
TEACHING STATISTICS IN SCHOOL MATHEMATICS.
CHALLENGES FOR TEACHING AND TEACHER EDUCATION
A Joint ICMI/IASE Study (18th ICMI Study)

EXECUTIVE SUMMARY

Since the mid-1980s, the International Commission on Mathematical Instruction (ICMI, www.mathunion.org/ICMI/) has investigated issues of particular significance to the theory or practice of mathematics education by organising specific ICMI studies on these themes.

The 18th Study in this series has been organised in collaboration with the International Association for Statistical Education (IASE; www.stat.auckland.ac.nz/~iase/) and addresses some of the most important aspects of the teaching of statistics in schools by focussing on the education and professional development of teachers for teaching statistics. The Study included an IASE Roundtable Conference and is fully reported in the Proceedings of the Study Conference (www.ugr.es/~icmi/iase_study/) and in the Study book now published in the ICMI Study series by Springer.

The main conclusions from research and exemplary practice reported and discussed in this Study are as follows;

Teaching statistics at school level. Although the teaching of statistics in secondary schools has a long tradition, in recent years many countries have also included statistics in the primary curriculum. In addition, more attention has been paid to developing statistical thinking in students across all levels of education.

Teachers' attitudes, beliefs and knowledge. At the school level, Statistics is usually taught within the mathematics curriculum by teachers who may or may not be specifically trained to teach statistics. Most teachers acknowledge the practical importance of statistics and are willing to give more relevance to the teaching of statistics. However many mathematics teachers, do not consider themselves well prepared to teach statistics nor face their students' difficulties. Research summarised in the Study has shown a variety of difficulties and misconceptions of prospective teachers with respect to fundamental statistical ideas. There is little research related to teachers' statistical pedagogical content knowledge, and what is available suggests that this knowledge is weak.

Current training of teachers. Few current teacher training programmes adequately educate teachers for teaching statistics at any school level. Few prospective secondary teachers receive specific pedagogical preparation in statistical thinking. The situation is even more challenging for primary teachers, since few of them receive any training in statistics.

The Study also involved sharing and analysing different experiences and initiatives in teacher education for teaching statistics. The following recommendations were produced.

Empowering teachers to teach statistics. There is a continuing need for finding approaches for preparing teachers that promote teachers' statistical literacy and reasoning, that engage teachers with real data and statistical investigations, and that connect teacher education to their teaching practice and the reality of their classrooms.

Collaboration in teacher education. Because of the nature of statistics and its key roles in all aspects of an information society, the statistics education of teachers could benefit from the support given by national statistical offices and statistical associations, which in many countries are increasingly involved in producing materials and organising initiatives to help increase statistical literacy of all citizens, with particular focus on education.

Relevance of research in statistics education. The rapid development of statistics and statistics education implies that further research in statistics education is needed. The analyses, research, and case studies reported in the Study provide a rich starting point for such research.

The study has been presented at the Conferencia Interamericana de Educación Matemática ([CIAEM](#)) conference in Recife, Brazil, June 2008, 2011 and will be released in August 2011.

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