

## *Working Group Report on Teacher Preparation for Statistics Education*

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### **General Issues and Concerns**

- In general, teachers are not well prepared to teach statistics and data analysis. Teacher knowledge needs to be broader and deeper than that of the students they are teaching.
  - Teachers need frameworks for understanding statistics and data analysis. They need to understand the “big picture”, so that they can understand where their students are coming from and where they are going.
  - Teachers need more experience with the entire process of statistical investigations, including data production and data analysis.
  - Teachers need to understand the importance of context and interpretation.
  - Teachers need to understand that statistics is different from mathematics. They are two different disciplines, each with its own set of goals. Statistics requires a different way of thinking and also a different way of teaching.
  - Teachers need to understand the usefulness of and the applications of statistics. They need to understand that statistics and data analysis are necessary in a global world.
  - Teachers need to become familiar with using technology, both as a tool for carrying out statistical analyses and as a tool to help students understand statistical concepts.
- Teacher educators need to think about both in-service and pre-service training. The goal should be to see in-service training as truly professional growth rather than corrective intervention. At the pre-service level, new courses should be developed whose goals are preparing future teachers to achieve the level of understanding described above.
- The statistics community needs to think carefully about its responsibility to educate teacher educators as well as future teachers.
- A useful model for professional development is to help teachers build communities of practice that can support teacher change. A community of practice could be in a single school or even across schools. Developing lead or master teachers who would then support other teachers in their own or other schools is one way that this might be accomplished.
- There is often a difference between the “official” or intended curriculum, the taught (implemented) curriculum, and the assessed (achieved) curriculum. The taught curriculum is probably closest to the assessed curriculum, and if statistics (data analysis) is to become part of the taught curriculum, it needs to become a meaningful part of the assessed curriculum. Most teachers are not motivated to do a better job with statistics and data analysis because assessments do not require it.
- There is a great need to develop resources for teachers, including high quality teaching materials.
- When problems are identified in the taught curriculum, such as in teaching informal inference, curriculum designers and educational researchers should work together with teachers and students to propose and test other approaches.

- We need to look for ways to facilitate broader dissemination of statistics education research so that research results can inform curriculum development, the writing of textbooks and other classroom materials, and teaching practice.
- It is important that teachers be viewed as professionals and that teachers view themselves as professionals. As professionals, teachers should have a deep understanding of the curriculum and understand the rationale for both the materials and activities selected and for the manner in which content is presented. Teachers should be recognized as having a critical role to play in the design and development of curriculum and assessment.