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Selected Writings from the Journal of the Saskatchewan Mathematics Teachers' Society Celebrating 50 years (1961-2011) of Vinculum

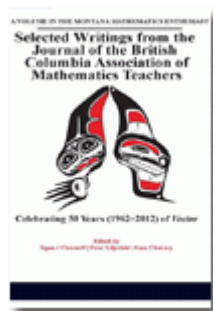
Egan J. Chernoff, University of Saskatchewan; Gale L. Russell, University of Regina; Bharath Sriraman, University of Montana

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The teaching and learning of mathematics in Saskatchewan—one of three Canadian provinces sharing a border with Montana—has a long and storied history. An integral part of the past 50 years (1961-2011) of history has been *Vinculum*: Journal of the Saskatchewan Mathematics Teachers' Society (in its many different renditions). This monograph, which presents ten memorable articles from each of the past five decades (i.e., 50 articles from the past 50 years of the journal), provides an opportunity to share this rich history with a wide range of individuals interested in the teaching and learning of mathematics and mathematics education. Each decade begins with an introduction, providing a historical context, and concludes with a decade-specific commentary by a prominent member of the Saskatchewan mathematics education community. As a result, this monograph provides a historical account as well as a contemporary view of many of the trends and issues (e.g., curriculum, technology) in the teaching and learning of mathematics. This book is meant to serve as a resource for a variety of individuals, including teachers of mathematics, mathematics teacher educators, mathematics education researchers, historians, and undergraduate and graduate students and, further, as a celebratory retrospective on the work of the Saskatchewan Mathematics Teachers' Society.

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Selected writings from the Journal of the British Columbia Association of Mathematics Teachers Celebrating 50 years of Vector

Egan J Chernoff, University of Saskatchewan; Peter Liljedahl, Simon Fraser University; Sean Chorney, Simon Fraser University

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The teaching and learning of mathematics in British Columbia has a long and storied history. An integral part of the past 50 years (1962-2012) of this history has been *Vector: Journal of the British Columbia Association of Mathematics Teachers*. This volume, which presents ten memorable articles from each of the past five decades, that is, 50 articles from the past 50 years of the journal, provides an opportunity to share this rich history with a wide range of individuals interested in the teaching and learning of mathematics and mathematics education. Each decade begins with an introduction, providing a historical context, and concludes with a commentary from a prominent member of the British Columbia mathematics education community. As a result, this monograph provides a historical account as well as a contemporary view of many of the trends and issues in the teaching and learning of mathematics. This volume is meant to serve as a resource for a variety of individuals including: teachers of mathematics, mathematics teacher educators, mathematics education researchers, historians, and undergraduate and graduate students. Most importantly, this volume is a celebratory retrospective on the work of the British Columbia Association of Mathematics Teachers.

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- What's in an emblem? *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 27(1), 13-15. III. Kelly, B. (1986). The microcomputer and the mathematics curriculum. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 28(1), 37-44. IV. Taylor, A. (1987). Mathematics education in North America. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 28(2), 35-42. V. O'Shea, T. (1987). The new BC math curriculum: A sheep in Wolfe's clothing. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 29(1), 32-37. VI. Walsh, C. (1988). Calculus in the secondary school. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 29(3), 25-31. VII. Edge, D. (1988). Teaching mathematics to mathematically gifted students. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 29(4), 21-27. VIII. Brochmann, H. (1988). The students and professors problem. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 29(4), 28-30. IX. Trivett, J. V. (1989). In mathematics, the ordinary can become extraordinary. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 30(2), 13-17. X. Liedtke, W. (1989). Mathematics teaching and learning in 1995: Looking back to 1988. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 30(3), 8-12. Commentary. *Vector in the 1980s: A Commentary, Ian deGroot*. THE 1990s. Introduction. The 1990s: An Introduction, *Kanwal Neel*. I. Shandola, D. (1992). Mathematics in the 90s. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 33(2), 29-33. II. Bilesky, D. (1994). I don't understand. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 35(2), 40-41. Milestone Moment. Phillips, G. (1994). The BCAMT Emblem. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 35(2), 53. Milestone Moment. Swift, J. (1995). The Information Highway: Part I. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 36(2), 37-39. III. Pusic, J. (1996). Using mathematical thinking. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 37(2), 60-63. IV. O'Shea, T. (1996). You want to do...what? *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 37(3), 33-37. V. Gray, J., Musgrave, S., Nenninger, R., Walker, R., & Austin, D. (1997). Mathematics: Art or Science of Both? *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 38(1), 25-28. VI.I. Dubiel, M. (1997). Math anxiety in students. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 38(3), 21-23. VI.II. Dubiel, M. (1998). Dealing with math anxiety in students. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 39(1), 15-17. VII. Mackey, K. (1998). The bias in the NCTM standards. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 39(2), 51-54. VIII. Robitaille, D. (1998). Canadian students' achievement: an international comparison. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 39(3), 45-52. IX. Graham, D. (1999). Incentive programs for males in mathematics. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 40(2), 19-21. X. Sherrill, J. (1999). The BCAMT: That was then, this is now. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 40(2), 27-30. Commentary. *Vector in the 1990s: A Commentary, Cynthia Nicol and Jennifer Thom*. THE 2000s. Introduction. The 2000s: An Introduction, *Brad Epp*. I. Brochmann, H. (2000). Why teach mathematics? *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 41(2), 35-37. II. Nicol, C. (2002). Knowing and learning mathematics for teaching. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 43(1), 29-34. III. Lin, J., Lin, E., & Wang, J. (2004). Why do Chinese students do well in math? What research says about the achievement gap and teaching practices. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 45(2), 39-44. IV. Easter, A. (2006). Lets learn together. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 47(2), 25-30. V. Roblin, M. (2007). Theory and practice: the two conflicting personalities of mathematics education. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 48(2), 42-46. VI. Tambellini, D. (2007). Metacognition in mathematics education. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 48(3), 56-64. VII. Flick, D. (2008). Teacher math anxiety and lack of conceptual understanding. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 49(1), 19-24. VIII. Lee, P. (2008). You, we or I - does it matter in math? *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 49(3), 32-39. IX. MacPherson, G. (2009). The rold of conditioned facts in elementary school mathematics. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 50(1), 11-15. X. Liedtke, W. (2009). The new mathematics curriculum: a golden opportunity for positive change that can easily be missed. - again. *Vector: Journal of the British Columbia Association of Mathematics Teachers*, 50(1), 34-43. Commentary. *Vector in the 2000s: A Commentary, Susan Oesterle*. 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Critique as Uncertainty

Ole Skovsmose

2014. Paperback 9781623967536 \$45.99. Hardcover 9781623967543 \$85.99. eBook 9781623967550 \$65.

The title of the book is Critique as Uncertainty. Thus Ole Skovsmose sees uncertainty as an important feature of any critical approach. He does not assume the existence of any blue prints for social and political improvements, nor that certain theoretical structures can provide solid foundations for a critical activities. For him critique is an open and uncertain activity. This also applies to critical mathematics education.

Critique as Uncertainty includes papers Ole Skovsmose already has published as well as some newly written chapters. The book addresses issues about: landscapes of investigations, students' foregrounds, mathematics education and democracy, mathematics and power. Finally it expresses concerns of a critical mathematics education.

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Selected writings from the Journal of the Mathematics Council of the Alberta Teachers' Association Celebrating 50 years (1962-2012) of delta-K

Egan J Chernoff, University of Saskatchewan; Gladys Sterenberg, Mount Royal University

2014. Paperback 9781623967000 \$45.99. Hardcover 9781623967017 \$85.99. eBook 9781623967024 \$65.

The teaching and learning of mathematics in Alberta - one of three Canadian provinces sharing a border with Montana - has a long and storied history. An integral part of the past 50 years (1962-2012) of this history has been delta-K: Journal of the Mathematics Council of the Alberta Teachers' Association. This volume, which presents ten memorable articles from each of the past five decades, that is, 50 articles from the past 50 years of the journal, provides an opportunity to share this rich history with a wide range of individuals interested in the teaching and learning of mathematics and mathematics education. Each decade begins with an introduction, providing a historical context, and concludes with a commentary from a prominent member of the Alberta mathematics education community. As a result, this monograph provides a historical account as well as a contemporary view of many of the trends and issues in the teaching and learning of mathematics. This volume is meant to serve as a resource for a variety of individuals, including teachers of mathematics, mathematics teacher educators, mathematics education researchers, historians, and undergraduate and graduate students. Most importantly, this volume is a celebratory retrospective on the work of the Mathematics Council of the Alberta Teachers' Association.

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The Development of Teaching Expertise from an International Perspective

Su Liang, California State University - San Bernardino

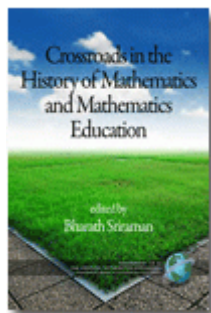
2013. Paperback 9781623963767 \$45.99. Hardcover 9781623963774 \$85.99. eBook 9781623963781 \$65.

This book provides an insightful view of effective teaching practices in China from an international perspective by examining the grades 7-12 mathematics teacher preparation in the Shandong province of China. It is an excellent reference book for teacher educators, researchers, reformers, and teaching practitioners. A qualitative research approach, involving in-depth interviews with purposive sampling of ten grades 7-12 award-winning mathematics teachers, was chosen to conduct the study. The participants are from the Shandong province and have been awarded recognition for his/her achievements in teaching grades 7-12 mathematics by the different levels: school, district, city, province, or nation; and his/her students have achieved high average scores in college entrance exams or in high school entrance exams among the classes at the same grade level.

Data analysis revealed the following findings: first, grades 7-12 mathematics teachers from the Shandong province of China were prepared to teach through pre-service training, in-service training, and informal learning. The pre-service training can be characterized as emphasizing formal mathematics training at advanced level. The in-service training is integrated with teacher collaboration and teaching research, and has the characteristics of diversity, continuity, and orientation toward teaching practice. The in-service training also stimulates teachers to conduct self-directed learning. Second, the award-winning grades 7-12 mathematics teachers are identified by the following characteristics: they are passionate about mathematics and share their passion through teaching; they actively take part in teaching research through application of teaching research in the classroom, collaboration with peers, and systematic lesson preparation; they apply technology into teaching; and they take an active role in teaching research in order to expand their professional opportunities.

Based on the findings of this study, the following conclusions were reached: pre-service training and in-service training are both necessary processes for mathematics teachers to build up their knowledge base for effective teaching. Pre-service training is just a starting point for the teaching profession. In-service training, integrated with teacher collaboration and teaching research should be a continuous activity that is a part of a teacher's everyday life.

CONTENTS: 1. Introduction. 2. Review of the Literature. 3. Methodology. 4. Findings. 5. Conclusion, Discussion, Implications, Recommendation. Appendixes. Appendix A: Interview Protocol. Appendix B: Pilot Study. Appendix C: A Sample of Comparison Matrix. Appendix D: An Example of Teaching. Appendix E: The Curriculum of China East Normal University. References.



Crossroads in the History of Mathematics and Mathematics Education

Bharath Sriraman, University of Montana

2012. Paperback 978-1-61735-704-6 \$45.99. Hardcover 978-1-61735-705-3 \$85.99. eBook 978-1-61735-706-0 \$65.

The interaction of the history of mathematics and mathematics education has long been construed as an esoteric area of inquiry. Much of the research done in this realm has been under the auspices of the history and pedagogy of mathematics group. However there is little systematization or consolidation of the existing literature aimed at undergraduate mathematics education, particularly in the teaching and learning of the history of mathematics and other undergraduate topics. In this monograph, the chapters cover topics such as the development of Calculus through the actuarial sciences and map making, logarithms, the people and practices behind real world mathematics, and fruitful ways in which the history of mathematics informs mathematics education. The book is meant to serve as a source of enrichment for undergraduate mathematics majors and for mathematics education courses aimed at teachers.

CONTENTS: TOPICS IN HISTORY AND DIDACTICS OF CALCULUS AND ANALYSIS. A note on the institutionalization of mathematical knowledge or “What was and is the Fundamental Theorem of Calculus, really”? *Eva Jablonka and Anna Klisinska (Sweden)*. Transitioning students to calculus: Using history as a guide, *Nicolas Haverhals & Matt Roscoe (USA)*. The tension between intuitive infinitesimals and formal mathematical analysis, *Mikhail Katz (Israel) & David Tall (UK)*. The didactical nature of some lesser known historical examples in mathematics, *Kajsa Bråting (Sweden) Nicholas Kallem & Bharath Sriraman (USA)*. The Brachistochrone Problem: Mathematics for a Broad Audience via a Large Context Problem, *Jeff Babb & James Currie (Canada)*. Chopping Logs: A Look at the History and Uses of Logarithms, *Rafael Villarreal-Calderon (USA)*. The history of mathematics as a pedagogical tool: Teaching the integral of the secant via Mercator's projection, *Nicolas Haverhals & Matt Roscoe (USA)*. **TOPICS IN THE HISTORY AND DIDACTICS OF GEOMETRY AND NUMBER.** Euclid's Book on the Regular Solids: Its Place in the Elements and Its Educational Value, *Michael N. Fried (Israel)*. Book X of The Elements: Ordering Irrationals, *Jade Roskam (USA)*. The Origins of the Genus Concept in Binary Quadratic Forms, *Mark Beintema & Azar Khosravani (USA)*. Where are the Plans: A socio-critical and architectural survey of early Egyptian Mathematics, *Gabriel Johnson, Bharath Sriraman, Rachel Saltzstein (USA)*. **HISTORY OF MATHEMATICS IN MATHEMATICS EDUCATION.** Classifying the arguments and methodological schemes for integrating history in mathematics education, *Constantinos Tzanakis & Yannis Thomaidis (Greece)*. A first attempt to identify and classify empirical studies on history in mathematics education, *Uffe Thomas Jankvist (Denmark)*. Reflections on and benefits of uses of history in mathematics education exemplified by two types of student work in upper secondary school, *Tinne Hoff Kjeldsen (Denmark)*. Adversarial and friendly interactions: Progress in 17th century mathematics, *Shirley B. Gray & Libby Knott (USA)*.



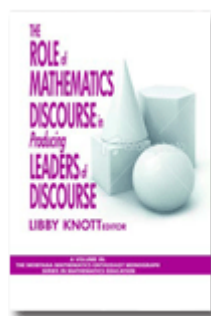
Interdisciplinarity for the 21st Century Proceedings of the 3rd International Symposium on Mathematics and its connections to the Arts and Sciences, Moncton 2009

Bharath Sriraman, University of Montana; Viktor Freiman, University of Moncton

2010. Paperback 978-1-61735-218-8 \$45.99. Hardcover 978-1-61735-219-5 \$85.99. eBook 9781617352201 \$65.

Interdisciplinarity has become increasingly important for emergent professions of the 21st century yet there is a dearth of systematic studies aimed at implementing it in the school and university curricula. The Mathematics and its Connections to the Arts and Sciences (MACAS) group places Mathematics as a vehicle through which deep and meaningful connections can be forged with the Arts and the Sciences and as a means of promoting interdisciplinary and transdisciplinary thinking traits amongst students. The Third International Symposium held by the MACAS group in Moncton, Canada in 2009 included numerous initiatives and ideas for interdisciplinarity that are implementable in both the school and university setting. The chapters in this book cover interdisciplinary links with mathematics found in the domains of culture, art, aesthetics, music, cognition, history, philosophy, engineering, technology and science with contributors from Canada, U.S., Denmark, Germany, Mexico, Iran and Poland amongst others.

CONTENTS: Introduction: Interdisciplinary Networks for Better Education in Mathematics, Science, and the Arts, *Viktor Freiman and Bharath Sriraman*. Intercultural Positioning in Mathematics, *David Wagner*. History in Mathematics Education—Why Bother? Interdisciplinarity, Mathematical Competence, and the Learning of Mathematics, *Tinne Hoff Kjeldsen*. The Role of the Aesthetic in Mathematical Problem Solving, *Nathalie Sinclair and Christian Berneche*. Mathematics in the Everyday World and at Work: Prolegomena for Rethinking the Concept of Interdisciplinarity, *Wolff-Michael Roth*. A Portrait on How Groups of Elementary Age Students in a French Language Minority Setting Pose an Environmental Problem, *Viktor Freiman, Diane Pruneau, Joanne Langis, Pierre-Yves Barbier, Marianne Cormier, and Monique Langis*. Teaching Citizenship Education Through the Mathematics Course, *Annie Savard*. Flow: An Emotional Experience in Mathematics Problem Solving, *T. Seifert, O. Radu, and A. Doyle*. Learner Directed Opportunities Through Adaptive Hypermedia Systems, *Adnen Barhoumi and Chadia Moghrabi*. Quantitative Reasoning as a Tool for Understanding, *Natalya Vinogradova*. Interdisciplinarity Through Processes of Modeling and Sociomathematical Decision Making, *Claus Michelsen and Jan Alexis Nielsen*. Do Mathematical Laboratories Enhance Primary School Students' Hands-On Learning Experiences? *Mark Applebaum and Viktor Freiman*. Amazing Math-Science-Arts Connections: Getting Insight Into the Golden Ratio, *Dominic Manuel, Viktor Freiman, Edel Reilly, Ildiko Pelczer, Natalya Vinogradova, Bharath Sriraman, and Astrid Beckmann*. Mathematics in Contemporary Art, *Nathalie Sayac*. Advancing the Concept of Variables Through Cross-Curricular Stations Between Arts and Mathematics Instruction, *Astrid Beckmann*. Visual Arts and Mathematics: Intertwining for a New Conversation in Education, *Lise Robichaud*. Why is a Negative \times a Negative = a Positive? Possible Benefits of Interdisciplinarity, *Polotskaia Elena*. Writing + Math = Opportunity: Forging New Interdisciplinary Connections, *Edel M. Reilly*. Study of the Potential of the Use of Degrees of Certainty to Provide the Common Sense with an "Alert Bell", *Sophie René de Cotret, Manon LeBlanc, and Réal Larose*. Visuo-Dynamic Learning: How Does the Net Generation Learn? *Zekeriya Karadag*. Online Video Technology as Enabler for Teaching and Learning Multidisciplinary Topics, *Dragana Martinovic*. Directional Pitch Spaces, *Ilhan M. Izmirli*. A Note on Fibonacci Numbers in Music, *Larry G. Blaine*. Robotic-Based Learning: RoboMaTIC, *Samuel F. J. Blanchard*. NET Generation: Social Media and its Link to Interdisciplinarity, *Samuel F. J. Blanchard*. A City Built on Geometry: Project-Based Learning in a Grade 10 Math Classroom, *Marcia Cormier*. Plato's Timaeus and the Intervals Used in Traditional Music of the Middle Classroom, *Amirhossein Damadi and Payam Seraji*. Using Origami as Context Builder to Teach (Pre)Math Skills, *Ildikó Pelczer*. Are There Mathematical Phenomena? *Herbert Gerstberger*. Mathematical Literacy and How Scientific Experiments Can Promote That Conception, *Simon Zell*. Cross-Curricular Teaching between Mathematics and Biology—Nutrition Circle, Similarity, and Allometry, *Astrid Beckmann and Annika Grube*. A Call for Integrating Engineering Through Cooperative Learning in the Mathematics and Science Teacher Education Program, *Ke Wu Norman, Anne L. Kern, and Tamara J. Moore*. Choosing to Study Mathematics and Science Beyond the Classroom: Who Participates and Why? *Karen Sullenger and Viktor Freiman*. A Brief History and Exploration of Some Didactic Journeys to Connect the Great Continents of Knowledge, *Alan Rogerson*. Some Remarks on the Comparison Between Mathematical and Poetical Facts/Events, *Romualdas Kašuba*.



The Role of Mathematics Discourse in Producing Leaders of Discourse

Libby Knott, Washington State University

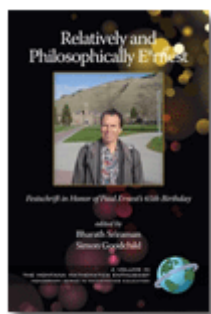
2010. Paperback 978-1-60752-282-9 \$45.99. Hardcover 978-1-60752-283-6 \$85.99. eBook 9781607522843 \$65.

The intent of this monograph is to showcase successful implementation of mathematical discourse in the classroom. Some questions that might be addressed are:

- * How does a teacher begin to learn about using discourse purposefully to improve mathematics teaching and learning?
- * How is discourse interwoven into professional development content courses to provide teachers with the tools necessary to begin using discourse in their own classrooms?

- * What does a discourse-rich classroom look like and how is it different from other classrooms, from both the teacher's and the students' perspectives?
- * How can teachers of pre-service teachers integrate discourse into their content and methods courses?
- * How can we use discourse research to inform work with teachers, both pre- and in-service, for example, to help them know how to respond to elicited knowledge from students in their classrooms?
- * What are the discourse challenges in on-line mathematics courses offered for professional development? Can on-line classrooms also be discourse-rich? What would that look like?
- * In what ways does mathematical discourse differ from discourse in general?

CONTENTS: Preface to The Role of Mathematics Discourse in Producing Leaders of Discourse, *Bharath Sriraman*. Student Mathematical Discourse and Team Teaching, *Martha VanCleave and Julie Fredericks*. Creating a Discourse-Rich Classroom (DRC) on the Concept of Limits in Calculus: Initiating Shifts in Discourse to Promote Reflective Abstraction, *Robert W. Cappetta and Alan Zollman*. Discursive Practices in College Pre-Calculus Classes, *Jo Clay Olson, Libby Knott, and Gina Currie*. "Yeah, but what if...?": A Study of Mathematical Discourse in a Third-Grade Classroom, *Karen M. Higgins, Cary Cermak-Rudolf, and Barbara Blanke*. The Role of Tasks in Promoting Discourse Supporting Mathematical Learning, *Sean Larsen and Joanna Bartlo*. Learning to Use Students' Mathematical Thinking to Orchestrate a Class Discussion, *Blake E. Peterson and Keith R. Leatham*. Orchestrating Whole-Group Discourse to Mediate Mathematical Meaning, *Mary P. Truxaw and Thomas C. DeFranco*. Eliciting High-Level Student Mathematical Discourse: Relationships between the Intended and Enacted Curriculum, *Nicole Miller Rigelman*. Beyond Tacit Language Choice to Purposeful Discourse Practices, *Beth Herbel-Eisenmann*. Care to Compare: Eliciting Mathematics Discourse in a Professional Development Geometry Course for K-12 Teachers, *Maria G. Fung, David Damcke, Dianne Hart, Lyn Riverstone, and Tevian Dray*. Sociomathematical Norms in Professional Development: Examining Leaders' Use of Justification and its Implications for Practice, *Rebekah Elliott, Kristin Lesseig, and Elham Kazemi*.



Relatively and Philosophically Earnest Festschrift in honor of Paul Ernest's 65th Birthday

Bharath Sriraman, University of Montana; Simon Goodchild, University of Agder, Norway

2009. Paperback 978-1-60752-240-9 \$45.99. Hardcover 978-1-60752-241-6 \$85.99. eBook 9781607523369 \$65.

Paul Ernest's name is synonymous with social constructivism as a philosophy of mathematics. His contributions to mathematics education have occurred at a very fundamental level and to a extent shaped theory development in this field. His research addresses fundamental questions about the nature of mathematics and how it relates to teaching, learning and society. For the last three decades Paul has been a prolific scholar who has published in a wide array of topics such as the relationship between the philosophy of mathematics and mathematics education, and more generally the philosophy of mathematics education, ethics and values in mathematics education, and the philosophy of research methodology.

The title of this Festschrift is meant to be a pun to convey the sometimes relativistic dimension to mathematical certainty that Paul argued for in developing his philosophy, and also a play on words for the fact that absolute "earnestness" may perhaps be a Platonic construct, and not possible in the realm of language and human discourse! Paul Ernest's scholarly evolution and life can best be summarized in the words of Walt Whitman "Do I contradict myself? Very well then I contradict myself" (I am large, I contain multitudes). Indeed his presence has been large and multitudinous and this Festschrift celebrates his 65th Birthday with numerous contributions coming from the mathematics, philosophy and mathematics education communities around the world.

CONTENTS: 1. Socially (Re)constructing Paul Ernest. *Bharath Sriraman (USA)*. 2. Listen to your Supervisor! *Simon Goodchild (Norway)*. 3. New Winds blowing in Applied Mathematics. *Philip J. Davis (USA)* 4. Tensions between Mathematics, the Sciences and Philosophy. *Jean Paul Van Bendegem (Belgium)* 5. The Analytic/Synthetic Distinction in Kant and Bolzano. *Michael Otte (Germany)* 6. Aesthetics and Creativity: An exploration of the relationship between the constructs. *Astrid Brinkmann (Germany) & Bharath Sriraman (USA)* 7. The Mathematical State of the World- Explorations into the characteristics of mathematical descriptions. *Ole Ravn Christensen (Denmark), Ole Skovsmose (Denmark) & Keiko Yasukawa (Australia)* 8. Humor in E(a)rnest. *Stephen I. Brown (USA)* 9. The Human condition, Mathematics and Mathematics Education. *Ubiratan D'Ambrosio (Brazil)* 10. On Field(ing) Knowledge. *Sharon Friesen & David W. Jardine (Canada)* 11. □□□□ *Paul Dowling (UK)* 12. Geometry: Tales of elegance and love. *Tim Rowland (UK)* 13. Needs versus Demands: Some ideas on what it means to know mathematics in society. *Tine Wedege (Sweden)* 14. New technologies in the classroom: Towards a semiotic analysis. *Ferdinando Arzarello (Italy)*



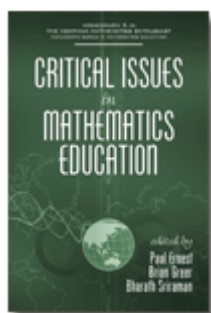
Interdisciplinarity, Creativity, and Learning Mathematics with Literature, Paradoxes, History, Technology, and Modeling

Bharath Sriraman, University of Montana; Viktor Freiman, University of Moncton; Nicole Lirette-Pitre, University of Moncton

2009. Paperback 978-1-60752-101-3 \$45.99. Hardcover 978-1-60752-102-0 \$85.99. eBook 9781607521884 \$65.

Interdisciplinarity is increasingly viewed as a necessary ingredient in the training of future oriented 21st century disciplines that rely on both analytic and synthetic abilities across disciplines. Nearly every curricular document or vision statement of schools and universities include a call for promoting creativity in students. Yet the construct of creativity and giftedness across disciplines remains elusive in the sense that the prototypical examples of such work come from eminent scientists, artists and mathematicians, and little if any work has been conducted with non-eminent individuals. This monograph is an attempt to fill this gap by putting forth the view that interdisciplinarity and creativity are related constructs, and that the cultivation of domain general creativity is possible. Mathematics has historically been anchored to numerous disciplines like theology, natural philosophy, culture and art, allowing for a flexibility of thought that is difficult to cultivate in other disciplines. In this monograph, the numerous chapters from Australia, U.S.A., Canada, Cyprus, Denmark and Japan provide a compelling illustration of the intricate connection of mathematics with literature, paradoxes, history, technology and modeling, thus serving as a conduit for interdisciplinarity, creativity and learning to occur.

CONTENTS: SECTION I: INTERDISCIPLINARITY IN MATHEMATICS AND LITERATURE. The Interdisciplinary Nature of Inductive Processes in Forming Generalizations, *Bharath Sriraman and Harry Adrian.* The Existential Void in Learning: Juxtaposing Mathematics and Literature, *Bharath Sriraman and Harry Adrian.* Mathematics and Literature: Synonyms, Antonyms or the Perfect Amalgam? *Bharath Sriraman.* Mathematics and Literature (The Sequel): Imagination as a Pathway to Advanced Mathematical Ideas and Philosophy, *Bharath Sriraman.* **SECTION I I: MATHEMATICS AND PARADOXES.** 1 or 0?: Cantorian Conundrums in the Contemporary Classroom, *Bharath Sriraman and Libby Knott.* Understanding Mathematics through Resolution of Paradoxes, *Margo Kondratieva.* Mathematical Paradoxes as Pathways into Beliefs and Polymathy, *Bharath Sriraman.* **SECTION III: GEOMETRY AND HISTORY.** Voronoi Diagrams, *Michael Mumm.* An In-Depth Investigation of the Divine Ratio, *Birch Fett.* Cyclide Manipulation, *Akihiro Matsuura.* **SECTION IV: INTERDISCIPLINARITY AND MODELING.** Modeling Interdisciplinary Activities Involving Mathematics and Philosophy, *Steffen M. Iversen.* Integrating Engineering Education within the Elementary and Middle School Mathematics Curriculum, *Lyn D. English and Nicholas G. Mousoulides.* Mathematical Modelling in the Early School Years, *Lyn D. English and James J. Watters.* **SECTION V: TECHNOLOGY AND THE NET GENERATION.** Connected Giftedness: Mathematical Problem Solving by Means of a Web Technology: Case of the CASMI Project, *Viktor Freiman and Nicole Lirette-Pitre.* Teaching and Learning for the Net Generation: A Robotic-Based Learning Approach, *Samuel Blanchard.* Does Technology Help Building More Creative Mathematical Environments? *Dominic Manuel.*



Critical Issues in Mathematics Education

Paul Ernest, University of Exeter, UK; Brian Greer, Portland State University; Bharath Sriraman, University of Montana

2009. Paperback 978-1-60752-039-9 \$45.99. Hardcover 978-1-60752-040-5 \$85.99. eBook 9781607522188 \$65.

The word "critical" in the title of this collection has three meanings, all of which are relevant. One meaning, as applied to a situation or problem, is "at a point of crisis". A second meaning is "expressing adverse or disapproving comments or judgments". A third is related to the verb "to critique", meaning "to analyze the merits and faults of". The authors contributing to this book pose challenging questions, from multiple perspectives, about the roles of mathematics in society and the implications for education. Traditional reasons for teaching mathematics include: preparing a new generation of mathematics researchers and a cadre of technically competent users of mathematics; training students to think logically; and because mathematics is as much part of cultural heritage as literature or music. These reasons remain valid, though open to critique, but a deeper analysis is required that recognizes the roles of mathematics in framing many aspects of contemporary society, that will connect mathematics education to the lived experiences of students, their communities, and society in general, and that acknowledges the global ethical responsibilities of mathematicians and mathematics educators.

The book is organized in four sections (1) Mathematics education: For what and why? (2) Globalization and cultural diversity, (3) Mathematics, education, and society and (4) Social justice in, and through, mathematics education

The chapters address fundamental issues such as the relevance of school mathematics in people's lives; creating a sense of agency for the field of mathematics education, and redefining the relationship between mathematics as discipline, mathematics as school subject and mathematics as part of people's lives.

CONTENTS: Section 1: Mathematics education: For what and why? *Brian Greer* • What is mathematics education for? *Bill Atweh* • Ethical responsibility and the "What" and "Why" of mathematics education in a global context *Uwe Gellert & Eva Jablonka* • The demathematising effect of technology: Calling for critical competence *Mellony Graven & Hamsa Venkat* • Mathematical literacy: Issues of engagement from the South African experience of curriculum implementation *Cecilia Agudelo-Valderrama* • The purpose of school mathematics: Perspectives of Colombian mathematics teachers *Roza Leikin* • Teaching mathematics with and for creativity: An intercultural perspective *Fiona Walls* • Whose mathematics education? Mathematical discourses as cultural matricide? *Alexandre Pais* • The tension between what mathematics education should be for and what it is actually for *Monica Mesquita* • Mathematics education: For whom? **Section 2:** Globalization and cultural diversity *Paul Ernest* • Mathematics education ideologies and globalization *Bill Atweh* • What is this thing called social justice and what does it have to do with us in the context of globalization *Bal Chandra Luitel & Peter Charles Taylor* • Defrosting and re-frosting the ideology of pure mathematics: An infusion of Eastern-Western perspectives on conceptualizing a socially just mathematics education *Gelsa Knijnik* • Mathematics education and the Brazilian landless movement *Dennis Almeida & George Gheverghese Joseph* • Kerala mathematics and its possible transmission to Europe *Paul Ernest* • The philosophy of mathematics, values, and Kerala mathematics **Section 3:** Mathematics, education, and society *Paul Ernest* • Classroom Research: Impact and Long Term Effect versus Justice, Liberation and Empowerment? *Simon Goodchild* • Values and the social responsibility of mathematics *Paola Valero* • What has power got to do with mathematics education? *Ole Skovsmose* • Mathematics in action *Ole Skovsmose & Keiko Yasukawa* • Formatting power of mathematics *Paul Budnik* • What is mathematics about? *Philip Davis* • Applied mathematics as social contract *De Freitas* • Mathematics and curriculum integration: Challenging the hierarchy of school knowledge **Section 4:** Social justice in, and through, mathematics education *Bharath Sriraman & Olof Steinhorsdottir* • Social justice and mathematics education: Issues, dilemmas, excellence and equity *Kurt Stembhagen* • Social justice and mathematics: Rethinking the nature and purposes of school mathematics *Eric (Rico) Gutstein* • Possibilities and challenges in teaching mathematics for social justice *Peter Applebaum & Erica Davila* • Math education and social justice: Gatekeepers, politics, and teacher agency *Jeff Evans* • On methodologies of research into gender and other equity questions *Carol V. Livingston* • The privilege of pedagogical capital: A framework for understanding scholastic success in mathematics *Kwame E. Glevy* • Pupils of African heritage, mathematics education, and social justice *Renuka Vithal* • Researching, and learning mathematics at the margin



Interdisciplinary Educational Research In Mathematics and Its Connections to The Arts and Sciences

Bharath Sriraman, University of Montana; Claus Michelsen, University of Southern Denmark; Astrid Beckmann, University of Education- Schwäbisch Gmünd, Germany; Viktor Freiman, University of Moncton

2008. Paperback 978-1-59311-983-6 \$45.99. Hardcover 978-1-59311-984-3 \$85.99. eBook 9781607528876 \$65.

The book is based on the recently held Symposium on mathematics and its connections to the arts and sciences, namely the second Mathematics and its Connections to the Arts and Sciences (MACAS2) Symposium in Odense, Denmark (May 29-31, 2007). The chapters are an eclectic collection of interdisciplinary research initiatives undertaken by mathematics educators with implications for practitioners concerned with teaching and learning processes. The papers cover a wide genre of research domains within mathematics education (cognition, modelling, problem solving, teacher education, ethnomathematics, mathematical/statistical literacy, curricular and technological initiatives and research related to science education). The major interdisciplinary themes of the papers in this book are:

1. How can modelling activities be used to foster interdisciplinary projects in the school and university setting?
2. How can the intricate connections between mathematics and physics be used to design and research interdisciplinary activities in schools and the university?
3. How can research within the ethnomathematics domain of mathematics education be linked to critical mathematics education and interdisciplinary projects involving mathematics, art and culture?

4. How can the push for mathematical and statistical literacy be connected to other subjects in the school curricula and emphasized via interdisciplinary activities?
5. What are concrete examples of classroom experiments with empirical data that demonstrate new and unusual connections/relations between mathematics, arts and the sciences with implications for pedagogy?
6. What is the role of technology and new ICT interfaces in linking communities of learners in interdisciplinary activities involving problem solving? The book is an important contribution to the literature on educational initiatives in interdisciplinary education increasing vital for emerging professions of the 21st century.



Creativity, Giftedness, and Talent Development in Mathematics

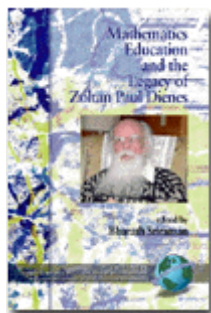
Bharath Sriraman, University of Montana

2008. Paperback 978-1-59311-977-5 \$45.99. Hardcover 978-1-59311-978-2 \$85.99. eBook 9781607528388 \$65.

Our innovative spirit and creativity lies beneath the comforts and security of today's technologically evolved society. Scientists, inventors, investors, artists and leaders play a vital role in the advancement and transmission of knowledge. Mathematics, in particular, plays a central role in numerous professions and has historically served as the gatekeeper to numerous other areas of study, particularly the hard sciences, engineering and business. Mathematics is also a major component in standardized tests in the U.S., and in university entrance exams in numerous parts of world.

Creativity and imagination is often evident when young children begin to develop numeric and spatial concepts, and explore mathematical tasks that capture their interest. Creativity is also an essential ingredient in the work of professional mathematicians. Yet, the bulk of mathematical thinking encouraged in the institutionalized setting of schools is focused on rote learning, memorization, and the mastery of numerous skills to solve specific problems prescribed by the curricula or aimed at standardized testing. Given the lack of research based perspectives on talent development in mathematics education, this monograph is specifically focused on contributions towards the constructs of creativity and giftedness in mathematics. This monograph presents new perspectives for talent development in the mathematics classroom and gives insights into the psychology of creativity and giftedness. The book is aimed at classroom teachers, coordinators of gifted programs, math contest coaches, graduate students and researchers interested in creativity, giftedness, and talent development in mathematics.

CONTENTS: Table of Contents. Preface *Bharath Sriraman* 1. The characteristics of mathematical creativity *Bharath Sriraman* 2. Mathematical giftedness, problem-solving and the ability to formulate generalizations. *Bharath Sriraman* 3. Gifted ninth graders' notions of proof: Investigating parallels in approaches of mathematically gifted students and professional mathematicians *Bharath Sriraman* 4. Are mathematical giftedness and mathematical creativity synonyms? A theoretical analysis of constructs. *Bharath Sriraman* 5. Does mathematics gifted education need a working philosophy of creativity? *Viktor Freiman & Bharath Sriraman* 6. Designing opportunities for all students to demonstrate mathematical prowess *Sylvia Bulgar* 7. Problems to discover and to boost mathematical talent in early grades: A challenging situations approach *Viktor Freiman* 8. Mathematical problem solving processes of Thai gifted students *Supattra Pattivisan & Margaret L. Niess* 9. Knowledge as a manifestation of talent: Creating opportunities for the gifted. *Alexander Karp* 10. An ode to Imre Lakatos: Bridging the ideal and actual mathematics classrooms *Bharath Sriraman* 11. Mathematically gifted Korean elementary students' revisiting of Euler's polyhedron theorem *Jaehoon Yim, Sanghun Song & Jiwon Kim* 12. Mathematically promising students from the space age to the information age *Linda Sheffield* 13. Revisiting the needs of the gifted mathematics students: Are students surviving or thriving? *Alan Zollman* 14. Playing with Powers *Bharath Sriraman & Pawel Strzelecki*



Mathematics Education and the Legacy of Zoltan Paul Dienes

Bharath Sriraman, University of Montana

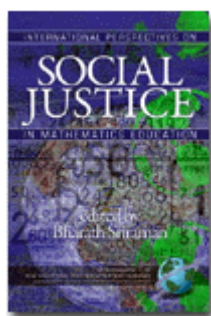
2008. Paperback 978-1-59311-896-9 \$45.99. Hardcover 978-1-59311-897-6 \$85.99. eBook 9781607529101 \$65.

The name of Zoltan P. Dienes (1916-) stands with those of Jean Piaget and Jerome Bruner as a legendary figure whose theories of learning have left a lasting impression on the field of mathematics education. Dienes' name is synonymous with the Multi-base blocks (also known as Dienes blocks) which he invented for the teaching of place value. He also is the inventor of Algebraic materials and logic blocks, which sowed the seeds of contemporary uses of manipulative materials in mathematics instruction. Dienes' place is unique in the field of mathematics education because of his theories on how mathematical structures can be taught from the early grades onwards using multiple embodiments through manipulatives, games, stories and dance.

Dienes' notion of embodied knowledge presaged other cognitive scientists who eventually came to recognize the importance of embodied knowledge and situated cognition - where knowledge and abilities are organized around experience as much as they are organized around abstractions. Dienes was an early pioneer in what was later to be called sociocultural perspectives and democratization of learning.

This monograph compiled and edited by Bharath Sriraman honors the seminal contributions of Dienes to mathematics education and includes several recent unpublished articles written by Dienes himself. These articles exemplify his principles of guided discovery learning and reveal the non-trivial mathematical structures that can be made accessible to any student. The monograph also includes a rare interview with Dienes in which he reflects on his life, his work, the role of context, language and technology in mathematics teaching and learning today. The book finds an important place in any mathematics education library and is vital reading for mathematics education researchers, cognitive scientists, prospective teachers, graduate students and teachers of mathematics.

CONTENTS: Preface: The Legacy of Zoltan Paul Dienes, *Bharath Sriraman*. Reflections of Zoltan P. Dienes on Mathematics Education, *Bharath Sriraman and Richard Lesh*. Some Problems with Logic Blocks, *Suggested by Zoltan Dienes*. Logic Blocks to Other Embodiments, *Zoltan Paul Dienes*. Some Reflections on Order and Density: A Child's Path to the Bolzano-Weierstrass Theorem, *Zoltan Paul Dienes*. Games Leading to the Tetrahedron, *Zoltan Paul Dienes*. Cognitive Psychology and Mathematics Education: Reflections on the Past and the Future, *Lyn D. English*. The Impact of Zoltan Dienes on Mathematics Teaching in the United States, *James Hirstein*.



International Perspectives on Social Justice in Mathematics Education

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International Perspectives and Research on Social Justice in Mathematics Education is the highly acclaimed inaugural monograph of The Montana Mathematics Enthusiast now available through IAP. The book covers prescient social, political and ethical issues for the domain of education in general and mathematics education in particular from the perspectives of critical theory, feminist theory and social justice research. The major themes in the book are (1) relevant mathematics, teaching and learning practices for minority and marginalized students in Australia, Brazil, South Africa, Israel, Palestine, and the United States., (2) closing the achievement gap in the U.K, U.S and Iceland across classes, ethnicities and gender, and (3) the political dimensions of mathematics. The fourteen chapters are written by leading researchers in the international community interested and active in research issues of equity and social justice.

CONTENTS: On the Origins of Social Justice: Darwin, Freire, Marx and Vivekananda, *Bharath Sriraman*. Home, School, and Community Partnerships in Numeracy Education: An Australian Perspective,