

A MODEL FOR INTEGRATING FIRST-YEAR COMPOSITION COURSES WITH ENGINEERING CURRICULUM

John R. Chandler¹, A. Dean Fontenot², Marion O. Hagler³

Abstract—This paper describes the development, pilot offering, and initial assessment of a first-year composition course, *Essentials of College Rhetoric*, specifically designed to provide students entering engineering programs at Texas Tech University with the critical reading and writing skills and rhetorical strategies traditionally taught in first-year composition. However, this course differs from traditional composition courses in that it shares curriculum and assignments with the introductory electrical engineering course, *Introduction to Engineering and Computer Programming*, and not only underscores the role of engineers as writers in the workplace by teaching documentation conventions common to engineering practice, but also requires students to think and write critically about ethical, political, and other issues that shape the role of engineering in our culture.

INTRODUCTION

The initial concept for developing a first-year writing course that incorporated disciplinary-specific writing topics and documentation conventions was an outcome of a series of meetings between program administrators from the Texas Tech University (TTU) English department, including the Director of Composition, Dr. Fred Kemp, and the Director of the Technical Communication Program, Dr. Carolyn Rude, and administrators from the Dean's office of the TTU College of Engineering, including Senior Associate Dean of Research, Dr. Marion Hagler, Managing Director of the Southwestern Bell Communications Community of Learners Educators And Researchers (SBC CLEAR) project, Dr. A. Dean Fontenot, and Director of Technical Communication for the college, Dr. John Chandler. These meetings are part of an ongoing collaboration ultimately aimed at improving student writing through a number of strategies, including:

1. providing professional development opportunities for public school teachers involving practical application of process-based writing pedagogy,

2. developing collaborative curriculum that teams technical communication students from the English department with engineering students to manage and document shared projects, and
3. creating sections of first-year composition courses with disciplinary-specific content and documentation conventions.

This paper describes the design and results of a pilot course taught by Dr. John Chandler in the Fall 2000 semester to examine the viability of the third strategy mentioned above for improving student writing. A primary design criterion was that the course be designed to provide a framework that would allow instructors from disciplinary areas outside of the English department to develop content for other, similar first-year composition courses grounded in conventions and topics reflecting the discursive practices of their own disciplines.

The writing course also was developed to meet all the requirements of the accredited first-year composition course in the inventory of the TTU English department, and is based upon the departmental syllabus [1], which incorporates prevailing composition theory and pedagogy by engaging the students in such collaborative exercises as online peer review and group invention strategies [2]. However, the content of the course and the topics of the writing assignments shared a significant number of curriculum elements and learning goals with the introductory course for electrical engineering students, *Introduction to Engineering and Computer Programming* [3]. The pilot offering of the course was open only to students also enrolled in a section of this electrical engineering course.

OVERVIEW OF THE COURSE

Shared curriculum elements between the courses include the texts *Soul of a New Machine*, by Pulitzer Prize winner Tracy Kidder [4], and *Dealers of Lightning: Xerox PARC and the Dawn of the Computer Age*, by Michael Hiltzik [5]. Some of

¹ John R. Chandler, Texas Tech University, College of Engineering, Box 43103, Lubbock, TX 79409 john.chandler@coe.ttu.edu

² A. Dean Fontenot, Texas Tech University, College of Engineering, Box 43103, Lubbock, TX 79409 dean.fontenot@coe.ttu.edu

³ Marion O. Hagler, Mississippi State University, Electrical and Computer Engineering, Box 9571 Mississippi State, MS 39762 hagler@ece.msstate.edu

the writing assignments that draw from these texts are specifically designed to allow students to more fully assess and articulate professional issues that are introduced in the engineering course [5,6,7,8]. Other writing assignments underscore documentation conventions of engineering practice by requiring students to document various elements of their engineering homework assignments as a means to help them think critically about not only writing as a process, but also the processes they employ to resolve actual engineering problems. The overarching aim of this course is to improve the writing of engineering students by providing them with rhetorical skills and strategies in a context that connects writing to the practice of the disciplinary area they expect to work in after they leave the university.

One of the goals of the course is to provide students with tangible tools and strategies for consciously considering the complex interplay of audience expectations and information needs, writer's purpose, and the logic of the subject matter that shape all discourse. All of the assignments and exercises move the students through a discernable writing process that begins with various invention strategies to develop content for their texts and to generate different perspectives on the topic they are writing about. Students were taught to employ a range of heuristic strategies to explore the writing topic and examine audience expectations, ranging from simple brainstorming to Young, Becker, and Pikes' particle, wave, field approach to invention [9]. Each writing assignment also required the students to engage in a drafting process much like one they can expect to find in practice, in which successive drafts are refined based upon the review comments of their peers and outside readers. In this case, outside readers were tutors from the TTU Writing Center—each writing assignment required the students to take at least one of their drafts to the Writing Center to get the response of an informed reader. The last element of the process required students to reflect on their experience in producing each essay by writing a self-assessment that described problems they encountered in writing the assignment and a discussion of the strengths and weaknesses of the final text they turned in to be graded.

DISCUSSION OF THE WRITING ASSIGNMENTS

Writing assignments included both the four major essay assignments outlined by the English department syllabus and an additional “conventions of writing in the workplace assignment” that required the students to frame the topic they wrote about in a context they could expect to find as practicing engineers. For example, first essay was an expository essay that required the students to explain and analyze the individual process they each employed in completing a homework assignment from the engineering

course and to describe the project in detail. The corresponding “writing in the workplace assignment” required them to summarize the content of their essay in a PowerPoint presentation, which they presented to the class.

The essay assignments were designed to engage students “gradually from a largely intuitive narrative/descriptive form of writing into a self-conscious, methodically rigorous way of presenting ideas” [10]. As they progressed through each successive assignment, the students were required to move from egocentric observations, characteristic of much first-year student writing, to identifying specific issues and then problematizing these issues by examining various possible, and often conflicting perspectives regarding the particular issue. The final essay assignment asks them to develop a disciplined argument in which they define and contextualize a problem taken from one of the course texts, identify potential solutions to the problem, and then take a position supporting one solution as the best resolution to the problem. This progression moves the students from the open-form personal essays that are the mainstays of much K-12 writing curriculum to the closed-form academic essays and practitioner documents that they will be expected to produce in college and in practice.

This progression of assignments is intended not only to require the students to think critically about various aspects of engineering practice, but also to require them to think critically about the writing process they use to codify their ideas and observations. The first essay asks the students to consider the factors that shape the process they employ in resolving an engineering problem. The second assignment has the students examine various factors that shape the roles of engineers in our culture. The third requires them to analyze the elements of a management problem from one of the texts and then discuss possible solutions that might resolve the problem. The final essay builds on the third by asking the students to make recommendations for resolving a particular problem and defend this position in a well-considered argument.

This progression of assignments is also intended to help students to develop strategies and habits of thought for critically examining issues and ideas. Each of the assignments is explicitly geared to helping students developing critical thinking and problem solving skills by moving them through a critical process that includes the following elements:

Contextualizing the Problem: The student identifies the factors, or constituent elements, that shape and define

the boundaries of the problem or issue under consideration.

Developing Perspectives Regarding the Problem: The student identifies a range of possible, alternative solutions or points of view for resolving the problem or looking at the idea.

Identifying the Most Reasonable Solution: Based upon how the student contextualizes the problem and develops perspectives regarding the issue, this stage of the sequence requires him or her to select the solution or position that seems most reasonable. Note: this does not mean finding “the” definitive solution or position—hopefully, the students are beginning to realize that there is never one solution or way of understanding any problem or idea, and that arriving at the solution or position that seems most reasonable is primarily a function of how the issue at hand has been contextualized.

Recognizing Underlying Assumptions. This step is the key to understanding (or making) an argument, because how a problem is contextualized (and why one perspective seems more reasonable than another within this framework) is based upon certain assumptions, and these assumptions reflect belief structures. Another way of describing the process of identifying the most reasonable solution or position would be selecting one perspective over other possible points of view and giving reasons why the one selected is better. Underlying this process of making a claim and supporting it (with reasons) are certain assumptions—both on the part of the person making the claim and those he or she is trying to convince. For example, to argue that some course of action is the most appropriate because it is the cheapest, assumes that cost is the most important factor to the audience.

ASSESSMENT OF THE INITIAL OFFERING

Teaching this course was a valuable and rewarding experience. The framework for the writing assignments used in this pilot course extends the already theoretically and pedagogically sound syllabus currently used by the TTU English department by providing a model for incorporating discipline-specific content, discursive practices, and documentation conventions into first-year writing curriculum.

In an exit survey, all of the students reported that this course was more beneficial than other writing courses they had taken previously, and that they felt had a better understanding of what engineers do in practice because of

the course. The reasons most often cited for this response was that the focus on engineering issues made the course more interesting, and the students perceived a real benefit to learning the conventions of writing in the engineering workplace, because they recognized that these would be the kinds of documents they would be expected to produce as practitioners. Of course, these results are purely anecdotal, but they suggest an area for future research that examines the quality of student writing and the strategies employed by students enrolled in this kind of course in comparison to students enrolled in other, more traditional, first-year writing courses. The results of such research would make an important contribution to composition theory and pedagogy; however, such a study would present a challenge in developing reliable methodology and evaluation metrics.

One of the most encouraging results of the exit survey was the fact that students felt that writing about their own discipline made the course more interesting. It has long been recognized that writing improves through practice, and that getting students engaged in writing is difficult. Perhaps the real benefit of this course is that it provides a model for writing instruction that students find interesting, and that by being interested in the topics, they will be more apt to consciously engage in writing activities.

REFERENCES

- [1] <http://english.ttu.edu/kemp/classes/syllabus/syllabus.asp?course=1301>
- [2] Fontenot, A. Dean and John Chandler, “Writing in Cyberspace: Using Networked Computers, the Internet, and the World Wide Web as Writing Spaces in the Classroom and the Workplace,” Society for Technical Communication Annual Conference, May 1996.
- [3] Kidder, Tracy, *The Soul of a New Machine*, Avon Books, New York, 1982.
- [4] Hiltzik, Michael, *Dealers of Lightning: Xerox PARC and the Dawn of the Computer Age*, HarperCollins, New York, 1999
- [5] Fontenot, A. Dean, Marion O. Hagler, and John R. Chandler, “Learning Outside the Classroom—On Campus and Beyond,” Proc. 2000 International Training in Higher Education Conference
- [6] Chandler, John R., A. Dean Fontenot, Marion O. Hagler and William M. Marcy “Why the Distinction between On-campus and Distance Learning is Blurring,” Proc. 1999 Frontiers in Education Conference, CD-ROM file \PAPERS\1305.PDF
- [7] Hagler, Marion O., and Marcy, William M., “Strategies for Designing Engineering Courses,” *J. Engr. Educ.* Vol. 88, 1999, pp. 11-13
- [8] <http://aln.coe.ttu.edu/ee1305fall/index.htm>
- [9] Young, Richard, Alton Becker, and Kenneth Pike, *Rhetoric: Discovery and Change*, Harcourt Brace, New York, 1970.
- [10] <http://english.ttu.edu/kemp/classes/assignments/assignmentread.asp?course=1301&designator=4.1&typeof=draft>