Novel Laboratory Instruction in Undergraduate Statistics Curricula

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The aim of this project is to address some of the shortcomings of traditional methods of instruction, as well as to enrich the scientific content of the undergraduate statistics curriculum. Special emphasis is put on recent advances in statistical/mathematical computing and modern computer intensive statistical methodology. The curricular resources developed under this project exploit the most sophisticated computing and multimedia technologies available to increase students’ interest and enhance learning. To that extent we have used funds awarded by the Instrumentation and Laboratory Improvement program, at the National Science Foundation, to establish a high-tech laboratory of unix-based graphics workstations. This laboratory has been in operation for nearly two years, providing support in the implementation of the intended curricular changes under this project.

The materials and methods that are being developed under this project feature active learning to increase conceptual understanding and statistical maturity, as well as extensive use of writing and revision as means of cognition. Real data examples chosen from fascinating applications of statistics are used extensively to provide motivation and to make the subject matter exciting to learn. Finally, the self-paced mode of instruction advocated by the project also facilitates efficiency in the delivery of more quality curricular resources, to more students, without increasing the cost.

Contentwise the project involves several courses, including a foundational laboratory course in statistical computing designed to provide the students with a broad introduction to numerical, graphical, and symbolic computation, an advance course in computer intensive methods, and companion laboratories for a few other courses. The objective is to provide the foundation as well as to initiate a broad revision of the undergraduate statistics curriculum to facilitate the adaptation of rapidly evolving advances in the aforementioned areas of statistical methodology.

In this poster we will present sample curricular resources from some of the courses involved in the project. A multimedia kiosk demonstrating our laboratory setting, including photos and video, as well as student discussions about the project will also be available.