Negotiating Expertise in Disciplinary "Contact Zones"

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Abstract.

This essay argues that the challenges we face in promoting WAC or WID initiatives in engineering stem in large measure from conceptions of expertise that divorce mastery of domain content from rhetorical process. It considers what we might gain by foregrounding the rhetorical or negotiated dimensions of expertise, especially as that negotiation becomes apparent in disciplinary "contact zones." Various curricular avenues for highlighting this interest are examined, and its complementary role to existing courses is stressed. Although expertise has its own complex political and economic dimensions, ABET's new accreditation criteria offer added impetus to use the negotiation of expertise to curricular advantage.

In a culture both obsessed with and skeptical toward experts, we seem to agree on this much: the "real" experts are scientists, doctors, and engineers. While scientists and doctors hone their expertise through years of postgraduate work until they are formally licensed by their elders, engineers are virtually alone in having their expertise certified professionally at the undergraduate level. This focus on professionally certifiable engineering expertise, in the context of an undergraduate education, may help us understand why the engineering curriculum is often perceived as the most challenging arena for projects encouraging writing across the curriculum (WAC) or, for that matter, writing in the disciplines (WID).

This essay argues that the challenges we face in promoting WAC or WID initiatives in an engineering context stem in large measure from competing conceptions of expertise. As we seek to help students communicate across and beyond the engineering disciplines, our efforts (under whatever curricular model) are shaped by at least two cultures: a distinctive culture of disciplinary expertise within the engineering professions

and an equally distinctive culture within composition, rhetoric, and writing across the curriculum, with its own professionally sanctioned notions of what constitutes rhetorical expertise. This essay explores the tug and pull that occurs as we negotiate both what counts as expertise and how we implement and assess efforts to develop that expertise. Such negotiations become most apparent in disciplinary "contact zones"—that is, in those areas where one disciplinary culture comes up against another as we address concerns, such as improving engineering students' communication skills, that span what might otherwise be tidy intellectual and organizational boundaries. I believe that such negotiation—as challenging as it is necessary—can emerge as a common interest that might connect and advance a variety of pedagogical and curricular experiments.

The role that competing conceptions of expertise can play in classrooms and curricula might easily seem tangential, inconsequential, or for that matter, invisible. Once we accommodate ourselves to a particular conception of expertise, and organize our curricular and pedagogical efforts around it, that conception tends not to announce itself. This is especially true when we equate expertise with the mastery of content. But this sort of invisibility is undesirable when it comes to improving students' communication skills. And for good reason. Expertise has a rhetorical dimension (Geisler, 1994). Although novice engineers may see data and evidence as incontrovertible, persuasive in their own right, disciplinary knowledge and expertise are in fact formed through interpersonal and textual negotiation over interpretations of that evidence (Winsor, 1996). Thus, the very process by which we negotiate expertise with an audience is inherent to the challenge of communicating well across and beyond engineering disciplines. This places the negotiation of expertise at the core, not on the periphery, of both rhetorical *and* engineering education.

We begin our exploration by recalling why disciplinary expertise in engineering and rhetorical expertise in communication skills have such a vexed relationship. The heart of this essay considers what we might gain by foregrounding the rhetorical—that is to say, negotiated—dimensions of expertise in disciplinary "contact zones." Work in such zones can complement the traditional strengths of WAC and WID approaches, but institutional support for such an enterprise is not always a given, for expertise has its political and economic dimensions. The advent of new accreditation standards in engineering may, however, offer a new opportunity to use the negotiation of expertise as a tool for improving teaching and learning.

Expertise and its Rhetorical Burden

In *Academic Literacy and the Nature of Expertise*, Geisler (1994) explores why we have separated expertise, so closely associated to aca-

demic projects of professionalization, from literacy, generally conceived of as a competency, not an expertise. She argues that

> the cultural movement of professionalization has used the technology of literacy to sustain claims to professional privilege, creating a *great divide* between expert and layperson. Academic literacy has had this effect, I suggest, via a *dual problem space framework* that bifurcated expertise into two distinct components, domain content and rhetorical process. This bifurcated practice, in turn, shapes the distinct activities and representations used by academic experts. (p. xiii)

For Geisler, this bifurcation between domain content and rhetorical process has troubling consequences. In so far as domain content is seen as a stable body of knowledge developed through supposedly autonomous texts meant to archive information, domain content can easily obscure underlying rhetorical processes that influence what and how we know. As Geisler cautions,

> We cannot take refuge in this invocation of the myth of the autonomous text any more. Too much evidence tells us that texts and knowledge-making do not work that way; that facts become facts through rhetorical processes rooted to specific times and places. A better way would be to more openly acknowledge the burden of rhetorical persuasion that our expertise places on us. (p. 253)

Geisler's lament is that the academy has "sidestepped the rhetorical burden of expertise, the burden of persuading others to believe and act" (p. xiii), and has thereby perpetuated both a great divide between expert and layperson and a bifurcation between domain content and rhetorical process. All of us who labor to improve the communication skills of engineering students encounter and try to heal such rifts on a daily basis.

Given the "burden of rhetorical persuasion" that accompanies expertise, I wish to consider the following question: Might that "burden" offer new curricular and pedagogical opportunities? More specifically, I am interested in locating moments and sites of rhetorical persuasion that force us to negotiate or "rhetoricize" our expertise, and in so doing, that encourage us to reflect on how and why we might construct our expertise in certain ways. For Geisler, meeting that "burden of rhetorical persuasion" bears on how we set our expertise in play as we communicate with two groups: (1) colleagues who already subscribe to a set of pre-negotiated disciplinary assumptions and those novices being socialized to them,

and (2) a general public prone to see expertise as a set of decontextualized facts. Where Geisler focuses on disciplinary insiders, their socialization, and their estrangement from a general public, I wish to explore how interactions in disciplinary "contact zones" might help us understand that burden of rhetorical persuasion. Moreover, I see the negotiation of expertise in those contact zones as a possible way to meet that burden. Doing so might enable us to explore and foster enactments of rhetorical persuasion that reveal how rhetorical processes influence constructions of disciplinary expertise for other differently trained experts.

If Geisler has alerted us to the unmet rhetorical burden that often accompanies expertise, Winsor can help us place the tensions between expertise and literacy in an engineering context. As Winsor (1990) notes, for those of us who work to improve engineering students' communication skills, the bifurcation between domain content and rhetorical process poses special problems:

> We accept the idea that our knowledge is shaped by our language. But this view of language and writing is not necessarily accepted in other parts of our campuses, as those of us who teach engineers, for example, can attest. Engineering defines itself as a field concerned with the production of useful objects. In keeping with this concern, engineers tend not only to see their own knowledge as coming directly from physical reality without textual mediation, but also to devalue the texts engineers themselves produce, seeing them as simple write-ups of information found elsewhere. (p. 58)

If professional ideology encourages novice engineers to deny the rhetorical nature of their work, this tendency is only fueled, as Geisler (1994) has shown, by popular culture and much of undergraduate education, both of which tend to treat knowledge as "a-rhetorical." Because engineers receive their *professional* certification as *undergraduates*, teachers working to improve their rhetorical skills thus face a double challenge in helping students become aware of the "hard argumentative labor by which knowledge is constructed and maintained" (Winsor, 1996, p. 35).

One way out of this impasse is to foreground those aspects of professional training, practice, and experience that teach novice engineers to think and write strategically—that encourage or require them to take on, as it were, the rhetorical burden that accompanies expertise. Winsor's finegrained longitudinal study of the rhetorical development of engineering students, *Writing Like an Engineer* (1996), suggests that we can further that development by helping students pay attention to audi-

ence and negotiated expertise in the context of meaningful shared activity and situated practice.

This remedy is implied in the very way Winsor diagnoses the particular difficulties faced by engineering students:

> The rhetorical nature of engineering writing and engineering work is not obvious at first glance, at least not to students. They tend to think of engineering as a matter of knowing something and perhaps as a way of doing something. The fact that knowing and doing happen *in concert with other people* seems like a minor detail. Technology seems data-determined and unarguable. As a profession, engineers frown on persuasiveness and find it suspect. (1996, p. 12, emphasis mine)

Given the communal nature of actual engineering practice (as distinguished, alas, from much of traditional engineering education), Winsor advises us to pay special attention to the ways we define audience and collaborative work as we design or draw on communication tasks:

> For a writer to be conscious of the rhetorical nature of knowledge, he or she must understand *audience* in a specific way: The writer has to believe that knowledge, and particularly disciplinary or organizational knowledge, is *negotiated* [emphasis mine] between people rather than passed from one to another. A rhetorical view of writing and knowledge would prevent a writer from seeing the members of an audience as passive receptors of finished information, rather than as active interpreters of the text or as comembers of a discipline who will negotiate the text's meaning. (1996, p. 45)

The emphasis that Winsor places on negotiation and interpretation in developing rhetorical and communication skills suggests, if only implicitly, one possible way of responding to Geisler's lament about the facile distinction between expertise (traditionally seen as the mastery of domain content) and literacy (often viewed as a competency divorced from actual engineering practice).

Disciplinary "Contact Zones"

In exploring this challenge, I have found it useful to think in terms of disciplinary "contact zones" that place students at the margins of their own fields or that have them straddle organizational boundaries. These

zones shift attention from an exclusive focus on domain content while still engaging and developing our students' expertise.

My apologies to Pratt for stretching what is already an elastic term even a bit further. Pratt coined the term "contact zone" to refer to "social spaces where cultures meet, clash, and grapple with each other" (1991, p. 34). The notion of communicating in disciplinary or organizational "contact zones" becomes apt indeed if we think of academic disciplines (or organizational domains such as research and development or marketing) as distinctive cultures in their own right. Contact zones occur not in any one discipline or organizational domain but at the margin or along the boundaries of each.

These contact zones serve as opportunities for what Bazerman and Russell call "interface discourse" (1994, p. xvi). This discourse occurs where experts meet each other without necessarily sharing the very same expertise, or where experts encounter the various fora of public discussion and decision making, thereby reconnecting expertise to arenas of civic action. Journet's term "boundary rhetoric" (1993) captures something of the same challenge, here focusing on the ways in which experts adjust—which is to say, rhetoricize—their own expertise when they find themselves straddling two or more disciplinary domains. Writing in these disciplinary contact zones means exploring how students and professionals alike engage and develop their disciplinary expertise when they communicate with literate—even expert—readers from outside their immediate disciplinary specialization. It means exploring what happens when writers—and readers—find themselves at the margins of their own fields.

Such dislocations from the comfortable domains of disciplinary knowledge, relatively commonplace in actual engineering practice, are now becoming less rare on campus. Educators are beginning to appreciate, for example, the role of multi-disciplinary teams, even courses, in engineering education. Yet most existing curricular and disciplinary structures do a poor job of placing students in those contact zones. Those structures are themselves insular, and often serve to protect professional turf. They tend to hide, not highlight, how one kind of expertise inevitably rubs up against a related but different kind of expertise, each becoming relevant to the other.

Traditional writing instruction has itself encouraged an accommodation to expertise that hides from view the situated and negotiated ways in which we use language to develop and apply knowledge. According to Carter (1990), composition has been of two minds on the way it approaches the very idea of expertise: which counts more, general knowledge or local knowledge, the cognitive dimension or the social dimension? Flower (1989, p. 5) aptly puts the question this way: "How general can our art be and still be practical?" Carter argues that as a field, composition has

lurched from one to the other conception, and has yet to develop a plural-ist or rhetorical approach to expertise that places the complex interactions between general and local knowledge at its core.

Lest writing teachers point fingers at engineering's supposedly re-ductionist notions of expertise, those of us in composition have been culprits ourselves. First-year composition, with its focus on general writ-ing skills instruction, has for years asked students to accommodate them-selves to a set of disembodied principles without helping them under-stand the ways in which those principles can be artfully negotiated and applied in various concrete disciplinary or professional settings (Petraglia, 1995; Crowley, 1998). Even published anthologies used in WAC-inspired writing courses suffer under a tyranny of content surprisingly similar to the focus on topical coverage common in the disciplines themselves (Norgaard, 1997a). Likewise, writing instruction geared specifically to engineering students can easily take an a-rhetorical perspective on com-munication skills, as Winsor herself laments (1990): "Technical writing textbooks, too, often present writing solely as a means to report on what the engineer already knows" (p. 58).

Given that traditionally conceived writing instruction has often side-stepped the rhetorical negotiation of expertise, one might expect—or at least hope—that more recent initiatives in writing across the curriculum (WAC) and writing in the disciplines (WID) would be more effective in this regard. Many initiatives indeed have. And yet, the prospect of rhetoric in these movements remains largely that—a prospect (Norgaard, 1997b). If the two major strands in the broadly defined WAC movement—writing to learn and writing in the disciplines—have themselves grown in different directions (Jones & Comprone, 1993; Kirscht, Levine, & Reiff, 1994), they share at least this much in common: both can at times succumb to the same tendency to accommodate expertise, and thus divorce domain content from rhetorical process.

If we are to encourage faculty and students to foster or avail them-selves of disciplinary "contact zones," we must suggest how work in such zones complements other curricular options. Exposure to the ways in which expertise is negotiated can only serve to enrich courses that avail themselves of the "writing to learn" model. Doing so would help students appreciate that both writing and learning are complex, highly negotiated activities. Likewise, students in courses emphasizing "writing in the discipline" could only benefit from exposure to the highly negotiated ways in which knowledge develops—even within supposedly homog-enous disciplinary communities. When not complemented and enriched in this fashion, common curricular arrangements might assume as settled what is now increasingly up for grabs—the role and nature of expertise amid permeable disciplinary boundaries. Yet many moments or sites in the

undergraduate engineering experience could easily foreground in creative or unexpected ways the activities of negotiation and interpretation that Winsor (1996) finds so central to the tacit rhetorical education of engineers.

Negotiating Expertise in the Classroom

Several moments and sites in the engineering curriculum offer themselves as natural opportunities for highlighting the negotiated or rhetorical nature of expertise. Upper-division design courses and capstone courses, for example, provide welcome opportunities to help engineering students understand how thoroughly they must rely on the resources of language and rhetorical persuasion throughout the engineering design process (Geisler, 1993). As Winsor (1996) found in her longitudinal study of four engineering students, internships and cooperative education programs also offer a tacit rhetorical education that we can build on and make more explicit. Likewise, most any setting that uses multidisciplinary teams will prompt students to negotiate expertise as they address design and communication tasks. Even the interdisciplinary first-year "Introduction to Engineering" course can, at a less sophisticated level, help novice engineers understand how language and communication are more than a part of an engineer's job; they are part of engineering itself.

While these can indeed be propitious moments for negotiating expertise, such opportunities can easily be lost unless we address that negotiation more directly and with greater self-reflection. We can do more to create or design educational experiences that foreground the negotiation of expertise in disciplinary contact zones. To lend some substance to this rationale, and some consequence to its real and potential difficulties, allow me to refer to one of the many ways such a rationale might become a curricular reality. I do so *not* to recommend a specific model for readers to emulate; rather, I wish to highlight both the opportunities and challenges that one encounters when negotiating expertise.

At the University of Colorado at Boulder I coordinate, among other things, an upper-division writing course for engineering and science students, taught through a freestanding, university-wide writing program. The course draws most of its students from various engineering disciplines, but also attracts a number of students from the natural and biological sciences. The course addresses the challenge of helping students use and negotiate their disciplinary expertise when addressing issues that bring them into contact with intelligent readers—experts in their own right—who are not trained in the same specific field. The course focuses on individually conceived projects that have students writing to real audiences about actual questions at issue using professional genres. Given our insistence on small class size (18 students), multiple drafts and several

oral presentations become the key texts in the classroom. Fellow students serve as readers and editors who help the author or authors make expertise both accessible and relevant, not to the narrow specialist but to intelligent readers trained in engineering and scientific disciplines beyond their own.

This approach, with its interest in the negotiated, rhetorical dimension of expertise, strikes students (and many faculty, for that matter) as at once familiar and strange, for it teaches both with—and against—the curricular grain. The course accommodates expertise in so far as it takes a student's disciplinary orientation as its point of departure. These juniors and seniors write about what they know, and their expertise is by now very sophisticated. Yet writing in the discipline is not the object, but rather the means.

This is where our approach complements the usual writing-in-the-disciplines course. While this course makes extensive use of students' expertise, it does so in creative ways—by fashioning a rhetorical community in the classroom that is not entirely congruent with the disciplinary community in which the expertise was first acquired. Students write in the company of each other—as knowledgeable readers with significant, but varied, expertise. In the process, students find themselves exploring the social construction of knowledge in their own discipline by having to reconstruct and enact that expertise for real audiences that lie beyond the immediate disciplinary community.

Our interest in *reconstructing* and *enacting* expertise helps to clarify how this approach highlights a concern that is often only implied in many upper-division technical communications courses. Various features of our course surely appear in these other courses, among them individually conceived projects addressed to real audiences using professional genres, honed through multiple drafts and oral presentations. What distinguishes our efforts is our interest in seeing expertise not as a given, which is then deployed in various ways for various audiences, but as something that is itself always constructed or "composed." Expertise is always enacted, and never a thing in itself.

To make good on this perspective, virtually everything we do in the course is motivated by questions at issue—open problems—that encourage students to enact expertise in specific rhetorical contexts. This represents a new challenge to students so thoroughly accustomed to what Paulo Freire (1993) called the "banking concept" of education. With few exceptions, engineering students acquire and store their expertise in what we might think of as discrete accounts. Our course presents them not with topics to write on for varied audiences (for they are accustomed to storing their expertise by topic) but with issues that have them reconstruct and enact their expertise in ways that speak to the audience's take on the

problem, not their own prior acquisition of expertise. Instead of simply drawing on a particular account to access their expertise, students must account for their expertise in ways that address knotty problems. Interests and issues—inherently rhetorical—fuel our discussion, precisely because expertise, as it is so often "banked," is devoid of competing interests and questions at issue. The ensuing negotiation of expertise, meant to undo the facile bifurcation between expertise and rhetorical process, is amenable to many existing technical communications courses.

Because this perspective is developed through course activities but is not itself limited to any one set of activities, faculty in various disciplines working with different curricular models at any number of institutions can avail themselves of this focus on negotiating expertise. By way of example, let me suggest two curricular and pedagogical innovations that easily lend themselves to this focus. Many engineering design classes have recently turned from "closed" to "open" problems. Because these problems permit a variety of solutions, the underlying if often unarticulated challenge is inherently rhetorical: persuading others of the cogency and appropriateness of one's own response. Likewise, many engineering programs put students into cross-disciplinary design teams to develop everything from hybrid electric vehicles and solar-powered machinery to robots. The explicit aim is often to help students learn how to work in groups, and to encourage them to see the applicability of their expertise in different disciplinary domains.   All too rarely do we help students realize how such an effort has them reconstruct their own understanding of their knowledge so as to include and respond to others. Such moments in the engineering curriculum can prompt students to question their expertise, to expand it in unexpected ways, or to integrate and synthesize their understanding. Such moments represent natural but often unseized opportunities for us to meet the burden of rhetorical persuasion that accompanies expertise—a burden that so often goes unaddressed because we fail to highlight the negotiations that attend our work.

My experience has been that the same concept works well in other curricular areas. I'm currently collaborating with our Business College on a similar project that aims to help students in such diverse majors as finance, marketing, and information systems meet the demands of "interface discourse" so prevalent in today's work place. For both business and engineering students, the approach seeks to anticipate the professional realities that lie ahead for them, because few of them will spend their days as they do now: communicating to an audience of one, the expert who knows more than they do. No, like students in this course, today's professionals often work in "contact zones," addressing intelligent readers with extensive, but varied, expertise. Recognizing the rhetorical burden that accompanies expertise, the approach seeks to forge a more com-

plex, varied connection between knowing one's subject and knowing one's audience. As Fahnestock (1986) so aptly put it, "There is no 'body of knowledge' without bodies of knowers, and these are multiple" (p. 293).

A focus on the negotiated, rhetorical dimensions of expertise offers several distinct opportunities. Faculty at other institutions needn't model their efforts after this one particular course in order to seize those opportunities.

- *The approach uses existing curricular and disciplinary structures, but does so to look beyond them.* By simply accommodating disciplinary expertise, current WAC paradigms may do little to connect today's balkanized curriculum. To my mind, we ought to complicate, even question, the tidy disciplinary shoe boxes in which students acquire and store their expertise.
- *The approach lends exigence to expertise.* To lend that exigence, we must ask students to focus not on *topics within* their expertise but on *issues that bear on* their expertise—not on the "what" or "how" of their expertise but on the analysis or argument that uses expertise to justify inferences. One way to create that exigence is to reconnect expertise to issues of public policy (Norgaard, 1995a). But that needn't be the only way. We can also ask students to write to varied audiences and in disciplinary "contact zones" where parading expertise is insufficient if they are to justify the relevance of their expertise to genuine questions at issue.
- *The approach rehabilitates and redefines that much maligned term "the general reader."* The term "general reader" has become trapped as one pole in a false dichotomy, and now denotes little more than the absence of expertise. Students may be better served by exploring the varying types of expertise—rhetorical *and* disciplinary—that readers bring to texts and that in the end help constitute audiences and publics.
- *The approach foregrounds the social dimensions of expertise.* Through its attention to negotiation and rhetorical exigence, the approach helps students understand the foundations of genre and disciplinary conventions in social activity (Miller, 1984; Swales, 1990; Russell, 1997). Likewise, it helps students appreciate the value of collaboration as they negotiate technical work (Winsor, 1994) and the value of role play or "creative imitation" in discerning and addressing the needs of audiences (Porter, 1992).

- *The approach fosters a productive and necessary tension among expertise, authority, and community.* Much teaching in engineering too readily assumes a simple, unproblematic connection among these three terms, leaving them static and one-dimensional. Indeed, many approaches to writing across the curriculum tend to conflate the three, rendering them virtually synonymous. We need to complicate and redraw those connections by granting a larger and more varied role for audience, by seeing expertise in explicitly rhetorical terms, and by acknowledging, if not capitalizing on disciplinary "contact zones."

Even as these opportunities can make for an innovative and productive classroom experience, I must admit that the approach raises larger institutional concerns. Negotiating expertise has ramifications that extend well beyond the immediate interdisciplinary classroom, for expertise also has its political and economic dimensions.

Negotiating the Politics and Economics of Expertise

The classroom negotiation of expertise is often framed by larger, admittedly vexed institutional negotiations. In our own case, these negotiations bear on three aspects of the course: its role in fulfilling a writing/communications requirement, its institutional location and funding, and its purpose amid varying curricular agendas.

Because all WAC and WID initiatives, like politics, must be local, efforts to enhance communication across and beyond the engineering curriculum are necessarily driven by local opportunities and constraints. That said, I submit that we all benefit by becoming more aware of how our political and economic negotiations about courses and curricula often rest on differing conceptions of expertise that must themselves be negotiated. Moreover, given the deep bifurcation between domain content and rhetorical process that shapes conceptions of expertise, the negotiation of that expertise in administrative contexts actually bears closely on pedagogical issues within the classroom.

The vast majority of engineering students at my institution fulfill their writing and communication requirement by taking the course I have described above. Its status as a required course may seem to suggest stability and consensus, and highminded institutional commitment, but as I have argued elsewhere, the rhetoric of writing requirements can actually license a variety of competing behaviors, creating in effect a curricular underlife (Norgaard, 1995b). Because the course fulfills a requirement, the specific course objectives can easily become invisible to faculty and students, as each substitutes their own deeply held disciplinary sense of

what constitutes "good writing" and a useful course.   Precisely because ours is a required course, our efforts elicit deeply ingrained (and in this sense unnegotiated) expectations and professional ideologies about the role and nature of writing in engineering. These expectations and ideologies are often not congruent with our own particular efforts in the classroom, or for that matter with the larger and growing recognition, in the academy at large, of the rhetorical nature of technical activity and communication (Winsor, 1996).

We find, then, an inverse law in operation: the greater the institutional endorsement given to a course, however innovative it may be, the less likely that course will be able to escape from preconceived, unnegotiated expectations that spring from that same institutional or disciplinary context. A required course stressing the rhetorical nature of expertise thus faces special obstacles in a disciplinary environment that routinely denies the rhetorical nature of its work. Oddly enough, the merits of our course might become more visible and attractive were it placed in a richer mix of communication opportunities throughout the curriculum—opportunities that our course could then complement. Although our Engineering College has taken a more active interest in communication of late, this one course still bears an undue burden of meeting various, often conflicting expectations.

A further complication has to do with the politics of place. Work in disciplinary contact-zones often does not have a secure institutional home. Consider our own case. As a freestanding unit located outside of the English Department, and with a charge to serve the entire campus, our University Writing Program is not haunted by the ancient ghosts of belletristic writing instruction. But because our institutional location lies outside of Engineering, and our geographical setting puts us a brisk twelve minute walk away from engineering offices and labs, we are nevertheless seen as outsiders. This despite a collaboration with the Engineering College that has lasted well over a decade. Although the faculty teaching the course demonstrate an ongoing interest in engineering issues and are themselves well trained ("experts," even, as nearly half hold Ph.D.s), the specific, rhetorical nature of our expertise further confirms our dislocation.

The economics of expertise, in turn, only magnifies these issues. Our course is funded by the College of Arts and Sciences, as one of many service courses, such as physics, relevant to the engineering curriculum. In instances where the objective of a course lies in the mastery of domain content, such funding relationships can be relatively unproblematic. But when competing expectations of expertise come into play, money and intellectual ownership emerge as contentious issues. Our course, then, has several homes, several masters.

Given these constraints, when the Engineering College approached me to develop a writing and communication course in 1987, I opted to see in those constraints a particular advantage. That is, the course we are in the best position to offer would encourage students to look beyond their home turf as they negotiate expertise in disciplinary "contact zones." Yet the geographic metaphors are apt, and inescapable. Expertise has a spatial dimension, made all the more concrete by disciplinary boundaries and professional gatekeeping activities.

A third area of negotiation concerns course ownership amid competing curricular agendas. Although the course is funded through the College of Arts and Sciences, only roughly 15 percent of our enrollment comes from students in the natural and biological sciences. By contrast, fully 85 percent of our students study engineering. Thus, it is quite reasonable, even appropriate, that the Engineering College considers the course in some sense to be its own, an attitude I by no means discourage. And yet for a course serving so many constituencies, and subject to so many competing definitions of expertise (disciplinary and rhetorical), negotiations about ownership are inevitable, at times testy, but often productive in quite unexpected ways.

The informal negotiations are interesting in that the engineering faculty themselves are divided over our course. Roughly a third appreciate our interest in what Miller (1979) terms "the humanistic rationale for technical writing," to quote the title of what is probably the most often cited article in the field. By understanding that science and engineering require participation in a community, "good technical writing becomes, rather than the revelation of absolute reality, a persuasive version of experience" (p. 616). Two factors conspire against this view: the dominant positivist perspective of science and what Miller calls a "windowpane theory of language" that has essentially turned technical writing into a task of simple transmission of given information. Another third of the faculty, often quite vocal, would prefer that students take a more traditional technical communication course, informed in large measure by that windowpane theory. The course for which this second group of faculty is lobbying would seek to provide students with an "algorithm" for producing various kinds of documents. The remaining third of our faculty, given the research orientation of our institution, frankly don't give a damn.

The interest expressed by this second group of faculty in specific forms of writing has prompted us of late to accord even more attention to genre. But we are doing so in ways that use formal structural features as a means to discuss the social dimension of genre, where various genres represent "typified rhetorical actions based in recurrent situations" (Miller, 1984, p. 159). In so doing, we have tried to equip students with an ability to communicate in their technical classes while still maintaining our rhe-

torical focus. Thus, ongoing negotiations of our expertise have led to ongoing modifications of the course.

These three facets of the political and economic negotiations surrounding the course, far from being extraneous to our pedagogy, actually duplicate in uncanny ways our concern with negotiating expertise. The challenges I have discussed, especially at the administrative and curricular levels, offer instantiations of precisely those concerns that the course is attempting to address in the classroom. That is, the need to help students negotiate expertise is only confirmed by the very negotiations that accompany our rhetorically motivated course. The need for all of us to foster such negotiations finds immediate exigency in the new standards adopted by the Accreditation Board for Engineering and Technology, known informally as "ABET 2000" or "Engineering Criteria 2000."

The Rhetorical Dimensions of ABET 2000

As the national agency monitoring, evaluating, and certifying engineering programs, the Accreditation Board for Engineering and Technology (ABET) has recently changed its evaluation criteria in rather radical ways (Peterson, 1997). The nature of these new criteria make even stronger the case that we should seek out or create opportunities to negotiate expertise.

The accreditation mechanism that was in place for many years assessed expertise in terms of narrow disciplinary content, seat-time, and credit hours. That is, the old criteria consisted of lists of required courses, rather rigid frameworks on where to place and how to count various courses, details about specific topics students should study, and guidelines on the specific educational experiences they should have. This approach led some engineering faculty and administrators to complain that ABET was often too busy counting beans and not flexible enough to understand how programs might meet desired goals in less conventional ways.

In its new criteria, "ABET 2000," the organization has shifted its focus to assessing outcomes and competencies, determined individually by each program or institution, that often cut across the usual disciplinary and curricular boundaries. This outcomes-based approach has three major components, requiring each individual program and institution to have: (1) educational objectives consistent with its unique mission, the needs of its various constituencies, and *Engineering Criteria 2000's* specifications; (2) an assessment process that demonstrates these educational objectives and their associated outcomes are being achieved; and (3) a system of evaluation that shows a commitment to continuous improvement. (Aldridge & Benefield, 1998, p. 22)

A significant departure from the previous accreditation mechanism, the new criteria give administrators and educators considerable freedom in determining how to satisfy these requirements. That freedom can be unsettling, and for good reason. What counts as expertise and how we count that expertise are both up for grabs. Although surely not an intention of its framers, ABET 2000 can be read as an implicit opportunity to refigure and contextualize expertise. ABET 2000 has us looking beyond curricular models that stress 'expertise as content mastery' in order to encourage curricular opportunities and assessment mechanisms that stress 'expertise as activity-based competency'.

Given this implicit opportunity to refigure expertise, the role accorded to communication skills in ABET 2000 becomes more significant than it may seem at first glance. ABET stipulates that engineering programs must demonstrate that their graduates meet eleven different outcomes goals, of which (predictably enough) "an ability to communicate effectively" is one. Yet in addition to the requisite mention of communication skills, attention to language plays a potentially significant role in most of the outcomes listed, from "an ability to function on multi-disciplinary teams" to "an understanding of professional and ethical responsibility." Thus, the reach and impact of ABET 2000 on communication skills might complement the otherwise isolated technical communication course or specific WAC/WID initiatives. Not only do communication skills have a potentially large role under these new criteria, they also have potentially fresh relevance to traditional conceptions of expertise, usually seen as mastery of domain content. As such, ABET 2000 offers a welcome if rather challenging opportunity to reconcile what Geisler (1994) observed as the traditional bifurcation between domain content and rhetorical process.

ABET 2000 adds, then, a rich (if rather covert) rhetorical dimension to what had previously been an exercise in bean counting. This rhetorical dimension may become increasingly evident on two fronts: as administrators and educators negotiate educational objectives and assessment procedures, and as students themselves encounter an educational experience that resists easy compartmentalization.

For administrators and educators, setting objectives and settling on assessment mechanisms require that they themselves *negotiate expertise*, in so far as they must understand and reconcile the needs and interests of various constituencies and stakeholders. To my mind, the enduring contribution of ABET 2000 will be precisely this conversation. The potential danger, of course, is that this conversation remains insular. Given that administrators and faculty within an engineering program are free to set objectives and determine assessment mechanisms, there remains the possibility that educators elsewhere on campus who play a vital role in engineering education, but who are nevertheless positioned beyond

engineering's traditional disciplinary and organizational boundaries, will fail to have a voice. On many campuses these educators are likely to include those who take an interest in the rhetorical and communication skills of engineering students. If ABET 2000 offers the prospect of bridging the divide between expertise and literacy, between domain content and rhetorical process, meeting that promise depends on both the quality and the breadth of our conversations.

For students, ABET 2000 offers the prospect of an engineering education that is also a rhetorical education. Because the eleven educational outcomes developed by ABET cut across disciplinary and organizational lines, and so thoroughly involve rhetorical and communication skills, students themselves might be more prone to apply and negotiate their expertise within a variety of curricular frameworks and to suit a variety of educational and professional purposes. In other words, students themselves will ideally become more sensitive to the rhetorical dimensions of engineering expertise and workplace practice. Students may be encouraged to function as both engineers *and* rhetors, without the sense of incongruity that can easily haunt them now. The chief impediments they are likely to encounter are traditional curricula and pedagogies that drive a wedge between these intertwined identities.

Given the sea change in engineering education that ABET 2000 potentially represents, it becomes all the more opportune to use the negotiation of expertise in disciplinary contact zones to curricular advantage.

Concluding Observations

As we look well beyond any one course, let us recognize that whatever our pedagogy, and whatever curricular model we call upon, the negotiation of expertise can emerge as a common, if knotty, thread connecting all of our efforts. The value for others in the course I teach lies less in any sort of radical innovation than in its willingness to foreground a negotiation that is nascent but often undeveloped in a wide variety of courses. I see considerable value in addressing that negotiation more directly and with greater self-reflection. Here we might take a page from curricular discussions in the humanities, where educators have benefitted from debating how they might "teach the conflicts" (Graff, 1992). We and our students might benefit from "teaching the negotiations."

In place of a conclusion, let me offer, then, the following observations that bear on the work of at least three groups: teaching faculty in engineering and composition/rhetoric; WAC directors, chairs, and deans; and WAC researchers:

- We would do well to have the rhetorical negotiation of expertise emerge as a central concern for us all; such a

concern might well offer focus and common ground to a variety of ongoing pedagogical and curricular efforts.

- The approach is by no means tied to one kind of model course; to the contrary, it lends itself to nuanced and varied application in the classroom, and throughout the curriculum.
- The approach is timely, given the highly negotiated, multidisciplinary nature of ABET 2000.
- The approach suggests an important research agenda, in that "interface discourse" or "boundary discourse," so important to professional and civic life, is only now beginning to be recognized and explored.
- Finally, and perhaps most importantly, the approach doesn't overlay communication skills onto engineering, but rather seeks to draw out, in the negotiation of expertise, the rhetorical dimension inherent in engineering practice.

If we are to realize the prospect of rhetoric in writing across the curriculum (Norgaard, 1997b), we must foreground in engineering education and in professional workplace practice those moments and activities that have us connect what we have long bifurcated: domain content and rhetorical process. By grounding our efforts in the actual ways we negotiate, and thus rhetoricize, our expertise in our daily engagements with audiences and each other, we have every chance of improving both engineering *and* rhetorical education.

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