

# Mathematics education in the Nordic countries

The journal *Nordic Studies in Mathematics Education* (NOMAD) is devoted to research and development work in mathematics education. It generally publishes articles based on theoretical analysis, empirical studies, and discussions of general issues related to mathematics education.

The publishing of NOMAD started in 1993 after a collaborative preparation for many years within the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden). NOMAD became the first research journal for the growing field of mathematics education within these countries and has played an important role in this respect. As NOMAD has the role of challenging researchers within the Nordic countries, papers have frequently been written in Danish, Norwegian or Swedish. This is important within these countries, but naturally has made the content of articles less accessible for readers outside these countries. However each year NOMAD has published at least one issue entirely in English, in order to offer international mathematics education community access to Nordic research, and English is now the most used language in NOMAD.

The Nordic countries have for a long time had formalised collaboration within many fields and do therefore have an experience in acting as a unit. Thus it was natural to collaborate when offering Copenhagen in Denmark as a site for ICME 10. A Nordic Contact Committee (NCC) was established to manage and oversee communications and initiate activity for promoting and supporting this large and influential event.

Amongst the initiatives suggested, was a special issue of NOMAD, reporting research within mathematics education in the five countries. This issue does not pretend to cover everything that is going on but it is our hope that it will provide insights and increase your interest in Nordic mathematics education.

What you will find here is a set of papers from the region, covering diverse topics in mathematics education from a range of perspectives. We provide here a short summary of each article.

Pekka Kupari's article relates the LUMA development programmes of the 1990s in Finnish mathematics education to the strong student performance in the recent large-scale TIMSS/PISA assessments of mathematical competencies. "The average is high and the deviation is small." The comprehensive school system "for all" and the standard of mathematics teacher preparation and professionalisation are discussed as being important factors.

The article by Erkki Pehkonen & Markku Hannula surveys belief research – a particularly strong area of study since the early 1990s in Finland. The focus is on a recent flourishing of work in this area, due to strong research support given by The Academy of Finland, and its contribution to the development of Finnish mathematics teacher education.

Helle Alrø & Ole Skovsmose provide insights into work within schools in Denmark in order to construct concepts and theories, which can cast light on the reality of mathematics education in schools. It is based on cooperation between researchers and teachers. Looking at mathematics learning as a 'landscape of investigation', where mutual inquiry and dialogue are essential, is gaining a growing interest due to the work of these researchers.

Marit Johnsen Høines offers a Bakhtinian perspective on research into interactions in mathematics learning and teaching in a teacher education course. In this paper, learning is seen as developing text, individual, social and genre-related, to conceptualise student-teachers' meaning making with reference to their learning of functions.

Carl Winsløv presents a theoretical analysis of the learning of mathematics in terms of semiotic systems. In doing so he addresses cognitive, social and cultural aspects of mathematics education, offering as a unifying topic the use of digital semiotic appliances in mathematics teaching.

Tine Wedege's research field is on mathematical competencies and qualifications for adults in and for the workplace. Her article focuses on an operational methodology based on a model for analysing numeracy in a dialectic relationship with practice. The conceptual development associated with this methodology has been usefully applied in teacher education.

Christer Bergsten & Barbro Grevholm focus on the education of mathematics teachers in Sweden, suggesting that many of the issues they highlight can be characterised in terms of a "didactic divide" between disciplinary and pedagogic knowledge. They situate their account in an historical background of teacher education in Sweden and describe recent research within an exemplary programme to illuminate and suggest ways of overcoming the conceived divide.

Kaarina Merenluoto & Erno Lehtinen present results from the wide application of a number concept test in Finnish upper secondary schools. The test focused on identification, classification and construction problems in the domain of rational and real numbers. Students were also asked to explain their answers and estimate their certainty in answering. The authors suggest that students' difficulties were due not only to complexity and abstraction in the concepts but also to the quality of prior knowledge which is not sufficiently taken into account in traditional teaching.

The article by Gilah Leder, Gerd Brandell and Barbro Grevholm is about a considerable innovation, the Swedish Graduate School in Mathematics Education. It describes the rationale for a countrywide initiative in creating a doctoral programme and the many associated activities and issues that have resulted. This doctoral programme is still in its first years but it has nevertheless stimulated the introduction of similar programmes in other Nordic countries.

As editors we had a tight timescale in receiving papers, managing a review process, overseeing modifications and corrections and bringing papers to publication. With the help of authors and reviewers we have achieved what we set out for. We should like to offer our sincere thanks to the reviewers listed after this editorial, who responded in length and depth to offer serious appreciations and critiques of these papers. We could not have done this job without them.

Otto B. Bekken  
Barbara Jaworski  
Anna Kristjánsdóttir

Agder University College, May 2004

### *List of Reviewers*

Leone Burton	Johan Lithner
Arne Engström	Doug McLeod
Gail FitzSimons	Candia Morgan
Karen Givvin	Lars Mouwitz
Gunnar Gjone	David Pimm
Gila Hanna	Joao Pedro da Ponte
Marja van den Heuvel-Panhuizen	Norma Presmeg
Anna Jørgensen	Roger Säljö
Jeremy Kilpatrick	Peter Weng
Lena Lindenskov	Dylan Wiliam

