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**Mathematics Education in the Early Years** - Tamsin Meaney 2016-01-22
This book presents chapters based on papers presented at the second POEM conference on early mathematics learning. These chapters broaden the discussion about mathematics education in early childhood, by exploring the debate about construction versus instruction. Specific sections investigate the teaching and learning of mathematical processes and mathematical content, early childhood teacher development, transitions for young children between home and preschool, between home and school and between preschool and school. The chapters use a range of innovative theoretical and methodological approaches which will form an interesting basis for future research in this area.
**Algebra in the Early Grades** - James J. Kaput 2017-09-25
This volume is the first to offer a comprehensive, research-based, multi-faceted look at issues in early algebra. In recent years, the National Council for Teachers of Mathematics has recommended that algebra become a strand flowing throughout the K-12 curriculum, and the 2003 RAND Mathematics Study Panel has recommended that algebra be “the initial topical choice for focused and coordinated research and development [in K-12 mathematics].” This book provides a rationale for a stronger and more sustained approach to algebra in school, as well as concrete examples of how algebraic reasoning may be developed in the early grades. It is organized around three themes: The Nature of Early Algebra Students’ Capacity for Algebraic Thinking Issues of Implementation: Taking Early Algebra to the Classrooms. The contributors to this landmark volume have been at the forefront of an effort to integrate algebra into the existing early grades mathematics curriculum. They include scholars who have been developing the conceptual foundations for such changes as well as researchers and developers who have led empirical investigations in school settings. Algebra in the Early Grades aims to bridge the worlds of research, practice, design, and theory for educators, researchers, students, policy makers, and curriculum developers in mathematics education.
*Selected Regular Lectures from the 12th International Congress on Mathematical Education* - Sung Je Cho 2016-10-17
This book comprises the full selected Regular Lectures from the Proceedings of the 12th International Congress on Mathematical Education (ICME-12), which was held at COEX in Seoul, Korea, from July


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8th to 15th, 2012. ICME-12 brought together 4700 experts from 100 countries, working to understand all of the intellectual and attitudinal challenges in the subject of mathematics education as a multidisciplinary research and practice. These selected Regular Lectures present the work of fifty-one prominent mathematics educators from all over the globe. The Lectures cover a wide spectrum of topics, themes and issues and aim to give direction to future research towards educational improvement in the teaching and learning of mathematics education. This book is of particular interest to researchers, teachers and curriculum developers in mathematics education.

*Making Sense of Mathematics Teacher Education* - Fou-Lai Lin 2011-06-28

This is a research-based book that deals with a broad range of issues about mathematics teacher education. It examines teacher education programs from different societies and cultures as it develops an international perspective on mathematics teacher education. Practical situations that are associated with related theories are studied critically. It is intended for teacher educators, mathematics educators, graduate students in mathematics education, and mathematics teachers.

Beliefs and Mathematics - Bharath Sriraman 2007-12-01

Beliefs and Mathematics is a Festschrift honoring the contributions of Günter Törner to mathematics education and mathematics. Mathematics Education as a legitimate area of research emerged from the initiatives of well known mathematicians of the last century such as Felix Klein and Hans Freudenthal. Today there is an increasing schism between researchers in mathematics education and those in mathematics as evidenced in the Math wars in the U.S and other parts of the world. Günter Törner represents an international voice of reason, well respected and known in both groups, one who has successfully bridged and worked in both domains for three decades. His contributions in the domain of beliefs theory are well known and acknowledged. The articles in this book are written by many prominent researchers in the area of mathematics education, several of whom are editors of leading journals in the field and have been at the helm of cutting edge advances in research and practice. The contents cover a wide spectrum of research, teaching and learning issues that are relevant for anyone interested in mathematics education and its multifaceted nature of research. The book as a whole also conveys the beauty and relevance of mathematics in societies around the world. It is a must read for anyone interested in mathematics education.

**How Students Think When Doing Algebra** - Steve Rhine 2018-11-01

Algebra is the gateway to college and careers, yet it functions as the eye of the needle because of low pass rates for the middle school/high school course and students' struggles to understand. We have forty years of research that discusses the ways students think and their cognitive challenges as they engage with algebra. This book is a response to the National Council of Teachers of Mathematics' (NCTM) call to better link research and practice by capturing what we have learned about students' algebraic thinking in a way that is usable by teachers as they prepare lessons or reflect on their experiences in the classroom. Through a Fund for the Improvement of Post-Secondary Education (FIPSE) grant, 17 teachers and mathematics educators read through the past 40 years of research on students' algebraic thinking to capture what might be useful information for teachers to know—over 1000 articles altogether. The resulting five domains addressed in the book (Variables & Expressions, Algebraic Relations, Analysis of Change, Patterns & Functions, and Modeling & Word Problems) are closely tied to CCSS topics. Over time, veteran math teachers develop extensive knowledge of how students engage with algebraic concepts—their misconceptions, ways of thinking, and when and how they are challenged to understand—and use that knowledge to anticipate students' struggles with particular lessons and plan accordingly. Veteran teachers learn to evaluate whether an incorrect response is a simple error or the symptom of a faulty or naïve understanding of a concept. Novice teachers, on the other hand, lack the experience to anticipate important moments in the learning of their students. They often struggle to make sense of what students say in the classroom and determine whether the response is useful or can further discussion (Leatham, Stockero, Peterson, & Van


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Zoest 2011; Peterson & Leatham, 2009). The purpose of this book is to accelerate early career teachers' "experience" with how students think when doing algebra in middle or high school as well as to supplement veteran teachers' knowledge of content and students. The research that this book is based upon can provide teachers with insight into the nature of a student's struggles with particular algebraic ideas—to help teachers identify patterns that imply underlying thinking. Our book, How Students Think When Doing Algebra, is not intended to be a "how to" book for teachers. Instead, it is intended to orient new teachers to the ways students think and be a book that teachers at all points in their career continually pull of the shelf when they wonder, "how might my students struggle with this algebraic concept I am about to teach?" The primary audience for this book is early career mathematics teachers who don't have extensive experience working with students engaged in mathematics. However, the book can also be useful to veteran teachers to supplement their knowledge and is an ideal resource for mathematics educators who are preparing preservice teachers.

**Innovations in Science Teacher Education in the Asia Pacific** - Chen-Yung Lin 2014-01-27

The chapters in this book will focus on pre-service and in-service science teacher education, because both are equally important. With case studies for China, Japan, Korea and Taiwan topics include: Professional Development of Chemistry Teachers in the New Curriculum, Using Classroom Observation to Assist Teacher Professional Development and Science Teacher Education and Science as Inquiry: Promises and Dilemmas.

**Early Algebraization** - Jinfa Cai 2011-02-24

In this volume, the authors address the development of students' algebraic thinking in the elementary and middle school grades from curricular, cognitive, and instructional perspectives. The volume is also international in nature, thus promoting a global dialogue on the topic of early Algebraization.

*The Didactical Challenge of Symbolic Calculators* - Dominique Guin 2006-03-30

A significant driver of recent growth in the use of mathematics in the professions has been the support brought by new technologies. Not only has this facilitated the application of established methods of mathematical and statistical analysis but it has stimulated the development of innovative approaches. These changes have produced a marked evolution in the professional practice of mathematics, an evolution which has not yet provoked a corresponding adaptation in mathematical education, particularly at school level. In particular, although calculators -- first arithmetic and scientific, then graphic, now symbolic -- have been found well suited in many respects to the working conditions of pupils and teachers, and have even achieved a degree of official recognition, the integration of new technologies into the mathematical practice of schools remains marginal. It is this situation which has motivated the research and development work to be reported in this volume. The appearance of ever more powerful and portable computational tools has certainly given rise to continuing research and development activity at all levels of mathematical education. Amongst pioneers, such innovation has often been seen as an opportunity to renew the teaching and learning of mathematics. Equally, however, the institutionalization of computational tools within educational practice has proceeded at a strikingly slow pace over many years.

**The Future of the Teaching and Learning of Algebra** - Kaye Stacey 2006-04-11

Kaye Stacey, Helen Chick, and Margaret Kendal The University of Melbourne, Australia Abstract: This section reports on the organisation, procedures, and publications of the ICMI Study, The Future of the Teaching and Learning of Algebra. Key words: Study Conference, organisation, procedures, publications The International Commission on Mathematical Instruction (ICMI) has, since the 1980s, conducted a series of studies into topics of particular significance to the theory and practice of contemporary mathematics education. Each ICMI Study involves an international seminar, the "Study Conference", and culminates in a published volume intended to promote and assist discussion and action at the international, national, regional, and institutional levels. The ICMI


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Study running from 2000 to 2004 was on The Future of the Teaching and Learning of Algebra, and its Study Conference was held at The University of Melbourne, Australia fromDecember to 2001. It was the first study held in the Southern Hemisphere. There are several reasons why the future of the teaching and learning of algebra was a timely focus at the beginning of the twenty first century. The strong research base developed over recent decades enabled us to take stock of what has been achieved and also to look forward to what should be done and what might be achieved in the future. In addition, trends evident over recent years have intensified. Those particularly affecting school mathematics are the “massification” of education—continuing in some countries whilst beginning in others—and the advance of technology.

**Handbook of International Research in Mathematics Education** - Lyn D. English 2015-07-30

This third edition of the Handbook of International Research in Mathematics Education provides a comprehensive overview of the most recent theoretical and practical developments in the field of mathematics education. Authored by an array of internationally recognized scholars and edited by Lyn English and David Kirshner, this collection brings together overviews and advances in mathematics education research spanning established and emerging topics, diverse workplace and school environments, and globally representative research priorities. New perspectives are presented on a range of critical topics including embodied learning, the theory-practice divide, new developments in the early years, educating future mathematics education professors, problem solving in a 21st century curriculum, culture and mathematics learning, complex systems, critical analysis of design-based research, multimodal technologies, and e-textbooks. Comprised of 12 revised and 17 new chapters, this edition extends the Handbook’s original themes for international research in mathematics education and remains in the process a definitive resource for the field.

**Algebra Teaching around the World** - Frederick K.S. Leung 2014-10-13

Utilizing the LPS dataset, Algebra Teaching around the World documents eighth grade algebra teaching across a variety of countries that differ geographically and culturally. Different issues in algebra teaching are reported, and different theories are used to characterize algebra lessons or to compare algebra teaching in different countries. Many commonalities in algebra teaching around the world are identified, but there are also striking and deep-rooted differences. The different ways algebra was taught in different countries point to how algebra teaching may be embedded in the culture and the general traditions of mathematics education of the countries concerned. In particular, a comparison is made between algebra lessons in the Confucian-Heritage Culture (CHC) countries and ‘Western’ countries. It seems that a common emphasis of algebra teaching in CHC countries is the ‘linkage’ or ‘coherence’ of mathematics concepts, both within an algebraic topic and between topics. On the other hand, contemporary algebra teaching in many Western school systems places increasing emphasis on the use of algebra in mathematical modeling in ‘real world’ contexts and in the instructional use of metaphors, where meaning construction is assisted by invoking contexts outside the domain of algebraic manipulation, with the intention to helping students to form connections between algebra and other aspects of their experience. Algebra Teaching around the World should be of value to researchers with a focus on algebra, pedagogy or international comparisons of education. Because of the pedagogical variations noted here, there is a great deal of material that will be of interest to both teachers and teacher educators.

*Handbook of Research on the Psychology of Mathematics Education* - 2006-01-01

This volume is a compilation of the research produced by the International Group for the Psychology of Mathematics Education (PME) since its creation, 30 years ago. It has been written to become an essential reference for Mathematics Education research in the coming years.

Sociocultural Research on Mathematics Education - Bill Atweh 2013-03-07

This volume--the first to bring together research on sociocultural aspects


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of mathematics education--presents contemporary and international perspectives on social justice and equity issues that impact mathematics education. In particular, it highlights the importance of three interacting and powerful factors--gender, social, and cultural dimensions. Sociocultural Research on Mathematics Education: An International Perspective is distinguished in several ways: * It is research based. Chapters report on significant research projects; present a comprehensive and critical summary of the research findings; and offer a critical discussion of research methods and theoretical perspectives undertaken in the area. * It is future oriented, presenting recommendations for practice and policy and identifying areas for further research. * It deals with all aspects of formal and informal mathematics education and applications and all levels of formal schooling. As the context of mathematics education rapidly changes--with an increased demand for mathematically literate citizenship; an increased awareness of issues of equity, inclusivity, and accountability; and increased efforts for globalization of curriculum development and research-- questions are being raised more than ever before about the problems of teaching and learning mathematics from a non-cognitive science perspective. This book contributes significantly to addressing such issues and answering such questions. It is especially relevant for researchers, graduate students, and policymakers in the field of mathematics education.

**Second Handbook of Research on Mathematics Teaching and Learning** - Frank K. Lester 2007-02-01

The audience remains much the same as for the 1992 Handbook, namely, mathematics education researchers and other scholars conducting work in mathematics education. This group includes college and university faculty, graduate students, investigators in research and development centers, and staff members at federal, state, and local agencies that conduct and use research within the discipline of mathematics. The intent of the authors of this volume is to provide useful perspectives as well as pertinent information for conducting investigations that are informed by previous work. The Handbook should also be a useful textbook for graduate research seminars. In addition to the audience mentioned above, the present Handbook contains chapters that should be relevant to four other groups: teacher educators, curriculum developers, state and national policy makers, and test developers and others involved with assessment. Taken as a whole, the chapters reflects the mathematics education research community's willingness to accept the challenge of helping the public understand what mathematics education research is all about and what the relevance of their research fi ndings might be for those outside their immediate community.

Selected Regular Lectures from the 12th International Congress on Mathematical Education - Sung Je Cho 2015-07-16

This book comprises the full selected Regular Lectures from the Proceedings of the 12th International Congress on Mathematical Education (ICME-12), which was held at COEX in Seoul, Korea, from July 8th to 15th, 2012. ICME-12 brought together 4700 experts from 100 countries, working to understand all of the intellectual and attitudinal challenges in the subject of mathematics education as a multidisciplinary research and practice. These selected Regular Lectures present the work of fifty-one prominent mathematics educators from all over the globe. The Lectures cover a wide spectrum of topics, themes and issues and aim to give direction to future research towards educational improvement in the teaching and learning of mathematics education. This book is of particular interest to researchers, teachers and curriculum developers in mathematics education.

**Challenging Mathematics In and Beyond the Classroom** - Edward J. Barbeau 2009-04-21

In the mid 1980s, the International Commission on Mathematical Instruction (ICMI) inaugurated a series of studies in mathematics education by comm- sioning one on the influence of technology and informatics on mathematics and its teaching. These studies are designed to thoroughly explore topics of c- temporary interest, by gathering together a group of experts who prepare a Study Volume that provides a considered assessment of the current state and a guide to further developments. Studies have embraced a range of issues, some central,


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such as the teaching of algebra, some closely related, such as the impact of history and psychology, and some looking at mathematics education from a particular perspective, such as cultural differences between East and West. These studies have been commissioned at the rate of about one per year. Once the ICMI Executive decides on the topic, one or two chairs are selected and then, in consultation with them, an International Program Committee (IPC) of about 12 experts is formed. The IPC then meets and prepares a Discussion Document that sets forth the issues and invites interested parties to submit papers. These papers are the basis for invitations to a Study Conference, at which the various dimensions of the topic are explored and a book, the Study Volume, is sketched out. The book is then put together in collaboration, mainly using electronic communication. The entire process typically takes about six years.

**Action Research, Innovation and Change** - Thomas Stern 2013-12-17

Action research continues to see a growth in interest both internationally and across disciplines. This book demonstrates the diversity in settings and focus for action research and provides a guide to its core aspiration: to achieve principled change. Written by authors from a range of countries and range of disciplines (including education, health care, palliative care, social work and community development), this book answers these key questions: How can action research be used to achieve principled change? How has action research been applied in various disciplines and in different countries? What can be learnt about the conduct of action research from these diverse settings? By means of detailed case studies of successful projects and discussions that challenge and raise theoretical questions, this book explores some of the contemporary cutting edge applications and conceptualisations of action research. Action research paves the way for the empowerment of people involved in social action, and the examples of successful change processes that are the core of this book will prove inspirational and provide practical advice. Written by a range of leading international researchers in the field, this book will define the future for action research for years to come.

**Proceedings of the 13th International Congress on Mathematical Education** - Gabriele Kaiser 2017-11-02

This book is open access under a CC BY 4.0 license. The book presents the Proceedings of the 13th International Congress on Mathematical Education (ICME-13) and is based on the presentations given at the 13th International Congress on Mathematical Education (ICME-13). ICME-13 took place from 24th- 31st July 2016 at the University of Hamburg in Hamburg (Germany). The congress was hosted by the Society of Didactics of Mathematics (Gesellschaft für Didaktik der Mathematik - GDM) and took place under the auspices of the International Commission on Mathematical Instruction (ICMI). ICME-13 brought together about 3.500 mathematics educators from 105 countries, additionally 250 teachers from German speaking countries met for specific activities. Directly before the congress activities were offered for 450 Early Career Researchers. The proceedings give a comprehensive overview on the current state-of-the-art of the discussions on mathematics education and display the breadth and deepness of current research on mathematical teaching-and-learning processes. The book introduces the major activities of ICME-13, namely articles from the four plenary lecturers and two plenary panels, articles from the five ICMI awardees, reports from six national presentations, three reports from the thematic afternoon devoted to specific features of ICME-13. Furthermore, the proceedings contain descriptions of the 54 Topic Study Groups, which formed the heart of the congress and reports from 29 Discussion Groups and 31 Workshops. The additional important activities of ICME-13, namely papers from the invited lecturers, will be presented in the second volume of the proceedings.

**Proceedings of the Fourth International Congress on Mathematical Education** - M. Zweng 2012-12-06

Henry O. Pollak Chairman of the International Program Committee Bell Laboratories Murray Hill, New Jersey, USA The Fourth International Congress on Mathematics Education was held in Berkeley, California, USA, August 10-16, 1980. Previous Congresses were held in Lyons in 1969, Exeter in 1972, and Karlsruhe in 1976. Attendance at Berkeley was about 1800 full and 500 associate members from about 90 countries; at


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least half of these come from outside of North America. About 450 persons participated in the program either as speakers or as presiders; approximately 40 percent of these came from the U.S. or Canada. There were four plenary addresses; they were delivered by Hans Freudenthal on major problems of mathematics education, Hermina Sinclair on the relationship between the learning of language and of mathematics, Seymour Papert on the computer as carrier of mathematical culture, and Hua Loo-Keng on popularising and applying mathematical methods. Gearge Polya was the honorary president of the Congress; illness prevented his planned attendence but he sent a brief presentation entitled, "Mathematics Improves the Mind". There was a full program of speakers, panelists, debates, miniconferences, and meetings of working and study groups. In addition, 18 major projects from around the world were invited to make presentations, and various groups representing special areas of concern had the opportunity to meet and to plan their future activities.

*Modelling and Applications in Mathematics Education* - Peter L. Galbraith 2007-12-05

The book aims at showing the state-of-the-art in the field of modeling and applications in mathematics education. This is the first volume to do this. The book deals with the question of how key competencies of applications and modeling at the heart of mathematical literacy may be developed; with the roles that applications and modeling may play in mathematics teaching, making mathematics more relevant for students.

**Affect and Mathematics Education** - Markku S. Hannula 2019-06-03

This open access book, inspired by the ICME 13 topic study group “Affect, beliefs and identity in mathematics education”, presents the latest trends in research in the area. Following an introduction and a survey chapter providing a concise overview of the state-of-art in the field of mathematics-related affect, the book is divided into three main sections: motivation and values, engagement, and identity in mathematics education. Each section comprises several independent chapters based on original research, as well as a reflective commentary by an expert in the area. Collectively, the chapters present a rich methodological spectrum, from narrative analysis to structural equation modelling. In the final chapter, the editors look ahead to future directions in the area of mathematics-education-related affect. It is a timely resource for all those interested in the interaction between affect and mathematics education.

**The Illusion of Linearity** - Dirk de Bock 2007-09-30

This book presents the reader with a comprehensive overview of the major findings of the recent research on the illusion of linearity. It discusses: how the illusion of linearity appears in diverse domains of mathematics and science; what are the crucial psychological, mathematical, and educational factors being responsible for the occurrence and persistence of the phenomenon; and how the illusion of linearity can be remedied.

Second International Handbook of Mathematics Education - Alan Bishop 2012-02-02

ALAN 1. BISHOP The first International Handbook on Mathematics Education was published by Kluwer Academic Publishers in 1996. However, most of the writing for that handbook was done in 1995 and generally reflected the main research and development foci prior to 1994. There were four sections, 36 chapters, and some 150 people contributed to the final volume either as author, reviewer, editor, or critical friend. The task was a monumental one, attempting to cover the major research and practice developments in the international field of mathematics education as it appeared to the contributors in 1995. Inevitably there were certain omissions, some developments were only starting to emerge, and some literatures were only sketchy and speculative. However that Handbook has had to be reprinted three times, so it clearly fulfilled a need and I personally hope that it lived up to what I wrote in its Introduction: The Handbook thus attempts not merely to present a description of the international 'state-of-the-field', but also to offer synthetic and reflective overviews on the different directions being taken by the field, on the gaps existing in our present knowledge, on the current problems being faced, and on the future possibilities for development. (Bishop et aI. , 1996) Since that time there has been even


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more activity in our field, and now seems a good time to take stock again, to reflect on what has happened since 1995, and to create a second Handbook with the same overall goals.

*Supporting Teachers: Improving Instruction* - Tomá? Janík 2019

In the last decades, progress in the field of pre-service and in-service teacher education has been evident. Despite the developments of curriculum programs, models and designs, various challenges are shaping the field. Models of teacher education are usually presented as 'research-based', but related research is often invisible or fragmented. The 'support for teachers' and the 'improvement of instruction' are only loosely coupled and their interdependence is not highlighted. These challenges were the impetus to initiate this publication. Individual approaches, models or designs of pre-service and in-service teacher education developed by the authors (action research, video clubs, lesson studies, and others) are introduced and their impact and shortcomings for further development are specified. In the concluding chapter, a reflective discussion across individual approaches to reveal particular issues that are shaping the field is provided. Practitioners as well as researchers in the field of teacher education can benefit from this book.

**Mathematics in African History and Cultures** - Paulus Gerdes 2007

This volume constitutes an updated version of the bibliography published in 2004 by the African Mathematical Union. The African Studies Association attributed the original edition a 'ÂÂspecial mention'ÂÂ in the 2006 Conover-Porter Award competition. The book contains over 1600 bibliographic entries. The appendices contain additional bibliographic information on (1) mathematicians of the Diaspora, (2) publications by Africans on the history of mathematics outside Africa, (3) time-reckoning and astronomy in African history and cultures, (4) string figures in Africa, (5) examples of books published by African mathematicians, (6) board games in Africa, (7) research inspired by geometric aspects of the 'ÂÂsona'ÂÂ tradition. The book concludes with several indices (subject, country, region, author, ethnographic and linguistic, journal, mathematicians). Professor Jan Persens of the University of the Western Cape (South Africa) and president of the African Mathematical Union (2000-2004) wrote the preface.

Relatively and Philosophically Earnest - Bharath Sriraman 2009-10-01

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.

*Critique as Uncertainty* - Ole Skovsmose 2014-09-01

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


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it expresses concerns of a critical mathematics education.

*Collaboration in Teacher Education* - Andrea Peter-Koop 2013-03-09

This book systematically explores and reflects on a variety of issues related to collaborative mathematics teacher education practice and research – such as classroom coaching, mentoring or co-learning agreements - highlighting the evolution and implications of collaborative enterprises in different cultural settings. It is relevant to educational researchers, research students and practitioners.

*Encountering Algebra* - Cecilia Kilhamn 2019-07-03

The book reports a comparative research project about algebra teaching and learning in four countries. Algebra is a central topic of learning across the world, and it is well-known that it represents a hurdle for many students. The book presents analyses built on extensive video-recordings of classrooms documenting the first introduction to symbolic algebra (students aged 12 to 14). While the content addressed in all classrooms is variables, expressions and equations, the teaching approaches are diverse. The chapters bring the reader into different algebra classrooms, discussing issues such as mathematization and social norms, the role of mediating tools and designed examples, and teacher beliefs. By comparing classrooms, new insights are generated about how students understand the algebraic content, how teachers instruct, and how both parties deal with difficulties in learning elementary algebra. The book also describes a research methodology using video in search of taken-for-granted aspects of algebra lessons.

**Youngsters Solving Mathematical Problems with Technology** - Susana Carreira 2016-02-19

This book contributes to both mathematical problem solving and the communication of mathematics by students, and the role of personal and home technologies in learning beyond school. It does this by reporting on major results and implications of the Problem@Web project that investigated youngsters' mathematical problem solving and, in particular, their use of digital technologies in tackling, and communicating the results of their problem solving, in environments beyond school. The book has two focuses: Mathematical problem solving skills and strategies, forms of representing and expressing mathematical thinking, technological-based solutions; and students´ and teachers´ perspectives on mathematics learning, especially school compared to beyond-school mathematics.

Dialogue and Learning in Mathematics Education - Helle Alrø 2006-04-11

Dialogue and Learning in Mathematics Education is concerned with communication in mathematics class-rooms. In a series of empirical studies of project work, we follow students' inquiry cooperation as well as students' obstructions to inquiry cooperation. Both are considered important for a theory of learning mathematics. Special attention is paid to the notions of `dialogue' and `critique'. A central idea is that `dialogue' supports `critical learning of mathematics'. The link between dialogue and critique is developed further by including the notions of `intention' and `reflection'. Thus a theory of learning mathematics is developed which is resonant with critical mathematics education.

Action Learning and Action Research - Ortrun Zuber-Skerritt 2019-03-11

Action Learning and Action Research deepens understanding and contributes to new knowledge about the theory, practice and processes of Action Learning (AL) and Action Research. It clarifies what constitutes AL/AR in its many forms and what it is not.

**Learning Discourse** - C. Kieran 2007-05-08

The authors of this volume claim that mathematics can be usefully re-conceptualized as a special form of communication. As a result, the familiar discussion of mental schemes, misconceptions, and cognitive conflict is transformed into a consideration of activity, patterns of interaction, and communication failure. By equating thinking with communicating, the discursive approach also deconstructs the problematic dichotomy between "individual" and "social" research perspectives.

The First Sourcebook on Nordic Research in Mathematics Education - Bharath Sriraman 2010-09-01

The First Sourcebook on Nordic Research in Mathematics Education: Norway, Sweden, Iceland, Denmark and contributions from Finland provides the first comprehensive and unified treatment of historical and


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contemporary research trends in mathematics education in the Nordic world. The book is organized in sections co-ordinated by active researchers in mathematics education in Norway, Sweden, Iceland, Denmark, and Finland. The purpose of this sourcebook is to synthesize and survey the established body of research in these countries with findings that have influenced ongoing research agendas, informed practice, framed curricula and policy. The sections for each country also include historical articles in addition to exemplary examples of recently conducted research oriented towards the future. The book will serve as a standard reference for mathematics education researchers, policy makers, practitioners and students both in and outside the Nordic countries.

**Forms of Mathematical Knowledge** - Dina Tirosh 2013-03-14

What mathematics is entailed in knowing to act in a moment? Is tacit, rhetorical knowledge significant in mathematics education? What is the role of intuitive models in understanding, learning and teaching mathematics? Are there differences between elementary and advanced mathematical thinking? Why can't students prove? What are the characteristics of teachers' ways of knowing? This book focuses on various types of knowledge that are significant for learning and teaching mathematics. The first part defines, discusses and contrasts psychological, philosophical and didactical issues related to various types of knowledge involved in the learning of mathematics. The second part describes ideas about forms of mathematical knowledge that are important for teachers to know and ways of implementing such ideas in preservice and in-service education. The chapters provide a wide overview of current thinking about mathematics learning and teaching which is of interest for researchers in mathematics education and mathematics educators. Topics covered include the role of intuition in mathematics learning and teaching, the growth from elementary to advanced mathematical thinking, the significance of genres and rhetoric for the learning of mathematics and the characterization of teachers' ways of knowing.

**History of Mathematics in Africa: 2000-2011** - Paulus Gerdes 2011

**Acquisition of Complex Arithmetic Skills and Higher-Order Mathematics Concepts** - David C. Geary 2017-02-08

Acquisition of Complex Arithmetic Skills and Higher-Order Mathematics Concepts focuses on typical and atypical learning of complex arithmetic skills and higher-order math concepts. As part of the series Mathematical Cognition and Learning, this volume covers recent advances in the understanding of children’s developing competencies with whole-number arithmetic, fractions, and rational numbers. Each chapter covers these topics from multiple perspectives, including genetic disorders, cognition, instruction, and neural networks. Covers innovative measures and recent methodological advances in mathematical thinking and learning Contains contributions that improve instruction and education in these domains Informs policy aimed at increasing the level of mathematical proficiency in the general public

Proceedings of the Ninth International Congress on Mathematical Education - Hiroshi Fujita 2007-05-08

Mathematics as a discipline has a long history, emerging from many cultures, with a truly universal character. Mathematicians throughout the world have a fundamentally common understanding of the nature of mathematics and of its central problems and methods. Research mathematicians in any part of the world are part of a cohesive intellectual community that communicates fluently. Among organizations devoted to mathematics education, The International Commission on Mathematical Instruction (ICMI) is distinctive because of its close ties to the mathematics community. The great challenges now facing mathematics education around the world demand a deeper and more sensitive involvement of disciplinary mathematicians than we now have, both in the work of educational improvements and in research on the nature of teaching and learning.

**Challenging Perspectives on Mathematics Classroom Communication** - Anna Chronaki 2006-05-01

The editors and contributors of these ten articles focus on the idea that communication includes both what is happening and being said among participants in a classroom and also the politics, values and ideologies


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that serve as the foundation of the practice. They describe how communication thereby involves register, representation and contexts through media-human interfaces in the classroom and in interpreting mathematics as a text, how communication in mathematics teaching becomes social interaction in cooperative settings and classroom activities, and how communication translates into practice, community, identity and policy.


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