PREPARING TEACHERS TO MEET THE CHALLENGES OF STATISTICS EDUCATION

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Statistics holds an increasingly central role in the school curriculum. Its importance in all levels of education, in the first place, emerges from the fact that this is a field with an enormous expression in social activity and in many knowledge domains, including natural sciences, social and human sciences, and technological activities. In current times, a full participation in society – in professional activity, daily life and citizenship – requires a strong foundation in statistical literacy. A second reason for the importance of this field in the school curriculum stems from the fact that statistics holds a strong specificity in relation to other curriculum topics. Its objects are not simple concepts like numbers or geometrical figures but complex objects (such as collections and samples) and processes. Furthermore, this is a field that must not be seen as self-contained but in relation to investigation processes and contexts of social activity. In this way, the larger aims of statistics teaching raise unique challenges for the mathematics teachers that teach it in the school. Preparing teachers to teach statistics requires a clear notion about the *purposes of statistics education*.

To teach statistics teachers need to know *statistics*. This means that they need to know the essential elements of statistical thinking, including formulating questions, collecting data, analysing data and interpreting results, appropriate to the school level that they teach. But they also need to know about *statistics education*, that is, the role and place of statistics education in the curriculum, including its relation to other mathematical and non-mathematical topics, as well as about the suitable kinds of tasks to propose to students, materials and technologies to use, representations, conventional and unconventional methods for solving problems, and forms of thinking and arguing appropriate in statistical situations. Educating teachers to teach statistics requires a clear notion about the statistical knowledge and the knowledge of statistics education they need to carry out their job.

For a long time, teacher education has been primarily provided through courses and workshops. Teachers and teacher candidates are presented with more or less structured knowledge on the topics and notions they need for their practice. This notion seems to be quite ineffective, both for pre- and in-service teacher education. Therefore, we need a better vision of how teachers learn so that that they can put it into their professional practice. Research findings and examples from the international literature will argue that this vision must include aspects such as

- *View teachers as professionals*, that is, view teachers as autonomous agents who deal with professional problems, reflect and investigate on their practice and working conditions and develop projects to improve them.
- *Connect pre-service, in-service and specialized teacher education*, with projects and joint activities, with participation of teacher educators, classroom teachers, and teacher candidates.
- *Ground teacher education in professional practice*, making all elements of practice (preparing lessons, tasks and materials, carrying out lessons, observing and reflecting on lessons) a central element in the teacher education process.
- *Introduce the school and the professional culture in the teacher education processes*, through school projects and projects involving the community.
- *Enter into a new era of investigating and evaluating statistics teacher education*, with research projects about models, contexts, conditions and teacher education processes – strengthening international cooperation.