**Cheryl Squair Teaching Notes**

Learning goal:

    In previous iterations of the course, students worked through a lab (third week of semester) that introduced data types (e.g., numeric vs. categorical variables) and graphing skills, along with basic spreadsheet skills. This lab was intended as a review for students to practice summarizing and interpreting data similar to what they would generate later in the semester. It turned out that many of our students had no experience with spreadsheets and were unfamiliar with different data types and graphing. The wide variation in students’ skills meant that the bulk of the lab time was spent helping those students who were new to spreadsheets, rather than completing the data summary and analysis exercises. Students familiar with spreadsheets either waited impatiently for everyone else to catch up and/ or left early. The result was that almost all students did not receive any direct instruction in data analysis and interpretation.

Implementation:

    I hoped to address the wide range of student skills by assigning the tutorials as homework before the lab. I reasoned that this would give students the ability to progress through the tutorials at their own pace. I hoped that students would come to class with a minimum set of spreadsheet skills, thereby allowing us to focus on data summary and interpretation. In order to ensure that students actually made their way through the tutorials, I required them to submit the answers to each of the exercises in each of the tutorials. Additionally, I gave them a simple data set and asked them to summarize the data using the appropriate graph.

    The in-class lab assignment was a case study (Fish as Fertilizer - <http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=470&id=470>). The case study presents a variety of data types. The hope was that the students, with the help of their teaching assistant,  would have enough background knowledge to be able to explore the data presented and to focus on how to interpret the results.

Results:

    The tutorials were excellent for introducing students to basic spreadsheet skills. However, students were still fuzzy on the concepts of data types and summary. Additionally, I thought that by using the case study, and presenting data in context, exploration of the data would be easier and more meaningful. Unfortunately, students focused more on the what they didn’t understand about the content presented, rather than on the data. So while we made gains in student spreadsheet skills, we were still unable to explore data interpretation.

Issues I did not anticipate:

1. Students used software other than Ms Excel or Google docs (e.g., OpenOffice) and some of the formulas did not work and graphics were poorly rendered. Many students gave up and did not attempt the tutorials.
2. Many students left the tutorials until the last minute and were not able to complete them before class. Consequently, we still had many students with poor spreadsheet skills.

Modifications:

    I will make several changes to the implementation of this material next semester.  Many students complained that they did not have enough time to complete the tutorials. Consequently, I will assign Tutorials 1 & 2 as homework during the first week and Tutorials 3 & x as homework in the second week. I will use the tutorials primarily to introduce spreadsheet skills. During the lab, I will scaffold learning of data and graph types with a series of group exercises. Rather than present the case study, I will choose data that is more similar to the kinds of data that the students will generate over the rest of the semester. Finally, I will have the students work through interpretation of results using data sets that can be modified, so that the interpretation will change.