DOCUMENT RESUME

ED 333 460 CS 212 908

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TITLE Composition and Professional Education: A Case Study of an Engineering Student.
PUB DATE 23 Mar 91
NOTE 12p.; Paper presented at the Annual Meeting of the Conference on College Composition and Communication (42nd, Boston, MA, March 21-23, 1991).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Case Studies; Higher Education; Professional Education; Rhetorical Theory; Teacher Role; *Technical Writing; *Writing Attitudes; *Writing Instruction; Writing Research; Writing Teachers
IDENTIFIERS Academic Discourse Communities; Syracuse University NY

ABSTRACT

A case study of a senior in mechanical engineering was undertaken to test the hypothesis that rhetorical theory can help students make sense of specialized discourse. The essay the subject finally produced concerning the rhetorical features in a technical engineering paper extended the claim she made at the beginning of the study: the text of the engineering report was devoid of rhetorical nuance--to an outsider it was opaque, and to an insider it was transparent. The subject already had a detailed knowledge of the social context in which the technical paper was written: her problem came in trying to write about her profession to nonspecialists. The subject never took up the rhetorical approach to language advocated by the instructor. What she did do, though, was explore how to represent her intellectual experience to outsiders. To the extent that students at the sophomore level or higher are "advantaged" writers (demonstrating competence in very limited writing assignments in their major), the advantage of a general writing course is difficult for them to see. It is up to composition teachers to help them find that value, and to do so, teachers need to immerse themselves in students' academic experience, seen from their own point of view, and to entice them to extend their intellectual projects to the point where they confront challenges of literacy. (RS)

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Composition and Professional Education: A Case Study of an Engineering Student

For those of us who have spent most of our careers teaching students who are obviously not advantaged, the experience of teaching those who are may pose troubling questions, some of which Lee and John have already explored. What do we in composition have to teach students who already regard themselves as competent writers? Whose definition of competence counts in writing class? And what does it mean to design a course around the needs of students when students may not agree they have needs, or when their perception of them differs from ours?

These are questions I posed myself when I came to teach at Syracuse, a medium-sized private university known for high tuition, successful athletic teams, and heavy emphasis on professional education. Students in professional programs present characteristic problems of the advantaged student in somewhat specialized form. Our students' goals--professional competence and credentials--encompass writing only in its most utilitarian aspect; most of their courses require very little writing at all. Why, then, should they be required to take writing classes at sophomore and junior levels, as most of them

are--and what can they gain from these courses that will be of any use to them?

This was one of the questions I addressed last spring, when I undertook a case study of a student in my sophomore writing class. The subject of the study, Heather Pollard, was a senior in mechanical engineering: writing courses were a low priority for her, and she'd postponed mine until her last semester in college, in order to concentrate on her professional curriculum. "Engineers are very highly programmed," she explained. I soon got a taste of what kind of programming she meant. When I asked students to bring in texts from their major fields of study, whose discourses my writing class was supposed to introduce them to, Heather produced a research report: "A Modeling Study of Metal Cutting With Abrasive Waterjets"--about a tool that blasts water and garnet chips through a thin nozzle to make very precise cuts in titanium and steel.

In undertaking my case study, I had hypothesized that the premise of my course--that rhetorical theory can help students make sense of specialized discourse--conflicted with the strongly utilitarian view of writing that students learned in professional schools. Heather, I anticipated, would pose an excellent test for this hypothesis. From the dubious shrug she gave when she handed me a copy of the article, and from the density of terms like "mixing nozzle parameters" and "hydrodynamic forces" in the summary she'd written, I guessed she realized that her skills of reading and writing had already led into realms of language where

her classmates and I would have a hard time following. I couldn't think of anyone less likely to be intrigued by the speculative approach to language I planned to teach than a mechanical engineer who might spend a career figuring out ways to cut titanium.

When we began close reading of students' articles in search of rhetorical features, Heather, as I had expected, argued that the language of engineering studies is factual and not rhetorical, and that there was nothing about it that could possibly relate to discussion in a composition classroom. Dr. Mohamed Hashish, the author of "A Modeling Study," had no need to press a claim or try to persuade his readers; the results of his experiment spoke for themselves. His prose seemed to confirm Heather's judgment. The principles I'd taught the class, which worked so well on less esoteric articles, were useless here. The waterjet experiment, recounted in the passive voice, seems to conduct itself; Hashish as researcher is never mentioned. It was no use looking for allusion in words like "impingement," "wear," or "deformation," which might elsewhere carry powerful resonance. In any case Heather had trained herself, as she put it, to "disregard the style and vocabulary in a piece of writing." It's hard enough just to take in the author's plain meaning, when he concludes his literature review by reporting: "no models were found that incorporate the means by which hydrodynamic and centrifugal forces imparted to the solid particles by the carrying fluid affect the cutting mechanism and volume removal

rate." There are no commas in that sentence. It would take Heather an entire evening to read through an article like this one--twelve pages long.

Could I ask her to read into a text something she thought wasn't there? She'd already warned me not to expect to teach her to be "creative"--others had tried. She even showed me one of her "failures" from another writing class which demonstrated precisely the problem I feared might arise in my own. Asked to compose a reflective essay, she had objected she had nothing to reflect on: the only subject she could think of was whether someone could be taught to write. What she wrote on this subject was not reflective in tone, but doggedly logical, and ended with a direct question--"What do <u>you</u> think?" The teacher who assigned the paper had advised her it was bad strategy to end a reflective essay in direct address to a reader. It didn't occur to him that she might have expected an answer. Apart from commending her perspicuity and giving the essay a high grade, his only reaction t· the fact that she had posed a question important to our profession was to have her stay after class, to find out if she thought she was too advanced to take his course. I asked if she had been surprised or crestfallen, but she said this response was exactly what she'd expected--he was the Writing Prof., and she the student.

Now I was in danger of falling into the same trap: failing to see the problem Heather had posed from her point of view. How was I to induce her to see the rhetorical aspect that she claimed

didn't exist in Hashish's paper? I had had no experience teaching rhetoric to engineers. I approached "A Modeling Study" as an outsider, with no conception of how an engineer might read it. To my eyes, the language of the waterjet study was tortured, and I did not try to disguise from her how strange and difficult I found it. My comments, I fear, fit in only too well with her idea of what a Writing Prof. would expect her to say about an engineering report. The essay she finally produced worked out and extended the very claim she'd made during our first discussion, that Hashish's text is devoid of rhetorical nuance in two quite different respects: to an outsider it is opaque, and to an insider, transparent.

Ironically, if she had taken my course when she was supposed to, this would have been a useful conclusion for her to reach. She wouldn't have read many research reports, if she'd read any at all; to describe one in detail from two different perspectives would have helped her develop strategies for reading them on her own more easily. This, in fact, was the experience of most of the students in the class. If I had chosen someone other than Heather as subject for my case study, I could have told you now that teaching advantaged students, at least the sophomores at Syracuse, involves a fairly simple negotiation: they write about something that matters to them, and I teach them something they can apply to what matters to them. The students give purpose to the class not by admitting a need but by asserting an intellectual commitment, and though they develop competence as

the course progresses, what they gain directly from me is not competence, but new perspective.

Heather, though, hadn't come away with any new perspective. Reviewing her drafts, I tried to reconstruct how she had worked through the project. Hoping to understand the context in which she read Hashish's report, I asked her how she had become interested in engineering. Her answer helped me to understand why it had been so difficult for her to find personal meaning in the idea of disciplinary rhetoric. She claimed her choice of career rested simply on her aptitude for math and science and her hopeless incompetence in nontechnical subjects, but what she actually said about her education suggested quite different reasons. Teachers in the humanities in her high school, she said, came across as remote, discouraged, and unenthusiastic, while math and science teachers were energetic and attentive to students. In college, she'd first majored in biology, and switched after she realized that the best a biologist without a Ph.D. could look forward to was to be a lab assistant for someone else's research project, or worse still, as she said, to find herself "stuck in teaching." Her decision, then, to go into a profession in which the social ramifications of language are discounted, was itself grounded in a complex social understanding which was far from objective or dispassionate, the very kind of social understanding whose traces I had been trying to get students to look for in their articles. Now, as an insider, she had refined that understanding by working with engineers,

listening to their speeches and making speeches of her own, assisting at demonstrations, and even co-authoring research reports. Heather was not only conversant with engineering texts, she also had a very detailed knowledge of their social context: what I was asking her to infer from Hashish's article couldn't be inference at all, because she already knew the things she was supposed to be inferring.

What did I teach her in that unit on rhetorical analysis, and in our work together on the case study? She never took up the rhetorical approach to language I'd hoped to impart--she had no use for it, in the very crude and general form in which I'd presented it to sophomores. What she did do, though, was explore how to represent her intellectual experience to outsiders--her classmates and me. She had told me, when I first asked her permission to do the case study, that she hoped it would contribute to a better understanding by writing teachers of, in her phrase, "us science nuts." Despite her skepticism about the rhetorical analysis project, she had welcomed the chance to write about engineering for nonspecialists: because of her concentration on professional studies, and because she lived off campus, she felt somewhat isolated from "normal students." Writing about engineering for nonengineers, as she expected, turned out to be quite difficult to do, and the difficulty of the project helped both of us see its appropriateness to a composition course. Later, when I taught advanced composition to junior-level students, I recognized this as a characteristic

problem of literacy for students sufficiently immersed in professional education that they are beginning to lose touch with the selves they were before they began. I wish now that I had been experienced enough to lead Heather more quickly and methodically to confront the problem of how to explain professional knowledge to a lay audience.

I also wish I had taken a somewhat different approach to teaching rhetoric. If, knowing what I know now, I had the rhetorical analysis project to do over again, I would ask Heather to focus her analysis on Hashish's main claim to fellow-engineers: his mathematical model. The relationship between a model and reality is a kind of argument; I would ask Heather to study how Hashish builds his argument as he develops, explains, and qualifies his model. Heather, I think, would have found this more technical approach to rhetoric stimulating, and highly relevant to her professional training. She had, after all, coauthored several studies in engineering, and she was toying with the thought of going to graduate school. It was easy to imagine her someday constructing and arguing for her own mathematical model.

Did I learn anything from my case study of Heather that would help solve the problem of teaching composition to advantaged students? It seems to me that if I learned anything, apart from the inadequacy of my own approach to rhetoric, it was about the nature of students' intellectual commitments and their relation to the assumptions of writing classes. I strongly

believe in the value of general upper-division writing classes not linked to disciplines or professional programs, but it seems to me students don't always see the value of these courses. To the extent students at sophomore level and beyond are advantaged, or think of themselves as [illegible]taged, they've already begun to demonstrate competence in [illegible] often very limited writing assignments in their major, and thus the value of a general writing course is difficult for them to see. It's up to us to help them find that value, and to do so, we need to immerse ourselves in students' academic experience, seen from their own point of view, and to entice them to extend their intellectual projects to the point where they confront challenges of literacy that we can help them with.

The term "advantaged," it seems to me, designates a group of students who pose a special challenge because they have already received some of the goods that education promises, and may therefore be more likely to wonder if they have any need of what we can still offer them. Heather, for example, told me and her previous writing instructor that the mood of the reflective essay was beyond her, that there was no way she could be taught to be creative, that she could find no application for rhetorical theory, and that it would be very difficult for her to write intelligibly or interestingly about engineering for a lay audience. Skepticism of this order is a very wearing thing for a composition teacher to have to deal with, and I can testify from personal experience that as much as I approve, in principle, of

critical thinking by students, over the long haul it can be a very wearisome business when the subject of it is one's own pedagogy. It took me a great deal of time, trouble, and frustration to begin to understand how what I knew about language could extend what Heather knew about engineering. The challenge I faced in Heather's case, I think, is characteristic of a challenge that advantaged students often present. It may be that as we meet this challenge, we'll find our curricula and our profession subtly redirected, centered not on our students' needs and deficiencies but on a broader vision of their whole educational enterprise as they themselves conceive it. Writing, after all, embodies not only skills and knowledge, but also aspiration--the thing that skills and knowledge are for: in Heather's case, a longing for the autonomy, authority, and financial security offered by a professional career. To teach writing, as I see it, is to abet aspirations like Heather's, and in order to abet them intelligently, we need to focus our ingenuity, not on the easy question--what do we know how to teach--but on the hard question, the perennially vexing question: what is the connection between what we know how to teach and what our students come to college hoping to learn?