May 7, 2008

Dear Dean Fraden,

This semester we were enrolled in an independent study, the goal of which was to analyze various methods of data representation with the intent of making them as efficient as possible. During the course of the semester we came across one particular example of data representation that provides information in one of the most important areas on campus, the classroom. We examined how data are represented for faculty members who opt to have their students complete the online evaluation forms. As you are considering starting a Teaching and Learning Center on Trinity's campus, we believe that now is an ideal time to review constructively the way in which the feedback from course evaluations is presented to faculty members.

The current format for representing course evaluations for an individual course features a series of demographic questions followed by each student's assessment of his or her performance in the course and then the student's assessment of the professor. This emulates how the questions are asked on the actual course evaluation survey. The data are then presented to the professor in colored pie charts. The pie charts are split into sections based on the students' responses. This presents a problem since pie charts are not a clear form of representation for small data sets (Tufte 2001, 178).

We have enclosed two sheets we offer as alternatives to the current format for representing course evaluation data. Both embody our original goal of clear and concise presentation, as well as the ideas of the authors we cite in our accompanying explanatory text. They also reflect the feedback received from faculty members who tested our first drafts. The first sheet (labeled "Evaluation_greyscale") offers a black-and-white rendition of our proposed data representation. The second sheet (labeled "Evaluation_color") offers a colored version of the same proposal.

It is our pleasure to present the final project for further critique with the hope that it will enlighten our professors and bridge the gap between students and faculty. We hope that our revised course evaluation will not only present clear data, but also demonstrate to students that their answers to these evaluations are taken seriously.

Sincerely,

Sheila McGourty, '08 Devlin Hughes, '09

An explanation

Our new forms feature several tables with distinct characteristics that make them effective for individuals who quickly want to understand students' impressions of the course. Tables are one of the best ways to show exact numerical data and are preferable for small data sets (Tufte 2001, 178). The tables compile the data for each question in neat rows. We provide the percentage of students who selected each response for each question, as well as the percentage of students who did not respond to certain particular questions ("NR" refers to "no response"). The reader can quickly scan the table and make an accurate assessment based on percentage points. Patterns or lack thereof become immediately obvious, which is one of the strong criterion for a good table (Ehrenberg 1977, 278).

The display of data in the tables is also effective for drawing comparisons between different questions. A reader can note that while 86% of students reported that a professor had a "very" effective teaching style, only 17% of students were so positive about whether class sessions were worthwhile. The eye can travel down columns quickly and make localized comparisons from question to question (Tufte 2001, 179).

Several professors who reviewed our revised evaluation expressed a desire to see the mean of each answer. This would allow them to interpret their performance on each question in much the same way as one would interpret a GPA. We have given the response "very" a score of 4, the response "fairly" a 3, and so on. We then calculated the mean based on the percentage of students who selected each answer. Thus, a professor with a mean of 3.8 on the question, "How effective was teaching style?" could interpret that they received nearly all 4's, or nearly all the students who answered selected "very." Including the mean in the display gives a visual focus and some direction in the summary of the data (Ehrenberg 1977, 282).

Our feedback from professors also provided us with insight regarding the order in which the questions on the evaluations are presented. Our evaluators made it clear to us that they were more interested in the answers to questions regarding their performances, and less so in the information about the students in the class. For this reason, we chose to display the professor evaluation data before the students' self-evaluations.

After modifying the quantitative display of the data, we also experimented with color. Rather than using arbitrary color choices, as in the pie charts, we have selected color based on the meaning of the data. Green corresponds with positive answers, such as a professor being "very" helpful with feedback, while red corresponds with warning areas, such as a professor being "not at all" available. In this way, different colors represent different meaning behind the data (Few 2007, 3). We have also taken into account the fact that readers who are colorblind will still be able to distinguish the relationships between answer and color (Few 2007, 11).

References

Ehrenberg, A. S. C. 1977. "Rudiments of numeracy." *Journal of the Royal Statistical Society* 140:277-297.

Few, Stephen. 2007. "Save the pies for dessert." *Visual Business Intelligence Newsletter* 2008. URL: http://www.perceptualedge.com/articles/visual_business_intelligence/save_the_pies_for_dessert.pdf. Accessed February 16, 2008.

Tufte, Edward R. 2001. *The visual display of quantitative information*. Chesire, CT: Graphics Press.