Editorial

The last issue of Nomad in 2012 (Vol. 17) was a thematic issue, and so is the case with this, the last issue in 2013. We expect to publish more thematic issues in the near future and we have just finished collecting papers for an issue on *Mathematical knowledge for teaching*. For each thematic issue there will be one or more guest editors, and for the current issue the guest editor is professor Per Nilsson, Örebro University.

This thematic issue is based on selected papers from the topic study group on teaching and learning of probability of the 12th International Congress on Mathematical Education (ICME12), which took place in Seoul, Korea from July 8 to July 15, 2012. 13 papers were presented in the topic study group. Each presented paper was peer reviewed by the participants of the group. After the conference all presenters were invited to submit a revised paper for this thematic issue of Nomad. Of the 13 papers six were submitted. The authors developed their papers based on the feedback they had received before and during the conference. The revised papers were reviewed by one of the other authors (internal review) and one external reviewer, who had not been at the conference. Three of the papers were either rejected or withdrawn during the review process, which led to the three papers presented in this special issue on teaching and learning of probability.

Since the late eighties, we observe that probability, along with statistics, has developed to be one of the main strands of the curriculum in mathematics. Today, probability and statistics constitute one of the main strands in all Nordic countries' school curriculum. That probability has emerged as a mainstream area in the mathematics curriculum is especially opportune because as members of a modern society we are daily confronted with randomly based prognoses based on probability calculations. It may include market investigations, opinion polls, weather forecasts and tools to predict the trends of the stock market. Measurements of probabilities are current in all sciences from the humanities to natural science and medicine. In quantum mechanics, which is a part of the physics that explores nature's intrinsic building blocks, randomness and probability are central. Probability theory has become both an important literacy and an indispensable tool for specialists in diverse area.

Research in probability education has its roots in psychological research. The focus of the psychological tradition has mainly been on investigating people's difficulties and shortcomings in understanding randomness and probability. Scant consideration has been paid to what the students

really can do and know, and how teaching should be designed to promote their doing and knowing. Profiling students' understanding is also prominent in mathematics education research. However, related to the general social and situational turn in mathematics education research and to the increasing emphasize of the subject in society and school curricula, there has been an increased interest in the past decades of studying students' understanding in relation to classroom interaction, instructional strategies and teacher knowledge for probability teaching.

This thematic issue begins with Theodosia Prodromou's article, which looks at how students apply and develop their understanding of probability concepts when modelling computer-based simulations of real-world problems. Two empirical studies are discussed. In the first study, 15-year-old students use TinkerPlots (a software for exploring data) to model and simulate random processes involved in generating a number of virtual students to populate a virtual school where each virtual student is acknowledged with different personal attributes (e.g. gender, name and height). In the second study, the *Facebook task simulation*, the students reflected on the hours they and/or their friends spent on Facebook and the impact of hours spent on Facebook on virtual students' school performance. Both studies show how the students integrate statistical information from data (real or generated) with information from the context of everyday life in their modelling by continuously checking the adequacy of the model and its mappings to reality.

In the second paper Judith Stanja introduces the concept of *Stochastic prognosis* as a key concept for teaching ideas and principles of randomness and probability in elementary school. A stochastic prognosis is characterized as a reflexive statement containing the structural components of *focus*, *evaluation* and *justification*. Stanja points to how crucial it is for the learning of stochastics (the combination of probability and statistics) that learners develop an awareness of what constitutes a stochastic phenomenon and a stochastic question. A case-study analysis shows what and how the focus of a stochastic process might be articulated and adjusted when confronted with the semiotic means of a list.

Probability has over the recent years gained greater importance and space in the school curriculum. However, the question is whether the schools and the teachers are prepared for this increased emphasis on chance and probability. Per Nilsson and Torsten Lindström offer a Swedish perspective on profiling teachers' knowledge base in probability. 43 compulsory school teachers answered a questionnaire on probability estimation tasks and concept tasks. The survey distinguishes five patterns in the teachers' knowledge profile. These patterns relate to the teachers' basic understanding of probability and their problems with

experimental probability and with structuring compound, conjunctional and conditional random events. The study implies strong needs to adjust or develop pre-service and in-service education that provide opportunities for teachers to develop their ability to teach in probability.

Altogether, this thematic issue provides a variety of theoretical and methodological perspectives on the teaching and learning of probability. On account of that, we hope that this issue of Nomad offers interesting reading and encourages more studies to be carried out on the topic of teaching and learning of probability.

Workshop for doctoral students

The third workshop for doctoral students led by the editors of Nomad will be held in Gothenburg April 2, 2014. At the moment the planning is still under way. The program and other information will be published on the Nomad website as the planning advances (see http://ncm.gu.se/node/6962).

Thanks to authors and reviewers 2013

We are grateful to all authors for submitting their papers to Nomad and to all reviewers for their valuable work. We sincerely thank everybody for their continued engagement. We are very happy to say that the flow of papers to Nomad now is quite good and we are also happy that we now are on a very good track to catch up with the delay in getting the issues out according to the publishing plan that has been troubling us lately. Below you will find the names of reviewers of papers that have been processed in 2013.

The Editors

List of reviewers 2013

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