# The role of overview papers in mathematics education research

The explosion of mathematics education research has been an issue of concern for many researchers in the field. For some people the explosion in terms of the growing amount of research results and, particularly, theoretical and methodological orientations, is problematic. Some people argue that some kind of unification of theories and clarity about the concepts used in the field would be desirable. Some other argue that such aspiration of coherence and unification is impossible due to the nature of the objects of study of mathematics education and the historical time in which the field has developed. Independently of which position a researcher adopts in relation to this issue, it is evident that there is a need of much more reflexivity in the field. Reflexivity refers to efforts to meta-analyse the field of research, its theories, its methodologies, and its results. Reflexivity allows having better qualified understandings of the advancements in the field and of the blind spots.

In mathematics education research there has been a tradition for publication of research report papers, presenting the results of empirical studies or papers, which develop a particular theoretical perspective. Published papers presenting overviews, classifications of results and analysis of existing sub-domains have been rarer. The scarcity of this type of research in the field is quite interesting since in most research processes the production of research overviews – meant to place the significance of a particular project – is an important activity to which researchers devote time. In the case of doctoral studies, students use a great deal of their time producing comprehensive literature reviews which provide ideas about the trends in particular sub-domains, as well as a pinpointing of the areas that could be further explored. Nevertheless, it is seldom to find published papers that capitalize on this important research activity to inform the community about what is being researched in the field.

We have seen that the type of overview papers mentioned above can be of importance as the platform for generating more reflexivity and awareness of the field about itself. Therefore, we would like to invite the Nomad audience to consider submitting solid, well-structured overview

papers that address some of the debates in particular research areas. We find this type of papers to be very informative for the Nordic community. It is also an important source for generating the possibility of crossing the specificities of particular research projects and building a basis for examining the contributions of the field in terms of results and possible fruitful interpretation of and for practice.

In this issue we have one of the few theoretical overview papers that NOMAD has ever published, namely the paper by Per-Eskil Persson in which key issues of the use of ICT in mathematics teaching and learning are presented and discussed. We encourage readers to study this paper and be stimulated to submit articles of this type.

## In this issue

In this issue we are publishing three research papers. The paper by Corine Castela, *An anthropological approach to a transitional issue, analysis of the autonomy required from mathematics students in the French lycee,* intends to contribute to the process of theoretical networking within the mathematics education research community by presenting to the Nordic community some key elements of the Anthropological Theory of Didactics. The intention is showing how this theoretical framework, in contrast to a theoretical framework of Advanced Mathematical Thinking, provides tools to analyse the changes when students move from one educational level to a higher level requiring different types of mathematical praxeologies.

The paper *The case of Brandon: The dual nature of key ideas in the classroom*, by Manya Raman and Michelle Zandieh, look at proof production in the midst of classroom interaction. The setting is a college level geometry course in which students are working on the following task: Prove that two parallel transported lines in the plane are parallel in the sense that they do not intersect. A proof of this statement is traced from a student's idea, through a small group discussion, to a large class discussion moderated by a teacher. As the proof emerges through a series of increasingly public settings we see ways in which the key idea of the proof serves to both open and close class discussion. The authors look at several examples of opening and closing, and hereby showing how not only the key idea, but also the warrants and justifications connected to it, play an important role in the proof development.

Per-Eskil Persson, in his paper *Handheld calculators as tools for students' learning of algebra,* presents a comprehensive literature review on the use and effects of two forms of ICTs in mathematics education. The focus of this literature review is the use of handheld calculators and

their effect on algebra learning, with theoretical backgrounds for the use of this type of technology in classroom practice. Special attention is given to three areas: students' conceptions of literal symbols and of algebraic expressions, fundamental for their ability to work with algebra; functional and modelling approaches, both important for students' view of algebra as a useful tool in problem solving; and approaches within CAS, which put special demands for changes in educational methods. Results of some recent meta-studies, based on a relatively large number of research papers and reports, are also discussed, as well as the importance of students' and teacher's beliefs. Common results are compiled and synthesized for a formulation of some important implications for teaching and pre-service teacher education.

In addition to the research papers this issue contains a review of *Relating practices and research in mathematics education – Proceedings of NORMA 05, fourth Nordic conference on mathematics education* by Ola Helenius, in which he also reflects on the role of conferences and conference proceedings in the Nordic mathematics education research community. In *Gard Olaf Brekke in memoriam* Gunnar Gjone commemorates the former Editor of Nomad. Gard Brekke passed away in the spring of 2009.