What Is a Statistical Poster?

A statistical poster is a display containing two or more related graphics that summarize a set of data, examine the data from different points of view, and answer specific questions about the data.

Statistician John W. Tukey said "[m]uch of what we want to know about the world is naturally expressed as phenomena, as potentially interesting things that can be described in non-numerical words." We collect data to describe and answer questions about phenomena. We present data to communicate our ideas to others. The purpose of a statistical poster, then, is to visually tell a story from the data about some phenomena revealing the conclusions that can be drawn. Because there is no narrator to tell the story, nor an accompanying report to discuss it, the poster must be able to stand alone; it should not have to be explained.

For this reason, special care must be taken to present ideas clearly. Not only must the viewers understand the individual graphics, but they must understand the relationships among the graphics and how the graphics address the question(s) being studied.

Data-Based Problemsolving

Data are everywhere. Teachers may assist students by suggesting topics of interest, but students should have little trouble generating or collecting data about themselves, their schools, their neighborhoods, and interesting phenomena in the world. The level of reasoning and the complexity of the problems will differ greatly depending on the maturity of the student(s), but, even in the lower grades, formulating and solving problems based on data should be the primary goal.

The poster, then, becomes a communication tool-a tool for the graphical presentation of data. In the upper grades, the poster can be used for not only data presentation, but also graphical problemsolving. The poster should demonstrate that the scientific method of solving a problem has been used. Keep in mind the following questions:

- Was there a carefully focused question or questions?
- Were appropriate data collected?
- Were the data analyzed thoughtfully?
- Were the correct conclusions drawn?

Basic Guidelines

While constructing a poster, it is important to keep in mind that the central idea of the study should be the prominent feature of the poster. To bring the main idea into focus, questions such as the following should be asked:

- What is the purpose for displaying this information?
- What comparisons should be made?
- Which trends should be shown?

Questions should be asked until the central idea of the study becomes clear. This becomes the focal point of the poster. The poster must reveal what the data have to say. It must allow the viewer to see the data; that is, to see the variation in the data, the structure of the data, the important patterns in the data (or lack of patterns), the data points that do not fit the pattern, and the conclusions to be drawn from the data. Further, each graphic on the poster should convey new information about the data-a pattern or structure, for example, that cannot be seen in the other graphics.

The poster title should be informative to reduce the need for additional explanatory text. For example, the title may indicate the questions addressed by the graphics or even convey the major conclusion to be drawn from the data.

Each graphic's legend should be positioned so there is no question which graphic and legend go together. Further, each graphic and its legend should stand alone. If the graphics need to be viewed in a certain sequence, however, then the viewer's eyes must be guided in that sequence.

Try to eliminate trivial and extraneous information, line work, or lettering. In particular, redundancy in titles and legends should be omitted. Only explanations needed to make the conclusions clear should be included. Data tables should not be shown on the poster, as reading off numbers is not the point of the display.

Choose a few harmonious colors that are easily visible. The key to using color effectively is restraint. Colors should not distract the viewer, but should enhance recognition of the structure of the data and the conclusions.

Edward Tufte, who wrote *The Visual Display of Quantitative Information*, said graphics may "… reveal the data at several levels of detail, from a broad overview to the fine structure." In a similar sense, a poster may do the same. At a distance, only a broad overview of the poster and the data is possible. Therefore, main titles should be visible, and overall outlines of the data-as revealed by the graphics-should be seen. On closer inspection, however, aspects such as individual data labels and legends should be more apparent.

A Final Note

The NCTM Standards for Curriculum and Evaluation in School Mathematics presents the vision that problemsolving is a main goal of mathematics instruction at all levels and calls for student involvement in statistical activities at all grade levels. The standards indicate statistical thinking should start in the primary grades with the creation of student data from class activities. In upper grades, the emphasis is on collecting, organizing, summarizing, and interpreting data from other school disciplines, such as the physical or social sciences, as well as outside interests. Graphical displays are exceptionally powerful tools for data presentation and analysis.

References on Graphics

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