

TABLE OF CONTENTS

Preface

1. Nordic research in mathematics education:
from NORMA08 to the future1
Carl Winsløw

Theme A: *Didactical design in mathematics education*

Plenary paper

2. Didactical design in mathematics education7
Michèle Artigue

Regular papers

3. Addition and subtraction of negative numbers using extensions
of the metaphor “arithmetic as motion along a path” 17
Cecilia Kilhamn
4. Complexity of operating beyond naïve empiricism when proving a conjectured
formula for the general term of a geometrical pattern.....25
Heidi S. Måsøval
5. Revisiting proficiency in the language of instruction as means
of improving mathematical proficiency35
Anthony A. Essien
6. Young children’s perception of geometric objects45
Frode Rønning
7. Mathematics learning difficulties: an analysis of primary teachers’
perceptions55
Hendrik Van Steenbrugge, Martin Valcke and Annemie Desoete
8. Relations between students’ motivation for learning mathematics
and a mathematical teaching approach65
Kjersti Wæge
9. Can student teachers and prospective engineers profit
from studying mathematics together?.....73
Ragnhild Johanne Rensaa
10. Challenges faced by those working towards a co-learning agreement81
Hildegunn Espeland, Simon Goodchild, and Barbro Grevholm

Short papers

11. Developing inquiry approaches to tasks and teaching in mathematics89
Anne Berit Fuglestad
12. To what kind of mathematical proficiency does learning material
guide in Finnish comprehensive school?91
Jorma Joutsenlahti and Jorma Vainionpää
13. Educational cooperation: an indispensable tool for the European
area of higher education93
Gerardo Rodríguez and Agustin de la Villa
14. To learn the way to learn mathematics: a learning study
of advancing number sense95
Tak-wah Wong and Yiu-chi Lai

Theme B: Education and identity of mathematics teachers**Plenary paper**

15. Researching teachers' beliefs and knowledge: What (not) to expect
in terms of impact?99
Jeppe Skott

Regular papers

16. The constitution of mathematics teacher identity109
Raymond Bjuland, Maria Luiza Cestari and Hans Erik Borgersen
17. Studying French preservice elementary teachers' relation
to geometry through their discourse117
Bernard Parzysz and Françoise Jore
18. Learning analysis: students' starting point127
Kristina Juter
19. Collaboration and inquiry in mathematics practice135
Marit Johnsen Høines
20. Is there always truth in equation?143
Iiris Attorps and Timo Tossavainen
21. Teaching development through discussion: a cultural-historical
activity theory perspective151
Simon Goodchild and Espen Daland
22. Teachers' beliefs and knowledge about the place value system159
Janne Fauskanger and Reidar Mosvold

23. Mathematics teachers' beliefs about teaching and learning mathematics and constraints influencing their teaching practice167
Bodil Kleve
24. Examining prospective teachers' reasoning of functions: a feedback perspective175
Örjan Hansson
25. Identity and genre literacy in student teachers' mathematical texts185
Hans Jørgen Braathe

Theme Group Reports

26. Formation of teacher identity during mathematics teacher education: combining subjectivity with academic.....193
Heidi Krzywacki-Vainio
27. Elementary school teachers' professional identity and competence as mathematics teachers199
Jónína Vala Kristinsdóttir
28. Form or content of mathematics teacher education – what matters most?205
Christer Bergsten and Barbro Grevholm

Short papers

29. On the way to becoming a mathematics teacher – looking for phenomenological teaching of mathematics211
Päivi Portaankorva-Koivisto
30. Can a partnership model between school and university be used to educate stronger mathematics teachers?.....213
Kari Hag
31. Some tendencies in the changes of teachers' beliefs about mathematics teaching.....215
Tiiu Kaljas, Kirsti Kislenko, Markku S. Hannula and Madis Lepik
32. Do prospective mathematics teachers see them-selves as language teachers – and should they?217
Harry Silfverberg and Päivi Portaankorva-Koivisto
33. Teacher students' views of the function concept.....219
Olov Viirman
34. Research based teaching221
Lisser Rye Ejersbo

Theme C: Technology in mathematics education**Plenary paper**

35. Tools and tests: technology in national final mathematics examinations225
Paul Drijvers

Regular papers

36. How mathematics teachers handle lessons in technology environments237
Maha Abboud-Blanchard
37. An interview technique to explore the process of instrumental genesis.....245
Mary Billington
38. The use of the graphing calculator in high stakes examinations: trends in extended response questions over time.....253
Roger Brown
39. The influence of calculators on students' learning of algebra – a literature review.....261
Per-Eskil Persson

Theme Group Reports

40. Mathematical e-content: expressing, manipulating and retrieving mathematics online269
Arne Amdal, Odd Bringslid, Olga Caprotti, Zsolt Lavicza, Morten Misfeldt, Anders Sanne, Agustin de la Villa

NoGSME workshop Report

41. The use of ICT in mathematics education – neither salvation nor catastrophe? what can we learn from research and what are our conclusions?.....273
Barbro Grevholm

Short papers

42. Teaching undergraduate mathematics with computer algebra systems – an overview287
Zsolt Lavicza
43. Digital tools and mathematics education289
Arne Amdal and Anders Sanne

Theme D: Mathematics for all: why? what? when?**Plenary paper**

44. Mathematics for all: why? what? when?293
Eva Jablonka

Regular papers

45. The development of mathematical concepts and the emergence
of affect307
Wolfgang Schlöglmann
46. The features of mathematical thinking among Finnish students in
upper-secondary school315
Jorma Joutsenlahti
47. Regula de tri its origin and presentation in Icelandic textbooks.....321
Kristín Bjarnadóttir
48. Researching multicultural mathematics classroom through the lens
of landscapes of learning329
Helle Alrø, Ole Skovsmose and Paola Valero
49. Outlining the development of the theory of meaningful learning
as a conceptual framework for teaching mathematics337
Rauno Koskinen
50. Everything has changed and all remains the same – a longitudinal
study of arguments for mathematics teaching in compulsory school.....345
Maria Bjerneby Häll

Theme Group Reports

51. Mathematics between society and the individual353
*Frode Olav Haara, Ingvill Stedøy-Johansen, Kari Smith,
and Christoph Kirfel*
52. Lifelong mathematics education (1): needs and constraints.....359
Tine Wedege and Paola Valero
53. Lifelong mathematics education (2): empower, disempower,
counterpower?363
Paola Valero and Tine Wedege

Short Papers

54. How to increase the motivation of ordinary pupils in studying
tedious mathematics367
Pavel Shmakov and Sergey Dudorov

TABLE OF CONTENTS

55. PISA: misleading items and misplaced methodology	369
<i>Inge Henningsen</i>	
56. Ethnomathematics: a way to achieve goals in mathematics education?	371
<i>Annica Andersson</i>	
57. Student–books in mathematics in lower secondary schools in Norway	373
<i>Hilde Opsal</i>	
58. Sciencemath – developing mathematical literacy through interdisciplinarity and modelling	375
<i>Claus Michelsen and Jan Alexis Nielsen</i>	
59. Towards European consensus? – what future role for adult education centres in life long learning including mathematics?.....	377
<i>Lena Lindenskov</i>	
60. An analytical framework for transitions between different learning environments.....	379
<i>Erika Stadler</i>	
61. The factors influencing motivation of mathematical thinking of younger pupils	381
<i>Pavel Shmakov and Natalia Slepova</i>	
62. Practical activities for the teaching of pure mathematical connections – on which basis does the teacher choose the activities?	383
<i>Frode Olav Haara, Kari Smith, Christoph Kirfel, Ingvill Stedøy-Johansen</i>	
63. Language, number sense and bilingual pupils – a case study.....	385
<i>Vigdis Flottorp</i>	
Final note for the future	
64. Final note: creation of a Nordic society for Research in Mathematics Education, NoRME.....	387
<i>Barbro Grevholm</i>	