either from one individual to the next or from one department
or college to the next. (For example, the sketches have been utilized

more often and responded to more positively in the College of Litera-ture, Science, and the Arts than in other colleges.) Aggregate assessments are best equipped to reveal uniform outcomes, but we are also interested in finding ways to document outcomes that are unusual but important, such as the success of the faculty meeting sketch when it was performed for a single department (rather than a cross-departmental group) in LSA.

One of the difficulties involved in measuring the impact of some-thing like the CRLT sketches is that what is easiest to measure is impact upon individuals, but what we really want to know is what impact the sketches may have had upon the entire system that is academic science and engineering at the University of Michigan. And, as with any ADVANCE intervention, it is difficult to single out effects from a sin-gle intervention when so many other interventions are taking place con-currently under ADVANCE auspices.

Conclusions

LSA's successful use of the theater sketches points to the importance of embedding such interventions in a larger agenda and engaging highly placed administrators like deans if the interventions are to have any last-ing impact. Framing—giving the target audience a reason to care about and a way to make use of the information given—is crucial, as are set-ting and audience composition. Relatively homogeneous groups may often be best equipped to have the most constructive discussions. Those who are in a position to make tenure decisions, for example, will have a different perception of the tenure evaluation sketch than untenured fac-ulty, who might find it threatening or overwhelming. It is important that the context in which the sketches are shown be a safe one for the audience, one that allows for receptivity and open-mindedness rather than defensiveness. Thus, despite the success of the faculty meeting sketch within one department in LSA, we still recommend showing that sketch to groups that cross departmental lines rather than using it within individual departments.

We remain open to experiment, however. And we believe that we have only begun to tap into the possible uses of interactive theater for addressing issues of academic climate. In summer 2005, CRLT held its first Summer Institute, a three-day seminar at which the players demon-strated the basics of source work, role-play, actor-audience interaction, facilitation, and other aspects of sketch creation and performance to thirty-three avid participants from sixteen other colleges and universi-

ties. The Summer Institute received rave reviews, and will be repeated. In addition, ADVANCE hopes to hold summer seminars specifically for scientists and engineers that will bring the CRLT Players and STRIDE together to mobilize faculty activists. We are certain that the CRLT Theatre Program will continue to collaborate with UM ADVANCE in finding new ways to foster discussion, reflection, and transformation in the academy.

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Ann Arbor, MI 48109-2218

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office: 734-615-8309
cell: 734-276-6560

EDUCATION

Northwestern University (NU), Evanston, IL
    Interdisciplinary Ph.D. in Theatre and Drama, June 2013
    Dissertation: *Teaching the Body, Learning Rhythm*
    Committee: Susan Manning (Chair), Harvey Young, Gary Fine
    Qualifying Exam Fields: 20th & 21st Century Performance Pedagogies
                                Theories of Embodiment
                                Ethnographic Methods
    Certificate: Graduate Teaching Certificate, Searle Center for Teaching Excellence

University of Birmingham, Birmingham, UK
    Graduate Direct Exchange Fellowship, 2004-05
    Playwriting Studies/Dramaturgy

University of Kansas (KU), Lawrence, KS
    M.A. in Theatre Studies with Honors, May 2004
    Thesis: *Evocation of Visceral Culpability*: *Juliana Francis's go go go*
    Committee: Patricia Ybarra (Chair), John Gronbeck-Tedesco, Jeanne Klein

Oklahoma State University (OSU),
    Honors B.A. in Theatre, Summa Cum Laude, December 1999

SITI Company Training
    Summer Theatre Workshop at Skidmore College, Saratoga Springs, NY, June-July 2011
    Two-Week Viewpoints and Suzuki Intensive at Links Hall, Chicago, IL, August 2010

Marta Sanchez Dalcroze Training Center, Pittsburgh, PA
    Summer Dalcroze Eurhythmics Workshop II & International Conference, July 2010
    Summer Dalcroze Eurhythmics Workshop I, July 2008

FACULTY DEVELOPMENT EXPERIENCE

Center for Research on Learning and Teaching, UM, Ann Arbor, MI, 48109
Artistic Director, CRLT Players, 2013-Present
- Maintain and expand Players repertoire
- Facilitate professional development sessions for faculty and graduate student audiences
- Oversee theatre staff

Searle Center for Teaching Excellence, NU, Evanston, IL, 2010-11
Graduate Assistant, 2011-2013
- Provide administrative support for the Graduate Teaching Certificate Program (GTCP) and all graduate student workshops
- Facilitate GTCP professional develop sessions
- Manage professional development events (e.g. coordinate with workshop facilitators, schedule/reserve rooms, publish events, etc…)

Graduate Teaching Fellow, 2011-2013
- Develop and lead workshops for the center's annual graduate workshop series
- Establish/strengthen relationships between the Searle Center and graduate programs across campus
- Develop teaching/learning programming and resources for MFA graduate students

Graduate Teaching Consultant, 2010-2013
- Facilitate small group analyses with students to gather formative feedback on courses/instruction and lead follow-up consultations with instructors

TA Fellow, 2010
- Developed and led discipline-specific and interdisciplinary sessions for new Northwestern's New TA Conference

Greenville Arts Partnership (GAP), Greenville, MS, 2005-07
Arts in Education Director
- Acted as liaison between the school district and community arts organizations
- Wrote grants and received over $25,000 of funding for arts-related professional development for elementary teachers
- Developed and led presentations for GAP professional development sessions
- Administered 15+ show season of free & paid performances and led gallery tours for K-12 students
- Designed student and teacher resources to supplement arts events

Teach for America, Delta Region
Volunteer Professional Development Course Leader, 2006
- Led courses in arts integration at Professional Saturday Training Program for TFA corps members

TEACHING EXPERIENCE

Northwestern University
Graduate Fellow, Brady Scholars Program in Ethics and Civic Life, NU, Evanston, IL 2010-11
Instructor, *Theories of Directing*, Fall 2010
  Upper level survey course exploring the convergent and divergent ways that influential Western theatre directors of the twentieth and twenty-first centuries have approached the actor, audience, space, and text
Instructor, *Theatre in Context: Playing with Time*, Spring 2010

    Freshman theatre seminar examining how time operates within the context of dramatic literature and performance

Teaching Assistant, *Production in Context* with Jennifer Collins, Spring 2009

Teaching Assistant, *Introduction to Fiction* with Dr. Jules Law, Winter 2009

Teaching Assistant, *Theatre in Context* with Dr. Harvey Young, Fall 2008

University of Kansas

Instructor, *Acting I* (courses for majors and non-majors), Fall 2001-Spring 2004
    Lower level practical course introducing students to the fundamental techniques of acting and scene study

Teaching Assistant, *Introduction to the Theatre* with Dr. Patricia Ybarra, Spring 2004

Teaching Awards

Outstanding Graduate Teaching Assistant, Theatre Dept, KU, 2002-03

Outstanding New Graduate Teaching Assistant, Theatre Dept, KU, 2001-02

SCHOLARSHIP

Conference Presentations

"Show or Tell: Discussing Diversity in Graduate Student and Faculty Orientations," *Incoming! Theatre at University Orientations as a Model of Prosocial Academic Enculturation.* Association for Theatre and Higher Education Conference, Orlando, FL, 2013

"Uncommon Courtesy: Embodied Criticism and the SITI Company." Theory and Criticism Focus Group's Roundtable Series. Association for Theatre and Higher Education Conference, Washington D.C., 2012

"Listening to Loneliness: Resisting Community in the Studio," Black Theatre Association Debut Panel adjudicated by Harry J. Elam, Jr., Nadine George-Graves, and Brandi Wilkins Catanese, Association for Theatre in Higher Education Conference, Chicago, IL, 2011

"Back & Forth: Ensemble Building through the Body in the Performance Classroom," Mid-America Theatre Conference, Minneapolis, MN, 2011

"From Outreach to the University, Does 'Good' Pedagogy Translate: An Exploration in Three Scenes," CORD/ASTR Conference, Seattle, WA, 2010

"Making Rhythm Public: The Inclusive Pedagogy of the Jump Rhythm Jazz Project," Mid-America Theatre Conference, Cleveland, OH, 2010

"*Character*izing History: Integrating Theatre into the Social Studies Curriculum," Mississippi Department of Education Summer Conference, Biloxi, MS, 2007

"Elegant Connections: Enhancing Curriculum through the Arts," Mississippi Department of Education Summer Conference, Oxford, MS, 2006

Other Scholarly Presentations

"Reimagining the Audience: The Theatre of Augusto Boal," Invited Guest Presenter for *Modern Drama*, UIC, Chicago, IL, Fall 2011

"Playing Well with Others: Physically Cultivating Concepts of Togetherness in Performance Learning Environments," Winter Symposium, Northwestern University, 2011

"The Role of the Dramaturg in the Production Process," Guest Lecturer for *Production in Context*, Fall 2007

Publications
Book Review of *Pedagogy and Human Movement: Theory, Practice, Research* by Richard
   Tinning. *Theatre Topics*. March 2012

Research Awards
Graduate Research Grant, The Graduate School, NU, 2011

PRODUCTION EXPERIENCE (selected)

Directing

A Woman Called Truth	Delta Center Stage	2006
The Importance of Being Earnest	Delta Center Stage	2006
The Tale of the Mouse	Delta Center Stage	2006
She Stoops to Conquer	Kansas Summer Theatre	2004
"A Sad Song"	KCACTF, National	2004
The Yellow Dress	E. Taylor Women's Resource Center	2004
Cloud Nine	The Barn Players	2003
"Hear No Evil, See No Evil"	KCACTF, Region V	2003
"Reality/TV," devised	University of Kansas	2003
"Army of One "	William Inge Center for the Arts	2002
Iphigenia at Aulis	University of Kansas	2002

Dramaturgy/Script Development

The Ravagers	Savage Umbrella Theatre Company	2011
Z Word	Savage Umbrella Theatre Company	2010
Love Me or Die!	Savage Umbrella Theatre Company	2009
Cabaret	Crafton-Preyer Theatre, KU	2003
Lulu	William Inge Theatre, KU	2003

Acting

Nancy, "Failing"	Savage Umbrella/Caffeine Theatre	2012
Laura in *The Glass Menagerie*	Delta Center Stage	2007
Belinda/Flavia in *Noises Off*	Delta Center Stage	2006
Helena in *A Midsummer Nights Dream*	Delta Center Stage	2005
Anna in *Prairie Fire*	Kansas Summer Theatre	2002
Desdemona in *Desdemona*	William Inge Theatre, KU	2002
Blue Fairy in *Pinnochio*	Circuit Playhouse	2000
June Sanders in *Sanders Family Christmas*	Circuit Playhouse	2000
Sara in *Stop Kiss*	Circuit Playhouse	2000
Babe in *Crimes of the Heart*	Vivia Locke Theatre, OSU	1999
Bananas in *The House of Blue Leaves*	Vivia Locke Theatre, OSU	1999
Anna in *Burn This*	Jerry Davis Black Box, OSU	1998
Miranda in *The Tempest*	Vivia Locke Theatre, OSU	1997

Artistic Awards
Warren McDaniel Award, Mississippi Theatre Association, *A Woman Called Truth,* 2006

Student Directing Award, KCACTF, "Hear No Evil, See No Evil," 2003
Student Dramaturgy Award, KCACTF, *Lulu*, 2003
Achievement in Direction and Sound Design, KCACTF, *Iphigenia at Aulis,* 2002
Ostrander Theatre Award, Best Actress in a Drama, Sara in *Stop Kiss*, 2000

ACADEMIC SERVICE

Member, Advisory Committee Member for *Good Kids*, University of Michigan, 2014
Grad Rep, IPTD Executive Committee, Northwestern University, 2011-2012
Grad Rep, Black Theatre Association, Association for Theatre in Higher Education, 2011-12
Grad Student Caucus Rep to the Committee on Conferences, American Society for Theatre Research, 2011-12
Judge, Mary Poole Emerging Scholars in Theatre Award, NU, 2010-11
Communications Officer, Graduate Student Association, NU, 2009-10
Referree, Mary Poole Emerging Scholars in Theatre Award, NU, 2009-10

PROFESSIONAL AFFILIATION

Association for Theatre in Higher Education   Black Theatre Association
American Society for Theatre Research   American Theatre and Drama Society

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Curriculum Vitae
Margaret A. Bakewell

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Plymouth, MI 48170   Home: (734) 455-6775
mbakewel@umich.edu

Education

Wayne State University, Detroit, MI
- Bachelor of Science in Biological Sciences, December 2002

University of Michigan, Ann Arbor, MI
- Master of Science in Molecular, Cellular and Developmental Biology, December 2004
- Ph. D. in Ecology and Evolutionary Biology, May 2011
  Dissertation Title: Genomic Patterns of Gene Evolution

Employment

Center for Research on Learning and Teaching, University of Michigan

Assistant Director	2012-present
Instructional Consultant	2011-2012
Graduate Teaching Consultant	2009-2011

Eastern Michigan University

Adjunct Lecturer   2009-2011
  Designed and taught courses for majors and non-majors in evolution and genetics

Program in Biology, University of Michigan

Graduate Student Instructor   2005-2011
  Ten terms as a graduate student instructor including EEB 390: Evolution, BIO 305: Genetics,
  BIO 310: Introductory Biochemistry, and BIO 162: Introductory Biology

Graduate Student Mentor   2008-2010
  Led training sessions for new Biology Graduate Student Instructors, facilitated practice teaching
  sessions, collected student feedback, conducted consultations with new instructors

Funding and Awards

- POD Network Innovation Award, 2013
- Genome Science Training Program Pre-doctoral Fellowship, University of Michigan, 2007-2009
- Travel award for participation in Walter M. Fitch Student Award Competition, Society for
  Molecular Biology and Evolution Annual Meeting, 2007

Publications

Bakewell, MA, Wittkopp, PJ. (2013) Basic Probability and Chi-Squared Tests. Genetics Society of
  America Peer-Reviewed Education Portal (GSA PREP): 2013.005; doi:
  10.1534/gsaprep.2013.005

Bakewell, MA, Zhang J. (2008) Positive selection on genes in humans as compared to chimpanzees.
  Encyclopedia of Life Sciences. John Wiley & Sons, Chichester, UK. (Review)

Teeter KC, Payseur BA, Harris LW, **Bakewell MA**, Thibodeau LM, O'Brien JE, Krenz JG, Sans-Fuentes
  MA, Nachman MW, Tucker PK. (2008) Genome-wide patterns of gene flow across a house
  mouse hybrid zone. Genome Res.; 18(1):67-76.

Margaret A. Bakewell

Bakewell MA, Shi P, Zhang J. (2007) More genes underwent positive selection in chimpanzee evolution than in human evolution. Proc Natl Acad Sci U S A;104(18):7489-94.

Shi P*, **Bakewell MA***, Zhang J. (2006) Did brain-specific genes evolve faster in humans than in chimpanzees?. Trends Genet.; (11):608-13. * indicates equal contribution from these authors.

Gardocki ME, **Bakewell M**, Kamath D, Robinson K, Borovicka K, Lopes JM. (2005) Genomic analysis of PIS1 gene expression. Eukaryot Cell; 4(3):604-14.

Presentations and Posters

Bakewell MA, DeMonner, S., Hershock, C. 2014. Rapid Evaluations of Emerging Instructional Technologies: Practical Strategies to Inform University IT Governance Decisions and Faculty Development. EDUCAUSE Learning Initiative Annual Meeting, New Orleans, Louisiana. 45 minute interactive presentation.

Bakewell MA, Zhu, E. 2013. Any content, any time: A flexible template for online professional development. 38th Annual POD Conference, Pittsburgh, Pennsylvania. Poster.

Bakewell MA, Zhu, E. 2012. "Flipping" the Seminar: Opportunities and Challenges for Blended Faculty Development. 37th Annual POD Conference, Seattle, Washington. 75 minute interactive presentation.

Bakewell MA, Zhang J. 2008. Comparison of positive selection in protein coding genes of fungi, insects and mammals. Annual Meeting of the Society for Molecular Biology and Evolution, Barcelona, Spain. Poster.

Bakewell MA, Shi P, Zhang J. 2007. More genes underwent positive selection in chimpanzee evolution than in human evolution. Walter M. Fitch Symposium, Annual Meeting of the Society for Molecular Biology and Evolution, Halifax, Nova Scotia. 15 minute contributed talk.

Bakewell MA, Shi P, Zhang J. 2006. Positive Selection in Human and Chimp. Evaluation Seminar, University of Michigan Department of Ecology and Evolution, Ann Arbor, Michigan. 50 minute talk.

CURRICULUM VITAE
CRISCA BIERWERT

ADDRESSES

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usmail   Center for Research on Learning and Teaching (CRLT)
1071 Palmer Commons
University of Michigan UM)
Ann Arbor, Michigan 48109-2218

telephone   (734) 945-1784 (cell phone, for contact anytime)

EDUCATION   Ph.D. in Anthropology, University of Washington, Seattle

EMPLOYMENT

2009-present   Chair and member of Executive Committee, UM Diversity Council

2006 to present   Associate Director, Multicultural Coordinator, Center for Research on Learning and Teaching (CRLT), University of Michigan (UM)

2000-2006   Assistant Director and Instructional Consultant, CRLT

1999-2000   Asst Research Scientist, Institute for Research on Women and Gender, UM

1991-1999   Assistant Professor, Visiting Asst. Professor, University of Michigan

1989-1991   Visiting Assistant Professor, University of Michigan

1987-1989   Instructor, Green River Community College, Auburn, Washington

MAJOR CRLT PROGRAMS

<u>Provost's Seminars on Teaching (recent ones organized)</u>
Tri-Campus Provosts' Seminar on Engaged Learning, Community-Based Research, and the Community Engagement Corridor
Teaching with Collections: Engaging Students in the Archives, Museums and Gardens of the University of Michigan
Connecting College Teaching with the Science of Learning

<u>Faculty Learning Communities</u>
Diversity and the Science of Learning
Faculty Dialogue Institute

<u>Consultations on Presidential or Provostial Initiatives</u>
Multidisciplinary Learning and Team Teaching
Task Force on GSI Testing and Training

MAJOR CRLT WORKSHOPS AND PRESENTATIONS

<u>Workshops on engaging diversity in classrooms</u>
(tailored to the department or group of instructors)
- Leveraging student diversity in the classroom
- Leading discussions, facilitating dialogue
- Untying Bundles of Silence

- Dealing with controversy during classroom discussion
- Listening and teaching students to listen

<u>Workshops on inclusive student success</u>
- Teaching for student retention
- Effective use of groups
- Course design: Framing strategies and using questions effectively

<u>Workshops on identity</u>
- Teaching across cultures
- Identity and authority in the classroom
- Navigating identity in the classroom
- Graduate student mentoring

<u>Presentations (all involve some interaction)</u>
- Issues and strategies that affect student success and climate
- CRLT resources available for departments

PRINCIPAL CONSULTATIONS
     <u>Consultations with Deans and Department Chairs</u>
- Consultations, design, and facilitation of faculty meetings and faculty retreats on any topic
- Consultations on climate issues for faculty, graduate students, and or undergraduate students
- Research and reporting on curriculum and program design and effectiveness (survey and focus groups)
- Research and reporting on climate issues (focus groups and survey)

     <u>Midterm Student Feedbacks, Class Observation, and Course Design</u>

PUBLICATIONS (selected)
2011   "Strengthening Diversity through Faculty Development." in *Advancing the Culture of Teaching on Campus: How a Teaching Center Can Make A Difference,* Constance E. Cook and Matthew L. Kaplan, eds. Sterling, VA: Stylus Publshing.
2008   "Privatizing Northwest Salmon: Indigenous Claims in the Context of a Global Transformation." in *Enclosing the Fisheries: People, Places and Power*, Marie E. Lowe and Courtney Carothers, eds. Bethesda, MD: American Fisheries Society.
2008   "Weaving in Time" in *S'abedeb* : The Gifts: Pacific Coast Salish Art and Artists. Seattle, WA: Seattle Art Museum and University of Washington Press.
2007." 'I lift her up ...' : Fred Ewen's Narrative Complexity." in *Be of Good Mind: Essays on the Coast Salish.* Bruce Miller, ed. Lincoln, NE: University of Nebraska Press.
2004.   "Post-Colonial Studies of Native America: A Review Essay." In *Comparative Studies in Society and History*. Ann Arbor, MI: Society for Comparative Study of Society and History.
2004   "Coyote and His Son." *Voices from Four Directions: Contemporary Translations of the Native Literatures of North America*. Brian Swann, ed. Lincoln, NE: University of Nebraska Press. 171-194.
2002   "Making Accommodations for Students with Disabilities: A Guide for Faculty and Graduate Student Instructors," *Occasional Paper No. 17.* Ann Arbor, MI: Center for Research on Learning and Teaching, University of Michigan.

1999   *Brushed by Cedar, Living by the River: Coast Salish Figures of Power*. Tucson, AZ: University of
              Arizona Press.
1998   "Remembering Chief Seattle: revisions of a vanishing native american." *American Indian
              Quarterly*. 22:3: summer
1996   *Anthropological Analysis* for *Petition for Federal Recognition by the Swan Creek Black River
              Confederated Ojibwa Tribes of Michigan* (available through the Tribes and
              through the Bureau of Acknowledgement and Recognition, Bureau of Indian
              Affairs, Washington, D.C.)
1996   *Lushootseed Texts: An Introduction to Puget Salish Narrative Aesthetics.* Editor and Co-
              translator. Lincoln, NE: University of Nebraska Press.

EXPERIENTIAL LEARNING COURSES FREQUENTLY TAUGHT AT UM (during faculty appointment)
- Narrative Structures in Oral Traditions (undergraduate seminar; mid-level; 15 to 25 students)
- Lines of Sight: Native American Art & Performance (undergraduate, mid-level; c. 18 students)
- Texts and Textiles of Native America (first year students course; intro.; 20 students)
- Ritual, Power, and the State (graduate seminar; c. 10 students)

CONSULTANCIES for community resources
                         Salish Art and Artists exhibit at Seattle Art Museum.
                         Swan Creek/Black River Tribe of Michigan, Saginaw, Michigan.
                         Lushootseed Research, Seattle, Washington.
                         Coqualeetza Cultural Centre, Sardis, British Columbia.
                         Muckleshoot Tribe and Auburn School District, Washington

OTHER SERVICE
Professional Memberships   American Association of Colleges and Universities (AACU)
                              Professional and Organizational Development (POD)
                              American Anthropological Association (AAA)

Community   Fundraising for American Cancer Society
                              Women's Health Network support

UM Native Community   Member, American Indians at the University of Michigan (aium)
                              Supporter, Native American Students' Association

THERESA BRAUNSCHNEIDER

tbraun@umich.edu   1609 Ferndale Place
734-763-5988 work; 616-821-7106 cell   Ann Arbor, MI 48104

Education

Ph.D., English and Women's Studies, 2002   University of Michigan
M.A., English Language and Literature, 1998   University of Michigan
B.A., English, *summa cum laude,* 1993   Kalamazoo College

Professional Positions

Instructional Consultant, Center for Research on Learning and Teaching (CRLT), University of
        Michigan, May 2013- present
Visiting Consultant, CRLT, University of Michigan, August 2012- May 2013
Associate Professor of English, Washington & Lee University, 2008-2013
Assistant Professor of English, Washington & Lee University, 2002-2008
Graduate Student Instructor, University of Michigan, 1997-2002

Primary responsibilities in current CRLT position: Consulting with U-M faculty and departments
about all aspects of teaching; editing and writing for the CRLT blog (crlt.umich.edu); advising
CRLT Players theatre program on script development, sketch preparation, and facilitation
planning; organizing Preparing Future Faculty conference and other graduate student professional
development programs; offering regular workshops and seminars, with particular focus on
inclusive teaching of diverse students

Publications

BOOK

Our Coquettes: Capacious Desire in the Eighteenth Century (University of Virginia Press,
        2009). Winner of the Walker Cowen Memorial Prize for an outstanding manuscript in
        eighteenth-century studies.

ESSAYS

"Monstrous Gallantry: Protective Masculinity in the Late Eighteenth Century." Forthcoming in
        Heteronormativity in Eighteenth-Century Literature and Culture, eds. Abby Coykendall
        and Ana Boe. Ashgate Press.
 "Reforming the Coquette: Poly, Homo, Hetero in *The Reform'd Coquet* and *The History of Miss
        Betsy Thoughtless*." In *Lesbian Dames: Sapphism in the Long Eighteenth Century*, ed.
        John C. Beynon and Caroline Gonda (Ashgate Press, 2010): 95-110.
 "The People that Things Make: Coquettes and Consumer Culture in Early Eighteenth-Century
        British Satire." In *Refiguring the Coquette*, ed. Yaël Schlick and Shelley King (Bucknell
        University Press, 2008): 39-61.
 "The Lady and the Lapdog: Mixed Ethnicity in Constantinople, Fashionable Pets in Britain." In
        *Humans and Other Animals in Eighteenth-Century Britain: Representation, Hybridity,
        Ethics*, ed. Frank Palmeri (Ashgate Press, 2006): 31-48.
"Acting the Lover: Gender and Desire in Narratives of Passing Women." *The Eighteenth
        Century: Theory and Interpretation* 45.3 (Fall 2004): 211-29.

"The Macroclitoride, the Tribade, and the Woman: Configuring Gender and Sexuality in English
   Anatomical Discourse." *Textual Practice* 13.3 (1999): 513-36.

<div align="center">REVIEWS</div>

Book Review of Ellen Pollak, *Incest and the English Novel, 1684-1814* (Baltimore: Johns
   Hopkins UP, 2003). *Tulsa Studies in Women's Literature* 23.2 (Fall 2004): 371-373.
Book Review of Joan Douglas Peters, *Feminist Metafiction and the Evolution of the British Novel*
   (Gainesville: U of Florida P, 2002). *Tulsa Studies in Women's Literature* 21.2 (Fall
   2002): 407-409.
Assistant to Valerie Traub, annotated bibliography on "Recent Studies in Homoeroticism."
   English Literary Renaissance 30.2 (2000): 284-329.

Fellowships & Grants

ACLS Fellowship, American Council of Learned Societies, 2009-2010
Senior Research Associate, Alice Paul Center for Research on Women, Gender, and Sexuality,
   University of Pennsylvania, 2009-2010
Lenfest Grants for Summer Research, Washington & Lee, 2009-2011
Frank Hideo Kono Fellowship, Huntington Library, Summer 2006
Andrew W. Mellon Fellowship, Huntington Library, Summer 2006
Jessie Ball duPont Fellowship, National Humanities Center, 2005-2006
Glenn Grants for Faculty Summer Research, Washington & Lee, 2003-2008
Sweetland Writing Center Junior Fellowship, University of Michigan, 2001-2002
Rackham One-Term Dissertation Fellowship, Fall 2000
Mellon Dissertation Fellowship, 1999-2000
D'Arms Award for Summer Research Travel, Summer 2000
Mellon Fellowship in Humanistic Studies (Woodrow Wilson Foundation), 1995-1996

Other Honors & Awards

Walker Cowen Memorial Prize, University of Virginia Press, 2007
Outstanding Graduate Student Instructor Award, Rackham School of Graduate Studies, 1999
David and Linda Moscow Prize for Excellence in Teaching English Composition, 1999
Phi Beta Kappa, inducted as junior in 1992
National Merit Scholar, 1989-1993

Teaching

Washington & Lee University:
Women's and Gender Studies 120, Introduction to Women's Studies and Feminist Theory
Women's and Gender Studies 396, Women and Marriage in Feminist Thought
Writing 100, First-Year Writing Seminar (various topics)
English 105, Composition and Literature (various topics)
English 232, The Novel
English 251, British Literature 1660s-1790s: Eighteenth-Century Encounters
English 261, Reading Gender
English 299, Seminar for Prospective Majors
   (Topics: Gothic Fiction from Walpole to Brontë; Aphra Behn in Context)
English 333, Studies in Restoration and Early Eighteenth-Century Literature
   (Topics: Restoration Masculinities, Libertine Literature, Encounters Abroad)

English 335, Eighteenth-Century Novels
English 358, Literature by Women before 1800
English 380, Literature Seminar
      (Topics: The Poetry of Pope and Finch, England's "Others")
English 413, Senior Capstone Seminar
      (Topics: Becoming a Metropolis, Literary Passing, Subjects and Objects)
Guest lectures in English 330 (Milton), Religion 215, (Male and Female in Western Religious
    Traditions) Women's Studies 120 (Introduction to Women's Studies and Feminist Theory),
    Law Seminar: Gender and Family Law

Other Teaching:
Washington and Lee Alumni College summer program, 2009: "The World of Jane Austen"
University of Michigan courses (as instructor of record): Introduction to College Writing;
      Writing about Literature; Introduction to Women's Studies; Women and Marriage in
      Feminist Thought; What is Literature?

Major Committee and Administrative Service: Washington & Lee

Faculty Liaison and Fellowships Advisor, UK and Ireland Distinguished Graduate Fellowships,
      Spring 2011-Summer 2012
Sexual Violence Prevention Strategy Working Group, 2012
President's Advisory Committee (tenure and promotions committee) (elected), 2011-2012
University Board of Appeals (elected), 2010-2012
Women's and Gender Studies Advisory Committee, 2002-2012
University Committee on Inclusiveness and Campus Climate, 2009-2012
GLBTQ Advisory Committee, 2010-2012
Violence Intervention and Prevention Committee, 2011-2012
English Department Hiring Committees, 2003-4, 2004-5, 2010-11
Writing Program Review Committee, 2007-2009
Organizer, "What's Up with English?" Research Presentation Series, 2003-2009
Student-Faculty Hearing Board, 2006-2008
Temporary Co-Chair, Women's and Gender Studies Program, Fall 2007
Writing Program Advisory Committee, 2004-2007
University Library Committee, 2003-2006

Professional Service

Manuscript Reviewer for *Tulsa Studies in Women's Literature* (as of 2003), *Signs* (as of 2009),
      and *The Eighteenth Century: Theory and Interpretation* (as of 2010)
Proposal Reviewer for Broadview Press (as of 2005)
Women's Caucus Co-Chair, American Society for Eighteenth-Century Studies (2006-7)

Conferences & Presentations

"Eighteenth-Century London Around the Clock." Literary London Conference, London, UK,
      July 2010.
Discussant, "Feminist Historiographies" panel. Women's Studies at Penn: The 35th Anniversary
      Conference. University of Pennsylvania. Philadelphia, October 2009.
"Coquetry as Polyamory" (invited roundtable contribution). American Society for Eighteenth-
      Century Studies Meeting. Richmond, March 2009.

Panel Organizer and Chair, "Women in Cities." American Society for Eighteenth-Century
　　　　Studies Meeting. Richmond, March 2009.
"Burney After Dark." Burney Society of North America Meeting. Chicago, October 2008.
Panel Organizer, "Nighttime in the Eighteenth Century." American Society for Eighteenth-
　　　　Century Studies Meeting. Atlanta, April 2007.
"Levity and Gravity: Coquettes in Motion." American Society for Eighteenth-Century Studies
　　　　Meeting. Montreal, April 2006.
"A More Substantial Bliss: Coquette and Lapdog in Eighteenth-Century British Satire."
　　　　American Society for Eighteenth-Century Studies Meeting. Las Vegas, March 2005.
"Lady Mary's 'Extraordinary Creatures.'" American Society for Eighteenth-Century Studies
　　　　Meeting. Boston, April 2004.
Invited Roundtable on "The Women's Studies Ph.D. and the Job Market" sponsored by
　　　　University of Michigan Women's Studies Program. Ann Arbor, March 2004.
"'A Composition of Contrarieties': Gender and Nation in the Memoirs of Jenny Cameron."
　　　　Eighteenth-Century Scottish Studies Society Meeting. Charleston, April 2003.
Faculty Panel on "Scholarship on Sexuality," sponsored by Washington & Lee University Gay-
　　　　Straight Alliance. February 2003.
"Teaching about Sexual Violence," roundtable co-coordinator and presenter. National Women's
　　　　Studies Association. Las Vegas, June 2002.
"Singing the Body Deceptive: Ballads of Passing Women." American Society for Eighteenth-
　　　　Century Studies Meeting. New Orleans, April 2001.
"'This Extravagant Turn of Her Lewdness': Accounting for Passing Women's Desires."
　　　　Midwest American Society for Eighteenth-Century Studies Meeting. East Lansing,
　　　　November 2000. (Also organized and moderated this panel on "Between Acts and
　　　　Identities: Eighteenth-Century Sexualities and the Notion of Taste.")
"'Acting the Lover': The Epistemology of Heterosexuality in Narratives of Passing Women."
　　　　Group for Early Modern Cultural Studies Meeting. New Orleans, November 2000.
Invited Participant, Seminar on teaching the "Race and Ethnicity Requirement" at the University
　　　　of Michigan, Summer 2000.
　"The Women's Studies Dissertation," panel co-chair and discussant. National Women's Studies
　　　　Association Meeting. Boston, June 2000.
"Reading the Tribade in Eighteenth-Century Medical Discourse." Group for Early Modern
　　　　Cultural Studies Meeting. Coral Gables, October 1999.

Professional Memberships

POD Network: Professional and Organizational Development in Higher Education
Modern Language Association (MLA)
American Society for Eighteenth-Century Studies (ASECS)

CYNTHIA J. FINELLI
Curriculum Vita
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College of Engineering	Center for Research on Learning and Teaching
208 Gorguze Family Laboratory	1071 Palmer Commons
2609 Draper Drive	100 Washtenaw Avenue
Ann Arbor, MI 48109-2101	Ann Arbor, MI 48109-2218

APPOINTMENTS

Appointments at University of Michigan

- Director, Center for Research on Learning and Teaching in Engineering. Feb. 2011 to present (80% appointment)

  o Director, CRLT North, Sept. 2007 – Jan. 2011

  o Managing Director, CRLT North, Nov. 2003 – Aug. 2007

  o Coordinator of Engineering Education, CRLT, Apr. 2003 – Oct. 2003

- Research Associate Professor, Engineering Education, Sept. 2010 to present. (20% appointment)

  o Associate Research Scientist, Engineering Education, Sep. 2004 – Aug. 2010.

Appointments at Kettering University (formerly GMI Engineering & Management Institute)

- Richard L. Terrell Professor for Excellence in Teaching, Dec. 2002 – July 2003.

- Director of Center for Excellence in Teaching and Learning, Apr. 2000 – July 2003.

- Associate Professor of Electrical Engineering, July 1996 – July 2003.

  o Assistant Professor of Electrical Engineering, Jan. 1993 – June 1996.

  o Instructor of Electrical Engineering, Sep. 1992 – Dec. 1992.

EDUCATION

- Ph.D., Electrical Engineering: Systems. University of Michigan, Ann Arbor, MI. May 1993.
  Doctoral thesis – *A signal modeling method for analysis of cardiac arrhythmia in intraventricular electrograms.*

- M.S.E., Electrical Engineering: Systems. University of Michigan, Ann Arbor, MI. Dec. 1989.
  (Optional) Master's thesis – *Effect of sympathetic tone on ventricular electrogram morphology*.

- B.S.E., Electrical Engineering. University of Michigan, Ann Arbor, MI. Aug. 1988.

SCHOLARSHIP

Past grants and contracts

1. Finelli, C. J., & Sutkus, J. A. "A longitudinal study of the ethical development of engineering and humanities students at the University of Michigan." *University of Michigan Office of the Vice President for Research & Horace H. Rackham School of Graduate Studies–Research on Ethics in Public Life Program*. $5,190, 01/01/08–05/30/08.

2. Finelli, C. J., King, P. M., & Dey, E. L. "Collaborative research: A holistic assessment of the ethical development of engineering undergraduates." *National Science Foundation–Engineering Education Program.* Proposal #0647532. $548,181, 03/01/07–02/28/13.

3. Finelli, C. J. "Evaluating methods to improve teaching in engineering." *Rigorous Research in Engineering Education Minigrant Program*. $3,000, 10/15/05.

4. Carpenter, D. D., Harding, T. S., & Finelli, C. J. "An investigation into the relationships between students' level of moral development and their academic integrity." *Kern Family Foundation.* $24,450, 12/17/03.

5. Harding, T. S., Carpenter, D. D., & Finelli, C. J. "A comparison of factors that influence cheating in engineering undergraduates." *ASEE Educational Research and Methods Minigrant Program.* $2,500, 06/23/03–06/22/04.

6.   Ohland, M. W., Bullard, L. F., Finelli, C. J., Layton, R. A., & Loughry, M. L. "Designing a peer evaluation instrument that is simple, reliable, and valid." *National Science Foundation–Assessment of Student Achievement in Undergraduate Education Program.* Proposal #0243254. $644,590, 06/01/03–05/30/07.

7.   Svinarich, K. A., Doty, S. L., & Finelli, C. J. "Effects of aminooxyacetate on the metabolism of the isolated rat retina as monitored via the electroretinogram." *Kettering University Research Initiation and Improvement Competition.* $5,000, 06/01/98.

8.   Finelli, C. J., Svinarich, K. A., & Doty, S. L. "Time-course analysis of the electroretinogram." *Kettering University Rodes Professorship Award.* $5000, 05/01/98.

9.   Finelli, C. J., Rust, L. M., & Melton, D. E. "An innovative digital signal processing laboratory for physical systems." *National Science Foundation–Instrumentation and Laboratory Improvement.* Proposal #9851088. $64,856, 04/01/98–03/31/01.

10. Finelli, C. J. *Kettering University Teaching Improvement Grant.* $1,000, 06/01/97.

11. Ravi, K., Thompson, M. G., Finelli, C. J., Melton, D. E., & Rust, L. M. "Improved equipment for student digital signal processing laboratories." *Texas Instruments' University Program.* $17,970, 12/01/95.

12. Finelli, C. J. *GMI Engineering & Management Institute Teaching Improvement Grant.* $1,000, 04/01/95.

13. Finelli, C. J. "Application of power spectral analysis to ST segment trends for improved assessment of coronary patency." *GMI Engineering & Management Institute Research Initiation/Improvement Grant.* $4,998, 11/01/93.

14. Finelli, C. J., & Jenkins, J. M. "Adaptive filtering techniques applied to arrhythmia analysis." *The University of Michigan Rackham Research Partnership Fellowship.* $22,000, 1991.

15. Finelli, C. J. "Effect of sympathetic tone and cardiovascular drugs on ventricular electrogram morphology." *Eli Lilly and Company/Cardiac Pacemakers, Inc. Research Fellowship.* $40,000, 1989.

Current grants and contracts

1.   Finelli, C. J., & Prince, M. "Collaborative Research: Understanding and reducing student resistance as a barrier to faculty change." *National Science Foundation–Widening Implementation and Demonstration of Evidence-based Reforms (WIDER)*. Proposal # 1347718. $211,669, 09/01/13–08/31/16.

2.   Perkins, N., Finelli, C. J., & Orr, B. "Piloting i-Newton for the experiential learning of dynamics in University of Michigan physics and engineering." *University of Michigan Transforming Learning for the Third Century (TLTC) Discovery Program.* $35,905, 05/01/13–10/31/14.

3.   Lattuca, L. R., Finelli, C. J., & Lawrence, J. H. "Catalyzing Interdisciplinary collaborations: Studying the impact of M-Cubed on researchers and research." *University of Michigan M-Cubed Program.* $60,000, 12/01/12–06/30/14.

4.   Finelli, C. J., & Borrego, M.A. "Workshops to create a taxonomy for engineering education research and prioritize areas of research." *National Science Foundation—Engineering Education*. Proposal #1240797. $233,178, 09/15/12–12/31/14.

5.   Finelli, C. J. "Collaborative Research: The SEED-PA. A practical instrument for assessing individual ethics initiatives," *National Science Foundation–Transforming Undergraduate Education in STEM (TUES)*. Proposal #1140175. $86,656, 04/15/12–03/31/15.

6.   Finelli, C. J., & Holloway, J. P. "Motivating change in faculty teaching practices to support a diverse student body in engineering," *National Science Foundation–Course, Curriculum, and Laboratory Improvement Program.* Proposal #0941924. $199,999, 09/15/10–08/31/14.

Refereed journal articles

1.   Finelli, C. J., Daly, S. R., & Richardson, K. M. (2013, in press). Bridging the research-to-practice gap: Designing an institutional change plan using local evidence. *Journal of Engineering Education – Special Issue on the Complexities of Transforming Engineering Higher Education.*

2.   Carpenter, D. C., Harding, T. S., Sutkus, J., & Finelli, C. J. (2013, in press). Assessing the ethical development of Civil Engineering undergraduates in support of the ASCE Body of Knowledge. *Journal of Professional Issues in Engineering Education and Practice*. Available online: http://ascelibrary.org/doi/abs/10.1061/(ASCE)EI.1943-5541.0000177

3.   Burt, B. A., Carpenter, D. D., Holsapple, M. A., Finelli, C. J., Bielby, R. M., & Harding, T. S. (2013). Out-of-classroom experiences: Bridging the disconnect between the classroom, the engineering workforce, and ethical development. *International Journal of Engineering Education, 29*(3). 714-725.

4.   Ohland, M. W., Loughry, M. L., Woehr, D. J., Finelli, C. J., Bullard, L. G., Felder, R. M., Layton, R. A., Pomeranz, H. R., & Schmucker, D. G. (2012, December). The Comprehensive Assessment of Team Member Effectiveness: Development of a behaviorally anchored rating scale for self and peer evaluation. *Academy of Management Learning & Education, 11*(4), 609-630. **Winner of the 2013 Maryellen Weimer Scholarly Work on Teaching and Learning Award (sponsored by Magna Publications).**

5.   Finelli, C. J., Holsapple, M. A., Ra, E., Bielby, R. M., Burt, B. A., Carpenter, D. D., Harding, T. S., & Sutkus, J. A. (2012, July). An assessment of engineering students' curricular and co-curricular experiences and their ethical development. *Journal of Engineering Education, 101*(3), 469-494.

6.   Harding, T. S., Carpenter, D. D., & Finelli, C. J. (2012, April). An exploratory investigation of the ethical behavior of engineering undergraduates. *Journal of Engineering Education, 101*(2), 346-374.

7.   Holsapple, M. A., Carpenter, D. D., Sutkus, J. A., Finelli, C. J., & Harding, T. S. (2012, April). Framing faculty and student discrepancies in engineering ethics education delivery. *Journal of Engineering Education, 101*(2), 169-186.

8.   Wright, M. C., Finelli, C. J., & Meizlish, D. (2011). Facilitating the scholarship of teaching and learning at a research university. *Change: The Magazine of Higher Learning, 43*(2), 50-56.

9.   Carpenter, D. D., Harding, T. S., & Finelli, C. J. (2010). Using research to identify academic dishonesty deterrents among engineering undergraduates. *International Journal of Engineering Education, 26*(5), 1156-1165.

10. Finelli, C. J., Wright, M. C., & Pinder-Grover, T. (2010). Consulting the Delphi: A new idea for collecting student feedback through the Two-Survey Method. *Journal of Faculty Development, 24*(2). 25-33.

11. Mesa, V., Jaquette, O., & Finelli, C. J. (2009). Measuring the impact of an individual course on students' success. *Journal of Engineering Education, 98*(4), 349-359.

12. Mayhew, M. J., Hubbard, S. M., Finelli, C. J., Harding, T. S., & Carpenter, D. D. (2009, Summer). Using structural equation modeling to validate the Theory of Planned behavior as a model for predicting student cheating. *Review of Higher Education, 32*(4), 441–468.

13. Finelli, C. J., Ott, M., Gottfried, A. C., Hershock, C., O'Neal, C., & Kaplan, M. (2008, Oct.). Utilizing instructional consultations to enhance the teaching performance of engineering faculty. *Journal of Engineering Education, 97*(4), 397–411.

14. Harding, T. S., Mayhew, M. J., Finelli, C. J., & Carpenter, D. D. (2007, Sept.). The Theory of Planned Behavior as a model of academic dishonesty in humanities and engineering undergraduates. *Ethics and Behavior, 17*(3), 255–279.

15. Davis, C.-S. G., & Finelli, C. J. (2007, Fall). Diversity and retention in engineering. In M. Kaplan & A. T. Miller (Eds.), *The Scholarship of Multicultural Teaching and Learning*. New Directions for Teaching and Learning, *111* (pp. 63–71). San Francisco: Jossey-Bass.

16. Passow, H. J., Mayhew, M. J., Finelli, C. J., Harding, T. S., & Carpenter, D. D. (2006, Sept.). Factors influencing engineering students' decisions to cheat by type of assessment. *Research in Higher Education, 47*(7), 643–684.

17. Carpenter, D. D., Harding, T. S., Finelli, C. J., Montgomery, S. M., & Passow, H. J. (2006, July). Engineering students' perceptions of and attitudes towards cheating. *Journal of Engineering Education, 95*(3), 181–194.

18. Harding, T. S., Carpenter, D. D., Finelli, C. J., & Passow, H. J. (2004, June). Does academic dishonesty relate to unethical behavior in professional practice? An exploratory study. *Science and Engineering Ethics, 10,* 311–324.

19. Finelli, C. J., Klinger, A., & Budny, D. D. (2001, Oct.). Strategies for improving the classroom environment. *Journal of Engineering Education, 90*(4), 491–498.

20. Finelli, C. J., & Wicks, M. A. (2000, May). An instrument for assessing the effectiveness of the circuits curriculum in an electrical engineering program. *IEEE Transactions on Education, 43*(2), 137–142.

21. Finelli, C. J. (1996, Aug.). The time-sequenced adaptive filter for analysis of cardiac arrhythmias in intraventricular electrograms. *IEEE Transactions on Biomedical Engineering, 43*(8), 811–819.

22. Finelli, C. J., DiCarlo, L. A., Jenkins, J. M., Winston, S. A., & Li, P. (1991, Nov. 15). Effects of increased heart rate and sympathetic tone on intraventricular electrogram morphology. *American Journal of Cardiology, 68,* 1321–1328.

23. Throne, R. D., Jenkins, J. M., Winston, S. A. Finelli, C. J., & DiCarlo, L. A. (1989, Oct.). Discrimination of retrograde from anterograde atrial activation using intracardiac electrogram waveform analysis. *Pacing and Clinical Electrophysiology, 12*(10), 1622–1630.

Refereed conference or symposium proceedings

1.   Finelli, C. J., DeMonbrun, M. Borrego, M., Shekhar, P., Henderson, C., Prince, M., & Waters, C. K. (2014). *Work in Progress: A classroom observation instrument for assessing student reaction to active learning*. Abstract submitted to the 44th IEEE/ASEE Frontiers in Education Conference, Madrid, Spain.

2.   Karlin, J., Finelli, C. J., Lord, S. M., Bates, R., Cheville, R. A., & Benson, L. (2014). *Special Session: Agents for STEM change – Articulating the goals of our community*. Abstract submitted to the 44th IEEE/ASEE Frontiers in Education Conference, Madrid, Spain.

3. Carpenter, D. D., Sutkus, J. A., Finelli, C. J., & Harding, T. S. (2014) *Work in Progress: SEED-PA. A practical instrument for assessing individual ethics initiatives*. Abstract submitted to the 44th IEEE/ASEE Frontiers in Education Conference, Madrid, Spain.

4. Anderson, O., & Finelli, C. J. (2014). *A faculty learning community to improve teaching practices in large engineering courses: Lasting impacts*. Draft paper accepted for publication, 2014 ASEE Annual Conference & Exposition, Indianapolis, IN.

5. Borrego, M. A., Waters, C. K., Finelli, C. J., & Prince, M. J. (2014). *Student perceptions of instructional change in engineering courses: A pilot study*. Draft paper accepted for publication, 2014 ASEE Annual Conference & Exposition, Indianapolis, IN.

6. Finelli, C. J., & Borrego, M. A. (2014). *An inclusive process for developing a taxonomy of keywords for engineering education research*. Draft paper accepted for publication, 2014 ASEE Annual Conference & Exposition, Indianapolis, IN.

7. Finelli, C. J., & Millunchick, J. M. (2013). The teaching circle for large engineering courses: A cohort-based model for faculty development. *Proceedings of the 2013 ASEE Annual Conference & Exposition*, Atlanta, GA.

8. Finelli, C. J., Richardson, K. M., & Daly, S. R. (2013, June). Factors that influence faculty motivation to adopt effective teaching practices in engineering. *Proceedings of the 2013 ASEE Annual Conference & Exposition*, Atlanta, GA.

9. Daly, S. R., Finelli, C. J., Al-Khafaji, A. B., & Neubauer, M. J. (2012, June). Student perspectives of faculty classroom practices. *Proceedings of the 2012 ASEE Annual Conference & Exposition*, San Antonio, TX.

10. Holsapple, M .A., Sutkus, J. A., Finelli, C. J., Carpenter, D. D., Burt, B. A., Ra, E., Harding, T. S., & Bielby, R. M. (2011, Nov.). *Exploring the relationship between satisfaction, pedagogical approaches, and student outcomes*. 26th Annual Conference of the Association for the Study of Higher Education Conference, Charlotte, NC.

11. Finelli, C. J., & Daly, S. R. (2011, Oct). Teaching practices of engineering faculty: Self-reported behavior and actual practice. *Proceedings of the 2011 International Research in Engineering Education Symposium*, Madrid, Spain.

12. Carpenter, D. D., Finelli, C. J., Holsapple, M. A., Bielby, R. M., Burt, B. A., Sutkus, J. A., & Harding, T. S. (2011, Oct). Assessing the ethical development of engineering undergraduates in the United States. *Proceedings of the 2011 International Research in Engineering Education Symposium*, Madrid, Spain.

13. Bielby, R. M., Harding, T. S., Carpenter, D. D., Finelli, C. J., Sutkus, J. A., Burt, B. A., Ra, E., & Holsapple, M. A. (2011, June). Impact of different curricular approaches to ethics instruction on ethical reasoning ability. *Proceedings of the 2011 ASEE Annual Conference & Exposition,* Vancouver, Canada.

14. Burt, B., Carpenter, D. D., Finelli, C. J., Harding, T. S., Sutkus, J. A., Holsapple, M. A., Bielby, R. M., & Ra, E. (2011, June). Outcomes of engaging engineering undergraduates in co-curricular experiences. *Proceedings of the 2011 ASEE Annual Conference & Exposition,* Vancouver, Canada.

15. Holsapple, M. A., Sutkus, J., Finelli, C. J., Carpenter, D. D., Burt, B. A., Ra, E., Harding, T. S., & Bielby, R. M. (2011, June). We can't get no satisfaction!: The relationship between students' ethical reasoning and their satisfaction with engineering ethics education. *Proceedings of the 2011 ASEE Annual Conference & Exposition,* Vancouver, Canada.

16. Ohland, M. W., Bullard, L. G., Felder, R. M., Finelli, C. J., Layton, R. A., Loughry, M. L., Pomeranz, H. R., Schmucker, D. G., & Woehr, D. J. (2010, Aug.). Comprehensive Assessment of Team Member Effectiveness: A behaviorally anchored rating scale. *Proceedings of the 2010 Academy of Management Annual Meeting*, Montreal, Canada.

17. Finelli, C. J., Meadows, L. A., Lorch, D., Davis, C.-S., & Meadows, G. (2010, June). Are we really "Crossing the Boundary"? Assessing a novel integrated math/science course. *Proceedings of the ASEE 2010 Annual Conference & Exposition*, Louisville, KY.

18. Holsapple, M. A. Carpenter, D. D., Sutkus, J. A., Finelli, C. J., Walczak, K., & Harding, T. S. & (2010, June). Understanding the differences between faculty and administrator goals and students' experiences with ethics education. *Proceedings of the ASEE 2010 Annual Conference & Exposition*, Louisville, KY.

19. Visco, D., Schaefer, D., Utschig, T. T., Mohsen, J. P., Fortenberry, N. L., Prince, M., & Finelli, C. J. (2010, June). Preparing for participation in SPEED: An ASEE initiative for a nationally recognized development program for engineering educators. *Proceedings of the ASEE 2010 Annual Conference & Exposition*, Louisville, KY. **Winner of the Best Paper Award – ASEE Professional Interest Council V.**

20. Walczak, K., Finelli, C. J., Holsapple, M. A., Sutkus, J. A., Harding, T. S., & Carpenter, D. D. (2010, June). Institutional obstacles to integrating ethics into the curriculum and strategies for overcoming them. *Proceedings of the ASEE 2010 Annual Conference & Exposition*, Louisville, KY.

21. Schaefer, D., Visco, D., Utschig, T. T., Mohsen, J. P., Fortenberry, N. L., Prince, M., & Finelli, C. J. (2010, April). SPEED: An ASEE initiative for a nationally recognized development program for engineering educators. *Proceedings of the 2010 ASEE Southeastern Section Conference*, Charleston, SC.

22. Holsapple, M. A., Finelli, C. J., Carpenter, D. D., Harding, T. S., & Sutkus, J. A. (2009, Oct.). Work-in-progress: A mixed methods approach to developing an instrument measuring engineering students' positive ethical behavioral outcomes. *Proceedings of the 39th IEEE/ASEE Frontiers in Education Conference*, San Antonio, TX.

23. Harding, T. S., Sutkus, J. A., Finelli, C. J., & Carpenter, D. D. (2009, July). Engineering culture and the ethical development of undergraduate students. *Proceedings of the 2009 International Research in Engineering Education Symposium*, Palm Cove, Queensland, Australia.

24. Finelli, C. J., & Kendall-Brown, M. (2009, June). Using an interactive theater sketch to improve students' teamwork skills. *Proceedings of the 2009 ASEE Annual Conference & Exposition*, Austin, TX.

25. Sutkus, J. A., Carpenter, D. D., Finelli, C. J., & Harding, T. S. (2009, June). An examination of student experiences related to engineering ethics: Initial findings. *Proceedings of the 2009 ASEE Annual Conference & Exposition*, Austin, TX.

26. Sutkus, J. A., Carpenter, D. D., Finelli, C. J., & Harding, T. S. (2008, Oct.). Work-in-progress: Building the Survey of Engineering Ethical Development (SEED) instrument. *Proceedings of the 38th IEEE/ASEE Frontiers in Education Conference*, Saratoga, NY.

27. Finelli, C. J., Sutkus, J. A., Carpenter, D. D., & Harding, T. S. (2008, July). A longitudinal study of the ethical development of engineering and non-engineering students at a national research university. *Proceedings of the 2008 International Research in Engineering Education Symposium*, Davos, Switzerland.

28. Carpenter, D. D., Finelli, C. J., & Harding, T. S. (2008, July). Investigating the linkages between unethical professional behaviors and engineering undergraduate cheating. *Proceedings of the 2008 International Research in Engineering Education Symposium*, Davos, Switzerland.

29. Mayhew, M. J., Hubbard, S., Harding, T. S., Finelli, C. J., & Carpenter, D. D. (2008, March). *Using structural equation modeling to validate the Theory of Planned Behavior as a model for predicting student cheating.* Paper at the 2008 Annual Meeting of the American Educational Research Association, New York, NY.

30. Finelli, C. J., Harding, T. S., Carpenter, D. D., & Mayhew, M. J. (2007, June). Academic integrity among engineering undergraduates: Seven years of research. *Proceedings of the 2007 ASEE Annual Conference & Exposition*, Honolulu, HI.

31. Mayhew, M. J., Harding, T. S., Finelli, C. J., & Carpenter, D. D. (2007, Apr.). *Examining the underlying motivations of undergraduates to behave unethically.* Paper at the 2007 Annual Meeting of the American Educational Research Association, Chicago, IL.

32. Meadows, L. A., Nidiffer, J., Ball, S. R., Davis, C.-S. G., Finelli, C. J., & Schultz, W. W. (2006, Oct). Work-in-progress: An initial assessment of the effect of the first year experience on under-represented student retention in engineering. *Proceedings of the 36th IEEE/ASEE Frontiers in Education Conference*, San Diego, CA. (Digital Object Identifier: 10.1109/FIE.2006.322672)

33. 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 & Exposition*, Chicago, IL.

34. 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.

35. 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.

36. Bullard, L. F., Carter, R. L., Felder, R. M., Finelli, C. J., Layton, R.A., Loughry, M. L., Ohland, M. W., & Schmucker, D. G. (2006, June).The Comprehensive Assessment of Team Member Effectiveness: A new peer evaluation instrument. *Proceedings of the 2006 ASEE Annual Conference & Exposition*, Chicago, IL.

37. 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, NE.

38. Carpenter, D. D., Harding, T. S., & Finelli, C. J. (2005, Oct.). Work-in-progress: An investigation into the effect of an institutional honor code policy on academic behavior. *Proceedings of the 35th IEEE/ASEE Frontiers in Education Conference*, Indianapolis, IN. (Digital Object Identifier 10.1109/FIE.2005.1611895)

39. Finelli, C. J., Szwalek, J. L., Harding, T. S., & Carpenter, D. D. (2005, Oct.). A case study of research in engineering education: Designing, testing, and administering the PACES-2 Survey on academic integrity. *Proceedings of the 35th IEEE/ASEE Frontiers in Education Conference*, Indianapolis, IN. (Digital Object Identifier 10.1109/FIE.2005.1612013)

40. Ohland, M. W., Loughry, M. L., Carter, R. L., Bullard, L. F., Felder, R. M., Finelli, C. J., Layton, R. A., & Schmucker, D. G. (2005, Sept.). Developing a peer evaluation instrument that is simple, reliable, and valid. Proceedings of the *4th ASEE/Australasian Association for Engineering Education Global Colloquium on Engineering Education*, Sydney, Australia.

41. Ohland, M. W., Loughry, M. L., Carter, R. L., Bullard, L. F., Felder, R. M., Finelli, C. J., Layton, R. A., & Schmucker, D. G. (2005, June). Developing a peer evaluation instrument that is simple, reliable, and valid. *Proceedings of the 2005 ASEE Annual Conference & Exposition*. Portland, OR.

42. Passow, H. J., Mayhew, M. J., Finelli, C. J., Carpenter, D. D., & Harding, T. S. (2005, Apr.). *Factors influencing engineering students' decisions to cheat by type of assignment.* Paper at the 2005 Annual Meeting of the American Educational Research Association, Montréal, Quèbec, Canada.

43. Passow, H. J., Mayhew, M. J., Finelli, C. J., Carpenter, D. D., & Harding, T. S. (2004, Nov.). *Factors influencing engineering students' decisions to cheat vary by type of assignment.* Paper at the 29th Annual Conference of the Association for the Study of Higher Education, Kansas City, MO.

44. Etter, B. K., Harding, T. S., Finelli, C. J., & Carpenter, D. D. (2004, Oct.). The role of moral philosophy in promoting academic integrity among engineering students. *Proceedings of the 34th IEEE/ASEE Frontiers in Education Conference*, Savannah, GA. (Digit Object Identifier 10.1109/FIE.2004.1408691)

45. Harding, T. S., Carpenter, D. D., Finelli, C. J., & Passow, H. J. (2004, June). The influence of academic dishonesty on ethical decision making in the workplace: A study of engineering students. *Proceedings of the 2004 ASEE Annual Conference & Exposition*, Salt Lake City, UT.

46. Harding, T. S., Carpenter, D. D., Finelli, C. J., & Passow, H. J. (2003, Nov.). An examination of the relationship between academic dishonesty and professional behavior. *Proceedings of the 33rd IEEE/ASEE Frontiers in Education Conference*, Boulder, CO. (Digital Object Identifier 10.1109/FIE.2003.1265933)

47. Finelli, C. J., Harding, T. S., Carpenter, D. D., & Passow, H. J. (2003, June). Students' perceptions of both the certainty and the deterrent effect of potential consequences of cheating. *Proceedings of the 2003 ASEE Annual Conference & Exposition*, Nashville, TN. **Winner of the Best Paper Award – ASEE Educational Research and Methods Division.**

48. Finelli, C. J., & Yokomoto, C. F. (2002, June). Do students who know more solve problems more successfully? *Proceedings of the 2002 ASEE Annual Conference & Exposition.* Montréal, Quèbec, Canada. (Available on CD-ROM)

49. Harding, T. S., & Finelli, C. J. (2002, June). Suggestions for establishing centers for engineering education. *Proceedings of the 2002 ASEE Annual Conference & Exposition.* Montréal, Quèbec, Canada. (Available on CD-ROM)

50. Carpenter, D. D., Harding, T. S., Montgomery, S. M., & Steneck, N. H. (2002, June). P.A.C.E.S.—A study on academic integrity among engineering undergraduates (preliminary conclusions). *Proceedings of the 2002 ASEE Annual Conference & Exposition*, Montréal, Quèbec, Canada.

51. Finelli, C. J. (2001, Oct.). Assessing improvement in students' team skills and using a learning style inventory to increase it. *Proceedings of the 31st IEEE/ASEE Frontiers in Education Conference*, Reno, NV. (Digital Object Identifier 10.1109/FIE.2001.964023)

52. Ohland, M. W., & Finelli, C. J. (2001, June). Peer evaluation in a mandatory cooperative education environment. *Proceedings of the 2001 ASEE Annual Conference & Exposition.* Albuquerque, NM. (Available on CD-ROM)

53. Klinger, A., Finelli, C. J., & Budny, D. D. (2000, Oct.). Improving the classroom environment. *Proceedings of the 30th IEEE/ASEE Frontiers in Education Conference,* Kansas City, MO. (Digital Object Identifier 10.1109/FIE.2000.897528)

54. Wilkinson, K. R., Finelli, C. J., Hynes, E., & Alzahabi, B. (2000, Oct.). University-wide curriculum reform: Two processes to aid in decision making. *Proceedings of the 30th IEEE/ASEE Frontiers in Education Conference,* Kansas City, MO. (Digital Object Identifier 10.1109/FIE.2000.897653)

55. Finelli, C. J. (1999, Nov.). A team-oriented, project-based freshman problem-solving course: Benefits of early exposure. *Proceedings of the 29th IEEE/ASEE Frontiers in Education Conference,* San Juan, Puerto Rico. (Digital Object Identifier 10.1109/FIE.1999.840479)

56. Melton, D. E., Finelli, C. J., & Rust. L. M. (1999, Nov.) A digital signal processing laboratory with style. *Proceedings of the 29th IEEE/ASEE Frontiers in Education Conference,* San Juan, Puerto Rico. (Available on CD-ROM)

57. Finelli, C. J., Doty, S. L., Svinarich, K. A., & Winkler, B. S. (1997, Oct.). A digitized acquisition system for electroretinograms and its use in studying the effects of organic buffers on the isolated rat retina. *Proceedings of the 19th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Chicago, IL, 2212–2214. (Digital Object Identifier 10.1109/IEMBS.1997.758797)

58. Svinarich, K. A., Finelli, C. J., & Doty. S. L. (1997, June) Issues involved in cross-discipline collaboration and off-campus research. *Proceedings of the 1997 ASEE Annual Conference & Exposition,* Milwaukee, WI. (Available on CD-ROM)

59. Finelli, C. J., Sullivan, L. L., & Loving. P. Y. (1994, June). Engineering and science for the twenty-first century woman: A pre-college program. *Proceedings of the 1994 Annual Women in Engineering Conference,* Washington, DC, 157–162.

60.	Finelli, C. J., Jenkins, J. M., & DiCarlo, L. A. (1993, Sep.). Detection and identification of cardiac arrhythmias using an adaptive, linear-predictive filter. *Proceedings of the IEEE 1993 Computers in Cardiology,* London, England, 177–180. (Digital Object Identifier 10.1109/CIC.1993.378475)

61.	Finelli, C. J., Wakefield, G. H., Jenkins, J. M., & DiCarlo, L. A. (1992, March). The time-sequenced adaptive filter for linear prediction of the intraventricular electrogram. *Proceedings of the IEEE 1992 International Conference on Acoustics, Speech, and Signal Processing,* San Francisco, CA, 577–580. (Digital Object Identifier 10.1109/ICASSP.1992.226382)

62.	Finelli, C. J., & Jenkins, J. M. (1991, Nov.). A cyclostationary least mean squares algorithm for discrimination of ventricular tachycardia from sinus rhythm. *Proceedings of the 13th Annual International Conference of the IEEE Engineering in Medicine and Biology Society,* Orlando, FL, 740–741.

63.	Finelli, C. J., Li, P., & Jenkins, J. M. (1991, Sep.). The time-sequenced adaptive algorithm: Application to morphological adaptation and arrhythmia onset detection. *IEEE 1991 Proceedings of the Computers in Cardiology,* Venice, Italy, 205–208. (Digital Object Identifier 10.1109/CIC.1991.169081)

64.	Finelli, C. J., Li, P., Jenkins, J. M., Throne, R. D., & DiCarlo, L. A. (1990, Sep.). Intraventricular electrogram morphology: Effect of increased heart rate with and without accompanying changes in sympathetic tone. *Proceedings of the IEEE 1990 Computers in Cardiology*, Chicago, IL, 115–119. (Digital Object Identifier 10.1109/CIC.1990.144177)

65.	Throne, R. D., Jenkins, J. M., Winston, S. A., Mays (Finelli), C. J., & DiCarlo, L. A. (1989, Sep.). A comparison of correlation waveform analysis with a bin area method for recognition of retrograde activation in atrial electrograms. *Proceedings of the IEEE 1989 Computers in Cardiology*, Jerusalem, Israel, 113–117. (Digital Object Identifier 10.1109/CIC.1989.130496)

Refereed conference summaries or abstracts

1.	Finelli, C. J., Kaplan, M. L., & O'Neal, C. M. (2006, Oct.). *How different types of instructional consultations affect faculty teaching practices.* Paper at the 2006 Annual Professional and Organizational Development Conference, Portland, OR.

2.	Harding, T. S., Carpenter, D. D., Finelli, C. J., & Mayhew, M. J. (2005, June). *Cheating in college and the workplace: An examination of engineering undergraduates' ethical behavior*. Paper at the 2005 ASEE Annual Conference & Exposition, Portland, OR.

3.	Harding, T. S., Carpenter, D. D., Finelli, C. J., & Passow, H. J. (2003, Oct.). *The relationship between academic dishonesty and ethical behavior in engineering practic*e. Paper at the 2003 Ethics and Social Responsibility in Engineering and Technology Conference, New Orleans, LA.

4.	Rust, L. M., Palmer, K. I., & Finelli, C. J. (1999, Nov.). *Energized enigma*. Paper at the 29th IEEE/ASEE Frontiers in Education Conference. San Juan, Puerto Rico.

5.	Finelli, C. J., & Wicks, M. A. (1999, June). *An assessment tool for the circuits sequence of an electrical engineering curriculum*. Paper at the 1999 ASEE Annual Conference & Exposition. Charlotte, NC.

6.	Rust, L. M., Palmer, K. I., & Finelli, C. J. (1998, June). *Electrical escapades*. Paper at the 1998 ASEE Annual Conference & Exposition: Women in Engineering Workshop. Seattle, WA.

7.	Svinarich, K. A., Doty, S. L., Finelli, C. J., Arnold, J. J., & Winkler, B. S. (1997, Oct.). *An evaluation of the role of aspartate aminotransaminase in rat photoreceptors*. Paper at the Annual Society for Neuroscience Conference, New Orleans, LA.

8.	Finelli, C. J., & Thompson. M. G. (1996, April). Integrating biomedical signal processing into the undergraduate curriculum. *Proceedings of the 1996 North Central Section ASEE Annual Conference,* Big Rapids, MI.

9.	Finelli, C. J., & Wicks. M. A. (1996, April). Assessment of student achievement and retention of electrical circuit concepts in a cooperative education program. *Proceedings of the 1996 North Central Section ASEE Annual Conference,* Big Rapids, MI.

10.	Finelli, C. J., DiCarlo, L. A., Jenkins, J. M., & Li, P. (1991, Sep.). *Increased heart rate and sympathetic tone: Impact on correlation waveform, area of difference, and electrogram amplitude analyses*. Poster at the IEEE 1991 Computers in Cardiology Conference. Venice, Italy.

11.	Finelli, C. J., Throne, R. D., Antoniadis, N., Jenkins, J. M., Winston, S. A., & DiCarlo, L. A. (1990, Apr.). *Impact of increased heart rate alone and heart rate plus contractility upon intraventricular ECG morphology*. Paper at the 15th Annual ISCE Conference on Computer Applications in Electrocardiology. Virginia Beach, VA.

12.	Meliones, J., Mays (Finelli), C. J., Dick, M., Jenkins, J. M., Blevins, M., & Armstrong, B. (1989, May). *Computer analysis of the dynamic relationship between RR and QT interval in infants*. Paper at the 1998 Annual Conference of the American Pediatric Society and the Society for Pediatric Research.

13.	Throne, R. D., Jenkins, J. M., Winston, S. A., Mays (Finelli), C. J., & DiCarlo, L. A. (1989, April). *Correlation waveform analysis of intraatrial electrograms: An accurate method for discriminating anterograde from retrograde atrial activation*. Paper at the 1989 Annual North American Society for Pacing and Electrophysiology Conference.

14. DiCarlo, L. A., Jenkins, J. M., Throne, R. D., Mays (Finelli), C. J., & Lin, D. (1989, April). *Classification of arrhythmias using atrial and ventricular endocardial electrograms*. Paper at the Engineering Foundation Conference on Computerized Interpretation of the Electrocardiogram XIV.

Chapters in books

1. Finelli, C. J., Pinder-Grover, T., & Wright, M. C. (2011). Consultations on teaching. Using student feedback for instructional improvement. In C. E. Cook & M. L. Kaplan (Eds.), *Advancing the culture of teaching at a research university: How a teaching center can make a difference*. pp 65-79. Sterling VA: Stylus Publishing.

Government, university, or industrial reports (non-refereed)

1. Finelli, C. J., Bergom, I., & Mesa, V. (2011). *Student teams in the engineering classroom and beyond: Setting up students for success*. Occasional Paper No. 29. Ann Arbor, MI: Center for Research on Learning and Teaching, University of Michigan. Available online: crlt.umich.edu/sites/default/files/resource_files/CRLT_no29.pdf

2. Kendall Brown, M., Hershock, C., Finelli, C. J., & O'Neal, C. (2009). *Teaching for retention in science, engineering, and math disciplines: A guide for faculty*. Occasional Paper No. 25. Ann Arbor, MI: Center for Research on Learning and Teaching, University of Michigan. Available online: crlt.umich.edu/sites/default/files/resource_files/CRLT_no25.pdf

3. Davis, C.-S. G., Finelli, C. J., Gregerman, S., Holloway, J., & Meadows, L. (2007, May). Undergraduate initiatives to improve diversity and retention in engineering. *Proceedings of educating a STEM workforce: New strategies for the University of Michigan and the State of Michigan*, Ann Arbor, MI.

Publications in popular press/magazines

1. Finelli, C. J. (2008, Nov.). JEE Selects: A way to enhance teaching. *ASEE Prism Magazine*. 61.

Invited presentations

1. Austin, A. E., Singer, S. R., Finelli, C. J., et al. (2014). Invited participant for *Linking theory, research, and action to improve undergraduate education*. Presidential session at presidential panel at American Educational Research Association presidential panel, Presidential panel at the 2014 Annual Meeting of the American Educational Research Association, Philadelphia, PA. 04/06/14.

2. Finelli, C. J. (2014). Title TBD. ENE Department Seminar, Virginia Tech. Blacksburg, VA. 03/28/14.

3. Finelli, C. J. (2014*). Educating ethical engineers*. Keynote address at European Regional CDIO Meeting. Gothenburg, Sweden. 01/16/14.

4. Finelli, C. J. (2014). *Evidence-based teaching practices: Bridging the research-to-practice gap*. Keynote address at Chalmers Conference on Learning and Teaching. Gothenburg, Sweden. 01/15/14.

5. Finelli, C. J. (2009). *Educating ethical engineers*. Invited presentation at the Carnegie Mellon University – University Lecture Series. Pittsburgh, PA. 04/01/09.

6. Finelli, C. J. (2007). *Academic integrity among engineering undergraduates*. Invited presentation at University of Texas Faculty Innovation Seminar. Austin, TX. 10/29/07.

7. Finelli, C. J. (2004). *Learning styles and their implications for teaching*. Invited workshop at Lawrence Technological University Professional Development Day. Southfield, MI. 01/08/04.

8. Finelli, C. J. (2000). *Promoting active learning using cooperative learning techniques*. Invited workshop at the 2000 North East Regional ASEE Annual Conference. Lowell, MA. 04/28/00.

9. Jenkins, J. M., Finelli, C. J., DiCarlo, L. A., & Greenhut, S. E. (1990). *Implantable defibrillation and external pace technology*. Invited presentation at the Association for the Advancement of Medical Instrumentation/Michigan Society for Clinical Engineering– Midyear Meeting & Exposition. Dearborn, MI. 11/04/90.

Workshops

1. Richards, L. G., Rowland, J., Lord, S., Froyd, J., Finelli, C. J., Meier, R., Atman, C., Jones, E., & Anderson-Rowland, M. (2014). *Panel: Pursuing the Frontiers*. Submitted to the 44th IEEE/ASEE Frontiers in Education Conference, Madrid, Spain.

2. Finelli, C. J., & Borrego, M. A. (2014). *Mini-Workshop: Using and disseminating a taxonomy for engineering education research*. Submitted for presentation at the 44th IEEE/ASEE Frontiers in Education Conference, Madrid, Spain.

3. Smith, K. A., & Finelli, C. J. (2014). *Special Session: Preparing facilitators for virtual faculty development programs.* Accepted for presentation at the 2014 ASEE Annual Conference & Exposition, Indianapolis, IN. 06/16/14.

4. Finelli, C. J. (2013). *Refining a taxonomy for engineering education research*. Workshop at the 43rd IEEE/ASEE Frontiers in Education Conference, Oklahoma City, OK. 10/23/13.

5. Finelli, C. J. (2013). *Refining a taxonomy for engineering education research*. Workshop at the 2013 International Research in Engineering Education Symposium. Kuala Lumpur, Malaysia, 07/06/13.

6. Finelli, C. J., & Borrego, M. A. (2013). *Refining a taxonomy for engineering education research*. Workshop at the 2013 ASEE Annual Conference & Exposition, Atlanta, GA. 06/23/13.

7. Finelli, C. J., Carpenter, D. D., Harding, T. S., & Sutkus, J. A. (2012). *An exploration of the ethical development of engineering undergraduates.* Workshop at the 2012 ASEE Annual Conference & Exposition, San Antonio, TX. 06/10/12.

8. Finelli, C. J., & Harding, T. S. (2011). Survey of Engineering Ethical Development – Regional Workshop, Ann Arbor, MI. 10/24/11.

9. Carpenter, D. D., Sutkus, J. A., Finelli, C. J., & Harding, T. S. (2011). An exploration of the ethical development of engineering undergraduates. Mini workshop at the 41st IEEE/ASEE Frontiers in Education Conference, Rapid City, SD. 10/21/11.

10. Pawley, A. L., Riley, D., Harding, T. S., Lord, S., & Finelli, C. J. (2009). *From active learning to liberative pedagogies: Alternative teaching philosophies in CSET education*. Special session at the 39th IEEE/ASEE Frontiers in Education Conference, San Antonio, TX. 10/19/09.

11. Litzinger, T. A., Finelli, C. J., Atman, C., Fortenberry, N. L., & Griffith, H. (2009). *Engineering education centers and academic units.* Workshop at the 2009 ASEE Annual Conference & Exposition, Austin, TX. 06/15/09.

12. Harding, T. S., Carpenter, D. D., & Finelli, C. J. (2009). *Ethics education or ethical development?* Invited workshop at the NSF Engineering Education and Centers Awardees' Conference, Reston, VA. 02/02/09.

13. Harding, T. S., Finelli, C. J., & Carpenter, D. D. (2008). *Ethics education or ethical development: What is the best goal for engineering education?* Workshop at the 2008 ASEE Annual Conference & Exposition, Pittsburgh, PA. 06/22/08.

14. Litzinger, T. A., Atman, C., Finelli, C. J., Fortenberry, N. L., & Radcliffe, D. F. (2008). *Engineering education centers and departments as drivers of change.* Workshop at the 2008 ASEE Annual Conference & Exposition, Pittsburgh, PA. 06/22/08.

15. Bullard, L., Finelli, C. J., Layton, R., Loughry, M., & Ohland, M. (2006). *Conducting peer evaluations using the comprehensive assessment of team member effectiveness*. Workshop at the 2006 ASEE Annual Conference & Exposition, Chicago, IL. 06/18/06.

Other publications (Poster presentations and non-refereed proceedings)

2. Finelli, C. J., Carpenter, D. D., & Harding, T. S. (2012, March). *Collaborative research: A holistic assessment of the ethical development of engineering undergraduates*. Poster at the NSF Engineering Education Awardees Conference, Arlington, VA.

3. Finelli, C. J., Carpenter, D. D., & Harding, T. S. (2011, Feb). *The Survey of Engineering Ethical Decision-Making: Developing measures of engineering students' positive ethical behavior*. Poster at the NSF Engineering Education Awardees Conference, Reston, VA.

4. Finelli, C. J., Holsapple, M. A., Sutkus, J. A., Carpenter, D. D., Harding, T. S., & Walczak, K. (2010, Feb.). *The Survey of Engineering Ethical Decision-Making: Developing measures of engineering students' positive ethical behavior*. Poster at the NSF Engineering Education Awardees Conference. Reston, VA.

5. Carpenter, D. D., Finelli, C. J., Harding, T. S., Sutkus, J. A., & Holsapple, M. A. (2009, Feb.). *A holistic assessment of the ethical development of engineering undergraduates.* Poster at the NSF Engineering Education and Centers Grantee Conference, Reston, VA.

6. Harding, T. S., Finelli, C. J., Carpenter, D. D., & Mayhew, M. J. (2007, Nov.). *Factors influencing moral development in professional education*. Roundtable discussion conducted at the 33rd Annual Conference of the Association for Moral Education, New York, NY.

7. Finelli, C. J., Harding, T. S., Carpenter, D. D., & Sutkus, J. A. (2007, Sep.). *Academic integrity among engineering undergraduates: Seven years of research by the E³ Team*. Poster at the NSF Engineering Education and Centers Grantee Conference, Arlington, VA.

8. Ohland, M. W., Loughry, M. L., Sill, B. L., Felder, R. M., Layton, R. A., Finelli, C. J., Schmucker, D. G., Bullard, L. G., & Carter, R. L. (2003, Sept.). *Designing a peer evaluation instrument that is simple, reliable, and valid*. Poster at the NSF Engineering and Computing Education Grantee Meeting, Washington, DC.

9. Finelli, C. J. (1992, Oct.) *The time-sequenced adaptive filter for linear prediction of the intraventricular electrogram*. Poster at the 1992 Third Annual GMI Industry Symposium. Flint, MI.

HONORS AND AWARDS

- American Society of Engineering Education, Fellow Award. April, 2013.

- 2013 Maryellen Weimer Scholarly Work on Teaching and Learning Award (sponsored by Magna Publications) for the paper *The Comprehensive Assessment of Team Member Effectiveness: Development of a behaviorally anchored rating scale for self and peer evaluation*. June 2013.

- University of Michigan Undergraduate Research Opportunity Program – Faculty Recognition Award for Outstanding Mentorship. Honorable Mention. April 2012.

- Educational Research and Methods Division of ASEE – Distinguished Service Award. Oct. 2010.

- ASEE Professional Interest Council V – Best Paper Award. June 2010.

- 2009 Premier Award for Engineering Education Courseware (for CATME instrument). June 2009.

- Educational Research and Methods Division ASEE – Best Paper Award. June 2003.

- Kettering University–Sigma Chi Faculty Appreciation Award. 03/20/01, 08/19/99, 11/04/98, and 11/19/96.

- Kettering University–Robot Society Honorary Member. Dec. 2000.

- Kettering University Outstanding Chapter Advisor of the Year (for service to Theta Phi Alpha sorority). 1998-1999 and 1997-1998.

- GMI Alumni Association Outstanding Teacher of the Year. June 1997.

- Tau Beta Pi (engineering honor society). Inducted 1986.

- Eta Kappa Nu (electrical engineering honor society). Inducted 1985.

LEADERSHIP AND SERVICE

Consultant/Reviewer/Editor responsibilities

- Co-facilitator – National Science Foundation Leadership Virtual Community of Practice project, 2012-2013 (PI R. Pimmel)

- Chair – National Science Foundation Community of Scholars Panel, 2010. (PI R. Seals)

- Member of the International Planning/Advisory Committee for the 2011 International Research in Engineering Education Symposium.

- Guest co-editor for *International Journal of Engineering Education: Special Issue on Applications of Engineering Education Research*. 2009

- Member of the International Planning/Advisory Committee for the 2009 International Research in Engineering Education Symposium.

- Member of Engineering Education Research Colloquy 2. Indianapolis, IN. 10/18/05–10/19/05.

- Invited participant in NSF workshop "Creating Engineering Education Opportunities: Why and How?" Washington, DC, 03/06/09.

- Participant in NSF Rigorous Research in Engineering Education Workshop. Golden, CO. 08/01/05–08/05/05.

- Panel reviewer for National Science Foundation. 2002–present.

- Reviewer for *International Journal of Engineering Education*. 2005.

- Reviewer for *Proceedings of the IEEE.* 2002.

- Reviewer for the *Journal of Engineering Education.* 2002–2004, 2006–2009.

- Reviewer for *IEEE Transactions on Education.* 1998–2001, 2013–present.

- Reviewer for *IEEE Transactions on Biomedical Engineering.* 1996.

- Reviewer for *McGraw Hill Publishing Company*. 1998, 2000, 2004.

- Reviewer for *John Wiley & Sons, Inc*. 1997.

- Reviewer for *Richard D. Irwin Publishing Company*. 1996.

Professional society leadership and membership

- American Society for Engineering Education. 1994 to present.

  o   University of Michigan, Campus Representative. June 2013 – present.

  o   Member, Frontiers in Education Steering Committee. July 2009 to June 2012.

  o   Member, ASEE SPEED (Strengthening the Performance of Engineering and Technology Educators across Disciplines) Advisory Council. Oct. 2009 – 2011.

  o   Chair, Educational Research and Methods Division. July 2007 to June 2009.

  o   Program co-chair for *2006 ASEE Annual Conference & Exposition*. July 2004 to June 2006.

  o   Program co-chair for *33rd IEEE/ASEE Frontiers in Education Conference*. July 2002 to Nov. 2003.

  o   Director. July 2000 to June 2002.

  o   New Engineering Educators Liaison. July 1999 to June 2001.

- American Educational Research Association. 2005 to 2010.

- Professional and Organizational Development in Higher Education Network. 2001 to present.

- Institute of Electrical and Electronic Engineers. 1985 to 2009.

- IEEE Education Society. 1994 to 2009.

University of Michigan, Committees and task forces

- Research Advisory Committee, School of Education. 2/26/14 – 8/30/15.

- Collaborative Domain Group, Oct. 2012 to May 2013.

- Responsible Conduct of Research Task Force. 2010, 2011.

- Faculty Advisory Committee to the Center for Engineering Diversity and Outreach. July 2010 to present.

- Planning Committee for Academic Practices for a Positive Learning Environment. Jan. 2008 to May 2008.

- President's Ethics in Public Life Initiative. Sep. 2006 to July 2007.

- Diversity and Outreach Council, College of Engineering. July 2005 to June 2010.

- Strategic Planning Implementation Committee for Engineering Education. Nov. 2003 to Dec. 2004.

- Engineering Teaching Academy Planning Committee. May 2003 – Nov. 2003.

- Engineering Teaching Academy. Nov. 2003 to present.

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STUDENT ADVISING

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Thesis committees

1. Fowler, R. Michigan State University College of Education. *Talk in teams: Participation in and characteristics of team conversations face-to-face and in synchronous chat*. Doctoral dissertation committee member, graduation expected June 2014.

2. Sutkus, J. A. University of Michigan School of Education. *An assessment of admissions strategy effects and self-selection issues in an enrollment study of Kettering University*. Committee member, PhD awarded June 2008.

3. Veenstra. C. University of Michigan Industrial and Operations Engineering. *Modeling engineering freshman success*. Doctoral dissertation committee member, PhD awarded Dec. 2007.

MATTHEW KAPLAN

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EDUCATION

Ph.D. in Comparative Literature, 1993. University of North Carolina at Chapel Hill.

M.A. in Comparative Literature, 1985, University of North Carolina at Chapel Hill.

B.A. cum laude in Comparative Literature, 1983, State University of New York at Stony Brook.

FACULTY DEVELOPMENT EXPERIENCE

Interim Director, Center for Research on Learning and Teaching, University of Michigan, February 2014-present.

Managing Director, Center for Research on Learning and Teaching, University of Michigan. July 2007-January 2014.

Associate Director, Center for Research on Learning and Teaching, University of Michigan. August 2000-July 2007.

Assistant Director, Center for Research on Learning and Teaching, University of Michigan. August 1999-August 2000.

Instructional Consultant, Center for Research on Learning and Teaching, University of Michigan. November 1994-August 1999.

Instructional Consultant, Center for Teaching and Learning, University of North Carolina. June 1990-June 1993.

PROFESSIONAL EXPERIENCE

Co-Principal Investigator, Teagle and Spencer Foundations Grant for the Systematic Improvement of Undergraduate Education on The Impact of Metacognitive Strategies Within Writing in the Disciplines: Experiments to Improve Writing and Critical Thinking.

Principle Investigator, Ford Foundation Difficult Dialogues Grant on Religious Diversity in a Public, Research University. Involved in coordinating work of 6 UM campus units as well as directing a faculty fellows program, January 2006-June2007.

Member, CIC Teaching Center Directors Group, 2002-present.

Member, Ivy Plus Consortium on Teaching, 2012-present.

Committee for the Advancement of Programs and Services, Professional & Organizational Development Network in Higher Education (POD), 2003-present.

Core Committee, executive board of POD, 1998-2001. Involved in long-range strategic planning and decision making for the largest faculty development organization in North America.

Editor, *To Improve the Academy* (1998 & 1999), a publication of the Professional & Organizational Development Network in Higher Education, Volumes 18 & 19.

Associate Editor, *To Improve the Academy* (1997), a publication of the Professional & Organizational Development Network in Higher Education, Volume 17.

Reviewer, International Journal for the Scholarship of Teaching and Learning, 2008-present

Reviewer, Journal of Faculty Development, 1997-present.

TEACHING EXPERIENCE

German, University of North Carolina at Chapel Hill, 1984-88, 1991. First-year language courses concentrating on grammar (1984-86), second-year courses incorporating a grammar review with an introduction to literature (1986-88, 1991-92).

Great Books, Comparative Literature, University of North Carolina at Chapel Hill, 1989-1991. A course on world literature in translation.

PUBLICATIONS

Kaplan, M., Silver, N., LaVaque-Manty, D., & Meizlish, D. (2013). *Using reflection and metacognition to improve teaching and learning*. Sterling, VA: Stylus Press.

Kaplan, M., Miezlish, D., Silver, N., & LaVaque-Manty, D. (2013). Amplifying the impact of pedagogical research: The role of teaching centers and writing centers. In R. J. Thompson, Jr. (Ed.), *Changing the conversation about higher education*. Lanham, MD: Rowan and Littlefield.

Meizlish, D., LaVaque-Manty, D., Silver, N., & Kaplan, M. (2013). Think like/write like: Metacognitive strategies to foster students' development as disciplinary thinkers and writers. In R. J. Thompson, Jr. (Ed.), *Changing the conversation about higher education*. Lanham, MD: Rowan and Littlefield.

Zhu, E., & Kaplan, M. (2013). Technology and teaching. In W. J. McKeachie & M. D. Svinicki (Eds.), *McKeachie's Teaching Tips (14th ed.)*. Belmont, CA: Wadsworth Cengage Learning.

Cook, C., & Kaplan, M. (Eds.). (2011). *Advancing a culture of teaching on campus: How a teaching center can make a difference*. Sterling, VA: Stylus.

Meizlish, D., & Kaplan, M. (2008). Valuing and evaluating teaching in academic hiring: A multi-disciplinary, cross-institutional study. *Journal of Higher Education, 79*(5), 489-512.

Kaplan, M., Meizlish, D., O'Neal, C., & Wright, M. (2007). A research-based rubric for developing statements of teaching philosophy. *To Improve the Academy* 26(1), 242-262.

Kaplan, M., & Miller, A. T. (Eds.). (2007). *The scholarship of multicultural teaching and learning*. New Directions for Teaching and Learning, No. 111. San Francisco: Jossey-Bass.

O'Neal, C., Meizlish, D., & Kaplan, M. (2007). *Writing a statement of teaching philosophy for the academic job search.* Occasional Paper, No. 23. Ann Arbor, MI: Center for Research on Learning and Teaching, University of Michigan.

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. Nominated for best paper award.

Kaplan, M. (2006). Getting religion in the public research university. *Academe*, 92(4), 41-45.

Kaplan, M., Cook, C., & Steiger, J. (2006). Using theatre to stage instructional and organizational transformation. *Change, 38*(3), 33-39*.

Kaplan, M., & Reed, B. G. (2005). But how can I talk to faculty about that? Approaches to consulting on multicultural issues. In M. Ouellett (Ed.), *Teaching inclusively: Multiculturalism and faculty development*. Stillwater, OK: New Forums Press.

McKeachie, W. J., & Kaplan, M. (2004). Looking at the Bologna Declaration from across the Atlantic. *International Journal for Academic Development* 9(2), 199-204.

Kardia, D., Bierwert, C., Cook, C., Miller, A. T., & Kaplan, M. (2002). Discussing the unfathomable: Classroom-based responses to tragedy. *Change, 34*(1), 18-22.

Cook, C., Kaplan, M., Nidiffer, J., & Wright, M. (2001). Preparing future faculty – faster. *AAHE Bulletin, 54*(3), 3-7.

DeZure, D., Kaplan, M., & Dearman, E. (2001). *Research on student notetaking: Implications for faculty and graduate student instructors*. CRLT Occasional Paper, No. 16. Ann Arbor, MI: Center for Research on Learning and Teaching, University of Michigan.

Kaplan, M. (2001-2002). The multicultural teaching portfolio. *Teaching Excellence, 13*(3).

Black, B., & Kaplan, M. (1998). Evaluating TAs' teaching. In M. Marinkovich, J. Prostko, & F. Stout (Eds.) *The professional development of graduate teaching assistants* (pp. 213-234). Bolton, MA: Anker.

Kaplan, M. (1998). *The teaching portfolio*. CRLT Occasional Paper, No. 11. Ann Arbor, MI: Center for Research on Learning and Teaching, University of Michigan.

McKeachie, W. J., & Kaplan, M. (1996). Persistent problems in evaluating college teaching. *AAHE Bulletin*, 48(6), 5-8.

Kaplan, M. (1993). Combining service and learning at UNC. *For Your Consideration*, *No. 13*. Center for Teaching and Learning, University of North Carolina at Chapel Hill.

Kaplan, M. (1991). *Evaluating student projects*. For Your Consideration, No. 9. Chapel Hill, NC: Center for Teaching and Learning, University of North Carolina at Chapel Hill.

PRESENTATIONS & WORKSHOPS

Kaplan, M., & Meizlish, D. (2010, October). Using metacognition to foster students' disciplinary thinking and writing skills. Presentation at the annual meeting of the Professional and Organizational Development Network in Higher Education, St. Louis, MO.

Meizlish, D., & Kaplan, M. (2010, October). *Preparing New Professors for a Research University's Teaching Mission: the LSA Teaching Academy at the University of Michigan*. Poster presented at the annual meeting of the Professional and Organizational Development (POD) Network in Higher Education, St. Louis, MO.

Kaplan, M., Meizlish, D., & Silver, N. E. (2009, November). *Crafting Meta-Cognitive Interventions and Analyzing Their Impact on Disciplinary Thinking.* Workshop presented at the annual meeting of the International Society for the Scholarship of Teaching and Learning, Bloomington, IN.

Kaplan, M., & McHale, I. (2007, October). *Religion and Spirituality in the Academy: How Do Developers Respond?* Pre-Conference workshop presented at the annual meeting of the Professional and Organizational Development Network in Higher Education, Pittsburgh, PA.

Kaplan, M. (2006, March). *Faculty Development Through Collaboration With Academic Administrators*. Paper presented at the meeting of the Arbeitsgemeinschaft für Hochschuldidaktik, Dortmund, Germany.

Kaplan, M., & Miller, A. T. (2006, April). *The Scholarship of Multicultural Teaching and Learning*. Poster presentation at the Carnegie Colloquium on the Scholarship of Teaching and Learning, Madison, WI.

Kaplan, M., Miller, A. T., Alexander, I., Burgoyne, S., & Johnson, N. (2006, April). *The Scholarship of Multicultural Teaching and Learning*. A paper presented at the Carnegie Colloquium on the Scholarship of Teaching and Learning, Madison, WI.

Miller, A. T., & Kaplan, M. (2006, April). *Evaluating Multicultural Institutional Initiatives: Evidence of Faculty Change.* Paper presented at the Carnegie Colloquium on the Scholarship of Teaching and Learning, Madison, WI.

O'Neal, C., & Kaplan, M. (2006, October). *Consulting About the Teaching Philosophy: A Rubric-Based Approach*. Pre-Conference workshop presented at the annual meeting of the Professional and Organizational Development Network in Higher Education (POD). Portland, OR.

Kaplan, M., Burgoyne, S., & Johnson, N. (2005, July). Toward a Scholarship of Multicultural Teaching and Learning. Workshop presented at the Carnegie Foundation for the Advancement of Teaching and Learning Summer Academy, Snowbird, UT.

Kaplan, M., & Meizlish, D. (2005) *How Important is Teaching? Results of Research on Academic Hiring*. Poster Presentation at the annual meeting of the Professional and Organizational Development Network in Higher Education (POD), Milwaukee, WI.

Johnston, K., Dezure, D., Kaplan, M., & O'Neal, C. (2004, October). *Faculty and TA Development: Making Assumptions About Practice*. Workshop presented at the annual meeting of the Professional & Organizational Development Network in Higher Education, Montreal, CA.

Kaplan, M., Bierwert, C., & Mintz, J. (2004, October). *Culture Clash? Reflections of Faculty Developers with Humanities Backgrounds.* Workshop presented at the annual meeting of the Professional & Organizational Development Network in Higher Education, Montreal, CA.

Kaplan, M., & DeZure, D. (2002, October). *Reflecting on Faculty Development Practices: Focus on SGIDs*. Workshop presented at the annual meeting of the Professional & Organizational Development Network in Higher Education, Atlanta, GA.

DeZure, D., & Kaplan, M. (2002, June). *Using Course Portfolios to Document Interdisciplinary Teaching and Learning*. A presentation at the annual AAHE Assessment Conference, Boston, MA.

Kaplan, M. (2001, October). *Fostering a Scholarship of Interdisciplinary Teaching: A Faculty Development Seminar*. Workshop presented at the annual meeting of the Professional & Organizational Development Network in Higher Education, St. Louis, MO.

Kaplan, M., & Wright, M. (2001, October). *Using a Research Model to Design a PFF Program*. Workshop presented at the annual meeting of the Professional & Organizational Development Network in Higher Education, St. Louis, MO.

Cook, C., Hart, J., Kaplan, M., & Lewis, E. (1998, October). *"You Say Multicultural, I Say…"* Workshop presented at the annual meeting of the Professional & Organizational Development Network in Higher Education, Haines City, FL.

Black, B., Kaplan, M., & Kardia, D. (1997, October). *A Reflective Approach to Workshops*. Workshop presented at the annual meeting of the Professional & Organizational Development Network in Higher Education, Snow Bird, UT.

Kaplan, M. (1995 & 1996, August). *The Seven Principles of Good Practice in Undergraduate Education*. Keynote address for TA orientation program at Wayne State University, Detroit, MI.

Kaplan, M. (1994, February). *Diversity in the Classroom*. A presentation at the Southern Regional Faculty and Instructional Development Consortium annual conference, Nashville, TN.

Kaplan, M., & Palmer, R. (1994, October). *"Such Stuff as Dreams Are Made on…" Examining the Assumptions of Teaching and Learning Support Programs*. Workshop presented at the annual meeting of the Professional & Organizational Development Network in Higher Education, North Falmouth, MA.

AWARDS AND HONORS

Stipend from the German Academic Exchange Service (DAAD) for dissertation research in Bonn, West Germany, 1988-89.

Phi Beta Kappa, 1983.

DAAD Award for Excellence in German Studies, 1982.

DEBORAH S. MEIZLISH

Center for Research on Learning and Teaching
University of Michigan
Ann Arbor, MI 48109-2218

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debmeiz@umich.edu
www.crlt.umich.edu

Education:

Ph.D. in Political Science, University of Michigan, 2001
> Dissertation: *Negotiating Federalism: Governors and the Politics of State-Federal Relations*

M.A. in Political Science, University of Michigan, 1994
> Master's Paper: *"The Individual, the State or the Nation? What Determines the Individual Vote Decision in Gubernatorial Elections?"*

B.A. with Honors in American Public Affairs/Metropolitan Studies, James Madison College, Michigan State University, 1991

Faculty Development Experience:

Senior Assistant Director, Center for Research on Learning and Teaching (CRLT), University of Michigan, 2014-Present

Assistant Director, CRLT, 2008-2014

Coordinator of Social Science Initiatives, CRLT, 2005-2008

Instructional Consultant, CRLT, 2001-2005

Teaching Experience

Rackham-CRLT Seminar on Preparing Future Faculty, University of Michigan, 2004-2006.

Introduction to American Politics*,* Department of Political Science, Wayne State University, 2000 – 2001; Department of Political Science, University of Michigan (various terms, 1992-1998); Social Science Department, Washtenaw Community College, 1996.

American Politics and Equality, James Madison College, Michigan State University, Fall 1999.

Bentley Seminar in American Politics, Department of Political Science, University of Michigan, Summer 1999.

Service and Professional Memberships
- Professional and Organizational Development (POD) Network in Higher Education
- International Society for the Scholarship of Teaching and Learning
- U-M Center for Ethics in Public Life, Executive Committee (2008-2011)
- U-M Ethics in Public Life Workgroup (2005-2008)
- U-M Constitution Day Planning Committee (2005)
- U-M Academic Services Board (2003-2004)
- Reviewer, POD Network Conference

- Reviewer, Journal of Faculty Development
- Reviewer, Journal of Higher Education

Workshops and Theatre Facilitation
- Academic Integrity in the Classroom
- Assessing Student Learning
- Classroom Assessment Techniques
- Effective Student Presentations
- Evaluating Student Writing
- Facilitating Practice Teaching
- First Days: Graduate Students Teaching Undergraduates
- First Days: Graduate Students Teaching Graduates
- Graduate Student Mentoring (Theatre)
- The Engaged Classroom
- Grading in Quantitative Courses and the Sciences
- Observing Classes and Conducting Midterm Student Feedback
- Peer Evaluation of Teaching
- Research on Effective College Teaching
- Working with Graduate Student Instructors

Publications:

Bernstein, J. L., & Meizlish, D. S. (2003). Becoming Congress: A longitudinal study of the civic engagement implications of a classroom simulation. *Simulation & Gaming*, *34*(2), 198-219

Bernstein, J., & Meizlish, D. (2003). Why Teaching, Like Mountain Climbing, Should Not Be Done Alone. *Political Science Education*, *8*, 5.

Cook, C. E., Meizlish, D. S., & Wright, M. C. (2011). The role of a teaching center in curricular reform and assessment. In C. E. Cook & M. L. Kaplan (Eds.), *Advancing the culture of teaching on campus: How a teaching center can make a difference*. Sterling, VA: Stylus.

Cook, C. E., & Meizlish, D. S. (2011). Forging relationships with faculty and academic administrators. In C. E. Cook & M. L. Kaplan (Eds.), *Advancing the culture of teaching on campus: How a teaching center can make a difference*. Sterling, VA: Stylus.

Kaplan, M., Meizlish, D., O'Neal, C., & Wright, M. (2007). A research-based rubric for developing statements of teaching philosophy. *To Improve the Academy*.

Kaplan, M., Silver, N., Lavaque-Manty, D., & Meizlish, D. (Eds.). (2013). *Using reflection and metacognition to improve student learning*. Sterling, VA: Stylus.

Meizlish, D. 2004. Promoting Academic Integrity in the Classroom. *CRLT Occasional Papers, 20 (available http://www.crlt.umich.edu/publinks/CRLT_no20.pdf)*.

Meizlish, D., & Kaplan, M. (2008). Valuing and evaluating teaching in academic hiring: A multidisciplinary, cross-institutional study. *The Journal of Higher Education, 79*(5), 489-512.

Meizlish, D., LaVaque-Manty, D., Silver, N., & Kaplan, M. (2013). Think like/Write like: Metacognitive strategies to foster students' development as disciplinary thinkers and writers. In R. J. Thompson (Ed.), *Changing the conversation about higher education*. Lanham, MD: Rowman and Littlefield Education.

Meizlish, D. & Lovell, R. (1997). Cost Neutrality and Welfare Reform. *Journal of Health and Human Services Administration. 20* (1), pp. 42-6.

Meizlish, D., Pinder-Grover, T., & Wright, M. C. (2012). Effective use of peer teaching consultants: Recruiting, training supervision and evaluation. In K. T. Brinko (Ed.), *Practically speaking: A sourcebook for instructional consultants in higher education* (Second Edition). Stillwater, OK: New Forums Press.

Meizlish, D., & Wright, M. C. (2009). Preparing advocates for faculty development: Expanding the meaning of "Growing our Own". *To Improve the Academy, 27*, 385-400.

O'Neal, C., Meizlish, D., & Kaplan, M. (2007). Writing a statement of teaching philosophy for the academic job search. CRLT Occasional Papers, 23 (available http://www.crlt.umich.edu/publinks/CRLT_no23.pdf).

Pinder-Grover, T., Wright, M. C., & Meizlish, D. S. (2011). Graduate peer consultants: Expanding the center's reach. In C. E. Cook & M. L. Kaplan (Eds.), *Advancing the culture of teaching on campus: How a teaching center can make a difference*. Sterling, VA: Stylus.

External Presentations:

"Guiding and assessing faculty teaching statements for reflective practice" (with Cheelan Bo-Linn). Workshop presented at the annual meeting of the Professional and Organizational Development Network in Higher Education, Pittsburgh, PA. November, 2013.

Meizlish, D. S. (2012). *Metacognition in the disciplines: Interventions in upper level writing.* Paper presented at the Annual Meeting of the International Society for the Scholarship of Teaching and Learning, Hamilton, Ontario.

Meizlish, D., & Kaplan, M. (2010). *Preparing New Professors for a Research University's Teaching Mission: The LSA Teaching Academy at the University of Michigan.* Poster presented at the Annual Meeting of the Professional and Organizational Development Network in Higher Education, Atlanta, GA.

Kaplan, M., Meizlish, D. S., & Silver, N. (2009). *Crafting Meta-Cognitive Interventions and Analyzing Their Impact on Disciplinary Thinking.* Workshop presented at the Annual Meeting of the International Society for the Scholarship of Teaching and Learning, Bloomington, IN.

"The Role of Teaching in the Academic Hiring Process" (with Matthew Kaplan). Poster presented at the Annual Meeting of the Professional and Organizational Development Network, Milwaukee, WI, November 2005

"Unpacking the 'Education' in Civic Education" (with Jeffrey Bernstein). Presented at the Annual Meeting of the International Civic Education Association, New Orleans, LA, November 2003.

"Academic Integrity in the Classroom" (with Patricia Yocum and Renoir Gaither). Workshop presented at the University of Michigan-Dearborn, Dearborn, Michigan. January, 2003.

"Promoting Academic Integrity." Workshop presented at the Annual Meeting of the Professional and Organizational Development Network, Atlanta, GA, October 2002.

"Becoming Congress: A Longitudinal Study of the Civic Engagement Implications of a Classroom Simulation" (with Jeffrey Bernstein). Presented at the Annual Meeting of the Midwest Political Science Association, Chicago, IL, April 2002.

"Governors as Intergovernmental Entrepreneurs," paper presented at the American Political Science Association Annual Meeting. Atlanta, Georgia. September 1999.

Participant, "Roundtable on Evaluating Faculty Performance in Teaching," at the American Political Science Association Annual Meeting. Atlanta, Georgia. September 1999.

"An Examination of Gubernatorial Activism," paper presented at the Association for Public Policy Analysis and Management meeting. New York, New York. October 1998.

"The Welfare Waiver Game," paper presented at the Midwest Political Science Association meeting. Chicago, Illinois. April 1997.

"History of Welfare Receipt as a Determinant of the Success of Michigan's Welfare Reforms," paper presented at the Midwest Political Science Association meeting. Chicago, Illinois. April 1996.

Rachel K. Niemer, Ph.D.

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Ann Arbor, MI 48103   rkniemer@umich.edu

EDUCATION

Ph.D. California Institute of Technology (Pasadena, CA)   February 2007
    Chemistry
    Advisor: Dr. William A. Goddard III

B.A. Bowdoin College (Brunswick, ME), *magna cum laude*   May 1999
    Chemistry (with honors) and Women's Studies
    Advisor: Dr. Jonathan M. Smith

PROFESSIONAL EXPERIENCE

Teaching and Learning

Assistant Director   January 2011-Present
University of Michigan (Ann Arbor, MI), Center for Research on Learning and Teaching
- Provide individual consultations to faculty and graduate student instructors regarding evidence-based best practices for teaching and student learning
- Create and deliver professional development workshops about teaching and learning for individual units on campus and university-wide programs (Comprehensive list of workshops available upon request)
- Actively participate on the center's instructional technology team
- Co-created and direct the Health Sciences Teaching Academy for recently hired faculty in seven health science schools/colleges
- Co-facilitate the Large Course Initiative for the College of Literature, Science and Arts
- Co-created and direct the Learning Analytics Fellows Program
- Coordinate social media efforts for the center
- Direct and co-teach the Postdoctoral Short Course on College Teaching in Science and Engineering
- Co-created "Flipped Classroom Faculty Learning Community" to help prepare an interdisciplinary group of faculty to flip their classes
- Coordinated university-wide graduate student instructor teaching orientations that served 500+ graduate students/year

Assistant Director, Study Group Program   July 2008-December 2010
University of Rochester (Rochester, NY), Learning Assistance Services
- Oversaw Study Group program
- Taught the credit-bearing pedagogy training course for Study Group Leaders
- Taught the credit-bearing pedagogy training course for Workshop leaders in a variety of STEM disciplines
- Served as an organizer for and presenter at the Graduate TA Training Seminar
- Collected and organized data for quantitative assessment of the Workshop program
- Conducted qualitative assessment of the Workshop Peer Leader Training program
- Provided consultation and workshops on study skills in STEM disciplines for Summer Undergraduate Research Fellows and Early College Opportunity students
- Reviewed mini-grant proposals for the Center for Workshop Education grant
- Assisted with the development of special training events for Workshop faculty and Workshop leaders

Visiting Instructor   September 2005-May 2006
Gustavus Adolphus College (St. Peter, MN), Department of Chemistry

Research Positions

Postdoctoral Fellow   January 2007-July 2008
University of Rochester (Rochester, NY), Department of Pharmacology and Physiology
Advisor: Dr. Alan Smrcka

Student Affairs

Resident Associate   August 2002-July 2004
California Institute of Technology (Pasadena, CA), Residential Life Department

Programming Coordinator   August 2001-July 2002
California Institute of Technology (Pasadena, CA), Residential Life Department

Residential Life Intern   August 1998-May 1999
Bowdoin College (Brunswick, ME), Residential Life Department

Head Residential Associate   August 1997-May 1998
Bowdoin College (Brunswick, ME), Residential Life Department

Residential Associate   January 1997-May 1997
Bowdoin College (Brunswick, ME), Residential Life Department

TEACHING EXPERIENCE
University of Rochester
Issues in Group Leadership - Computer Science
Issues in Group Leadership - Math
Issues in Group Leadership - Electrical Engineering
Issues in Group Leadership - Biology
Issues in Group Leadership - Study Group Program
Methods of Inquiry

Gustavus Adolphus College
Kinetics and Thermodynamics
Kinetics and Thermodynamics Laboratory
Quantum Chemistry and Dynamics
Chemistry in Context
Chemistry in Context Laboratory
Organic Chemistry Laboratory I
Fairy Tales and Modern Interpretations (Women's Studies Department)

California Institute of Technology
Head Teaching Assistant, *Nature of the Chemical Bond*   Fall 2002
Teaching Assistant, *Nature of the Chemical Bond*   Fall 2000 and 2001
Teaching Assistant, *Atomic Level Simulations of Molecules and Materials*   Spring 2000
Laboratory Teaching Assistant, *Fundamental Techniques of Exp. Chemistry*   Winter 2000
Grader, *Fundamental Techniques of Experimental Chemistry*   Fall 1999

HONORS AND AWARDS

POD Innovation Award Finalist, *University of Michigan*	Fall 2013
Outstanding Graduate Teaching Assistant Service Award, *Cal. Inst. Of Technology*	Fall 2000
Honors Degree in Chemistry, *Bowdoin College*	May 1999
Graduated *magna cum laude*, *Bowdoin College*	May 1999
Hypercube Award, *Bowdoin College*	May 1999

PAPERS AND PRESENTATIONS

Remington, T., Hershock, C., Bleske, B., Klein, K., & Niemer, R. (2014). *Lessons from the trenches: Implementing team-based learning across several courses*. Manuscript submitted to Currents in Pharmacy Teaching and Learning for publication, College of Pharmacy, University of Michigan, Ann Arbor, MI

Munz, S., Niemer, R.K., Inglehart, M., *Development and Implementation of a New Course Regarding Patients with Special Health Care Needs*. Special Care Dentistry Association: 2014 Annual Meeting, Chicago, IL., United States, April 11-13, 2014 (oral presentation)

Hershock, C., Niemer, R. K., *"Flipping" Communities of Practice: Impact More Faculty Faster*. Freedom to Connect -- Freedom to Risk -- Freedom to Learn: POD 2013 Conference, Pittsburgh, PA., United States, November 6-10, 2013 (poster presentation)

Bruff, D., *et al.*, *From the Conference to the Campus: Educational Development through the Lens of Crowdsourcing*. Pencils & Pixels: POD 2012 Conference, Seattle, WA., United States, October 24-28, 2012 (oral presentation)

Hershock, C., Niemer, R. K. *Preparing New Health Science Faculty to Excel in Teaching: The University of Michigan's Health Science Teaching Academy*. Pencils & Pixels: POD 2012 Conference, Seattle, WA., United States, October 24-28, 2012 (poster presentation)

Wright, M. C., Niemer, R. K., Bruff, D., and Valle, K. (2012). Tweeting #PODHBCU: Content and process of the 2011 POD HBCUFDN conference twitter backchannel. In J. E. Groccia & L. Cruz (Eds.), *To Improve the Academy, 31* (311-328). San Francisco: Jossey-Bass and the POD Network (peer-reviewed publication)

Perez, C.,Niemer, R. K., & Frye, R. *The Peer-Led Workshop Program at the University of Rochester: A Case Study in Nursing Education*. Innovations in Teaching: The Impact of Technology & Global Perspectives on Education for Health Care Professionals, Nazareth College, Rochester, NY, United States, June 14 & 15, 2010 (oral presentation)

Niemer, R. K. *Computational Studies of the Structure and Function of Two Lipid-Activated GPCRs*. Joint Meeting of the Great Lakes G Protein-Coupled Receptor Retreat and le Club des Récepteurs à Sept Domaines Transmembranaires, London, Ontario, Canada, September 27-29, 2007 (poster presentation)

Niemer, R. K., 2007 *Computational Studies of the Structure and Function of Two Lipid-Activated G Protein-Coupled Receptors* [Dissertation], Pasadena, CA, California Institute of Technology

Vaidehi, N., Floriano, W. B., Trabanino, R. J. Hall, Spencer E. Freddolino, P. L., Kalani, Y., Shen, H., Heo, J., Sharma, S., Niemer, R., & Goddard, W. A. *First principles structure and function prediction for G protein-coupled receptors.* Abstracts of Papers, 227th ACS National Meeting, Anaheim, CA, United States, March 28-April 1, 2004

Niemer, R. K., Blanco, M., Seinfeld, J. H., & Goddard, W. A. *First principle predictions of VLE phase diagrams (activity coefficients from quantum mechanics).* Annual Meeting Archive - American Institute of Chemical Engineers, Indianapolis, IN, United States, Nov. 3-8, 2002 (oral presentation)

SELECTED SCREENCASTS
https://www.youtube.com/watch?v=9GhoStbI6So
https://www.youtube.com/watch?v=-oSwU5MfZFk
http://www.youtube.com/watch?v=u9WBsBar3AQ&feature=results_video

SKILLS
General Technology: Filemaker Pro, SPSS, Microsoft Office, HTML, *c-shell* scripting, Mac OS X, Linux, Windows, iOS, Drupal, Google Apps, Camtasia, Twitter (@rkniemer, @UMich_CRLT), Prezi

Instructional Technology: Blackboard, Sakai, Google Apps for Education, Personal Response Systems, Screencasting

COMMUNITY INVOLVEMENT

POD Network, Electronic Communications and Resource Committee	December 2012-Present
Parent Partnership Committee at The Children's School, Rochester, NY	April 2010-December 2011
American Red Cross First Aid Provider, Pasadena, CA	January 2004-April 2005
V-Day: Caltech, California Institute of Technology	November 2003-April 2005
Graduate Review Board, California Institute of Technology	June 2003-May 2005
Alcohol Policy Committee, California Institute of Technology	July 2002-September 2004
Women's Center Advisory Committee, California Institute of Technology	August 2002-September 2005
Committee reporting to Trustees on graduate student life, California Institute of Technology	Spring 2002
Women's Studies Curriculum Committee, Bowdoin College	September 1997-May 1999
Kamerling Society (Chemistry Club) President, Bowdoin College	May 1998-April 1999

Tershia Pinder-Grover, Ph.D.

University of Michigan
Center for Research on Learning and Teaching (CRLT)
Center for Research on Learning and Teaching in Engineering (CRLT-Engin)
tpinder@umich.edu
734-615-9263

1071 Palmer Commons   201 Gorguze Family Laboratory
100 Washtenaw Ave   2609 Draper
Ann Arbor, MI 48109   Ann Arbor, MI 48109

Education

April 2006   **University of Michigan**   Ann Arbor, MI
Ph.D. Degree, Mechanical Engineering
Dissertation: Experimental Investigation of the Effects of Fuel Concentration and Velocity Fluctuations on Nonpremixed Flames
Advisor: Arvind Atreya

August 2002   **University of Michigan**   Ann Arbor, MI
M.S. Degree, Mechanical Engineering
Thesis: Experimental and Computational Investigation of Dynamic Control Strategies for an Ethylene Jet Diffusion Flame
GPA 7.688/9.0

May 1999   **University of Maryland**   College Park, MD
B.S. Degree, Fire Protection Engineering
GPA 3.8/4.0, Cum Laude

Work Experience

2008-Present   **University of Michigan, Center for Research on Learning and Teaching (CRLT) and CRLT in Engineering (CRLT-Engin)**   Ann Arbor, MI
Assistant Director: Consults with faculty and graduate student instructors on best teaching practices and ways to assess the effectiveness of pedagogical developments on student learning. Conducts research on engineering education including the effect of instructional technology on student learning and performance, effective teaching strategies for new graduate student instructors, and the impact of GSI mentoring programs on the mentors and mentees. Edits the following volume: A guidebook for University of Michigan Graduate Student Instructors: Strategies and resources for new and experienced GSIs for CRLT. Co-directs the month-long Preparing Future Faculty program for advanced doctoral students.
Previously managed the Rackham-CRLT Mentorship program which brings together U-M graduate students with faculty from liberal arts and comprehensive colleges in Michigan and Ohio.

2006-2008   **University of Michigan, Center for Research on Learning and Teaching (CRLT)** Ann Arbor, MI
Coordinator of Engineering GSI Initiatives: Consults with faculty on techniques to enhance student learning through classroom interventions and educational research projects. Coordinates the College of Engineering Graduate Student Instructor Mentor (EGSM) program, the Engineering Graduate Student Instructor Training for new teaching assistants and the CRLT-Engin workshops for graduate students instructors each semester.

Summer 2006   **University of Michigan, Department of Mechanical Engineering**   Ann Arbor, MI
Mechanical Engineering Post-doctoral Researcher: Applying optical detection technology from dissertation research toward energy related issues and presented research poster at 31st International Symposium on Combustion.

2005-2006	**University of Michigan, Center for Research on Learning and Teaching**	Ann Arbor, MI

<u>Instructional Consultant</u>: Consulted with faculty through classroom observations and midterm student feedback to strategize techniques to enhance student learning. Coordinated the College of Engineering Graduate Student Mentor (GSM) program and the Engineering Graduate Student Instructor Training for 80 new teaching assistants. Developed a two-year curriculum for the GSM program to effectively train mentors to consult with graduate student instructors.

1999-2006	**University of Michigan, Department of Mechanical Engineering**	Ann Arbor, MI

<u>Mechanical Engineering Graduate Student Research Assistant</u>: Developed unique combustion apparatus capable of generating velocity and fuel concentration fluctuations in a nonpremixed buoyant jet flame. Developed fast-response sensor technology to monitor combustion species with applications for combustion control in industrial settings.

1998-1999	**National Institute of Standards and Technology**	Gaithersburg, MD

<u>Engineering Trainee</u>: Performed research investigating the thermal conductivity of fire fighter protective clothing and analyzed thermal properties to assess burn injury potential for senior research project.

Winter 1998	**NASA Goddard Space Flight Center**	Silver Spring, MD

<u>Quality Education for Minorities Fellow (QEM)</u>: Performed fire protection engineering analysis consisting of surveys, design layouts, cost analysis, and maintenance prioritization of fire protection system based on hazard severity and probability of occurrence.

Summer 1997	**Baltimore Gas and Electric Company**	Calvert Cliffs, MD

<u>Intern</u>: Analyzed procedures for the technical specification fire doors and modified data for the Fire Fighter Strategies Manual and mediated discussion with separate divisions about the revisions.

<u>Teaching Experience</u>

University of Michigan

2007-Present	<u>Co-Director:</u> Preparing Future Faculty Seminar

Designed and taught a 10-day seminar for advanced graduate students interested in an academic career with two collaborators. Seminar topics focus on learning about higher education (e.g. Carnegie classification of institutions, college students, academic freedom, etc.), reflecting on best practices for teaching and learning, and developing materials for the academic job market (e.g. teaching philosophy statements and course syllabus). (http://www.crlt.umich.edu/gsis/teaching_seminar.php)

Fall 2003-2004	<u>Graduate Student Mentor</u>: Mechanical Engineering Department

Developed workshops on "Facilitating Office Hours" and "Preparing for a Section," and facilitated practice teaching sessions for Engineering Graduate Student Instructor Training for the Center for Research on Learning and Teaching. Conducted 22 midterm student feedback sessions, 13 classroom observations and numerous individual consultations on effective teaching methods for engineering graduate student instructors.

Winter 2003	<u>Graduate Student Instructor</u>: ME 454 CAD/CAM/CAE Systems

Conducted office hours for 20 students, evaluated homework, quizzes and exams, developed homework problems, and maintained student grades.

Fall 2002	<u>Graduate Student Instructor</u>: ME 230 Thermal Fluid Sciences I

Taught weekly recitation section for 100+ students in thermodynamics and heat transfer, held biweekly office hours, and graded exams. Received a 4.2/5.0 for being an "excellent teacher" in the course evaluations.

Winter 2001	<u>Teaching Assistant</u>: Detroit Area Pre-College Engineering Program (DAPCEP) Mechanical Engineering Division, "Making of the Automobile"

Conducted weekly projects for 15-20 historically underrepresented 8th graders to motivate and encourage them to pursue careers in engineering, science, and mathematics.

University of Maryland

Fall 1998   <u>Laboratory Assistant</u>: ENFP 320 Fire Assessment Methods and Laboratory
Demonstrated laboratory procedures in fire protection engineering test methods for 20 students, assisted students with experiments and graded laboratory reports.

Fall 1997   <u>Section Leader</u>: HONR 100 Honors Colloquium
Developed a syllabus, organized community service and cultural activities, and facilitated discussions for 15 freshmen in the Honors Department with another section leader.

Publications

Pinder-Grover, T. Discovering the Possibilities: Initiatives to Explore the Higher Education Landscape. Manuscript in preparation for *Studies in Graduate & Professional Student Development.*

Pinder-Grover, T., Green K., Mirecki Millunchick, J. (2013, January) Screen Savers: Short video tutorials and minilectures can boost student performance. *ASEE Prism Magazine. 22* (5), 43.

Green K., **Pinder-Grover, T.** & Mirecki Millunchick, J. (2012). Impact of screencast technology: Connecting the perception of usefulness and the reality of performance. *Journal of Engineering Education. 101*(4), 717–737.

Kalish, A., Robinson, S., Border,L. L. B, Chandler, E. O., Connolly, M., Eaton, L. J., Gilmore, J., Griffith, L., Hanson, S., **Pinder-Grover, T.**, & von Hoene, L. (2012). Steps toward a framework for an intended curriculum for graduate and professional students: How we talk about what we do. In A. Kalish & S. Robinson, (Eds.), *Studies in Graduate and Professional Student Development, 14. 163-173.*

Meizlish, D.M., **Pinder-Grover, T.A.**, & Wright, M.C. (2012). Effective Use of Graduate Peer Teaching Consultants: Recruitment, Training, Supervision, and Evaluation. In K. Brinko (Eds), *Practically Speaking*. New Forums Press: Stillwater, OK. pp. 307-313.

Pinder-Grover, T., Milkova, S., Hershock, C. (2012). Training TAs as Consultants at the University of Michigan: Workshop Series for Peer Mentors. In K. Brinko (Eds), *Practically Speaking*. New Forums Press: Stillwater, OK. pp 225-245.

Finelli, C., **Pinder-Grover, T**. & Wright, M. (2011). Consultations on teaching: Using student feedback for instructional improvement. In C. Cook (Eds.) *Advancing the Culture of Teaching on Campus: How a Teaching Center Can Make a Difference*. Stylus Publishing: Sterling, VA.

Pinder-Grover, T. Meizlish, D.M., & Wright, M. (2011). Graduate peer teaching consultants: Expanding the center's reach. In C. Cook (Eds.) *Advancing the Culture of Teaching on Campus: How a Teaching Center Can Make a Difference*. Stylus Publishing: Sterling, VA.

Pinder-Grover, T., Green K. & Mirecki Millunchick, J. (2011). The efficacy of screencasts to address the diverse academic needs of students in a large lecture course. *Advances in Engineering Education. 2* (3). Retrieved from http://advances.asee.org/vol02/issue03/09.cfm

Finelli, C.,J. Wright, M.C., **Pinder-Grover, T.** (2010, May). Consulting the delphi: A new idea for collecting student feedback through the Two Survey Method (TSM). *Journal of Faculty Development. 24*(2), 25-33.

Pinder-Grover, T., & Groscurth, C. R. (2009). Principles for teaching the millennial generation: Innovative practices of U-M faculty. Occasional Paper No. 26. Ann Arbor, MI: Center for Research on Learning and Teaching.

Pinder, T. (2007) Teaching practice: Emphasis on active learning. In C. Ross and J. Dunphy (Eds). Strategies for Teaching Assistant and International Teaching Assistant Development. (pp.76-79). San Francisco, CA; Jossey-Bass.

Lawson, J. R. and **Pinder, T.** (2000) Estimates of thermal conductivity for materials used in fire fighter's protective clothing, NISTIR 6512.

<u>Refereed Conference Proceedings</u>

Pinder-Grover, T. (2013, June). Active learning in engineering: Perspectives from graduate student instructors. Proceedings of the 2013 American Society for Engineering Education Annual Conference and Exposition. Atlanta, Ga.

Pinder-Grover, T. & Groscurth, C. (2010, June). Perceptions of Millennial Student Learning: The Future Faculty Perspective. Proceedings of the 2010 American Society for Engineering Education Annual Conference and Exposition. Louisville, KY.

Pinder-Grover, T., Mirecki Millunchick, J., and Bierwert, C. Shuller, L. (2009, June). The Efficacy of Screencasts on Diverse Students in a Large Lecture Course. Proceedings of the 2009 American Society for Engineering Education Annual Conference and Exposition. Austin, TX.

Pinder-Grover, T., Mirecki Millunchick, J., and Bierwert, C. Shuller, L. (2009, June). Leveraging Screencasts to Stratigically Clarify Unclear Material Science Concepts. Proceedings of the 2009 American Society for Engineering Education Annual Conference and Exposition. Austin, TX.

Pinder-Grover, T., Root, S., and Cagin, E. (2008, June). Preparing Graduate Students to be Successful as Teaching Mentors and as Future Professionals. *Proceedings of the 2008 American Society for Engineering Education Annual Conference and Exposition.* Pittsburgh, PA.

Pinder-Grover, T., Mirecki-Millunchick, J., & Bierwert, C. (2008, October). Work in progress: Using screencasts to enhance student learning in a large lecture materials science and engineering course. Proceedings of the 38th IEEE/ASEE Frontiers in Education Conference, Saratoga Springs, NY.

<u>Presentations</u>

Pinder-Grover, T. & Greenberg, A. (2014, March). Leveraging choice to motivate ongoing professional development for new engineering graduate student instructors. Poster presented at the CRLT in Engineering Eighth Annual Research and Scholarship in Engineering Poster Session. Ann Arbor, MI.

Pinder-Grover, T. (2013, March). Active learning in engineering: Perspectives from graduate student instructors. Poster presented at the CRLT in Engineering Seventh Annual Research and Scholarship in Engineering Poster Session. Ann Arbor, MI.

Kalish, A., Gilmore , J., Border, L., Rando , B., Hansen, S., Griffith, L., Robinson , S., **Pinder-Grover, T.,** von Hoene, L., Chandler, E., Connolly, M.   (2012, October). Graduate & professional student developers design a competency-based approach. Workshop for the annual meeting of the Organization of Professional Organizers and Developers, Seattle, WA.

Green, K., **Pinder-Grover, T.,** and Mirecki Millunchick, J. (2012, February) Impact of screencast technology: Connecting perceptions and performance. Poster presented at the CRLT in Engineering Sixth Annual Research and Scholarship in Engineering Poster Session. Ann Arbor, MI.

Pinder-Grover, T., Green, K., and Mirecki Millunchick, J. (2011, February) The efficacy of screencasts to address the diverse academic needs of students in a large lecture course. Poster presented at the CRLT in Engineering Fifth Annual Research and Scholarship in Engineering Poster Session. Ann Arbor, MI.

Mirecki Millunchick, J., **Pinder-Grover, T**. and Bierwert, C.. (2008, October) Using screencasts to enhance student learning in a large lecture material science and engineering course. Poster presented at the CRLT North Third Annual Research and Scholarship in Engineering Poster Session. Ann Arbor, MI.

Yalisove, S., **Pinder-Grover, T.,** Bierwert, C. and Tebo, K. (2008, October) Teaching where students learn: A fresh approach to deploying GSIs. Poster presented at the CRLT North Third Annual Research and Scholarship in Engineering Poster Session. Ann Arbor, MI.

Kieffer, J., Aldridge, M., Bickel,J., Feldman, A., Katz, M., Warren, M., Zhen, C. , and **Pinder-Grover**, T. (2008, October) Enhancing materials science & engineering curricula through computation. Poster presented at the CRLT North Third Annual Research and Scholarship in Engineering Poster Session. Ann Arbor, MI.

Pinder-Grover, T., Root, S., and Cagin, E. (2008, June). Preparing graduate students to be successful as teaching mentors and as future professionals. Paper presented at 2008 ASEE Conference and Exposition. Pittsburgh, PA.

Pinder-Grover, T. (2007, October). Fostering a teaching community through graduate student peer mentoring. Presented at 2007 Professional and Organizational Development (POD) Network Conference. Pittsburgh, PA..

Pinder, T., Sirsi, S., Brogan, C., and Atreya, A., (2006, August). An experimental investigation of the effect of velocity fluctuations on nonpremixed buoyant jet flames. Work-In-Progress Poster Presented at the Thirty-first International Symposium on Combustion, Heidelberg, Germany.

Pinder, T., Sirsi, S., Brogan, C., and Atreya, A., (2006, May). The effect of fuel concentration fluctuations on non-premixed flames. Presented at the Spring Technical Meeting of the Central States Section of the Combustion Institute.

Lee, H., **Pinder, T**., and Atreya, A., (2005, July). Radiative homogenous combustion for improved efficiency and reduced emissions. Poster presented at the American Council for an Energy-Efficient Economy Summer Study on Energy Efficiency in Industry, West Point, NY.

Pinder, T. and Atreya, A., (2005, March). Optical measurements of radiative emission to monitor the effect of fuel concentration fluctuations on nonpremixed flames. Poster presented at the Fourth Joint Meeting of the U.S. Section of the Combustion Institute, Philadelphia, PA.

Pinder, T. and Atreya, A., (2004, July). An experimental investigation of the effect of fuel concentration fluctuations on nonpremixed jet flames. Work-In-Progress Poster, Presented at the Thirtieth International Symposium on Combustion, Chicago, IL.

Pinder, T. and Atreya, A., (2004, March). An experimental investigation of the effect of fuel concentration and velocity fluctuations on non-premixed jet flames, Presented at the 2004 Spring Technical Meeting of the Central States Section of the Combustion Institute, Austin, TX. Received Outstanding Student Presentation Award.

Pinder, T. and Atreya, A., (2003, August). Experimental and computational investigation of fuel concentration fluctuations for nonpremixed flames. Presented at the Second KAIST-UM Workshop, Ann Arbor, MI.

Pinder, T. and Atreya, A., (2003, March). Experimental and computational investigation of dynamic control strategies for nonpremixed flames, Poster presented at the Third Joint Meeting of the U.S. Section of the Combustion Institute, Chicago, IL.

Leadership Experience

2001-2002	<u>President of Society of Minority Engineering Students--Graduate Component</u>: Coordinated calendar of events including IMPACT recruitment weekend for 50 potential historically underrepresented graduate students in engineering and the physical sciences.
2001	<u>Chairperson of Mechanical Engineering Graduate Student Symposium</u>: Managed the organization and logistics for a one-day graduate student research conference.
2000-Present	<u>Co-Founder and Choreographer</u>: Brown Chapel African Methodist Episcopal Church's Liturgical Dance Ministry, Responsible for age appropriate dance choreography for three dance groups (children, teenagers and adults) and for administrative duties.
2000-2001	<u>Secretary of Society of Minority Engineering Students--Graduate Component</u>: Created website and the solicitation packet to request funds from corporate sponsors.

Academic Recognitions and Fellowships

2013   <u>Maryellen Weimer Scholarly Work on Teaching and Learning Award Finalist:</u> Created to recognize outstanding scholarly work on teaching and learning. For details see: http://www.teachingprofessor.com/conferences/conference/teaching-and-learning-award

2005   <u>Outstanding Student Presentation Award</u> (Central States Section of the Combustion Institute): Recognized for the outstanding student presentation at the Spring Technical Meeting of the Central States Section of the Combustion Institute, Austin, TX, March 2004.

2004   <u>Spirit of Brotherhood Award</u> (Brotherhood Banquet Committee at Brown Chapel A.M.E. Church**):** Honored for community service that improves the relationship of people in the community with a spirit of love, peace and unity.

2003   <u>National Collegiate Engineering Award</u> (United States Achievement Academy): Honored nationally based on academic performance, teacher's recommendation, leadership, responsibility, and cooperative spirit.

         <u>Engineering Academic Scholar</u> (Academic Careers in Engineering and Science): Developed a research plan, an introduction to a grant application, and identified sources for research funding upon completion of this Preparing Future Faculty program.

         <u>Michigan Teaching Fellow</u> (Rackham-CRLT): Created teaching philosophy, a teaching portfolio, and a syllabus for a proposed course upon completion of this Preparing Future Faculty program.

         <u>SREB-AGEP Doctoral Scholars Program</u>: Attended the Institute for Mentoring and Teaching sponsored by the Compact for Faculty Diversity for two years, served as the session chair for the workshop, "Teaching for Diversity and Social Justice" in 2004.

         <u>University of Michigan ScholarPower Ph.D. Student Achievement Award</u>: Award sponsored by the Minority Engineering Program Office (MEPO), the MEPO Advisory Council, and the U-M College of Engineering for students of color who have obtained candidacy.

         <u>University of Michigan College of Engineering Distinguished Leadership Award</u>: Recognized for demonstrating outstanding leadership through significant contributions to the College of Engineering and/or community.

2002   <u>University of Michigan Outstanding Leadership Award</u>: Awarded for outstanding academic achievement, making meaningful contribution to students, University and surrounding communities through responsible stewardship.

2001   <u>Lucile B. Conger Alumnae Award</u>: Awarded one of three scholarships for female students at the University of Michigan based on community involvement and financial need.

         <u>Martin Luther King Jr. Spirit Award</u>: Honored for student leadership and service that exemplified the spirit of Dr. Martin Luther King, Jr.

2000-2001   <u>Committee on Institutional Cooperation-General Electric (CIC-GE) Fellowship</u>: Awarded one of five competitive predoctoral Fellowships in the Sciences and Engineering to an underrepresented minority.

1999-2004   <u>University of Michigan Rackham Merit Fellowship</u>: Awarded a five-year fellowship at the University of Michigan-Ann Arbor for historically underrepresented racial and ethnic groups in graduate education.

Professional Memberships

American Society of Engineering Education (ASEE)

Professional and Organizational Development (POD) Network in Higher Education

Laura N. Schram

1033 Palmer Commons
Center for Research on Learning and Teaching
University of Michigan
100 Washtenaw Ave.
Ann Arbor, MI 48109-2218
lnschram@umich.edu
.
http://www-personal.umich.edu/~lnschram/Site/Home.html

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Education

University of Michigan, Ann Arbor, MI
Doctor of Philosophy (Ph.D.) in Political Science, May 2010
Dissertation: *Conditional Extremism – When do Exclusionary National Identities Spur Hostility to Immigrants and Radical Right Support?*
Major Fields: Comparative Politics, Political Psychology
Minor Field: Methodology
U-M Graduate Teacher Certificate, 2010

Middlebury College, Middlebury, VT
Bachelor of Arts (B.A.) in International Studies, Summa Cum Laude, May 1999

Current Position

Assistant Director, Center for Research on Learning and Teaching (CRLT), University of Michigan, July 2012-present.
Coordinate several graduate student development programs, including the Graduate Teaching Consultant (GTC) group, the Rackham-CRLT May Seminar on Preparing Future Faculty, and the "What's It Like" panel series on academic careers. Co-teach the ELI 994 GSI pedagogy course for graduate students from non-English-medium undergraduate universities who assume graduate instructor duties in LSA departments. Coordinate the Internationalizing the Curriculum grant competition. Consult with faculty on course design and teaching, and support them in achieving student learning goals. Facilitate several workshops related to teaching and learning, including developing pedagogical workshops for individual units. Conduct midterm student feedback sessions for faculty. Research interests include the scholarship of teaching and learning, graduate student professional development, learner-centered teaching, and mentorship.

Publications

Schram, L., & Wright, M.C. (2012). Teaching mentorship programs for graduate student development. *Studies in Graduate and Professional Student Development, 14*.

Schram, L.N. & Allendoerfer, M.G. (2012). Graduate Student Development Through the Scholarship of Teaching and Learning. *Journal of Scholarship of Teaching and Learning 12* (1), 8-22.

Heinze, J., Schram, L., & Wright, M.C. (2012). Recognizing and enhancing future faculty teaching: An inventory of grants and teaching awards. *Studies in Graduate and Professional Student Development, 15.*

Wright, M.C. & Schram, L.N. (2011). Mentoring Graduate Students. *The POD Network Teaching Excellence Essay Series.*

Educational Development Experience

Instructional Consultant, Center for Research on Learning and Teaching (CRLT), University of Michigan, February 2011-July 2012.

Post-Doctoral Research Associate, CRLT, August 2010-February 2011.

Graduate Teaching Consultant (GTC), CRLT, Fall term 2007-Winter term 2010.

Practice Teaching Facilitator, CRLT/English Language Institute (ELI) 994 International GSI Training Course, Winter term 2008, and Winter term 2009.

Experienced Graduate Student Consultant, CRLT/English Language Institute (ELI) 994 International GSI Training Course, Summer term 2007, Summer term 2008.

Graduate Student Mentor Political Science (PS993): GSI Training, Fall term 2005-Winter term 2007.

University Teaching Experience

Lead Instructor
　　PS140: Introduction to Comparative Politics, Summer 2009, Spring 2008 & Spring 2007.

Graduate Student Instructor (GSI)
　　PS341 (Upper Level Writing Requirement - ULWR): Politics of Advanced Industrial Democracies, Fall 2006.

　　PS140: Introduction to Comparative Politics, Fall 2005-Winter 2005 and Winter 2006.

　　PS356 (ULWR): Japanese Politics, Fall 2004.

Selected Conference Presentations

Professional and Organizational Development (POD) Network Conference, October 2011 interactive presentation (co-presenter): "International Educational Development Engagement: Perspectives from US-China Collaborations."

Professional and Organizational Development (POD) Network Conference, October 2011 interactive presentation (co-presenter): "Developmental Stages of New Instructional Consultants: Implications for Professional Training."

Professional and Organizational Development (POD) Network Conference, November 2010 roundtable: "Graduate Student Perspectives on a Faculty Development Career."

Professional and Organizational Development (POD) Network Conference, October 2009 poster presentation: "Graduate Student Involvement in the Scholarship of Teaching and Learning."

Professional and Organizational Development (POD) Network Conference, October 2009 panel (co-presenter): "Structured Professional Development for Graduate and Professional Students: A Taxonomy."

Scholarship of Teaching and Learning Academy, May 2009: "Experiential Learning through Film."

Professional and Organizational Development (POD) Network Conference, October 2008 (co-presenter): "Engaging Graduate Students in the Scholarship of Teaching and Learning."

Awards and Fellowships

Nominee for Rackham Outstanding GSI Award, University of Michigan (2010)

Rackham One Term Dissertation Fellowship, University of Michigan (Spring/Summer 2010)

Harvey Fellow, Mustard Seed Foundation (2008-2010)

Kingdon Outstanding Graduate Student Instructor Award, Political Science Dept. (2006)

Honor's distinction on Comparative Politics Preliminary Exam (2005)

Roy Pierce Scholar's Fund Award, Center for Political Studies (2005)

Foreign Language and Area Studies Fellowship, US Department of Education (2003-2004)

Phi Beta Kappa Prize, Middlebury College (1999)

Professional Activities

Member of POD Network.
POD Network Graduate and Professional Student Development Committee Outreach Subcommittee (2010-2012).

Amber R. Smith, Ph.D.

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Education

Ph.D., Plant Breeding Plant Genetics, University of Wisconsin-Madison   **December 2010**

Dissertation Title:

> The Participation of *SECRETORY CARRIER MEMBRANE PROTEINS* in Floral Organ Abscission in *Arabidopsis thaliana*

Honors:

- University of Wisconsin-Madison Capstone Teaching Award, 2011
- Future Faculty Partner of the University of Wisconsin-Madison Teaching Academy, Inducted May 2010
- Howard Hughes Medical Institute Teaching Fellow 2006-2010

B.S., Biology, magna cum laude, **Carroll College; Helena, MT**   **May 2004**

Undergraduate Thesis Title:

Expression and Localization of *dab 5-1*, a delayed abscission mutant in *Arabidopsis thaliana*

Work Experience

Instructional Consultant, Center for Research on Learning and Teaching, University of Michigan

- August 2013-Present
- Provide consultation to faculty and graduate students on teaching and learning issues through seminars & workshops, mid-semester feedback reports, departmental programing, and individual consultations
- Planned and executed campus-wide graduate student instructor teaching orientation

Instructional Specialist, Science Curriculum Internationalization Program, University of Wisconsin-Madison

- February 2013-August 2013
- Working one-on-one with faculty to develop science curriculum with global learning goals, outcomes, and assessments
- Conducted focus groups and analyzed data on student perspectives of science internationalization
- Developed two new courses; "Seed to Seed: Plant Breeding to Feed the World", "Learning Expeditions: Internationalizing the STEM Curriculum"

Curriculum consultant, Science Curriculum Internationalization Program, University of Wisconsin-Madison

- June 2012-January 2013
- Provided consultation on curriculum development and best practices in STEM education
- Developed curriculum with international content and global learning goals

HHMI Bioscholar Post-doctoral Fellow, Institute for Biology Education, University of Wisconsin-Madison

- February 2011-January 2013
- Developed two programs associated with the first-year transition to college of biology students
- Engaged in biology education research literature and designed pilot study about effectiveness of program

Higher Education Teaching Experiences

Course director and lecturer, "Exploring Biology", University of Wisconsin-Madison, Fall 2011

- Responsible for coordinating components of a large enrollment course (150 students) including weekly guest speakers, six discussion sections, and the 14 person teaching team
- Developed curriculum for discussion sections and delivered four lectures throughout the semester

Lecturer, "Survey of Horticulture", University of Wisconsin-Madison, Fall 2008
- Responsible for teaching lecture and lab
- Mentored a graduate student teaching assistant
- Developed and evaluated new course materials and activities

Teaching Assistant, "Survey of Horticulture", University of Wisconsin-Madison, Fall 2005, 2006, 2007, 2009
- Responsible for teaching 3 lab sections per semester and for providing support for the lecturer
- Developed new materials for lab activities, wrote and graded weekly quizzes, collaborated with lecturer to write exam questions

Guest instructor, honors biology, University of Wisconsin-Madison, Spring 2006, Fall 2009
- Taught and assessed two novel units (genetics and molecular biology) that I designed in the lab portion of the course.

Professional Development Programs, Workshops, and Projects

Internationalizing the Science Curriculum-University of Wisconsin, Madison, 2012
- Consulted with working group on national recommendations for science curriculum and strategies for approaching internationalization of science curriculum from the perspective of a scientist and educator

National Academies Summer Institutes on Undergraduate Education in Biology, **2011**
- University of Wisconsin-Madison: Invited as an evaluator to make observations and take process notes used to assess the institute as a whole and to provide recommendations for how to improve the institute.
- Yale University: Invited as a facilitator of a small group of science instructors to help the group to create a short teaching unit

Technology Enhanced Learning-Feedback Manager Project, University of Wisconsin-Madison, 2008-2010
- Worked collaboratively with a design team to develop a new open-source tool (Feedback Manager) that allows instructors to more efficiently grade and provide feedback to open-ended responses submitted on-line (http://biology.wisc.edu/1129.htm)
- Contributed the Feedback Manager tool to the Moodle community (https://moodle.org)
- Presented ideas about pedagogy to faculty and staff and helped instructors to refine their learning goals and assessment plans
- Coordinated development team efforts to ensure that development goals were met in a timely fashion
- Communicated with faculty, staff, students, and technical developers across many disciplines
- Proficient in Moodle (course management system) and provided technical support to faculty and staff instructors

Planting Science Summer Retreats
Texas A&M University, June 2009, Presenter; University of Wisconsin-Madison, July 2010, Presenter and Host
- Collaborated with Dr. Paul Williams to develop and implement workshop materials for high school teachers interested in learning more about the science involved in the Planting Science Fast Plant units. During the workshops we focused on biological concepts, experimental design, and pedagogy.

W.H. Freeman Publishing Scientific Teaching Workshops
St. Louis, MON 2008; Montreal, Quebec-2008; Harvard University, Cambridge, MA-2009
- Presented ideas about scientific teaching and modeled pedagogy that supports these ideas for college instructors (St. Louis and Montreal).

Smith-2

- Invited to work with a group of textbook authors from Harvard University whose goal was to write a theme based introductory biology textbook. My knowledge and experience of aligning learning goals, assessment, and activities was of interest to the group.

Tuskegee University Teachers Biotechnology and Genomics Workshops, Tuskegee, AL 2006-2008
- Developed and presented workshop materials to support high school teachers learning new technologies and concepts. The workshop promoted bringing cutting edge science and technology to rural and impoverished communities in Alabama.

Curriculum Design Experiences

Developed the curriculum for a first-year course, "Seed to Seed: Plant Breeding to Feed the World", University of Wisconsin-Madison
- Developed novel lecture and lab materials about the principles of plant breeding and genetics in the context of feeding the world
- Encouraged cross· cultural discussions with a purposeful enrollment strategy of equal numbers of international and domestic students

Developed the curriculum for a professional development course, "Learning Expeditions: Internationalizing the STEM Curriculum", University of Wisconsin-Madison
- Developed a series of discussion prompts, readings, and mini· field trips to showcase the theory and practice of internationalizing a STEM course

Developed the curriculum for a first-year course, "Exploring Biology", University of Wisconsin-Madison, 2011
- Developed lecture and discussion materials structured around the "big ideas in biology" (AAAS Vision and Change, 2011)
- Developed a professional development unit to help students identify possible career paths, practice creating resumes and cover letters, and create a plan to help them accomplish their goals

Developed a summer experience for first-year biology students, "MadBiology Boot Camp", University of Wisconsin-Madison, 2011
- Collaborated with team members to develop and implement a developmentally appropriate summer program targeted for first generation, low income, and/or underrepresented first-year students
- Developed and analyzed assessments to determine the effectiveness of program components

Planting Science Curriculum Writer 2009-2010
- Provided major contributions of content, instructional material design, and pedagogy to two units: "Foundations of Genetics: Traits, Variation, and Environment in Rapid Cycling *Brassica rapa*" and "Genetics and Evolution: Phenotypic Variation in Rapid Cycling *Brassica rapa.*" (www.plantingscience.org)

Developed genetics curriculum for honors biology, University of Wisconsin-Madison, 2009-2013
- Collaborated with Dr. Paul Williams to develop a new model of teaching introductory genetics by contributing knowledge about curriculum design and effective pedagogies
- Designed, wrote, and implemented the instructional materials (Fall 2009)
- Gathered preliminary assessment data about the usefulness of the new materials and contributed to the revision of the materials based on the evaluation data

Developed molecular biology curriculum for honors biology, University of Wisconsin-Madison, 2005-2006
- Developed new instructional materials and activities to improve students' understanding of molecular biology techniques, to meet a need previously identified by the program. Successfully implemented, assessed, revised, and published the materials

Participant in the Wisconsin Program for Scientific Teaching, University of Wisconsin-Madison, 2005-2006
- Learned multiple teaching pedagogies and learning theories
- Designed, implemented, assessed, and revised novel curriculum for a UW-Madison honors biology course

Mentoring and Outreach Experiences

Middle School Science Fair Mentor, Spring 2013
- Met with two middle school students over the course of a semester to provide support while they developed and carried out an experiment

Course director of Exploring Biology, University of Wisconsin-Madison, Fall 2011
- Incorporated graduate student and post-doc Teaching Fellows and undergraduate Peer Mentors into the class structure
- Created opportunities for professional development through short presentations during the weekly teaching meeting and various activities related to the course

Science Expeditions Presenter, 2010-2011
- Developed activities about the diversity of *Brassicaceae* throughout the world, its central role in many cultures, and the biology of *Brassica* pollination by bees

Planting Science Mentor, 2007-2010 (*Master Planting Science Mentor 2008-2010*)
- Planting Science (http://www.plantingscience.org/) is a program designed to virtually connect middle and high school students with plant scientist mentors. Students design and carry out research at school and the scientists guide and mentor the students through online discussions.
- Mentored 3-4 student teams per semester

Summer Research Program Mentor, University of Wisconsin-Madison, 2005, 2005, 2007, 2010
- Provided mentorship for 1-2 students during their 9 week research experience
- Guided students to develop testable research questions
- Provided support for data analysis, written and oral presentations

After-School Science Club Instructor, Spring 2008
- Planned and developed highly interactive activities for a diversity of elementary aged students

West High School Outreach Program, Spring 2005, 2006, 2007
- Provided plant research opportunities for approximately 25 high school students per semester
- Developed new research activities to increase student learning of plant biology in addition to lab skills

Publications

Batzli, J. M., **Smith, A. R.,** Williams, P. H., McGee, S. A., Dosa, K. Beyond Punnett squares: Student word association and explanations of phenotypic variation through an integrative quantitative genetics unit investigating anthocyanin inheritance and expression in Brassica rapa Fast Plants. *Accepted with revision CBE-Life Sci Edu.*

Smith, A. R., Tong, L., Jeanne, R. Using technology to assist in giving feedback on students' writing in large lecture courses. *Submitted to CBEN Life Sci Edu.*

Cramer, S., Jeanne, R., Lafayette, M., Litzkow, M., **Smith, A.R.,** Tong, L. 2010. Sustaining appropriate technology enhanced learning in STEM disciplines. *Proceedings of the 2010 American Soc. Engineering Education Conference and Exposition.* AC 2010-1922.

Robertson, A.L. and Phillips, A.R. 2008. Integrating PCR theory and bioinformatics into a research-oriented primer design exercise. CBE-Life Sci Edu 7: 89-95.

Phillips, A.R., **Robertson, A.L.,** Batzli, J., Harris, M., Miller, S. 2008. Aligning goals, assessments, and activities: an approach to teaching PCR and gel electrophoresis. CBE-Life Sci Edu 7: 96-106.

Selected Presentations and Posters

Tong, L., **Smith, A. R.,** Jeanne, R. L. Lecture-centered instructor goals for online writing/feedback drive tool development process. *Poster*. POD Network Conference. October 2012. Seattle, WA.

Smith, A.R. and Evenstone, A. "Writing Effective Case Studies in the Sciences: Backward Design and Global Learning Outcomes." *Presenter*. CALS International Programs Case Study Workshop. March 2012. Madison, WI.

Branchaw, J., **Smith, A.,** Lipske, W. "Welcoming Students to UW – Madison: Life Sciences Community and Preparing Them for Success". *Presenter*. Center for the First Year Experience 2011 First Year Conference. November 2011. Madison, WI.

Smith, A. R., Balser, T. Setting first-year students on a course for success with a low-stakes, high-impact large seminar course. *Poster*. CIRTL Forum. October 2011. Madison, WI.

Jeanne, R. L., Tong, L., **Smith, A. R.** "Students' write to learn: How STEM instructors are engaging their students through on-line quizzing, writing, and feedback." *Presenter.* University of Wisconsin Teaching and Learning Symposium. May 2010. Madison, WI.

Tong, L., Jeanne, R. L., **Smith, A. R.** "Feedback to student thinking: open-source technology to reduce instructor pain." *Poster.* The University of Wisconsin System 2010 President's Summit on Excellence in Teaching and Learning. May 2010. Madison, WI.

Robertson, A., Simon, P., Batzli, J. "How do we know what they know?: Moving from passive to active classroom learning" . *Presenter*. Horticulture Department Retreat. January 2008

Robertson, A. "Secretory Carrier Membrane Proteins (SCAMPs) in *Arabidopsis thaliana*." *Presenter.* American Society of Plant Biologists annual conference. June 2007. Chicago, IL.

Robertson, A., Phillips, A.R. "Integrating PCR theory and bioinformatics into an inquiry based primer design exercise." *Poster*. American Society of Plant Biologists annual conference. June 2007. Chicago, IL.

Robertson, A. "Genomics and Microarray Technology for the Classroom Laboratory." *Presenter.* National Association of Biology Teachers annual conference. October 2006. Albuquerque, NM.

Mary C. Wright
Center for Research on Learning and Teaching
1071 Palmer Commons, University of Michigan
Ann Arbor, MI 48109
mcwright@umich.edu; 734-936-1135

Education
University of Michigan, 1995-2002
    Ph.D. in Sociology, 2002 (Chair: Mark Chesler)
    M.A. in Higher Education, 2000

Princeton University, 1989-1993
    B.A., *summa cum laude* (Major: Sociology)

Employment
<u>Current Position</u>: Director of Assessment and Associate Research Scientist
    Center for Research on Learning and Teaching (CRLT), University of Michigan.

Responsibilities include:
- CRLT leadership team (e.g., budgeting)
- Action-oriented assessment and program evaluation for CRLT and U-M's schools, colleges and departments, focused on curricular enhancement. (For more details of projects, see: <<www.crlt.umich.edu/assessment/assess-services >>.)
- Development of programs and retreats for curriculum planning and development.
- Administration and development of the Investigating Student Learning (ISL) Grant, which provides research and financial support to faculty who engage in the scholarship of teaching and learning or curricular assessment.
- Coordination of learning analytics initiatives
- Mentorship and supervision of CRLT graduate students and postdoctoral scholar staff on research- and teaching-based projects
- Research on department cultures, professional development for chairs and graduate students, evaluation/assessment approaches, retention in the sciences, and student learning
- Workshops and retreats on teaching skills, professional development, and course/curriculum reform.
- Oversight of CRLT's process for program evaluation and documentation of impact.

<u>Previous Positions at CRLT</u>: Coordinator of GSI Initiatives (2003-2009); Assistant Research Scientist (2007-2011)

Publications
<u>Books</u>
Wright, M.C. (2008). *Always at odds?: Creating alignment between faculty and administrative values*. Albany, NY: SUNY Press.

<u>Peer-Reviewed Articles</u>
Schram, L. N., & Wright, M. C. (2012). Teaching mentorship programs for graduate student development. *Studies in Graduate and Professional Student Development, 14.*

Wright, M. C., Niemer, R. K., Bruff, D., & Valle, K. (2012). Tweeting #PODHBCU: Content and process of the 2011 POD HBCUFDN Conference Twitter backchannel. In J.E. Groccia, Ed. (pp. 104-121). *To Improve the Academy, 33.*

Heinze, J., Schram, L., & Wright, M.C. (2012). Recognizing and enhancing future faculty teaching: An inventory of grants and teaching awards. *Studies in Graduate and Professional Student Development.*

Wright, M.C., Bergom, I., & Brooks, M. (2011). The role of teaching assistants in student-centered learning: Benefits, costs, and negotiations. *Innovative Higher Education, 36*(5)*:* 1-12.

Finelli, C. J., Wright, M.C., & Pinder-Grover, T. (2010). Consulting the Delphi: A new idea for collecting student feedback through the Two Survey Method (TSM). *Journal of Faculty Development, 24*(2): 25-33.

Wright, M.C., Cook, C.E., & O'Neal, C. (2009). The role of a teaching center in administrative training: A developmental model for academic leadership preparation. *To Improve the Academy, 28:* 278-291.

Wright, M.C. & Meizlish, D.M. (2008). Preparing advocates for faculty development: Expanding the meaning of "growing our own." *To Improve the Academy,* 27: 385-400.

Wright, M.C., Purkiss, J., O'Neal, C., & Cook, C.E. (2008). International teaching assistants and student retention in the sciences. *Studies in Graduate and Professional Student Development*, 11(1): 109-120.

Kaplan, M., O'Neal, C., Meizlish, D., & Wright, M. (2007). A rubric-based method for developing statements of teaching philosophy. *To Improve the Academy, 26*: 242-262.

O'Neal, C., Wright, M., Cook, C., Perorazio, T., & Purkiss, J. (2007) The impact of teaching assistants on student retention in the sciences: Lessons for TA training. *Journal of College Science Teaching*, 24-29.

Cook, C.E., Wright, M.C., & O'Neal, C. (2007). Action research for instructional improvement: Using data to enhance student learning at your own institution. *To Improve the Academy*, 25: 123-138.

Wright, M.C. (2007). Making sense of data: Building theory through qualitative research teaching techniques. *Qualitative Health Research*, 17(1): 1-8.

Wright, M.C., & Dolance, S. (2006). Learning from physics: Applying peer instruction to the undergraduate statistics classroom. *Journal of Student-Centered Learning*, 3(1): 49-54.

Zhu, E., & Wright, M.C. (2006). Recruiting instructional technology specialists for faculty development. *International Journal of Teaching and Learning in Higher Education*, 17(2).

Wright, M.C. (2005). Always at odds? Congruence in faculty beliefs about teaching at a research university. *Journal of Higher Education*, 76(3): 331-353.

Wright, M., Howery, C., Assar, N., McKinney, K., Kain, E.L., Glass, B., Kramer, L., & Atkinson, M. (2004). Greedy institutions: The importance of institutional context for teaching in higher education. *Teaching Sociology, 23*(2): 144-159.

Wright, M. (2002). Same old textbook? Web-based textbook supplements in sociology. *Journal of Computing in Higher Education, 14*(1): 28-49.

Wright, M. (2000). Getting more out of less: The benefits of short-term experiential learning in undergraduate sociology courses. *Teaching Sociology, 28*(2): 116-126.

Non-peer reviewed publications and edited volumes

Wright, M.C., McKay, T., Hershock, C., Miller, K., & Tritz, J. (2014). Better than expected: Using learning analytics to promote student success in gateway physics. *Change 46(1),* 28-34.

Wright, M.C., Bernstein, J.L., & Williams, R. (2013). "The steps of the ladder keep going up": A case study of *hevruta* as reflective pedagogy in two universities. In M. Kaplan, D. Meizlish, N. Silver, & D. Lavaque-Manty (Eds.). *Reflection and metacognition in college teaching.* Sterling, VA: Stylus.

Wright, M.C., & Howard, J. (2013, May 20). Teaching quantitative reasoning. Tomorrow's Professor post #1256. Available: http://cgi.stanford.edu/~dept-ctl/cgi-bin/tomprof/postings.php

Meizlish, D.M., Pinder-Grover, T., & Wright, M.C. (2012). Effective use of graduate peer teaching consultants: Recruitment, training, supervision, and evaluation. In K. Brinko (Ed.), *Practically speaking.* Stillwater, OK: New Forums.

Wright, M.C. (2011). Measuring a teaching center's effectiveness. In Cook, C.E. & Kaplan, M. (Eds.) *Advancing the culture of teaching on campus: How a teaching center can make a difference*. Sterling, VA: Stylus.

Pinder-Grover, T., Wright, M.C., & Meizlish, D. (2011). Graduate Peer Teaching Consultants: Expanding the center's reach. In Cook, C.E. & Kaplan, M. (Eds.) *Advancing the culture of teaching on campus: How a teaching center can make a difference*. Sterling, VA: Stylus.

Meizlish, D., Cook, C.E., & Wright, M.C. (2011). The role of a teaching center in curricular reform and assessment. In Cook, C.E. & Kaplan, M. (Eds.) *Advancing the culture of teaching on campus: How a teaching center can make a difference*. Sterling, VA: Stylus.

Wright, M.C., Finelli, C.J., & Meizlish, D. (2011). Facilitating the scholarship of teaching and learning at a research university. *Change: The Magazine of Higher Learning, 43*(2): 50-56.

Wright, M.C., & Schram, L. (2011). Graduate student mentoring. *Essays on Teaching Excellence: Toward the Best in the Academy.* Available: http://www.podnetwork.org/publications/essayseries.htm.

Bergom, I., Wright, M.C., Brown, M.K., & Brooks, M. (2011). Promoting college student development through collaborative learning: A case study of *hevruta*. *About Campus*, *15*(6): 19-25.

Wright, M.C., Cook, C.E., & O'Neal, C. (2010). Developing and renewing department chair leadership: The role of a teaching center in administrative training. *The Department Chair*, *20*(3): 11-13.

Wright, M.C. (2008, October). Building a shared value of teaching in a department: What chairs can do. *The Department Chair*: 18-20.

Wright, M., & Kaplan, M. (2007). *Departmental Graduate Student Instructor development: A handbook for faculty and Graduate Student Mentors who work with GSIs*. Center for Research on Learning and Teaching, University of Michigan.

Wright, M.C. (2007). Introduction to online teaching and learning: Using asynchronous discussions effectively. In C. Ross & J. Dunphy (Eds). *Strategies for teaching assistant and international teaching assistant development: Beyond micro-teaching*. San Francisco: Jossey-Bass.

Wright, M.C. (2007). Identity and authority in the classroom: An exercise for new TAs. In C. Ross & J. Dunphy (Eds). *Strategies for teaching assistant and international teaching assistant development: Beyond micro-teaching*. San Francisco: Jossey-Bass.

Wright, M. (2005). *Teaching effectively with GSI-faculty teams*. CRLT Occasional Paper No. 21. Center for Research on Learning and Teaching, University of Michigan.

Kardia, D., & Wright, M. (2003). Gender, identity, and teaching: What are students rating? *SWS Network News*, 20(1): 7-10.

Wright, M., & Hermann, J. (2002). Preparing future sociology instructors to teach in diverse classrooms. In J. Chin, C.W. Berhide, & D. Rome (Eds.) *Teaching for inclusion*. Washington, D.C.: AAHE.

Cook, C.E., Kaplan, M., Nidiffer, J., & Wright, M. (2001, November). Preparing Future Faculty – Faster. *AAHE Bulletin*, 3-7.

Wright, M. (2001). Pell grants, politics and the penitentiary: Connections between the development of U.S. higher education and prisoner postsecondary programs. *Correctional Education, 52*(1): 11-16.

Wright, M. (2001). Preparing graduate student instructors to address challenges to their authority. In R. Bach & B. Lucal (Eds.). *Hostility in the classroom*. American Sociological Association Teaching Resources Center.

Cook, C.E., Wright, M.C., & Hollenshead, C.S. (2000). *More than a research university: The importance of teaching at the University of Michigan*. CRLT Occasional Paper No. 14. Center for Research on Learning and Teaching, University of Michigan.

Wright, M.C., Cook, C.E., & Brady, E. (2000). *Using grants to enhance student learning*. CRLT Occasional Paper No. 13. Center for Research on Learning and Teaching, University of Michigan.

Wright, M. (2000). School inequality. *Teaching Social Stratification: Resources and Issues*. American Sociological Association Teaching Resources Center.

Wright, M. (1997, Spring). Feminism and the politics of experience: The case of the Detroit Feminist Women's Health Center. *Michigan Feminist Studies (11), 38-58*.

Presentations

Trumpey, J., Wright, M.C., & Wiley, S. (2014, April). Assessment of school-wide international experience requirement in studio-based curriculum. Forum on Education Abroad, San Diego, CA.

Greenberg, A.K., Gross, M., & Wright, M.C. (2014, March). Effects of image-based and text-based activities on student learning outcomes. Poster presented at the Learning Analytics and Knowledge Conference, Indianapolis, IN.

State, A., & Wright, M. (2013, October). *International perspectives on building a teaching center*. Roundtable for the annual meeting of the Organization of Professional Organizers and Developers, Seattle, WA.

Wright, M.C., Hershock, C., & Sampson, N. (2012, October). Educational development and learning analytics. Workshop presented at the annual meeting of the Organization of Professional Organizers and Developers Conference, Seattle, WA.

Wright, M.C., & Schram, L. (2011, October). Developmental stages of new instructional consultants: Implications for professional training. Workshop presented at the annual meeting of the Organization of Professional Organizers and Developers Conference, St. Louis, MO.

Wright, M.C., Huerta, M., & Milkova, S. (2011, October). Developing intercultural competence in art & design students: Evaluation of the impact of an international experience requirement. Poster presented at the annual meeting of the International Society for Scholarship of Teaching and Learning, Milwaukee, WI.

Wright, M., & Jacobson, W. (2010, October). Educational development as a framework for outcomes assessment. Workshop for the annual meeting of the Organization of Professional Organizers and Developers Conference, St. Louis, MO.

Wright, M. (2009, October). *Hevruta* in the research university classroom: An evaluation of a dyadic learning method. Paper presented at the annual meeting of the International Society for the Scholarship of Teaching and Learning, Bloomington, IN.

Wright, M.C., & Bergom, I. (2009, October). Overcoming barriers to SoTL: Program development and evaluation. Workshop for the annual meeting of the International Society for the Scholarship of Teaching and Learning, Bloomington, IN.

Wright, M.C. & Milkova, S. (2009, October). Uncovering students' conceptions of the academic job market: PFF implications. Workshop for the annual meeting of the Organization of Professional Organizers and Developers Conference, Houston, TX.

Ching, P., & Wright, M.C. (2009, October). 'Regenerating' the SGID: New ideas for collecting early student feedback. Workshop for the annual meeting of the Organization of Professional Organizers and Developers Conference, Houston, TX.

Wright, M. (2009, October). *Hevruta* in the research university classroom: An evaluation of a dyadic learning method. International Society for the Scholarship of Teaching and Learning. Bloomington, IN.

Wright, M.C. (2009, August). Navigating the academic job market. Paper presented at the Annual Meeting of the American Sociological Association, San Francisco, CA.

Wright, M. (2008, November). Narrating and navigating the academic job market. Paper presented at the Annual meeting of the Association for the Study of Higher Education, Jacksonville, FL.

Wright, M. (2008, October). Encouraging the Scholarship of Teaching and Learning: Helping instructors navigate IRB and FERPA. Organization of Professional Organizers and Developers, Reno, NV.

Wright, M.C., & Schram, L. (2009, October). Engaging graduate students in the Scholarship of Teaching and Learning. Organization of Professional Organizers and Developers, Reno, NV.

Wright, M.C., & Meizlish, D. (2007, October). Graduate teaching consultants: "Quick starters" in faculty development. Organization of Professional Organizers and Developers.

Grooters, S., & Wright, M. (2007, October). Supporting "peripheral" graduate students in instructional development. Organization of Professional Organizers and Developers.

Bogart, P., & Wright, M. (2006, October). Mutual benefits: Developing intercultural learners and ITAs. Michigan Teachers of English as a Second Language, Central Michigan University.

Wright, M.C. (2006, October). Mutual benefits: Developing intercultural learners and ITAs. Organization of Professional Organizers and Developers.

Wright, M.C. (2005, November). A sociological approach to classroom climate and student attrition. North Central Sociological Association, Indianapolis, IN.

Wright, M.C. (2005, November). Building teaching cultures: How research university leadership can create instructional communities. Association for the Study of Higher Education.

With Cook, C., & O'Neal, C. (2005, October). Undergraduate science majors: Using TA training to improve retention. Organization of Professional Organizers and Developers.

With Cook, C., & O'Neal, C. (2005, May). Gateway science at large institutions. Annual Conference of the Center for the Integration of Teaching and Learning (CIRTL), University of Wisconsin at Madison.

With Cook, C., & O'Neal, C. (2005, April). Gateway science: Student views about instructors and good teaching. Invited presentation for National Science Foundation Workshop: "What It Means to Be Fully Educated for the 21st-Century Workforce." Syracuse University.

Wright, M.C. (2005, April). Teaching students to develop theory. North Central Sociological Association.

With Dolance. S. (2004, August). Learning from physics: Applying peer instruction to the undergraduate statistics classroom. American Sociological Association.

With Mesa, V. (2003, October). Resources for Graduate Student Instructor Training. Organization of Professional Organizers and Developers.

With Kaplan, M. (2001, October). A Model to Prepare Future Faculty. Workshop presented at the annual meeting of the Organization of Professional Organizers and Developers. St. Louis, Missouri.

With Kardia, D. (2001, October). Gender and student ratings. Invited presentation for Grand Valley State University.

"Local Resources to Prepare Future Faculty" and "Preparing Graduate Students to Teach: Models for Success." American Sociological Association, August 2001.

With Cook, C.E., & Kardia, D. (2003, November). Gender and authority issues in the classroom. Paper presented at the annual meeting of the Association for the Study of Higher Education.

External Assessment/Evaluation Experience

- External evaluator for a six-university NSF Partnership for Adaptation, Implementation and Dissemination (PAID) Grant, originating from Case Western Research University, NSF ADVANCE program, 2010- 2012.
- External evaluator for The Ohio State University's NSF Institutional Transformation Grant, NSF ADVANCE program, 2011-2013.
- ADVANCE site visit teams, 2009 & 2011.
- External evaluation of Academic Careers in Engineering and Science, a NSF ADVANCE Institutional Transformation Grant, at Case Western Reserve University. Co-Conducted with Dr. Lisa Frehill, 2007.
- Evaluation of NSF CAREER Grant projects: by Dr. Julia Rodriguez, University of New Hampshire; and Dr. Brandon Aragona, University of Michigan

Teaching & Mentoring Experience

Co-Instructor, University of Michigan, College of Language, Science & Arts
  Graduate Student Instructor preparation course for international students (ELI 994), 2006-2009.

Lecturer, University of Michigan, School of Public Health
  Qualitative Methods and Participatory Action Research (HBHE 636, graduate class), 2003 & 2005.

Lead facilitator of Graduate Teaching Consultants (GTC) group, CRLT, 2005-2010 (Mentoring of 10-12 GTCs per year, see http://www.crlt.umich.edu/gsis/gtc.php)

Graduate Student Instructor, University of Michigan, Department of Sociology
  Courses with full responsibility:
  Sociology 993: Teaching in Sociology (graduate class), Fall 1999-Winter 2001
  Sociology 485: Deviant Behavior, Spring 1999
  Sociology 468: Criminology, Spring 1998
  Sociology 389: Project Community (service learning course), Fall 1997

CRLT mentorship of Center for the Study of Higher and Postsecondary Education (CSHPE) interns, Graduate Student Research Assistants, and postdoctoral scholars: Jeffrey Chun (2007-8), Inger Bergom (2008-10), Ruby Siddiqui (2010-11), Dr. Kirsten Olds (2009-10), Dr. Laura Schram (2010-11), Dr. Mary Antonaros (2010-11), Kathryn Valle (2011-12); Dr. Allyson Bregman (2011-12), Dr. Kris Gorman (2012-13); Dr. Olivia Anderson (2013-present); Stefan Turcic (2013-14)

International Experience

Faculty development workshop for Chinese National Academy of Educators and Administrators (NAEA), December 2013

Participation in University of Michigan Seminar for Chinese university presidents and administrators, 2011-present

University of Michigan African Presidential Scholars faculty mentor for Dr. Andrew State, Makerere University, Uganda, 2011-12.

Participant in Fulbright International Higher Education Administrators Program, 2007.

Invited presentations to Nagoya University and Tokyo University of Foreign Studies, "Creating a Culture of Teaching," 2006.

Grants and Instructional Awards

Exploring Learning Analytics Grant, $53,000. Awarded on December 2013 by University of Michigan Provost's Learning Analytics Task Force.

Organization of Professional Organizers and Developers, Innovation Award finalist, 2006, 2008, 2010.
Awarded for new program innovations: the "What's It Like?" seminar series, a partnership with IRB to facilitate the Scholarship of Teaching and Learning and the University of Michigan Graduate Student Mentorship Program.

Rackham Graduate Student Instructor Teaching Award, 2001.
Awarded each year to 20 (out of 2,000+) outstanding teaching assistants at the University of Michigan.

Professional Service and Affiliations

Executive Committee, Organization of Professional Organizers and Developers (POD) Network, the professional association for faculty development, 2013-present.

Board of Directors of Organization of Professional Organizers and Developers (POD) Network, the professional association for faculty development, 2012-present.

Chair, Graduate and Professional Student Development Committee, Organization of Professional Organizers and Developers (POD Network), 2009-2012.

Member of CIC National Institute of Learning Outcomes Assessment (NILOA) group and CIC Assessment group.

Editorial Board, *Studies in Graduate and Professional Student Development.*

Invited participant to the 2000 ASA Scholarship of Teaching and Learning Workshop at James Madison University.

Erping Zhu

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Ann Arbor, Michigan 48109-2218
Phone: 734-763-3757, Email: ezhu@umich.edu

Education

1996   PhD in Instructional Systems Technology, Indiana University, Bloomington

1990-1992   MS in Instructional Systems Technology, Indiana University, Bloomington

Experience

2000-present   Assistant Director, Instructional Technology, Center for Research on Learning and Teaching (CRLT), University of Michigan

- Coordinating CRLT midterm student feedback services
- Providing consultations on teaching and learning issues
- Assisting faculty in exploring and using creative technologies and pedagogies
- Working with other support units to provide IT programs and services
- Conducting seminars and workshops about technology and teaching
- Engaging in applied research in teaching, learning, and technology
- Working on CRLT international initiatives and programs

1997 – 1999   Instructional Designer/Coordinator of Academic Programs, Florida Gulf Coast University

Selected Publications

- Using laptops in the classroom: The University of Michigan (2012). Zhu, Kaplan, Dershimer, & Bergom. *Seeking Evidence of Impact (SEI) Case Studies, Educause Learning Initiative (ELI)*.
- Use of laptops in the classroom: research and best practices (2011). Zhu, Kaplan, Dershimer, & Bergom. *CRLT Occasional Paper*, University of Michigan.
- Engaging faculty in effective use of instructional technology (2011). Zhu, Kaplan, & Dershimer. In C. E. Cook & M. L. Kaplan (Eds.) (2011). *Advancing the culture of teaching on campus: How a teaching center can make a difference.* Sterling, VA: Stylus Publishing.
- Assessing and meeting TAs' instructional technology training needs: Research and practice (2010). Zhu & Groscurth. *The Journal of Faculty Development*, *24*(3), 37-43.
- Lecture capture: A guide for effective use. (2010). Zhu & Bergom. *CRLT Occasional Paper*, University of Michigan
- *Teaching with clickers* (2007). Zhu. *CRLT Occasional Paper*, University of Michigan.
- Interaction and cognitive engagement: An analysis of four asynchronous online discussions (2006). Zhu. *Instructional Science. 34*(6), 451-480.
- Recruiting instructional technology specialists for faculty development (2006) Zhu & Wright. *The International Journal of Teaching and Learning in Higher Education, 17*(2), 119-126.

- From learning community to community learning: Pedagogy, technology, and interactivity (2004). Zhu & Baylen, *Educational Media International. 42*(3), 251-268.
- Going online: Challenges and issues (2005). Baylen & Zhu, in P. Rogers (Ed.). *Encyclopedia of Distance Learning, Teaching, Technologies, and Applications.* Hershey, PA: Idea Group Inc.
- Teaching with clickers (2007). Zhu. *CRLT Occasional Paper*, University of Michigan.
- Teaching Online (2003). Zhu. *CRLT Occasional Paper*, University of Michigan.
- Online learning communities (2003). Zhu. In *Education and Technology: An Encyclopedia*, edited by Ann. Kovalchick and Kara. Dawson. Santa Barbara, CA: ABC-CLIO, 2003
- Technology and Teaching: Characteristics and Implications of an Integrated Approach (2001). Zhu. *Global Learning Center*, UM Business School, 2001.
- Teaching and Technology. (Zhu & Kaplan, 2002-2013.). In W. J. McKeachie (Ed.). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers (Chapter 17)*. Boston, MA: Houghton Mifflin Co.
- Hypermedia interface design: The effects of number of links and granularity of nodes (1999). Zhu. *Journal of Educational Multimedia and Hypermedia*, *8*(3), 331-358.
- Learning and mentoring: Electronic discussions in a distance-learning course (1998). Zhu. In C. J. Bonk & K. King (Eds.). *Electronic collaborators: Learner-centered technologies for literacy, apprenticeship, and discourse* (Chapter 10), Mahwah, NJ: Erlbaum.
- The design of web-based instruction: A human-computer interaction perspective (1997). Zhu. In B. H. Khan (Ed.). *Web-Based Instruction* (Chapter 25), Educational Technology Publications, Englewood Cliffs, New Jersey.

Selected Presentations

- Evaluating the quality of MOOCs: Is there room for improvement? (2013). Zhu & Baylen. *POD Conference*, Pittsburgh, Pennsylvania, November 6-10.
- Flipping the seminar: Opportunities and challenges for blended faculty development (2012). Zhu, Bakewell, & Hershock. *POD* Conference, October 24-27, Seattle, WA .
- Using laptops and other wireless devices effectively in classroom: Lessons from a study of LectureTools. (2011). Dershimer, Zhu, Bergom, & Samson. *Sloan-C 4th Annual International Symposium: Emerging Technologies for Online Learning*, July 11-13, San Jose, CA.
- Assessing Teaching Assistants' Instructional Technology Training Needs: Research and Practice. (2009). Groscurth, Zhu, & Hershock. *POD Conference,* October 28-November 1, Houston, TX.
- Types of Interaction in Online Discussions. (2003). Zhu. *E-Learning: World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education*, November 7-11,, Phoenix, AZ.
- Development of Interactive Learning Environment: Just-in-time Instruction and Effective Course Management (October 2001). Nakatani, Edwards, & Zhu, *IACIS Conference 2001* and published in *Issues in Information Systems.*

- Goal-Oriented Approach to Web-based Distance Course Design (October 2000), Nakatani & Zhu, IACIS Conference 2000 and published in *Issues in Information Systems, (1),* 346-352.
- Web-Based Distance Learning: A Case of Using Systems Approach to Design and Deliver a Cross-cultural Communication Course (February 1999). Zhu & Vázquez-Montilla. *AECT National Conference.*

Awards
- 2001 Best Pedagogy Paper for IACIS 2001 International Conference. Edwards, Nakatani, & Zhu. Development of Interactive Internet-Based Learning Environments: Just-in-Time Instruction and Effective Course Management
- 2013 POD (Professional and Organizational Development Network in Higher Education) Innovation Award. (2013). Zhu & Bakewell. Any content, any time: A flexible template for online professional development.

Professional Affiliations
- Professional and Organizational Development Network in Higher Education (POD)
- Association for Educational Communications and Technology (AECT)
- Association for the Advancement of Computing in Education (AACE)

Board member and Journal Reviewer
- Member of executive committee 2013-2014: U-M Chinese Professor Association American (CPA)
- Board member: Zhejiang University Education Foundation (USA)
- Executive Peer-Reviewer: *Journal of Society and Technology*
- Reviewer: *Learning, Media & Technology Journal*