SUNDAY, JULY 13, 2003

12:00–16:00
REGISTRATION
ROOM
CONVENTION CENTER

17:00–18:00
CULTURAL PRESENTATION
CHURCH
& CONFERENCE OPENING
KAWAIAHA‘O

18:00–19:00
PLENARY LECTURE 1
CHURCH
Nainoa Thompson
Navigating Between Theory And Practice
KAWAIAHA‘O

19:00–20:30
RECEPTION
KAWAIAHA‘O CHURCH HALL
08:00–09:30

WORKING SESSIONS I

**WS1 Embodiment In Mathematics: Metaphor And Gesture**
Edwards, Laurie & Janete Bolite Frant

**WS2 Exploring Alternative Interpretations Of Classroom Data**
Breen, Chris & Markku Hannula,

**WS3 Models And Modeling Working Session**
Lesh, Richard, Helen Doerr, Lyn English, & Margret Hjalmarson

**WS4 Researching The Teaching And Learning Of Mathematics In Multilingual Classrooms**
Barwell, Richard, Anjum Halai, & Mamokgethi Setati

**WS5 Symbolic Cognition In Advanced Mathematics**
Hegedus, Stephen

**WS6 The Complexity Of Learning To Reason Probabilistically**
Stohl, Hollylynne & James Tarr

**WS7 The Design And Uses Of Curriculum Materials**
Li, Yeping

**WS8 The Role Of Syntax And Technology In The Development Of Algebraic Reasoning In The Early Grades (K-8)**
Olive, John, Maria Blanto; & Jim Kaput

**WS9 Understanding Learning Through Teaching In The Mathematics Classroom**
Cockburn, Anne & Fran Lopez-Real

**WS10 Videopapers: An Emerging Way To Publish And Conduct Research And Classroom Analysis**
Cogan-Drew, Daniel & Ricardo Nemirovsky

09:30-10:00

REFRESHMENTS

10:00–11:00

PLENARY LECTURE 2

Jo Boaler

*Studying And Capturing The Complexity Of Practice: The Case Of The Dance Of Agency*
### Monday, July 14, 2003

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Rebecca C. Ambrose, Randolph Philipp, Jennifer Chauvot & Lisa Clement

A Web-Based Survey to Assess Prospective Elementary School Teachers’ Beliefs About Mathematics and Mathematics Learning: An Alternative to Likert Scales

Manuel Santos, Evelyn Aguero, Alexander Borbon & Cristhian Paez

Students’ Use Of Technology In Mathematical Problem Solving: Transforming Technological Artifacts Into Mathematical Tools

12:15–13:05
LUNCH
(FIRST TIMERS’ MEETING—to be held in Room 312)

13:05–13:45
RESEARCH REPORTS 2

Marilyn Carlson, Nanci Smith & Joni Persson

Developing And Connecting Calculus Students’ Notions Of Rate-Of-Change And Accumulation: The Fundamental Theorem Of Calculus

Arthur B. Powell & Carolyn A. Maher

Heuristics of Twelfth-Graders Building Isomorphisms

Gilah C. Leder, David G. Pederson & Graham H. Pollard

Mathematics Competitions, Gender, And Grade Level: Does Time Make A Difference?

Judit Moschkovich

What Counts As Mathematical Discourse?

Richard Barwell

Attention To Mathematical Structure During Participation In A Mathematics Classroom Task By Learners Of English As An Additional Language (EAL)

Tony Brown

Mathematical Identity In Initial Teacher Training

Sarah B. Berenson & Rod Nason

Using Instructional Representations Of Ratio As An Assessment Tool Of Subject Matter Knowledge

Christina Misailidou & Julian Williams

Measuring Children’s Proportional Reasoning, The “Tendency” For An Additive Strategy And The Effect Of Models

Franco Favilli, M. Luisa Oliveras & Margarida Cesar

Bridging Mathematical Knowledge From Different Cultures: Proposals For An Intercultural And Interdisciplinary Curriculum
MONDAY, JULY 14, 2003

Helen M. Doerr
Using Students’ Ways Of Thinking To Re-Cast The Tasks Of Teaching About Functions
Page 2-333 Room 306B

Sandra Crespo & Cynthia Nicol
Learning To Investigate Students’ Mathematical Thinking: The Role Of Student Interviews
Page 2-261 Room 307A

Peter Sullivan, Robyn Turner Harrison, Judy Mousley & Robyn Zevenbergen
Being Explicit About Aspects Of Mathematics Pedagogy
Page 4-267 Room 307B

Analucia Schliemann, David Carraher, Barbara Brizuela, Darrell Earnest, Anne Goodrow, Susanna Lara-Roth & Irit Peled
Algebra In Elementary School
Page 4-127 Room 308A

Howard Tanner & Sonia Jones
Self-Efficacy In Mathematics And Students’ Use Of Self-Regulated Learning Strategies During Assessment Events
Page 4-275 Room 308B

Lisa Clement, Jennifer Chauvot, Randolph Philipp & Rebecca Ambrose
A Methodological Approach For Developing Rubrics For Research Purposes
Page 2-221 Room 313A

Michele Cerulli & Maria Alessandra Mariotti
Building Theories: Working In A Microworld And Writing The Mathematical Notebook
Page 2-181 Room 313B

13:45–13:50
BREAK

13:50–14:50
SHORT ORAL COMMUNICATIONS I

Helena Müller & Dirk Wessels
Types and levels of spatial representation in the data tasks of Grade 4-7 students
Page 1-245 Room 301A

Tara-Lynn Scheffel, Cornelia Hoogland, Daniel Jervis & George Gadanidis
Mathematics As An Aesthetic Experience
Page 1-250 Room 301A

Bridget Arvold
Taking, Playing, and Making the Role of Secondary Mathematics Teachers
Page 1-201 Room 301A

William E. Geeslin
Exploring Fourth Grade Students' Probabilistic Reasoning In A Game Situation Based On Binomial Trials
Page 1-223 Room 301B
MONDAY, JULY 14, 2003

Lynn M. Gordon
Parent Contributions To The Collective
1-226 301B

Stephen Lerman, GuoRong Xu, Anna Tsatsaroni
Developing Theories Of Mathematics Education Research: The PME Story
1-242 301B

Tonya Gau, Laurie Rubel, Marian Slaughter & Laura Grandau
Teacher Beliefs And Practices Regarding The Black-White Mathematics Achievement Gap
1-221 303A

Jesse Solomon
On Culture, Race And Being Explicit In Mathematics Teaching
1-252 303A

Peter Winbourne
Tracking Beginning Teachers’ Developing Expertise Within The Practice Of Primary School Mathematics Teaching
1-263 303A

George Booker & Janeen Lamb
The Impact Of Teachers’ Understanding Of Division On Students’ Division Knowledge
1-207 303B

Maria A. Droujkova
The Role Of Metaphors In The Development Of Multiplicative Reasoning Of A Young Child
1-213 303B

Olimpia Figueras & Alicia Martinez Hernandez
Construction Of Personal Symbol Systems
1-216 303B

Jing Chung & Tien-Chen Chu
The Formation Of Discussion Culture In Mathematics Classrooms
1-211 304A

Penina A. Ogolla
Changing Teachers’ Pedagogical Beliefs
1-247 304A

Barba Patton & Estella de los Santos
Strategies Used By A Beginning Middle-School Mathematics Teacher Seeking Certification
1-248 304A

Jeanette Berman, Lorraine Graham & Ted Redden
Defining Students’ Instructional Needs In Numeration Using Dynamic Assessment
1-204 304B

Anne Goodrow & Analucia D. Schliemann
Linear Function Graphs And Multiplicative Reasoning In Elementary School
1-224 304B

Masataka Koyama
Research On The Process Of Understanding Mathematics: Ways Of Measuring Area Of Trapezoid
1-239 304B
Ching-Kuch Chang

*Designing Professional Development For In-Service Mathematics Teachers In Taiwan*

Zahra Gooya

*Mathematics Teachers’ View Of Teaching Geometry In Iran*

Susan Nickerson

*Changing Instructional Practice And The Classroom Community*

Leicha Bragg

*The Relationship Between Games, Learning, And Student Responses*

Eric Hsu & Megan Moore

*Online Teacher Communities: Measuring Engagement, Responsiveness And Refinement*

Daniel Krupanandan

*Problem Solving The Challenge Facing South African Mathematics Teachers*

Robert P. Hunting

*The Role Of Fingers In Preschoolers’ Mathematical Problem Solving*

Ji-Won Son

*The Usefulness Of Performance Assessment In Students’ Understandings Of Fractions In Korea*

Ian Thompson

*An Investigation Of The Relationship Between Young Children’s Understanding Of The Concept Of Place Value And Their Competence At Mental Addition*

Corvell George Cranfield

*How Grade 12 Students Understand And Solve Geometric Problems*

Pessia Tsamir & Luciana Bazzini

*Students’ Solutions To Similarly Structured Inequalities*

Avikam Gazit

*Carpenter, Tractors And Microbes For Developing Mathematical Thinking: How Do 10th Grade Students & Preservice Teachers Solve Challenging Problems?*
### Critical Review Of Geometry In Current Textbooks In Lower Secondary Schools In Japan And The UK
Taro Fujita & Keith Jones  
1-220  306A

### Enabling Students’ Interaction With Diagrams While Making And Proving Reasoned Conjectures
Patricio Herbst  
1-229  306A

### Learning Mathematics Within The Context Of Linguistic And Cultural Diversity – An Empirical Study
Gabriele Kaiser  
1-236  306A

### The Usefulness And Limitations Of Incommensurability In Analyzing 8th Grade Students’ Understanding Of Algebra
Michael N. Fried & Miriam Amit  
1-218  306B

### Eighth Grade Students’ Understandings Of Geometric Transformations In The Context Of A Dynamic Software Environment
Karen F. Hollebrands  
1-230  306B

### The Teaching and Learning of Geometric Proof: An Emerging Theory
Tami S. Martin & Sharon Soucy McCrone  
1-244  306B

### 14:50–15:10
**REFRESHMENTS**

### 15:10–16:40
**RESEARCH FORUM I**

#### RF1 Perceptuo-Motor Activity and Imagination in Mathematics Learning
Ricardo Nemiroskvy & Marcelo Borba (Co-ordinators)

#### RF2 Equity, Mathematics Learning and Technology
Colleen Vale, Gilah Leder & Helen Forgasz (Co-ordinators)
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TUESDAY, JULY 15, 2003

11:00–11:30  CULTURAL PRESENTATION  310

11:30–11:35  BREAK

11:35–12:15  RESEARCH REPORTS 3

Mike Thomas  4-291  301A
The Role Of Representation In Teacher Understanding Of Function

Nadá Stehliková  4-251  301B
Emergence Of Mathematical Knowledge Structures. Introspection.

Ann C. Howe & Sarah B. Berenson  3-87  303A
High Achieving Girls In Mathematics: What’s Wrong With Working Hard?

Marja van den Heuvel-Panhuizen  4-323  303B
On The Search For Gender-Related Differences In Dutch Primary Mathematics Classrooms

Lyn D. English & Helen M. Doerr  2-357  304A
Perspective-Taking In Middle-School Mathematical Modelling: A Teacher Case Study

Marie Hofmannová, Jarmila Novotná & Zuzana Hadj-Moussová  3-71  304B
Attitudes Of Mathematics And Language Teachers Towards New Educational Trends

Wim Van Dooren, Dirk De Bock, An Hessels, Dirk Janssens & Lieven Verschaffel  4-331  305A
Remedying Secondary School Students’ Illusion Of Linearity: A Teaching Experiment

Sylvia Bulgar  2-157  305B
Using Research To Inform Practice: Children Make Sense Of Division Of Fractions

Vivi Nilssen  3-381  306A
Mentoring Teaching Of Mathematics In Teacher Education

Catherine A. Brown & Yusuf Koc  2-145  306B
An Examination Of How People With Diverse Background Talk About Mathematics Teaching And Learning Both Face-To-Face And On-Line

Immaculate Namukasa  3-357  307A
Collective Learning Structures: Complexity Science Metaphors For Teaching
TUESDAY, JULY 15, 2003

Els De Geest, Anne Watson & Steph Prestage  2-301  307B
Thinking In Ordinary Lessons: What Happened When Nine Teachers Believed Their Failing Students Could Think Mathematically

David W. Carraher & Darrell S. Earnest  2-173  308A
Guess My Rule Revisited

Rossella Garuti, Carlo Dapueto & Paolo Boero  2-413  308B
Evolution Of Forms Of Representation In A Modelling Activity: A Case Study

Martin A. Simon  4-183  309
Logico-Mathematical Activity Versus Empirical Activity: Examining A Pedagogical Distinction

Helen J. Forgasz  2-381  313A
Equity And Beliefs About The Efficacy Of Computers For Mathematics Learning

Liz Bills, Janet Ainley & Kirsty Wilson  2-105  313B
Particular and general in early symbolic manipulation

12:15–13:05
LUNCH ON THE BUSES

13:05–22:00
EXCURSION  POLYNESIAN CULTURAL CENTER
WEDNESDAY, JULY 16, 2003

08:00–09:30
MEET WITH PLENARY SPEAKERS
OR

WORKING SESSIONS II

WS1 Embodiment In Mathematics: Metaphor And Gesture
Edwards, Laurie & Janete Bolite Frant

WS2 Exploring Alternative Interpretations Of Classroom Data
Breen, Chris & Markku Hannula,

WS3 Models And Modeling Working Session
Lesh, Richard, Helen Doerr, Lyn English, & Margret Hjalmarson

WS4 Researching The Teaching And Learning Of Mathematics In Multilingual Classrooms
Barwell, Richard, Anjum Halai, & Mamokgethi Setati

WS5 Symbolic Cognition In Advanced Mathematics
Hegedus, Stephen

WS6 The Complexity Of Learning To Reason Probabilistically
Stohl, Hollylynne & James Tarr

WS7 The Design And Uses Of Curriculum Materials
Li, Yeping

WS8 The Role Of Syntax And Technology In The Development Of Algebraic Reasoning In The Early Grades (K-8)
Olive, John, Maria Blanto; & Jim Kaput

WS9 Understanding Learning Through Teaching In The Mathematics Classroom
Cockburn, Anne & Fran Lopez-Real

WS10 Videopapers: An Emerging Way To Publish And Conduct Research And Classroom Analysis
Cogan-Drew, Daniel & Ricardo Nemirovsky

09:30-10:00
REFRESHMENTS

10:00–11:30
PLENARY PANEL

Teachers Who Navigate Between Their Research And Their Practice
Novotná, Jarmila (Co-ordinator)
Lebethe, Agatha
Zack, Vicki
Rosen, Gershon

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Elizabeth Warren
Young children’s understanding of equals: A longitudinal study

Hanna Haydar
Daring To Ask The Hard Questions: The Effect Of Clinical Interview Training Upon Teachers Classroom Questioning

Stephen J. Hegedus & James Kaput
The Effect Of A Simcalc Connected Classroom On Students’ Algebraic Thinking

Carolyn Kieran & Jose Guzman
The Spontaneous Emergence Of Elementary Number-Theoretic Concepts And Techniques In Interaction With Computing Technology

12:15–13:05
LUNCH

13:05–13:45
RESEARCH REPORTS 5

Darina Jirotkova & Graham H Littler
Student’s Concept Of Infinity In The Context Of A Simple Geometrical Construct

Elena Nardi & Paola Iannone
Mathematicians On Concept Image Construction: ‘Single Landscape’ vs ‘Your Own Tailor-Made Brain Version’

Paul White & Michael Mitchelmore
Teaching Angles By Abstraction From Physical Activities With Concrete Materials

Peter Grootenboer
The Affective Views Of Primary School Children

Irit Peled & Juhaina Awawdy Shahbari
Improving Decimal Number Conception By Transfer From Fractions To Decimals

Rosetta Zan & Pietro Di Martino
What Does ‘Positive’ Attitude Really Mean?

Cinzia Bonotto
Investigating The Mathematics Incorporated In The Real World As A Starting Point For Mathematics Classroom Activities

Dor Abrahamson
Text Talk, Body Talk, Table Talk: A Design Of Ratio And Proportion As Classroom Parallel Events
Elaine Simmt, Brent Davis Lynn, Gordon & Jo Towers
Teachers’ Mathematics: Curious Obligations

Ilan Lavy & Atara Shriki
Pre-Service Teachers’ Transition From “Knowing That” To “Knowing Why” Via Computerized Project-Based-Learning

Anibal Cortes
A Cognitive Model of Experts’ Algebraic Solving Methods

Tom J. Cooper & Elizabeth Warren
Open-Ended Realistic Division Problems, Generalisation And Early Algebra

Jose Guzman, Nadine Bednarz & Fernando Hitt
Theoretical Model of Analysis Of Rate Problems In Algebra

Haralambos Sakonidis & Anna Klothou
Assessment Practices In School Mathematics: Acting And Debating

Dave Pratt & Ian Davison
Interactive Whiteboards And The Construction Of Definitions For The Kite

Sarah M. Davis
Knowledge Sharing Systems: Advantages Of Public Anonymity And Private Accountability

13:45–13:50
BREAK

13:50–14:50
POSTER PRESENTATIONS 1

Solange Amorim Amato & Anne Watson
Improving Student Teachers’ Understanding Of Multiplication By Two-Digit Numbers

Babette M. Benken
Investigating The Complex Nature Of Mathematics Teaching: The Role Of Beginning Teachers’ Perceptions In Their Practice

Angelika Bikner-Ahsbahs
Insight Into A Theory About Interest-Dense Situations In Maths Classes

Sang Sook Choi-Koh
Students’ Development In Exploration Using A Hand-Held Calculator

Kathryn B. Chval
Calculator Keystrokes: Tools For Thought And Communication
WEDNESDAY, JULY 16, 2003

Noel Geoghegan & Ann Reynolds
Learning Mathematics: Systems Theory As A Guide To Practise

Barbara H.Glass
Towers, Pizza, And Pascal: Students Connecting Mathematical Ideas

Valery A. Gusev & Ildar S. Safuanov
The structure of mathematical abilities

Heather Kelleher & Cynthia Nicol
Learning To Learn From Students: Teacher Learning In The British Columbia Early Numeracy Project

Hari P. Koirala
Student Created Mathmagic And Their Relationship To School Algebra

Konrad Krainer & Gertraud Benke
Students As Teachers, Teachers As Researchers

Oh-Nam Kwon, Kyoung-Hee Cho, Mi-Kyung Ju, Kyung-Hee Shin & Jung-Sook Park
Students’ Conceptual Understanding And Attitudes In RME-Based Differential Equations Class

Michal Mashiach-Eizenberg
Inter-Relations Between Control Processes And Successful Solutions Of Combinatorial Problems

Rebecca McGraw
The Process Of Facilitating Mathematics Discussions

Joyce Mgombelo & Florence Glanfield
Using Manipulatives As Generative Mechanisms For Explaining Mathematics Phenomena

Kay Dianne Owens, Rex Matang & Wilfred Kaleva
Ethnomathematics In Papua New Guinea: Practice, Challenges and Opportunites for Research

John Pegg, Lorraine Graham, Howard Doran & Anne Bellert
An Analysis Of Long-Term Effects Of An Intervention Program Designed To Enhance Basic Numeracy Skills For Low-Achieving Middle-School Students

Axelle Person, Michelle P. Longest, Sarah B. Berenson, Joan J. Michael & Mladen A. Vouk
Relationship Between Proportional Reasoning And Achievement for Early Adolescent Girls
WEDNESDAY, JULY 16, 2003

Sandra Richardson
A Design of Useful Implementation Principles for the Diffusion of Knowledge In the Mathematics Classroom

Luisa Rosu
Learning From Ancient People...

Pavel Satianov & Miriam Dagan
One Problem - Ten Models And Cumulative Cognitive Affect

Maria Tereza Carneiro Soares
Oral And Written Practice At Initial Teaching Mathematics: Teachers’ Knowledge And The Creation Of Didactic Situations

Paola Sztajn
Developing A Mathematics Education Community In An Elementary School

Wen-Huan Tsai
Supporting Teachers In Building Classroom Discourse Centered On Mathematics

Hasan Unal & Eric Jakubowski
A Technology Tool To Support Teachers In Motivational Dimension Of Math Lessons

Michelle L. Wallace
Mathematics and Physics: A Shared Language

Lisa Warner & Daniel Ilaria
The Interplay Between Teacher Questions And Flexible Mathematical Thought

Pamela S. Webster
Developmental Mathematics Course Interventions And The Texas Academic Skills Program Test

Dirk Wessels & Helena Müller
Data Arrangement Types Of 10-12 Year Old Students

Melvin (Skip) Wilson & Laura Jacobsen Spielman
Secondary Teachers’ Conceptions of Graph Theory and Functions: Implications for Teaching

Caroline Yoon
Student-Controlled Factors Enhancing Creative Mathematical Problem Solving

14:50-15:10
REFRESHMENTS
RESEARCH REPORTS 6

15:10–15:50

Samuele Antonini
Non-Examples And Proof By Contradiction

Erh-Tsung Chin
Mathematical Proof As Formal Procept In Advanced Mathematical Thinking

Ildar S. Safuanov & Valery A. Gusev
Thinking in images and its role in learning mathematics

Keith Weber
A Procedural Route Toward Understanding The Concept Of Proof

Günter Törner
Obstacles for mental representations of real numbers: Observations from a case study

Erkki Pehkonen, Anu Nurmi, Markku Hannula & Hanna Maijala
On Pupils’ Self-Confidence In Mathematics: Gender Comparisons

Allen Leung
Dynamic Geometry And The Theory Of Variation

Glenda Anthony
‘Sensing’: Supporting student understanding of decimal knowledge

Veronica Hoyos
Mental Functioning Of Instruments In The Learning Of Geometrical Transformations

JeongSuk Pang
Student-Centered Teaching Practices In Korean Elementary Mathematics Classrooms

Florence Mihaela Singer
From Cognitive Science To School Practice: Building The Bridge

Kylie Thompson, Annette Baturo & Tom Cooper
Effective teaching with virtual material: Years Six and Seven case studies

Luis Radford, Serge Demers, Jose Guzman & Michele Cerulli
Calculators, Graphs, Gestures And The Production Of Meaning

Truus Dekker & Els Feijs
Scaling Up Strategies For Change

Chronis Kynigos & Georgos Psycharis
13 Year-Olds’ Meanings Around Intrinsic Curves With A Medium For Symbolic Expression And Dynamic Manipulation
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                 *The Assessment of Mathematical Logic: Abstract Patterns and Familiar Contexts* | 4-283 |
|               | **Victor Giraldo, Luiz Mariano Carvalho & David Tall**  
                 *Descriptions And Definitions In The Teaching Of Elementary Calculus* | 2-445 |
|               | **Nitsa Cohen**  
                 *Curved Solids Nets* | 2-229 |
|               | **Nadia Douek & Michel Pichat**  
                 *From Oral To Written Texts In Grade 1 And The Approach To Mathematical Argumentation* | 2-341 |
|               | **Carolyn Vela & Michael O. J. Thomas**  
                 *Computers In The Primary Classroom: Barriers To Effective Use* | 4-347 |
|               | **Tracey Smith**  
                 *Connecting Theory And Reflective Practice Through The Use Of Personal Theories* | 4-215 |
|               | **Stephen Hwang & Jinfai Cai**  
                 *A Perspective For Examining The Link Between Problem Solving And Problem Posing* | 3-103 |
|               | **Cecilia Monteiro**  
                 *Prospective Elementary Teachers’ Misunderstandings In Solving Ratio And Proportion Problems* | 3-317 |
|               | **Rebecca McGraw, Fran Arbaugh, Kathleen Lynch & Catherine A. Brown**  
                 *Mathematics Teacher Professional Development As The Development Of Communities Of Practice* | 3-269 |
|               | **Razia Fakir Mohammad**  
                 *A Co-Learning Partnership In Mathematics Lower Secondary Classroom In Pakistan: Theory Into Practice* | 3-309 |
|               | **Lisa Warner, Lara J. Alcock, Joseph Coppolo Jr. & Gary E. Davis**  
                 *How Does Flexible Mathematical Thinking Contribute To The Growth Of Understanding?* | 4-371 |
|               | **Annette Baturo**  
                 *Australian indigenous students’ knowledge of two-digit numeration: Adding one ten* | 2-81 |
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An Analysis Of Mental Space Construction In Teaching Linear Equation Word Problems

Susanne Prediger & Katja Lengnink
Development Of Personal Constructs About Mathematical Tasks – A Qualitative Study Using Repertory Grid Methodology

Margaret P. Sinclair
The Provision Of Accurate Images With Dynamic Geometry

Ann Heirdsfield
“Spontaneous” Mental Computation Strategies

Carmel Diezmann
Teachers’ Characteristics: Introducing Investigations To Young Children

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*Software Design As A Method Of Accessing Students’ Understanding*

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*Improving mathematics written tests: Impact of research on student teachers’ conceptions*

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*An Exploration Of The Effect Of Improved Automaticity And Retrieval Of Basic Number Facts On Middle-School Students’ Higher-Order Problem-Solving Performance*

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*Constructivist Approaches In The Mathematical Education Of Future Teachers*

*Gesture In The Context Of Mathematical Argumentation*

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*Mathematics For Future Secondary Teachers*
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Erkki Pehkonen, Hanna Maijala, Markku S. Hannula & Riitta Soro
Understanding And Self-Confidence In Mathematics

Armando M. Martinez-Cruz & Jose N. Contreras
How To Pose It: An Empirical Validation Of A Problem-Posing Model

Bryan Moseley & Charles Bleiker
Pre-Service Early Childhood Teacher’s Representations of Quantity Relations: The Role of Math Mediated Language

Hiro Ninomiya
How To Summarize What We’ve Learned: Two Types Of Summary In Mathematics Learning

Jarmila Novotná & Jana Kratochvilova

Judith Olson, Fay Zenigami, Linda Venenciano & Melfried Olson
An Overview of Measure Up: Algebraic Thinking Through Measurement

Ana Pasztor & Cengiz Alacaci
Making Sense (Literally!) Of Students’ Mathematics Experience

Peter E. Patacsil
Using Ethnomathematics To Enhance Elementary Classroom Teaching In Guam

Andrea Peter-Koop
Open Real-World Problems In The Primary Classroom: Investigating Pupils’ Interactive Modelling Processes

Katrina Piatek-Jimenez
Undergraduate Students’ Beliefs and Misconceptions About Proof

Steve Rhine
Considerations Of Veteran Mathematics Teachers As They Prepare Their Lessons

Luisa Rosu & Bridget Arvold
Questioning In Action, An Inherent Attribute Of Teaching Mathematics In The Future

Ana Isabel Sacristan
Implementing Computer Programming Activities For Mathematical Learning In Mexican Schools
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Hollylynne Stohl & Robin L. Rider
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Örjan Hansson & Barbro Grevholm
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Preservice Teachers’ Conceptions of Y=X+5: Do They See A Function?

Jose N. Contreras & Armando M. Martinez-Cruz
303A
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Paolo Boero, Nadia Douek & Rossella Garuti
303B
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Areti Panaoura & George Philippou
304A
The Construct Validity Of An Inventory For The Measurement Of Young Pupils’ Metacognitive Abilities In Mathematics

Nathalie Sinclair
304B
Aesthetic Values In Mathematics: A Value-Oriented Epistemology

Bob Speiser & Chuck Walter
305A
Getting At The Mathematics: Sara’s Journal

Ron Tzur
305B
Teacher And Students’ Joint Production Of A Reversible Fraction Conception

Michelle T. Chamberlin
306A
Teacher Investigations Of Students’ Work: Meeting The Challenge Of Attending To Students’ Thinking

Laura R. Van Zoest & Jeffrey V. Bohl
306B
The Value Of Wenger’s Concepts Of Modes Of Participation And Regimes Of Accountability In Understanding Teacher Learning

Gaye Williams
307A
Empirical Generalisation As An Inadequate Cognitive Scaffold To Theoretical Generalisation Of A More Complex Concept
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Rina Zazkis, Peter Liljedahl & Karen Gadowsky
*Translation Of A Function: Coping With Perceived Inconsistency*

Kirsty Wilson, Janet Ainley & Liz Bills
*Comparing competence in transformational and generational algebraic activities*

Mariana Saiz
*Primary Teachers’ Conceptions About The Concept Of Volume: The Case Of Volume – Measurable Objects*

Morten Misfeldt
*Mathematicians’ Writing*

Marj Horne
*Gender Differences In The Early Years In Addition And Subtraction*

13:45–13:50
BREAK

13:50–14:50
SHORT ORAL REPORTS II

Mike Askew, Tamara Bibby, Margaret Brown & Jeremy Hodgen
*Mental Calculation: Interpretations And Implementation*

Cristianne Butto & Teresa Rojano
*Early Introduction To Algebraic Thinking: An Experience In The Elementary School*

Mary Pat Sjostrom & Melfried Olson
*Effects Of Measure Up On Area Conservation*

Lisser Ejersbo
*Developing The Reflective Competencies Of The Mathematics Teacher*

Lynn C..Hart
*The Voice Of The Student: Elementary Students’ Beliefs And Self-Efficacy About Mathematics*

Marianna Tzekaki, Maria Kaldrimidou & Haralambos Sakonidis
*A Typology Of Teachers’ Interventions In Students’ Mathematical Work In The Classroom*

Hui-Yu Hsu
*An Experimental Study of the Effects of Portfolio Assessment and Paper-and-Pencil Test on Mathematical Concepts, Mathematical Communicating Capability, and Mathematical Learning Attitude*

Elizabeth B.Uptegrove
*Understanding Pascal’s Triangle*

Seok-Il Kwon & Mi-Ai Park
*A Historic-Genetic Approach To Teaching The Meaning of Proof*
THURSDAY, JULY 17, 2003

Chaim Tirosh & Shlomo Vinner
Prospective Teachers’ Knowledge Of Proofs And Refutations

Oleksiy Yevdokimov
Intuitive Proofs As A Tool For Development Of Student’s Creative Abilities While Solving And Proving

Nancy Whitman & Claire Okazaki
What “=” Means

Jennifer M. Young-Loveridge
Becoming A Part-Whole Thinker: The New Zealand Early Numeracy Project

Johann Engelbrecht & Ansie Harding
The Impact of Web-Based Undergraduate Mathematics Teaching On Developing Academic Maturity

Elizabeth Jakubowski & Hasan Unal
A Critical Examination Of A Community College Mathematics Instructor’s Beliefs And Practices

Robin L. Rider
The Effect Of Multi-Representational Methods On College Students’ Success In Intermediate Algebra

Nadine Bezuk & Jane Gawronski
Increasing Content And Pedagogical Knowledge Of Practicing Elementary Teachers

Dale Havill & Eric Benson
Arabic Students’ Probability Judgments

Noriyuki Inoue
The Significance Of Interpretive Activity In Problem Solving: Less Is More As A Design Principle

Hollylynne Stohl
Prospective Teachers’ Development In Teaching With Technology

Nermin Tosmur & Behiye Ubuz
Professional Engineer’s View On University Mathematics And Mathematics Education

Lara Alcock & Adrian Simpson
Logical Consequences Of Procedural Reasoning

Jan Bezuidenhout
How Can Students’ Ability To Deal Effectually With Calculus Symbolism Be Enhanced?
Sergiy Klymchuk, Norbert Gruenwald & Zlatko Jovanoski
Investigating The Ways Of Reducing The Gap Between The School And University Mathematics—An International Study

Cengiz Alacaci & Ana Pasztor
Effects of Semantic Content on Logical Reasoning With Negation

Babette M. Benken & Bridget Arvold
Transforming Mathematics Teacher Education

John Francisco
Students’ Epistemological Ideas in Mathematics

Ok-Kyeong Kim & Joy Whitenack
K-3 Teachers’ Learning Of Questioning

Anne Berit Fuglestad
Developing Students’ ICT Competence

Po-Hung Liu
College Students’ Views of Mathematics And Behavior

Robyn Turner-Harrison
Self Concept & Participation In Mathematics

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REFRESHMENTS

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Mamokgethi Setati
Language Use In A Multilingual Mathematics Classroom In South Africa: A Different Perspective

Talli Nachlieli & Anna Sfard
The Activity Of Defining

Jya-Yi Wu Yu, Fou-Lai Lin & Yuan-Shun Lee
Students’ Understanding Of Proof By Contradiction

Kaarina Merenluoto
Abstracting The Density Of Numbers On The Number Line – A Quasi-Experimental Study

Bernadette Baker, Maria Trigueros & Laurel Cooley
Thematization Of The Calculus Graphing

Iasonas Lamprianou & Thekla Afantiti Lamprianou
The Probabilistic Thinking Of Primary School Pupils In Cyprus: The Case Of Tree Diagrams
THURSDAY, JULY 17, 2003

Olive Chapman

Teachers’ Conceptions Of Mathematical Word Problem: A Basis For Professional Development

Kathryn Irwin

Multiplicative Strategies Of New Zealand Secondary School Authors

Len Sparrow & Sandra Frid

Using An Empowerment Professional Development Model To Support Beginning Primary Mathematics Teachers

Andrea McDonough & Doug Clarke

Describing The Practice Of Effective Teachers Of Mathematics In The Early Years

Lyndon Martin & Jo Towers

Collective Mathematical Understanding As An Improvisational Process

Janet Ainley

Generalizing the context and generalising the calculation

Kathy M. C. Ivey

Effective vs. Efficient: Teaching Methods Of Solving Linear Equations

Masakazu Okazaki

Characteristics Of 5th Graders’ Logical Development Through Learning Division With Decimals

Jeremy Roschelle, Phillip Vahey, Deborah Tatar, Stephen Hegedus & Jim Kaput

Five Key Considerations For Networking In A Handheld-Based Mathematics Classroom

Hanlie Murray

The Relative Influence Of The Teacher In Third Grade Mathematics Classrooms

Charalambos Charalambous, Leonidas Kyriakides & George Philippou

Testing A Comprehensive Model For Measuring Problem Solving And Problem Posing Skills Of Primary Pupils

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BREAK

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One Line Proof: What Can Go Wrong?

Mirko Maracci 3-221 303A
Difficulties In Vector Space Theory: A Compared Analysis In Terms Of Conceptions And Tacit Models

John Olive 3-421 303B
Nathan’s Strategies For Simplifying And Adding Fractions In Third Grade

Terry Wood & Betsy McNeal 4-435 304A
Complexity In Teaching And Children’s Mathematical Thinking

Hari P. Koirala 3-149 304B
Secondary School Mathematics Preservice Teachers’ Probabilistic Reasoning In Individual And Pair Settings

Oh NamKwon, Kyoung Hee Cho, Kyung Hee Shin & Jeong Sook Park 3-157 305B
Social Transformation of Students’ Conceptual Model: Analysis of Students’ Use of Metaphor for Differential Equations

Cynthia Nicol & Sandra Crespo 3-373 306A
Learning In And From Practice: Pre-Service Teachers Investigate Their Mathematics Teaching

Pi-Jen Lin 3-205 306B
Enhancing Teachers’ Understanding Of Students’ Learning By Using Assessment Tasks

Kay McClain 3-253 307A
Supporting Teacher Change: A Case From Statistics

Dave Hewitt 3-63 307B
Notation Issues: Visual Effects And Ordering Operations

Robyn Pierce, Lynda Ball & Kaye Stacey 4-15 308A
Recognising Equivalent Algebraic Expressions: An Important Component Of Algebraic Expectation For Working With CAS

Francis Lopez-Real & Nirmala Rao 3-213 308B
Early Mathematics Teaching: The Relationship Between Teachers’ Beliefs And Classroom Practices

Fulvia Furinghetti & Domingo Paola 2-397 313A
To Produce Conjectures And To Prove Them Within A Dynamic Geometry Environment: A Case Study
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PMENA ANNUAL GENERAL MEETING

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CONFERENCE BANQUET AND DANCE
### FRIDAY, JULY 18, 2003

**08:30–10:00**

**MEET WITH PLENARY PANEL & SPEAKER OR DISCUSSION GROUP II**

**DG1 Examining Theses**
Forgasz, Helen & Kathleen Hart (A Continuation From PME26)

**DG2 Facilitating Conceptual Change In Mathematics**
Pehkonen, Erkki & Kaarina Merenluoto (From PME26)

**DG3 Fostering The Mathematical Thinking Of Young Children: Pre-K-2**
Hunting, Robert & Catherine Pearn

**DG4 Integrated Mathematics And Science: Setting A Research Agenda**
Marrongelle, Karen & Brian Keller

**DG5 Integrating Equity And Complex Social Problems In Mathematics Teacher Education**
Mesa, Vilma

**DG6 Research On Gender And Mathematics From Multiple Perspectives**
Becker, Joanne & Ferdinand Rivera

**DG7 Semiotic And Socio-Cultural Evolution Of Mathematical Concepts**
Saenz-Ludlow, Adalira & Norma Presmeg

**DG8 Stochastical Thinking, Learning And Teaching**
Shaughnessy, Michael & Jane Watson (From PME26)

**DG9 The Messy Work Of Studying Professional Development: The Conversation Continues**
Brown, Catherine, Rebecca McGraw & Fran Arbaugh

**DG10 The Rise And Fall Of Mathematics Education Research**
Teppo, Anne

**DG11 The Role Of Mathematics Education In Social Exclusion: Reviewing The Interface Between Psychological And Sociological Research Paradigms**
Gates, Peter, Tansy Hardy, Robyn Zevenbergen, Mike Askew, & Stephen Lerman

### 10:00–11:00

**PLENARY LECTURE 5**

Toshiakaira Fujii

*Probing Students’ Understanding Of Variables Through Cognitive Conflict: Is The Concept Of A Variable So Difficult For Students To Understand?*
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11:00–11:30 PAGE ROOM
REFRESHMENTS

11:35–12:15 RESEARCH REPORTS 11

Bettina Dahl 2-277 301A
What Can We Learn About Cognitive Learning Processes By Asking The Pupils?

Francesca Ferrara 2-373 301B
Metaphors As Vehicles Of Knowledge: An Exploratory Analysis

Ernesto Sanchez & Ana Isabel Sacristan 4-111 303A
Influential Aspects Of Dynamic Geometry Activities In The Construction Of Proofs

J. Michael Shaughnessy, Dan Canada & Matt Ciancetta 4-159 303B
Middle School Students’ Thinking About Variability In Repeated Trials: A Cross-Task Comparison

Inaqui de Olaizola & Manuel Santos Trigo 2-309 304A
Towards A Redefinition Of The Mathematics Culture In The Classroom

Joaquin Giménez & Marcelo Barrial 2-429 304B
On Line Professional Community Development And Collaborative Discourse In Geometry

Azita Manouchehri 3-221 305A
Factors Motivating Reform: Learning From Teachers’ Stories

Susan N. Friel 2-389 305B
Identifying A Research Agenda: The Interaction Of Technology With The Teaching And Learning Of Data Analysis And Statistics

Aurora Gallardo 2-405 306A
“It Is Possible To Die Before Being Born”. Negative Integers Subtraction: A Case Study

Ferdinand D. Rivera & Joanne Rossi Becker 4-63 306B
The Effects Of Numerical And Figural Cues On The Induction Processes Of Preservice Elementary Teachers

George Philippou, Charalambos Charalambous & Leonidas Kyriakides 4-7 307A
The Development Of Student Teachers’ Efficacy Beliefs In Mathematics During Practicum

Federica Olivero 3-429 307B
Cabri As A Shared Workspace Within The Proving Process

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Ann Gervasoni
Key Transitions In Counting Development For Young Children Who Experience Difficulty

Vicki Steinle & Kaye Stacey
Grade-Related Trends In The Prevalence And Persistence Of Decimal Misconceptions

12:15–13:05
CONFERENCE CLOSING