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Statistical Thinking in Computer-Based Learning Environments

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Summary

The theme of technology is particularly important for statistics education because of the role of technology in changing views of statistical knowledge, pedagogy and learning. The interactive multimedia technology of today allows for the creation of powerful learning environments where the focus is on the process that produced the data and its associated variation and the statistical thinking required to solve the problem. However, despite this optimistic view, students' self-regulation and intrinsic motivation seem to be key concepts for learning in complex interactive computer-based learning environments. We conclude with observations of teachers and students working with applets. More of these evaluations should be published and/or made available to the statistical community so that both positive and negative teaching experiences can be shared.

Key words: Computer technology; hypermedia environments; learning support; statistical thinking; statistics education.

1 Introduction

The theme of technology is particularly important for statistics education because of the role of technology in changing views of statistical knowledge, pedagogy and learning. Ten years ago these views were described by Moore (1997) in his thought-provoking paper "New Pedagogy and New Content: The Case of Statistics" and by some statisticians, statistics educators and people from business and industry commenting on Moore's ideas. To quote Moore (1997, p.123), "... technology strongly influences both what we teach and how we teach. The case for substantial change in statistics instruction is built on strong synergies between content, pedagogy, and technology."

2 Statistical Thinking

Over the past 15 years the scope of statistics education broadened from data-driven to stimulating all aspects of statistical thinking. Many papers utilize "statistical thinking" as a container concept. Wild & Pfannkuch (1999) developed a four-dimensional framework to define statistical thinking consisting of the investigative cycle, types of thinking, the interrogative cycle and dispositions. Their approach is based on what statisticians and practitioners are "doing" when solving real-world problems where the context of the problem and the problem-solving