

Fostering Creativity, Teamwork, and Scientific Thinking in Introductory Statistics through Computer-based Laboratories

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Goals of project:

We are revising our course in elementary statistics so that a computer laboratory will be an integral part of the course. This revision involves creating a series of laboratory exercises, using real data, which span one semester's material. The students will analyze various data sets, usually working in groups, after receiving guidance and examples. The laboratory exercises under development are based on the Windows version of Minitab (Release 10 Xtra).

What we have accomplished so far:

We have prepared some of the laboratory exercises and data sets. The titles and purposes of these exercises are as follows:

- Lab 0-A Introduction to MS-Windows to familiarize new users with the Microsoft Windows 3.1 environment
- Lab 0-B Introduction to Minitab for Windows to familiarize new users with the Minitab-for-Windows environment
- Lab 1 Minitab Sample Session to familiarize new users with the operation of Minitab for Windows
- Lab 2 Graphical displays of Data to produce dotplots, stemplots, and histograms, and to describe the main features of what we see
- Lab 3 Measures of Location and Spread; Boxplots; the Empirical Rule to learn about mean, median, quartiles, interquartile range, standard deviation; effect of skewness on measures of center; five-number summary; modified boxplots (with outliers); Empirical Rule
- Lab 4 Regression; Normal scores plots to learn about scatterplots; fitting a straight line to data and assessing the fit; checking for normality

How the funding has benefited our department:

NSF funds are being used to equip a laboratory with appropriate computers and software. This facility will allow us to implement the changes in the statistics course as outlined above. Current (pre-existing) equipment is inadequate.