

THEMATIC WORKING GROUP 5

STOCHASTIC THINKING

Theme:

CURRICULAR ISSUES AND TEACHER EDUCATION

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After a brief introduction 4 papers were presented in this session.

In their paper “*Hazard's Treatment*” in *Secondary School*, Pilar Azcárate, José M. Cardeñoso and Anna Serradó, Universities of Cádiz and Granada, Spain, describe an investigation agenda whose aim is the analysis of the intervention models associated with the planning, development and assessment of the “Hazard’s treatment” in the teaching and learning process in Secondary School. In particular they present an analysis of the curriculum developed in the Spanish textbooks.

Maria Meletiou-Mavrotheris, Cyprus Ministry of Education and Despina A. Stylianou, University of Massachusetts, Dartmouth presents a paper *On the formalist view of mathematics: Impact on statistics instruction and learning* where they argue that the persistence of students’ difficulties in reasoning about the stochastic, despite significant reform efforts in statistics education, might be the result of the continuing impact of the formalist mathematical tradition.

Celi Aparecida Espasandin Lopes, Universidade Estadual de Campinas, Brazil discuss the *Stochastics in the professional development of primary school teachers*. In this study the role of reflection in teacher development, the relation with the curriculum and the relation with the collaborative work emerge. The results promote the development of the teacher’s professional role to create the teaching and learning process in terms of children’s cognitive development.

Irene Pitarch and Pilar Orús, University Jaume I, Castellón Spain present the paper *Logic and data handling in secondary education* and defend the feasibility and didactic interest of introducing new data analysis techniques into secondary education. The theoretical analysis is completed with results from an experiment carried out with secondary school pupils in the province of Castellón, Spain.

In the debate that followed the presentations, there was an agreement that since Statistics education has been introduced in the majority of countries as a part of the mathematics curriculum, the teaching and learning process is strongly dependent on the teachers’ conceptions about stochastics. Three main problems were identified:

Deep-rooted beliefs about the nature of mathematics are imported into statistics and this affect the teaching and learning of the topics, since formal teaching of stochastic is suppressing primary correct intuitions about stochastics. There is a need

for teachers to recognise and accept the uncertainty associated with stochastics in contraposition to the usual determinism in the other mathematical areas. It is important to find appropriate ways of teaching stochastics in the classroom that emphasise modelling activity and, when possible, introduce some ideas about multivariate methods and logic at secondary school level.

Teachers lack appropriate training. It is important to identify didactical knowledge and adequate ways to be taught to teachers, prepare didactical materials and Internet tools.

There is a high dependence on textbooks, where stochastics is disconnected from real life applications and incomplete or biased content is presented that can influence teachers' stochastic conceptions and beliefs.

Further research is needed on teachers' conceptions and beliefs and how they are related to children's learning.

[List of contributions \(related to this theme\)](#)

[Introduction to Thematic Group 5](#)