

How Students Learn Statistics Revisited: A Current Review of Research on Teaching and Learning Statistics

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Summary

This paper provides an overview of current research on teaching and learning statistics, summarizing studies that have been conducted by researchers from different disciplines and focused on students at all levels. The review is organized by general research questions addressed, and suggests what can be learned from the results of each of these questions. The implications of the research are described in terms of eight principles for learning statistics from Garfield (1995) which are revisited in the light of results from current studies.

Key words: Statistics education; statistical reasoning; teaching and learning statistics.

1 Introduction: The Expanding Area of Statistics Education Research

Fifteen years ago the research related to teaching and learning statistics was reviewed and a subsequent paper was published in this journal (Garfield, 1995). In the years since that paper was published, there has been a proliferation of research studies across many disciplines, as well as new scientific conferences and publications devoted to research in statistics education. Therefore, it seems appropriate to revisit the 1995 paper, to see what new relevant knowledge has been accumulated since then, and to re-examine the links between research and teaching practice. This paper is an attempt to do just that.

Today, statistics education can still be viewed as a new and emerging discipline, when compared to other areas of study and inquiry. This new discipline has a research base that is often difficult to locate and build upon. For many people interested in reading this area of scholarship, statistics education research can seem to be an invisible, fragmented discipline, because studies related to this topic of interest have appeared in publications from diverse disciplines, and are more often thought of as studies in those disciplines (e.g. psychology, science education, mathematics education, or in educational technology) than in the area of statistics education. In 2002 the *Statistics Education Research Journal* (SERJ, <http://www.stat.auckland.ac.nz/serj>) was established, and the statistics education discipline now has its first dedicated scientific journal in which to publish high-quality research. This should make it easier for future researchers to become acquainted with the discipline and locate studies for literature reviews, and for teachers of statistics to look for research relevant to the teaching and learning of statistics.