

# Korta litteraturanmälningar

## Recent Research in Mathematics Education 5 – 16

Authors: *Mike Askew & Dylan William*  
Publisher: HSMO, London, 1995, pp.53.  
ISBN: 0-1-350049-1

Fifteen years ago, the Cockcroft Committee in the UK, commissioned a review of existing research on the teaching and learning of mathematics which was published in three volumes 1983. The aim of this booklet is to present, in as accessible form as possible, subsequent research into effective mathematics teaching. The review is organised around twenty statements:

- The international context
- Young children's competency with number is often underestimated
- 'Knowing by heart' and 'figuring out' support each other in pupils' progression in number
- Moving from practical to formal work is often far from straight-forward
- Learning is more effective when common misconceptions are addressed, exposed and discussed in teaching
- Careful choice of examples improves children's concept formation
- Effective questioning can raise achievement
- The quality of praise is at least as important as its quantity
- Pupils learn more when their teachers know their attainment and can act on this information
- Pupil need to be introduced to a wide range of problem-solving situations
- Success in problem-solving requires both specific content knowledge and general skills
- What mathematics is learnt is closely tied to the circumstances in which it is learnt
- Pupils' self-confidence and beliefs affect their success in mathematics
- Calculators can improve both performance and attitude
- The differences between girls' and boys' attainment in mathematics are small and narrowing
- Computers can have a substantial positive impact on pupils' achievement in mathematics
- Co-operative small group work has a positive effect on pupils achievement
- The benefits of small group work depend on the type of grouping
- Mathematical attainment grouping can lead to some gains in attainment
- Many aspects of mathematics teaching are under-researched.

## Gender and Mathematics Education

Editors: *Barbro Grevholm & Gila Hanna*  
Publisher: Lund University Press, 1995, pp. 428  
ISBN: 91-7966-276-5

This book is an ICMI Study on Gender and Mathematics Education based on a conference held in Höör, Sweden, October 7-12, 1993. The present volume of proceedings contains plenary speeches, paper presentations, summaries of panel discussions and reports from working groups.

### **Plenary Speeches:**

*Elisabeth Fennema*

Mathematics, Gender and Research

*Mary W. Gray*

Recruiting and Retaining Graduate Students in the Mathematical Sciences and Improving Their Changes for Subsequent Success

*Karin Beyer*

A Gender Perspective on Mathematics and Physics Education: Similarities and Differences

### **Paper presentations:**

*Josette Adda*

Is Gender a Relevant Variable for Mathematics Education? The Case of the French Situation

*Mary Barnes*

Development and Evaluation of a Gender Inclusive Calculus

*Thora Blithe & Megan Clark*

Choice, Success, and Context in Questions in University Statistics Examination for Male and Female Students in New Zealand

*Laura S Cavallo & T Bibelnieks*

Enhancing Female Participation in Mathematics through Pre-program Intervention

*Susan F. Chipman, David H. Krantz & Rae Silver*

Mathematics Anxiety/Confidence and Other Determinants of College Major Selection

*Agnes Cordeau*

Empowering Young Women in Mathematics: Two Important Considerations

*Suzanne K. Damarin*

Gender and Mathematics Education: Some Implications from Feminist Science

*Andrejs Dunkels*

Why Are Boys as Afraid of Mathematics as Girls?

*Jeff Evans*

Gender and Mathematics Thinking: Myths, Discourse and Context as Positioning in Practices

*Sharleen Forbes*

Are Assessment Procedures in Mathematics Gender-Biased?

*Helen Forgasz*

Girls' Attitudes in Mixed and Single-Sex Mathematics Classrooms

*Janice M. Gaffney*

Women in Higher Education in Australia: Changing Patterns of Participation

*Barbro Grevholm*

Gender and Mathematics Education in Sweden

- Liv Sissel Grønmo*  
An Overview of TIMSS Focusing  
on Gender Issues in the Study
- Maggie Haynes*  
Gender Issues in the Primary  
Classroom
- Setuko Hazama & Hamaka Semuna*  
Gender Issues in Japanese  
Mathematics Education
- Lesley Jones & Teresa Smart*  
The Confidence Factor – Inter-  
ventions Strategies Designed to  
Encourage Positive Attitudes to  
Mathematics
- Helen Jungwirth*  
An Interactionist and Ethnomet-  
hodological View on Gender-  
Related Differences in Teacher-  
Student Interaction
- J Kadlecek, O Odvárko & J Troják*  
Gender Differences in the Special  
Higher Secondary-School Mathe-  
matics Classes of the Gymnasium  
in Prague
- Christine Keitel*  
Beyond the Number Game
- Gordon Knight & Gillian Thornley*  
Is There A Female Mathematics?  
A View from the New Zealand  
Supermarket and Garden
- Gilah Leder & Peter Taylor*  
Gender and Mathematics  
Performance: A Question of  
Testing?
- Elfrida Rahla*  
Mathematics and Gender. The  
Situation in Portugal
- B. Reilly, M. Morton & A. Lee*  
Achievement and Participation in  
a Nationwide Calculus Examina-  
tion
- Kristina Reiss & Anke Albrecht*  
A Gender Specific View on Geo-  
metry Learning
- Kristine Revak*  
Girls and Mathematics
- Khariya Saif*  
Gender Issues in Mathematics in  
Kuwait
- Claudie Solar*  
From a Feminist to an Inclusive  
Pedagogy in Mathematics
- Else-Marie Staberg*  
We want to understand!
- Neela Sukthankar*  
Gender and Mathematics Educa-  
tion in Papua New Guinea
- Tang Rui Fen*  
Gender and Mathematics Educa-  
tion: The views from China
- Gillian Thornley*  
Women and Mathematics in New  
Zealand Universities
- Panel discussions:**  
Gender and Mathematics Education  
Feminist Perspectives on Gender and  
Mathematics  
The Role of Organisations in Gender  
and Mathematics Education  
International Perspectives  
Research Perspectives
- Working groups:**  
Students – Personal and Psychologi-  
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Mathematics as a Discipline (1)  
Mathematics as a Discipline (2)  
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Developments  
Assessment and Curriculum  
Teachers – Personal and Psychologi-  
cal Factors  
Sociological and Cultural Factors

**NORMA-94 Conference. Theory into practice**  
**Proceedings of the Nordic Conference on Mathematics**  
**Teaching in Lahti, Finland, 1994**

Editor: *Erkki Pehkonen*  
Publisher: University of Helsinki, Finland  
ISBN: 951-45-7003-0

The main purpose of this conference was to study the influence of the latest learning theories on the practice of teaching mathematics, and to give examples how to realise these ideas in school practice. In addition, the aim of the conference was to give a forum for researchers in the Nordic and Baltic countries. The volume of proceedings contains plenaries, paper presentations and summaries of workshops.

**Plenaries**

*Joop van Dormolen, Israel:*

The use of concrete material as a means to support the learning of mathematics

*Barbara Jaworski, England:*

Constructing mathematics, learning and teaching

*Jarkko Leino, Finland:*

Constructive teaching in mathematics

**Paper presentations**

*Andras Ambrus, Hungary:*

Control activities at problem solving

*Kostadin Antchev, Finland, Seppo Pohjolainen, Finland & Jari Multisilta, Finland:*

Interactive Exercises as a Part of Mathematical Hypermedia

*Ole Björkqvist, Finland:*

Assessment in mathematics from a social constructivist viewpoint

*Trygve Breiteig, Norway:*

Responsibility for own learning in mathematics

*Gard Brække, Norway & Algirdas Zabulionis, Lithuania:*

A comparison of school leaving math exams

*Günter Graumann, Germany:*

The General Education of Children in Mathematics Lessons

*Barbro Grevholm, Sweden:*

Gender and mathematics education. Theory into practice

*Ivan Tafteberg Jakobsen, Denmark:*

The Geometry behind the Cupola of the Cathedral of Florence

*Tünde Kántor, Hungary:*

Theory Into Practice of Teaching Mathematics

*Tapio Keranto, Finland:*

A heuristic alternative to formalistic teaching in school geometry: theoretical scrutiny

*Simo K. Kivelä, Finland:*

DiffEqLab, A MATLAB Based Package for Studying Ordinary Differential Equations

*Ricardas Kudzma, Lithuania:*

Structural teaching

**Pekka Kupari, Finland:**

Mathematics teachers' beliefs and conceptions of mathematics education

**Frantisek Kurina, The Czech Republic:**  
Learning and teaching geometry

**Anna Löthman, Sweden:**

On mathematical education - content, meaning and application

**Marja-Liisa Malmivuori, Finland:**

Study on Affective Factors in Mathematics

### **Learning**

**Hartwig Meissner, Germany:**

Teaching Geometry, A Constructivist Approach

**Dagmar Neuman, Sweden:**

Five fingers on one hand and ten on the other: The teacher as a mediator in interactive, playful teaching

**Kullervo Nieminen, Finland & Robert Piché, Finland:**

The 1994 Finnish Summer Math Camp and The Edutech Mathematics and Physics Enrichment Programme for Gifted High Schoolers 1993-1995

**Seppo Pohjolainen, Finland, Jari Multsilta, Finland & Kostadin Antchev, Finland:**

On the Role of Hypermedia in Mathematics Education

**Maido Rahula, & Kaarin Riives, Estonia:**

Some new geometrical ideas in teaching mathematics

**Maarit Rossi, Finland:**

New Components for the Study and Evaluation of Mathematics.

**Rui J.B. Soares, Portugal:**

The use of computers in mathematics

**Vitaly. V. Tsuckerman, Russia:**

Calculus and general secondary education

**Günter Törner, Germany:**

Factors for change in teachers' conceptions about mathematics

### **Workshops**

**Maija Ahtee, Finland & Hellevi Putkonen, Finland:**

Teaching of measurements – experiences from primary teacher education

**Joop van Dormolen, Israel:**

The use of concrete material as a means to support the learning of mathematics

**Günter Graumann, Germany:**

Symmetry in Primary School

**Lenni Haapasalo, Finland & Roland J. K. Stowasser, Germany:**

Computer based geometric ideas for construction of mathematics

**Anna Loimulathi, Finland:**

Hypermedia as motivation medium

**Erkki Pehkonen, Finland:**

Open approach to mathematics in lower secondary level

**Zbigniew Semadeni, Poland:**

Verbal arithmetical problems in exercise books printed for children

The report is available from:

University of Helsinki, Finland

Department of Teacher Education P.O. Box 38 Fin 00014

Tel : +358 0 191 8112, Fax: +358 0 191 8114

## **Research on Mathematics Education Reported in 1994**

**Supplement to the July 1995  
JRME**

Så har ännu en årgång av JRME:s och ERIC/CSMEE:s gemensamma rapportering om föregående års forskning i matematikämnets didaktik kommit ut. Denna gång är rapporten en bilaga till JRME:s julnummer 1995. Hur man skall informera nästa år om publicerade arbeten inom vårt vetenskapsområde är ännu inte bestämt. Häftet innehåller en klassificerad förteckning över 251 doktorsavhandlingar, varav alla utom 7 försvarats vid universitet i USA och Kanada. Klassificeringen har gjorts med hjälp av en lista över 72 olika delområden och 7 olika utbildningsnivåer. Det innehåller också en klassificerad förteckning över 185 tidskriftsartiklar från 46 olika tidskrifter och 57 forskningsrapporter och monografier.

Supplementet kan beställas från

NCTM. Dept. 1906 Association Dr.,  
Reston, VA 22091 - 1593, USA.  
Tel: +1 703 620-9840  
Fax: +1 703 476-2970

## **Att möta matematiken i förskolan**

### **Matematik i temaarbetet**

Författare: *Ann Ahlberg*

I denna rapport redogörs för resultat från en fallstudie på en förskola där man med olika aktiviteter försökt att synliggöra matematiken i arbetet inom ett tema. Författaren redovisar positiva resultat av elevernas arbete med bl a geometriska begrepp, mätning, uppskattning och talbegrepp.

Rapport 1995:14 beställs från  
Institutionen för pedagogik, Göteborgs universitet, Box 1010, 431 26 Mölndal, Sverige.

## **The Emergence of Mathematical Meaning. Interaction in Classroom Cultures**

Editors: *P. Cobb & H. Bauersfeld*  
Publisher: Lawrence Erlbaum,  
Hove, UK, 1995  
ISBN: 0-8058-1729-8

This book is a result of ten years of collaboration between researchers approaching instruction in mathematics from two different theoretical perspectives – social and interactional aspects of mathematical activity and development as an individual process of conceptual construction. The combined approach taken by the authors draws on interactionism and ethnomethodology.

## **Symbols and Meanings in School Mathematics**

Author: *David Pimm*  
Publisher: Routledge, London, 1995  
ISBN: 0-415 11385-7

In this book, David Pimm explores the various uses and aspects of symbols in school mathematics, and also examines the notion of mathematical meaning. It is concerned with the power of language which enables us to do mathematics, giving us the ability to use name and rename, to transform names and to use names and descriptions to conjure, communicate and control our images. One theme which runs throughout the book is the core metaphor of manipulation.

## **New Directions for Equity in Mathematics Education**

Editors: *Walter G. Secada, Elisabeth Fennema & Lisa Byrd Adajian*

Publisher: Cambridge University Press, New York, USA, 1995

ISBN: 0-521-47720-4 (pbk)

In this book a group of researchers examine equity from the standpoint of mathematics education; how to provide equitable schooling for females and for ethnic and linguistic minorities.

## **Equity in Mathematics Education Influences of Feminism and Culture**

Editors: *Pat Rodgers & Gabriele Kaiser*

Publisher: The Falmer Press, London, UK, 1995

ISBN: 0-7507-0401-2

This book provides an overview of the most recent developments and changes in the field of gender and mathematics education.

## **Assessment Standards for School Mathematics**

Author: *NCTM*

Publisher: Author, Reston, VA, USA, 1995

ISBN: 0-87353-419-0

Med detta häfte avslutar NCTM ett imponerande arbete med en trilogi om mål och kriterier för inläring, undervisning och utvärdering i matematik. Utgångspunkten för arbetet var *An Agenda for Action: Recommendations for School Mathematics for the 1980s* som utkom 1980. De båda föregående dokumenten i serien, *Curriculum and Evaluation Standards for School Mathematics* och *Professional Standards for Teaching Mathematics* gavs ut 1989 respektive 1991.

*Assessment Standards for School Mathematics* innehåller förutom sex olika "Standards" en omfattande diskussion kring fyra grundläggande motiv för utvärdering i matematik. Häftet avslutas med en ordlista över termer och begrepp och en bibliografi över böcker, rapporter, artiklar och testmaterial inom området utvärdering.

## **Matematikk i Skole og Samfunn**

### **11 artikler om grunnskolematematiikkens problemer**

Detta är den första rapporten från det norske MiSS-projektet (Matematikk i Skole og Samfunn). I förra numret av NOMAD (s 53 - 56) publicerade vi mål och mandat för den arbetsgrupp som skall genomföra projektet. I rapportens sammanfattning konstateras bl a att

- Vi savner en matematikklærerforening i Norge
- Matematikk er et historisk fag – par excellence
- Hovedsiktetpunktet må være å sette elevene i stand til å løse problemer
- Til tross for denne store vektleggingen av regneteknikk, har resultatene vært forstemmende
- Regnevansker er for mange elever et språkproblem
- Ingen anstrengelser for å bedre matematikkundervisningen vil lykkes uten en god tilgang på vel kvalifiserte matematikklærere
- Drillpreget arbeid oppleves som gøy fordi det er lett, men det etterlater liten matematisk forståelse
- En forskyvning mot mer teamarbeid og språkintensive prosesser vil tjene jenternes interesser
- Nye begrep kan bare utvikles gjennom egen-aktiviteter
- Matematisk modellbygging i skolen kan gi elevene erfaring såvel med fagets muligheter som med dets begrensninger

Rapporten kan beställas under adressen  
Prosjekt MiSS  
v/Otte B. Bekken  
Høgskolen i Agder  
Postuttak, 4604 Kristianstad,  
Norge



## Learn from the Masters

Editors: *Frank Swetz, John Fauvel, Otto Bekken, Bengt Johansson & Victor Katz*

Publisher: The Mathematical Association of America (MAA)

This book has just been published by the Mathematical Association of America. It is designed for high school and college teachers who want to know how they can use the history of mathematics as a pedagogical tool to help their students construct their own knowledge of mathematics. Often, a historical development of a particular topic is the best way to present a mathematical idea, but teachers may not have the time to do the research needed to present the material this way. This book provides its readers with historical ideas and insights which can be immediately applied in the classroom.

The book is divided into two sections: the first in the use of history in high school mathematics, and the second on its use in university mathematics. So high school teachers planning a discussion of logarithms will find the historical background of that idea along with suggestions for incorporating that history in the development of the idea in the class. College teachers of abstract algebra will benefit by reading the three articles in the book dealing with aspects of that subject and considering their ideas for presenting groups, rings, and fields.

The articles are diverse, covering topics such as trigonometry, mathematical modelling, calculus, linear algebra, vector analysis, and celestial mechanics. Also included are articles of a somewhat philosophical nature, which give general ideas on why history should be used in teaching and how it can be used in various special kinds of courses. Each article contains a bibliography to guide the reader to further reading on the subject.

Learn from the masters grew out of a conference in Norway which brought together mathematicians and mathematics educators from a dozen countries who were interested in the use of the history of mathematics as a pedagogical tool in the teaching of mathematics. Since the conference which provided the genesis of this book took place in Norway near the home where Niels Henrik Abel spent his final days, the book's title comes from a note scribbled in one of Abel's notebooks: "It appears to me that if one wants to make progress in mathematics, one should study the masters". The authors hope that readers will benefit from Abel's advice and show their students how they too can learn from the Masters.

The book can be ordered by mail, ISBN: 0-88385-703-0

MAA, PO Box 91112, Washington, DC 20090-1112, USA

or by fax: +1 202 265 2384

## Ethnomathematics and education in Africa

Author: *Paulus Gerdes*

Publisher: Institute of International Education, University of Stockholm, Sweden.

This report No 97 is published within the framework of the institutional cooperation that started in 1991 between the Institute of International Education, University of Stockholm and Instituto Superior Pedagógico in Maputo, Mozambique.

Ethnomathematical research has taken place in Mozambique since the end of the 1970s. In 1988 it became organized as the *'Ethnomathematics in Mozambique'* research project supported by SA-REC, Sweden that envisages the following general objectives:

1. To reconstruct and to analyse mathematics in African cultures in general and in Mozambican cultures in particular;
2. To contribute to the elaboration of the methodology for this reconstruction;
3. To analyse and to experiment (with the possibilities of 'embedding' or 'incorporating' African cultural elements into mathematical education;
4. On the basis of the reconstructed mathematics, to reflect on;
  - 4.1 didactical alternatives;
  - 4.2 the (early) history of mathematics;
  - 4.3 philosophical problems of mathematics;
  - 4.4 the involved mathematics.

Most 'mathematical' traditions that survived colonization and most 'mathematical' activities in the daily life of the Mozambican people are not explicitly mathematical. The mathematics is *'hidden'*. The first aim of the project is to 'uncover' some of this 'hidden' mathema-

tics. As many traditions are nowadays rather obsolete, the 'uncovering' often also meant a tentative reconstruction of past knowledge.

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On culture, geometrical thinking and mathematics education

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'Pythagoras', similar triangles and the "elephants' defence" - pattern of the Bakuba (Central Africa)

In possible uses of traditional Angolan sand drawings in the mathematics classroom

Exploration of the mathematical potential of 'SONA': an example of stimulating cultural awareness in mathematics teacher education

Technology, Art, Games and Mathematics Education: an example

On the history of mathematics in Africa south of the Sahara