

Mathematics Education Research in Denmark: A Brief Introduction

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This section presents nine chapters describing and discussing recent mathematics education research at primary, secondary, and tertiary level as well as adult mathematics education in Denmark. The papers represent a wide range of research methodologies such as qualitative, quantitative, historical, sociological, and philosophical accounts. Most of the authors are university researchers from all corners of Denmark, with some exceptions. All this contributes to a very broad and comprehensive view of contemporary Danish mathematics education research.

In the chapter “Learning mathematics through modelling: the case of the integral concept”, Blomhøj and Kjeldsen investigate mathematical modelling as a means for learning mathematics. They analyse and discuss how modelling has the potential of supporting students’ learning of mathematical concepts, and how these potentials can be realised in teaching situations. In another chapter entitled “Mathematical modelling as goal in mathematics education: Developing modelling competency through project work”, the same two authors argue that problem-oriented student-guided project work in interdisciplinary science studies is a powerful pedagogical strategy for developing students’ mathematical modelling competency. These two chapters focus at tertiary level mathematics teaching at the university. The chapter by Lindenskov and Andresen entitled “Recent Development in School Mathematics’ Roles and Relations” also relates to modelling. They focus at the upper secondary teaching and discuss the new construct, multi disciplinarity, which was recently introduced into the curriculum. They do a curricula and

qualitative study and relate it to three key characteristics on educational culture in Denmark namely regulations and the teachers' autonomy, educational aims and goals, and lastly the students' attitude towards mathematics. They also discuss the potentials of multidisciplinary mathematics teaching. In the chapter "Preparing in-service teachers for an interdisciplinary curriculum", Michelsen works within a similar area as he also discusses interdisciplinary and the modeling competence. He introduces the didactical framework and the outcomes of a recent developed educational programme for in-service teacher from primary and lower secondary levels and how to prepare them for a more interdisciplinary curriculum in mathematics and science. These chapters use qualitative research methods.

Dahl (who is also the editor of this volume) writes the chapter "Can the two different types of mathematics teacher preparation in Denmark integrate? A discussion of research-based teaching, mathematics competencies, and content". This chapter also focus on teacher preparation and compares the systems for compulsory and lower secondary education with that for upper secondary teaching. The two systems are very different. The chapter does a curricula and quantitative analysis discussing the competencies and the progression of mathematics competencies in the curricula as well as the idea of research-based teaching.

A chapter by Wedege is entitled "Adults learning mathematics: Research and education in Denmark". She discusses the borderland between mathematics education and adult education as a new research field. The subject area encompasses formal adult mathematics education as well as adults' non-formal mathematics learning in the communities of everyday practice, e.g. the workplace. The key concept is numeracy and the article presents an overview of Danish research in adults learning mathematics with a focus on the interplay between research and education.

The last two chapters move away from a mere focus on classroom research and curricula study. The chapter by Alrø, Skovsmose, and Valero “A learning landscape: Building perspectives on mathematics learning in multicultural classrooms” discusses that students’ mathematics learning cannot be understood by looking solely at mathematical classroom activities. The notion of ‘learning landscape’ serves as a theoretical and methodological tool. They draw on data and results of an empirical study on students’ foregrounds with 45 students in two 8th grade multicultural classes in Denmark and show the dialectical relationship between each dimension of the landscape and the whole of it; and how, as a whole, it can help us come closer to better theorisations. Skovsmose in a separate chapter called “Critical mathematics education: in terms of concerns” continues some of this discussion. He characterises critical mathematics education in terms of five corners for instance that mathematics education operates in a globalised world and that globalisation includes ghettoising as well as the fact that much research in mathematics education has concentrated on affluent teaching-learning environments, which has brought about a prototypical bias in theory building. The concluding chapter by Lange and Meaney is a comparative analysis of sense making activities that children in Denmark and New Zealand were involved in. These authors explore factors that enable the enactment of agency in children. Similar to the comparative study of classrooms in Iceland and Finland included in the previous section featuring Iceland, the value of such studies lies in the fact that basic constructs in mathematics education can be comprehensively studied in different national and cultural contexts.

The Sourcebook on Nordic Research in Mathematics Education

Section IV

Danish Research in Mathematics Education

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Table of Contents

Mathematics Education Research in Denmark: A Brief Introduction

Bettina Dahl and Bharath Sriraman

Mathematical Modelling as Goal in Mathematics Education: Developing Modelling

Competency through Project Work

Morten Blomhøj and Tinne Hoff Kjeldsen

Learning Mathematics through Modelling: The Case of the Integral Concept

Morten Blomhøj and Tinne Hoff Kjeldsen

Recent Development in School Mathematics' Roles and Relations

Lena Lindenskov and Mette Andresen

Preparing In-Service Teachers for an Interdisciplinary Curriculum

Claus Michelsen

Can two Different Types of Mathematics Teacher Preparation in Denmark Integrate? A
Discussion of Research-Based Teaching and Mathematics Competencies

Bettina Dahl

Adults learning mathematics: research and education in Denmark

Tine Wedege

A learning landscape: Building perspectives on mathematics learning in multicultural
classrooms

Helle Alrø, Ole Skovsmose and Paola Valero

Critical mathematics education: in terms of concerns

Ole Skovsmose

If a quarter crashes, so it dies: Children's meaning making in mathematics lessons

Troels Lange and Tamsin Meaney