

Opportunities for Student Writing in Statistics Courses

by Tom Moore

For the past several years I have been giving students in my statistics courses an opportunity to write. I have done this by assigning them a project with a written final report. The basic assignment has remained stable over this time and it goes something like this: Find a question whose solution requires the collection of some data. Collect the data, analyze the data, and report the results. I ask the students to work in pairs and to make the entire project, including the final report, a collaboration.

When I first began assigning projects I would typically give out the assignment about halfway through the semester and it would read approximately as written above. However, I was motivated to require more structure on the assignment by incidents like the following. A pair of students came to me the day before the final report was due and said, "We're having a little trouble getting the data into Minitab." Over time I realized that the students would be better off if I assigned the project on day one and if I held them accountable to some intermediate deadlines. For example, I require a project proposal at about week 5, a progress report at week 7 or 8, raw data about week 10, an optional first draft at week 13, and the final paper at the end of the semester. Most recently I included oral final presentations the last couple of days of class and, in one case, oral presentations of project proposals.

I don't have to convince this audience of the importance of assigning writing "across the curriculum." But it might be comforting to know that the importance of writing in the teaching of statistics is finding its way into respectable journals and conferences. For example, in the November 1991 *American Statistician* appears the article "Writing as a Component of Statistics Education" by Noreen Radke-Sharpe. Radke-Sharpe lists and then expands upon four advantages of requiring writing in a statistics course:

- it improves writing skills;
- it focuses internalization and conceptualization of material;
- it encourages creativity; and
- it enhances the ability to communicate methods and conclusions. (292)

She also describes assignments besides the project report that can involve writing. Gudmund Iversen of Swarthmore spoke at the 1991 meeting of the American Statistical Association about ways he uses writing in a course called "Statistical Thinking." Although the course is a bit different from our introductory course, he does assign something akin to my project as well as a more expository paper about a statistical issue or application. His short answer for why he assigns writing is that ". . . any writing is good for you" (30). Finally, at next summer's meeting the American Statistical Association is organizing a major invited session on the importance of writing in statistics education.

I assign the project in my course because I want students to see that statistics is more than a textbook subject and because I also want them to experience more fully the activity of doing

statistics, which means a process that starts with a question that leads to a design and the collection of data, but ultimately ends with the communication of conclusions, often as a written report. So I assign the writing because writing is integral to statistics. Writing also, of course, helps the students more fully understand what they have accomplished; students who write good final reports typically also have done the other facets of the study well.

Doing a project is typically much harder work for the student than a typical statistics assignment or even an exam. The student usually experiences frustration with the project from time to time. Despite this, many students rate the project as the high point of the course, the part of the course that was by far the most fun and rewarding.

The main pleasure I gain from assigning these projects is that I learn a lot of facts I wouldn't ordinarily have learned. From student projects I have learned that class sizes since the inception of the 3-2 have, if anything, gone down. I know that the lower floors of Burling really are quantifiably "social floors," especially on Monday and Wednesday evenings. I know that if you are a contestant on the "Price is Right," you'd best avoid sitting in the left-most seat. I know that the home-court advantage for Grinnell's basketball teams exists but is, surprisingly, stronger for the women than for the men. And I know that men think they are better informed on political issues than they are and that women are better informed than they think they are. These are just a few of the tantalizing facts I have learned from student projects; this rich variety of project topics makes them genuinely fun to read.

Works Cited

Iversen, Gudmund R. "Writing Papers in a Statistics Course." 1991 Proceedings of the *Section on Statistical Education--American Statistical Association* (1991):29-32.

Radke-Sharpe, Norean. "Writing as a Component of Statistics Education." *The American Statistician* 45(1991):292-293.