

26. DISCUSSION: TECHNOLOGY, REACHING TEACHERS, AND CONTENT

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The interface between technology and teachers is an open question with new avenues occurring through the internet and distance learning. The use of technology can connect teachers to professional development, provide additional resources for teachers, and help teachers conduct classes. Discussions following these two final papers included the ability of the internet to keep up with the demand it may face as it becomes a more common tool. Teachers may go to internet web sites, but some participants were concerned that information on CD ROM should be available as backup. It was agreed that, in general, the internet was continually improving, although some way should be found to bring to teachers' attention the valuable resources on the net.

A second issue for discussion was how teachers use internet resources to conduct classes. A suggestion was made that teachers need some guidance; for example, a project was presented that provided a structured introduction to simulation that helped answer many questions teachers have about introducing probability. Video conferencing is another venue that may prove useful. A comparison was made between the internet and Computer Assisted Instruction (CAI). One of the lessons learned from CAI is to provide teachers with resources and then let teachers decide how to use them. In the situation described in the Watson and Baxter paper, teachers were treated as professionals; that is, they shared their own ideas but were also given some suggestions for ways to use technology.

Another issue discussed was how technology interfaces with the two roles of statistical education: statistical needs for professionals in their work and the statistical needs of members of society to help them make decisions and choices in their daily life. It was suggested that this dichotomy parallels the situation in mathematics, and can be handled by beginning with a broad education for all, which can then be used as a foundation for the additional knowledge needed by specialists.

It was suggested that it is necessary in statistics education to begin with a definition of statistics that includes both design and description of data, to identify the activities that constitute the nature of statistics, and to then consider the available tools and technologies that can be used in the teaching process. The categories of tools and technology described in the paper by Glencross and Binyavanga (data collection, data editing, and data analysis) were discussed. This discussion focused on the impact of individual and cultural differences in using these tools in the teaching process. A question was raised concerning how to help people make rational decisions based on data when their intuitions and belief systems are different by acknowledging that people look at similar events from different perspectives. One of the presenters indicated that, in his experience, Africans have a strong oral tradition so recording is not done with pencil and paper but rather with the mind, which leads to a great ability to memorize, a statistical tool that most cultures do not cultivate the same way. This could have a significant effect on how technology tools are

viewed as resources. Although many of the problems are universal, there are still some areas in which statistics is not a "natural" process. A participant offered one example, using issues related to statistics and its importance in rural areas. Statistics grew out of the need to record, which is not a natural inclination for many rural people.

The notion that probability is based on alternative descriptions of reality was discussed, which challenges students in all classes. Teachers respond by presenting alternatives and insisting that students think about these possible alternatives. For example, the importance of statistics in modern society includes applications in government, management, social statistics, and science - and there is an inherent message here of the significance of statistics to economic progress.

There was a clear consensus about the need to think carefully about these issues as technology becomes an increasingly significant part of statistics education, from how to help teachers understand and implement technology in a variety of ways to recognizing how such implementation may differ depending on diverse cultures and educational environments.