Poetry Lessons

Bridging the chasm between the sciences and the humanities

By IVARS PETERSON

The room echoed with the familiar sounds of a first day of class: nervous coughs, creaking chairs, shuffling feet, scratching pens and crackling notebook pages. Unspoken questions hung in the air: What am I doing here? How will I stack up against the others? What does the professor expect? How much time will this take?

But this was no ordinary class. The 14 students who gathered during the summer of 1988 to ponder the words and wherefores of Chaucer and Wordsworth were all science or engineering professors at Cornell University. They had interrupted their research to accept an invitation to participate in an unusual experiment billed as "an interesting week of poetry."

The experiment served as an extension of a research project designed to elucidate what makes science difficult for neophytes and why students abandon science for other disciplines. Initiated by political scientist Sheila Tobias, a visiting scholar at the University of Arizona in Tucson, the ongoing program has involved documenting and analyzing how faculty and graduate students in the humanities and social sciences, acting as "surrogate learners," react to science courses.

In the poetry seminar, the roles were reversed. What might educators learn about teaching if scientists and engineers encountered a challenging subject in the humanities? How would science and engineering faculty react to the different norms of research and scholarship in the humanities?

"I started with the hypothesis that the scientist is just as uncomfortable with humanistic studies as the humanist is with scientific study," Tobias says.

Results from the Cornell poetry week, described in the September AMERICAN JOURNAL OF PHYSICS and the October ENGLISH EDUCATION, challenge some common assumptions about the differences between the humanities and the sciences. At the same time, the experiment provided useful insights into why physical science and engineering students have difficulty with and often avoid literature courses.

Writing in the AMERICAN JOURNAL OF PHYSICS, Tobias and Lynne S. Abel, associate dean for undergraduate instruction at Cornell's College of Arts and Sciences, conclude: "Perhaps the most important outcome of the seminar was that it stimulated faculty in the sciences to articulate and question what they assume and do as teachers."

For the participants, it was like going back to their college days. They spent the mornings listening to Chaucer expert Winthrop Wetherbee and Wordsworth specialist Stephen Parrish, both members of Cornell's English Department, and discussing the material, which included passages from *The Canterbury Tales* (in Middle English) and a number of Wordsworth's poems.

"I moved a little faster because it was a very compact five-day session," Parrish says, "but I presented about the same material that I would have presented to English majors — juniors or seniors."

The students had reading assignments and had to prepare and submit three short papers for grading. They also kept notes on what they noticed about the teaching style, what they enjoyed doing, what caused them difficulty and what they discovered about the humanities.

Everyone noticed the central role of words, especially spoken words. Unlike science and engineering instructors, these lecturers just talked. They wrote very little on the blackboard. They used no diagrams, no equations, no tables, not even lists of key words or concepts. Class discussions followed unpredictable courses.

"When we give a [physics or engineering] course to a comparable level of students, most of the time we're at the blackboard deriving something or analyzing a problem with lots of equations and diagrams," says physicist Douglas B. Fitchen, who helped organize the seminar and then participated as a student. "Here, we would have these 1½-hour seminar sessions with a professor who just sat in his chair the whole time and talked, making a lucid presentation of all kinds of context and connections. It was impressive."

Most participants felt obliged to take notes. Physicist Richard S. Galik, for one, found note-taking a useful exercise for keeping track of important ideas and as a way of imposing a structure on subject matter that appeared to have little form.

"In physics, it's hard to keep all the steps straight in your mind," Galik says. "It helps to have them on a page of your notebook, on a textbook page or on the blackboard."

Late on the first day, when one of the instructors finally did write something on the blackboard, the class cheered.

Initially, the scientists and engineers approached this foreign terrain with wariness. "They seemed bewildered at first by the variety of responses you can make to a poem," Parrish says. "It isn't like using a formula. You can look in various places for the essential statement a poem makes, or you can be persuaded that it doesn't make a statement at all or that it makes contradictory statements."

The apparent lack of focus and the absence of clear-cut answers proved frustrating for some participants, who felt rudderless on an unfamiliar sea of words.

For many, the moment that brought back the most vivid memories of their school days came when they confronted a blank sheet of paper and began writing the first essay. All the participants expressed some misgivings about that assignment.

"You knew something was due tomorrow, but you didn't know quite what it was supposed to be about," says organic chemist Jon Clardy. "It was unsettlingly vague."

Writing the essays also proved time-consuming. "It was one heck of a lot of work," says engineer Christopher K. Ober. "It was impossible to sit back and simply knock off a composition. You actually had to sit there and think about it."

The participants appreciated the time and effort their instructors spent evaluating the papers. There were no answer keys available in a textbook, no "ideal" essay posted for all to see.

"I asked them to write two papers — both quite short," Parrish says. "The first one they did was pretty clumsy and mechanical, but all of them wrote very, very good second papers, and I could see that they learned rapidly from my comments on the first paper."

"I was blown away by the amount of time the instructors spent reading the essays — the detailed comments they made," Clardy says. "When you grade science papers, you tend to

just circle right answers or make Xs, trying to get some sense of whether the students were following a correct process."

In general, the scientists and engineers caught on quickly and seemed to become quite comfortable with both the subject and the scholarly techniques used in studying it. "Our hypothesis that the foreignness of literary analysis would interfere with scientists' appreciation of the humanities turned out to be unfounded," Tobias and Abel conclude.

"They were astonishingly conscientious about their homework, admirably attentive in class and very willing to take on such extra assignments as learning to read Chaucer aloud," Wetherbee says. "All in all, it was one of the most enjoyable classes I've ever worked with."

Indeed, the students coped well with the ambiguities and uncertainties inherent in literary analysis. "They noticed, before we did, that the search for 'layers of meaning' was not unlike what they have to do in science, not at the undergraduate course level, but in graduate school and, above all, in research," Tobias and Abel write in the AMERICAN JOURNAL OF PHYSICS.

"This seems to be very different from the way we teach science and engineering, especially to undergraduates, but this is not so different from the way we do research," says applied mathematician Philip J. Holmes, a seminar participant who also happens to be a published poet. "We are often floundering around in the dark. We really don't know what the important points are. We really don't know exactly what to look for."

Most participants agreed that taking some humanities courses might help science students develop the kind of intellectual flexibility useful for scientific research, especially the ability to notice patterns and trends and to make decisions about which data are important and which are not. "It's a wonderful complement to the standard way of teaching science," Holmes says.

"The [scientific] research faculty is well aware of the fact that the laws we present to the students are merely successive approximations to the truth," Galik adds. However, the problem remains that to reach the frontiers of research, science and engineering students must build up a strong mathematical foundation and a store of basic knowledge crucial for understanding physical systems.

"Whereas building up a basic competence [in science] takes a long time because everything is connected in a tightly woven structure, you can get quite far in appreciating a poem because it's relatively short, discrete and sits by itself on a page," Holmes remarks. "There's much less baggage required."

Nearly everyone ended up enjoying the seminar. "It made me remember the literature courses that I had enjoyed so much in my college days," says Mary Sansalone, who had started as an English literature major before turning to engineering. "I wish I had more time to pursue that kind of thing."

"As an undergraduate I avoided such things as much as possible," Ober says. "The seminar brought back my old frustrations and feelings of inadequacy. Nevertheless, it was a wonderful experience."

"It was fun," Fitchen says. "It was the kind of fun that we should have our engineering and science students more exposed to than they typically are."

Chemist John McMurry, author of several textbooks, was one of the exceptions. "I can't say that I enjoyed it," he says. "What I found is that I was never particularly good at this sort of thing in college, and I'm not particularly good at it now. I just don't like thinking in vague terms. I like working in concrete terms where there's an answer and not just an opinion."

The seminar did prompt many participants to think about the way they teach their own courses and the advice they give their students concerning studies in the humanities. Several noted subtle changes in their teaching styles after the experiment.

"Since being in that course, I find in my lectures I still do a lot of writing on the blackboard, but I do more chitchat now," Holmes says. "I try to be more verbal with the class. I try to paint a little bit of a picture, provide a little bit of background for what I am doing on the blackboard."

Galik reports a similar response. "I tend to speak more and write less than I used to. I let the textbook and the homework assignments do much more of the formula writing now," he says.

"[The seminar] made me realize how much that kind of presentation and that style is missing in the ways that we teach engineering," Sansalone says. "We need to change the way we teach engineering to make it an enjoyable experience for students and not just something they have to suffer through."

The week held some lessons for the poetry professors as well. Wetherbee was particularly impressed by the concern his students showed for precise, "hard" knowledge.

"I came away from all this with a recognition of how easily a conversation about poetry can come to seem arbitrary or slapdash to somebody not really attuned to looking at language in a 'literary' way," he says. "I have since done a certain amount to clean up my act in this respect, working to be more precisely informative about social and linguistic history, more discreet in using lit-crit language and more scrupulous about defining my terms as I go."

But Wetherbee also warns that the age difference between these special students and typical undergraduates may limit the experiment's applicability to teaching in the humanities. "It seems to me... that where scientific information of an objective kind is in question, all beginners are pretty much on the same footing, whether they are 19 or 45," he says. "But in the case of literature, the difference between 19 and 45 fundamentally affects a reader's approach to the material."

Whereas the faculty-students more readily appreciated the social and psychological situations of Chaucer's characters — whose ages were comparable to their own — they were in some ways less flexible than a junior-year class would have been in adapting to the peculiar demands of literary study, such as constructing an argument to support a particular viewpoint, Wetherbee says. Thus, lessons learned about pedagogy when science professors study the humanities may not be as relevant to Tobias' study as lessons learned when humanities professors study science.

What did the participants learn about scholarship in the humanities?

"I'm concerned that people incorrectly think of the humanities as cultural fluff rather than as a way of understanding the real world, the way science is," Abel says. "I was hoping to dispel some of that. I'm not sure we did."

"I think the rigor and sophistication came through," Tobias says. "What didn't come through is whether there is any truth in the humanities."

Nonetheless, it was a valuable experience for the participants, Wetherbee says. "It is very salutary for scientists to be teased, even baited, by having to try to engage the elusive kinds of knowledge accessible through imaginative literature," he maintains.

The experiment as a whole could serve as a model for increasing interaction among faculty members in diverse disciplines. "It has always struck me that our students are having a more interdisciplinary experience than we are," Tobias says. "It's a natural activity for a faculty day or weekend... to stir the pot and get faculty to talk about core curricula."

Adds Parrish, "I wouldn't mind sitting at the feet of some scientists to see how they live." □