Review of *Learning to Communicate in Science and Engineering: Case Studies from MIT*

Mya Poe, Neal Lerner, and Jennifer Craig, 2010. Cambridge, MA: MIT P, [ISBN 978-0-262-16247-0. 256 pages, including index. (hardcover).] Foreword by James Paradis.

Reviewed by Martha Patton, University of Missouri

Learning to Communicate in Science and Engineering: Case Studies from MIT is an important book for anyone interested in the relationship between college writing and learning. The five case studies of undergraduate communication-intensive (CI) courses at MIT presented in this study offer valuable insights about learning to communicate in science and engineering, insights that are useful not only for professionals in technical and scientific communication, but also for professionals in other writing-related fields including first-year writing and writing-in-the-disciplines. Because the book so succinctly and lightly builds on some of the best current research in writing studies, it also provides graduate students with a good introduction to research in situated writing and cognition. With this engaging study of CI courses at MIT, Mya Poe, Neal Lerner, and Jennifer Craig challenge all of us in writing studies to look closely at the promise of integrated models for learning to communicate, especially models that attend to identity, authenticity, argumentation, and collaboration.

Grounded in current sociocognitive theories of learning, the study draws particularly on the work of Jean Lave, Paul Prior, and others who reject a purely cognitive view and emphasize the social and rhetorical "situatedness" of learning; the work of Lev Vygotsky and others who introduced the concepts of *cognitive apprenticeship* and *zones of proximal development* to learning theory; the work of James Paul Gee and others who study the role of identity formation in learning to communicate; and the work of Carolyn Miller, Charles Bazerman, Aviva Freedman, and other genre and activity theorists who suggest that genres are not mere formats functioning in isolation, but rather are dynamic processes that "travel together in sets and even operate in entire systems, all supporting a human activity" (12); as well as an extensive body of research on writing and speaking in sociocognitive environments. The authors acknowledge their huge debt to David Russell, Susan McLeod, Margaret Soven, Chris Thaiss, and others in the writing-in-the-disciplines movement (WID) and to professionals specializing in science and engineering communication. Writing is, they suggest, an activity that takes place in complex systems, some of which are scientific. Quoting Michelle McGinn and Wolff-Michael Roth, the authors note that "scientific knowledge emerges from a nexus of interacting people, agencies, materials, instruments, individual and collective goals and interests, and the histories of all these factors" (4).

Typical of qualitative research in writing studies, the data collection methods and instruments include IRB-approved student and faculty surveys and interviews, focus groups, and text analysis of student writing, all thoroughly documented in the appendices. The authors claim that, by far, the richest tool was the individual interview. Even though the authors use these instruments to produce situated case studies that resist generalization, the instruments could be used in other settings in future studies to consider the impact of particular local features.

As teacher scholars, the three authors not only present research, but also suggest what the research implies for best practices, implying that their study can be understood as a form of "teacher research" or "action research." Each of the five approximately-thirty-page chapters presents cases focused on a particular setting (a CI class in biology, bioengineering, aeronautical engineering, or biomedical engineering) and a particular sociocognitive frame. The first chapter looks at what is required to "write a scientific identity." Two overarching questions (what are students' challenges and opportunities as they face the research article and how do students' identities as science students and neophytes shape their learning) are explored in depth via cases of Nira, Carla, April, and Jake. While the cases collectively affirm research that suggests students fare better when they have a strong sense of purpose when they write, the cases also raise new questions about identity and learning. For example, Carla's and April's cases raise questions about students whose professional identity is in flux. "The need to develop rhetorical flexibility and apply lessons learned in Sci Comm to future scientific writing was in competition with their large concerns about majors and careers" (8). The second chapter considers what is at stake when taking on the identity of a professional researcher. Through the cases of Kay, JoAnna, and Nedra, the authors conclude that "students develop as writers through engaging in a range of professional tasks and from a range of potential readers" and that "authentic communication tasks themselves are entry points to developing a professional identity" (79). The third chapter asks how young researchers carve out a research niche, while the fourth looks at the messy ways in which undergraduates learn to argue with data. The fifth chapter asks what kind of collaborative interactions are involved with learning to write and speak. All of the chapters suggest that learning to write in any situation is non-linear, that some students are more ready than others, and that many students achieve the desired outcomes only by degree, indicating that teachers need to be flexible and to understand ways in which schooling is both enabling and constraining.

Descriptive and situated as the findings are, they nonetheless corroborate other research that suggests that learning to communicate effectively is a messy process and that it is accomplished in micro-communities. Messy though it is, learning is supported by active, problem-based approaches. "While there may be challenges in measuring the efficacy of certain models, researchers agree that the data are conclusive: active learning and, more specifically, collaborative and cooperative learning, are effective in undergraduate science, mathematics, and engineering and technology courses and programs (Prince 2004; Springer et al. 1999; Smith 1995)."

The integrated, collaborative teaching practices described in this study are put in historical perspective in the foreword and in the introduction. In the foreword, James Paradis suggests that MIT has fostered collaborative approaches to communication for decades, ever since Robert R. Rathbone established an integrated model in the 1950s. More recently, as the authors note in the introduction, the push to put communication in a professional context comes not only from university WID programs at MIT and elsewhere, but also from external entities including national accrediting agencies, faculty development organizations, and grant-funding agencies. As they make clear, the MIT cases are part of a larger trend toward collaborative approaches to the teaching of writing and speaking.

Thorough as this study of CI courses at MIT is, more studies are needed to explore learning to communicate in other college settings, public and private, large and small. The authors readily acknowledge that other writing specialists may not enjoy some of the resources available at MIT. What unique obstacles to collaborative approaches to teaching exist elsewhere? How should we prepare future writing specialists to thrive in collaborative and situated settings? The authors are the first to call for more study of the role of

identities in shaping learning, especially the role of racial/ethnic and sexual orientation identities in learning. What disciplinary identities may be more challenging to cultivate? Is identity formation more important when learning to communicate in some disciplines than in others? Given this study's focus on engineering and scientific communication, what does it offer writing specialists in other areas?

Perhaps those who stand to benefit the most from this stunningly accessible book are those who are interested in sociocognitive studies of writing but who have limited direct experience teaching writing outside the humanities. By studying writing in unfamiliar settings, writing scholars might be more likely to notice what is particular, or not completely generalizeable, in the teaching settings with which they are most familiar. Moreover, this book might help writing scholars in the humanities understand more about the dominant rhetoric in the modern research university, the rhetoric of science. The call to use science writing as a means to understand other kinds of communication is similar to the case that Cary Moskovitz and David Kellogg make in "Primary Science Communication" and that Michael Zerbe makes in *Composition and the Rhetoric of Science*. Furthermore, as Zerbe says, "The rhetoric of science may be one of the most important rhetorics in this era, yet it is discussed very little in rhetoric and comp as a whole" (37). Zerbe illustrates how little we attend to rhetoric of science in composition with these figures: Between 1999-2005 there were about 30 articles on the rhetoric of science in *Rhetoric Society Quarterly, Rhetoric Review, Written Composition, Technical Communication Quarterly, Journal of Technical Writing and Communication,* and *Rhetorica;* between 1999-2005, there was just one article in *College Composition and Communication*, considered by many to be the flagship journal in writing studies, and in 2005, Jack Selzer's CCC talk on scientific discourse was one of fewer than five at a conference with over 500 sessions. Zerbe argues that we need to do a much better job of admitting other discourses into writing studies and that we need to acknowledge the "situated-ness" of the discourses we do admit. Poe, Lerner, and Craig's study of communication at MIT makes an important contribution to this effort.

References

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Erratum

- [importance](#) [corrected March 19, 2011 to important].

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Complete APA Citation