TECHNOLOGY IN THE TEACHING OF STATISTICS: POTENTIALS AND CHALLENGES IN PREPARING THE TEACHERS

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The biggest challenge in preparing teachers to make effective use of technology in the teaching of statistics is to enthuse and excite them about statistics and its applications in the first place. The importance of statistics stems from its usefulness (Clarke & Cooke, 2004). In this panel we will discuss the following potentials and challenges:

POTENTIALS
- P1. Helping teachers learn to use technology to motivate students, get students to realize the importance of statistics and encourage them to use it as a life skill and/or adopt it as an essential tool for making evidence-based decisions across the full range of subjects. Teaching statistics through problem solving has the greatest potential for achieving these goals.
- P2. Educating teacher trainers, new teacher trainees and experienced teachers in the appropriate use of technology.
- P3. Communicating about the role and value of statistics so teachers are prepared to make effective use of technology in teaching statistics, realizing the great potential for affecting their students to use technology and communicate the subject better.

CHALLENGES
- C1. Appropriate curriculum: In preparing the teachers it is essential to work from a curriculum that is suitable to integrate technology into the specification of that curriculum. We need to develop critical thinking skills, including the ability to solve problems. See, for example, Groth (2006) and Gibson et al. (2007a, b). We need to encourage the use of established internationally recognized projects such as CensusAtSchool (see Connor et al., 2006) and work with teachers to change the way they approach the teaching of statistics.
- C2. International organizations: The challenge is to persuade an international body like the International Statistical Institute (ISI) to (a) promote and fund initiatives that are likely to promote technology within appropriate statistics curricula and (b) ensure ISI uses the findings of such initiatives to recommend adoption by the relevant education bodies in countries.
- C3. The challenge is to get National Statistical Offices (NSO) engaged in promoting good practice for integrating technology with the practice of statistics and relate it to teaching and learning in the classroom. This could go a long way to helping teachers understand and promote with their learners the active practice of statistics. The ISI has close connections with NSOs and may be able to help.
- C4. Getting national mathematics bodies on board: The challenge is to persuade national mathematics bodies of the intellectual merits of statistics as a subject in its own right that can actually help in the teaching of mathematics.
- C5. Starting afresh with textbooks: The challenge is to change the mindset and get writers to write books about statistical thinking and the cognitive skills that are needed to use the subject to solve problems; such books should be integrated with the use of technology. Techniques are then just one part of the portfolio of activities used to solve those problems.
- C6. Technology - Statistics software: The challenge is to use appropriate software for doing, learning, teaching, and assessing statistics.

- C7. Professional development: The challenge is at a national level to convince even experienced teachers of their need for professional development in statistical knowledge and pedagogy, linked to the use of technology. See, for example, Goldsworthy et al (2000)
- C8. Nature of the curriculum: The challenge is to ensure that the four types of curriculum: intended; taught; learned; assessed all match, ensuring that technology is integrated within and among them.

TO CONCLUDE
- Do
- Rehearse the big ideas in statistics using technology;
- Overcome prejudices from statistics-unfriendly mathematics and other teachers;
- Get teachers to learn from the research evidence (for example. Garfield, (1995);
- Teach through a wide range of examples/problems/real data in other subjects;
- Teach using a balance between traditional and IT-based methods.

- Do not
- Re-invent the wheel;
- Repeat and/or mis-teach topics within different subjects;
- Overuse technology;
- Treat statistics as a branch of mathematics (see Cobb & Moore, 1997).

There have been many calls for a change in the way that statistics is taught, for example, Cobb, (1992), Stuart (1995), Cobb and Moore (1997) and Smith (2004). Investigating statistically is an enjoyable, challenging activity, which technology can enrich and enhance. Our task is to convince the teachers of all ages and experiences of this!

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