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Handbook on the History of Mathematics Education Nov 23 2020 This is the first comprehensive International Handbook on the History of Mathematics Education, covering a wide spectrum of epochs and civilizations, countries and cultures. Until now, much of the research into the rich and varied history of mathematics education has remained inaccessible to the vast majority of scholars, not least because it has been written in the language, and for readers, of an individual country. And yet a historical overview, however brief, has become an indispensable element of nearly every dissertation and scholarly article. This handbook provides, for the first time, a comprehensive and systematic aid for researchers around the world in finding the information they need about historical developments in mathematics education, not only in their own countries, but globally as well. Although written primarily for mathematics educators, this handbook will also be of interest to researchers of the history of education in general, as well as specialists in cultural and even social history.
Teaching Math at a Distance, Grades K-12 Jan 06 2022 Make Rich Math Instruction Come to Life Online In an age when distance learning has become part of the "new normal," educators know that rich remote math teaching involves more than direct instruction, online videos, and endless practice problems on virtual worksheets. Using both personal experience and those of teachers in real K-12 online classrooms, distance learning mathematics veteran Theresa Wills translates all we know about research-based, equitable, rigorous face-to-face mathematics instruction into an online venue. This powerful guide equips math teachers to: Build students' agency, identity, and strong math communities Promote mathematical thinking, collaboration, and discourse Incorporate rich mathematics tasks and assign meaningful homework and practice Facilitate engaging online math instruction using virtual manipulatives and other concrete learning tools Recognize and address equity and inclusion challenges associated with distance learning Assess mathematics learning from a distance With examples across the grades, links to tutorials and templates, and space to reflect and plan, Teaching Math at a Distance offers the support, clarity, and inspiration needed to guide teachers through teaching math remotely without sacrificing deep learning and academic growth.
Mathematics Education for a New Era Jan 18 2023 Stanford mathematician and NPR Math Guy Keith Devlin explains why, fun aside, video games are the ideal medium to teach middle-school math. Aimed primarily at teachers and education researchers, but also of interest to game developers who want to produce videogames for mathematics education, Mathematics Education for a New Era: Video Games as a Medium for Learning describes exactly what is involved in designing and producing successful math educational videogames that foster the innovative mathematical thinking skills necessary for success in a global economy. Read the author's monthly MAA column Devlin's Angle
Mathematics Education at Highly Effective Schools that Serve the Poor Jun 18 2020 Examines the theories and practices employed by highly effective schools that serve poor communities, using qualitative and quantitative methods to explore school- and classroom-level factors that led to high achievement.
Critical Issues in Mathematics Education Oct 03 2021 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.

Mathematics Education Dec 05 2021 First Published in 1995. Routledge is an imprint of Taylor & Francis, an informa company.

International Perspectives on Mathematics Teacher Education Jan 26 2021 Mathematics teacher education includes the mathematics content teachers need to understand, ways that pedagogical approaches are developed, messages about the nature of mathematics teaching and learning, and interfaces between tertiary preparation and school contexts. Scholars from Sweden, France, Malawi, Singapore, New Zealand, Brazil, the USA, and Canada provide insights for the mathematics education community's understanding of how teacher educators structure, develop, and implement their respective mathematics teacher education programs. Several themes emerged across the chapters, including: varied approaches to developing culturally responsive pedagogies and/or Indigenous perspectives; issues and challenges in fostering partnerships and collaborations; strategies for developing mathematics knowledge for teaching; and preparing flexible and resourceful teachers. Praise for International Perspectives on Mathematics Teacher Education: "International Perspectives on Mathematics Teacher Education explores different facets of mathematics teacher education in eight countries across five continents. The authors and editors answer important questions and open the door to critical conversations about policies and practices related to mathematics teacher recruitment, preparation, and professional development, among other topics. Every reader will develop new perspectives as they learn how one institution is engaging with Indigenous perspectives while other countries struggle with an insufficient supply of certified teachers. This book clearly demonstrates challenges, constraints, nuances and complexities to initiating and maintaining improvement across systems to enhance the work and spaces of mathematics teachers within different historical, cultural, social, and political contexts. This volume also generates ideas and opportunities for leaders, policymakers, and teacher educators to consider and learn from international colleagues about different approaches to mathematics teacher education practice and policy. Undoubtedly, debates about standards, content and experiences in programs, and accountability structures such as accreditation will continue. It is clear from the insights in this volume that strengthening mathematics teacher education will require stronger collaborations, frameworks, policies, infrastructure, and investments on a global scale and it will be critical to collaborate with and learn from colleagues in international settings. These conversations will require reciprocity, interdependence, and resilience as we pursue the ultimate goal of equipping the field of mathematics teacher education." Kathryn Chval Dean, College of Education Professor of Mathematics Education University of Illinois Chicago

Distance Learning, E-Learning and Blended Learning in Mathematics Education May 10 2022 This book builds on current and emerging research in distance learning, e-learning and blended learning. Specifically, it tests the boundaries of what is known by examining and discussing recent research and development in teaching and learning based on these modalities, with a focus on lifelong mathematics learning and teaching. The book is organized in four sections: The first section focuses on the incorporation of new technologies into mathematics classrooms through the construction or use of digital teaching and learning platforms. The second section presents a wide range of perspectives on the study and implementation of different tutoring systems and/or computer assisted math instruction. The third section presents four new innovations in mathematics learning and/or mathematics teacher education that involve the development of novel interfaces' for communicating mathematical ideas and analyzing student thinking and student work. Finally, the fourth section presents the latest work

on the construction and implementation of new MOOCs and rich media platforms developed to carry out specialized mathematics teacher education.
Advances in Mathematics Education Research on Proof and Proving Oct 11 2019 This book explores new trends and developments in mathematics education research related to proof and proving, the implications of these trends and developments for theory and practice, and directions for future research. With contributions from researchers working in twelve different countries, the book brings also an international perspective to the discussion and debate of the state of the art in this important area. The book is organized around the following four themes, which reflect the breadth of issues addressed in the book: • Theme 1: Epistemological issues related to proof and proving; • Theme 2: Classroom-based issues related to proof and proving; • Theme 3: Cognitive and curricular issues related to proof and proving; and • Theme 4: Issues related to the use of examples in proof and proving. Under each theme there are four main chapters and a concluding chapter offering a commentary on the theme overall.
The Professional Education and Development of Teachers of Mathematics Aug 13 2022 The premise of the 15th ICMI Study is that teachers are key to students' opportunities to learn mathematics. What teachers of mathematics know, care about, and do is a product of their experiences and socialization, together with the impact of their professional education. The Professional Education and Development of Teachers of Mathematics assembles important new international work- development, research, theory and practice - concerning the professional education of teachers of mathematics. As it examines critical areas to reveal what is known and what significant questions and problems warrant collective attention, the volume also contributes to the strengthening of the international community of mathematics educators. The Professional Education and Development of Teachers of Mathematics is of interest to the mathematics education community as well as to other researchers, practitioners and policy makers concerned with the professional education of teachers.
International Perspectives on Social Justice in Mathematics Education Jul 12 2022 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.
The Math Pact, Middle School Apr 09 2022 A schoolwide solution for students’ mathematics success! Do you sometimes start to teach a mathematics concept and feel like you’re staring at a sea of bewildered faces? What happens when you discover students previously learned a calculation trick or a mnemonic that has muddied their long-term understanding? When "rules" seem to change from year to year, teacher to teacher, or school to school, mathematics can seem like a disconnected mystery for students. Clear up the confusion with a Mathematics Whole-School Agreement! Expanded from the highly popular "Rules that Expire" series of NCTM articles, this essential guide leads educators through the collaborative step-by-step process of establishing a coherent and consistent learner-centered and equitable approach to mathematics instruction. Through this work, you will identify, streamline, and become passionate about using clear and consistent mathematical language, notations, representations, rules, and generalizations within and across classrooms and grades. Importantly, you’ll learn to avoid "rules that expire"—tricks that may seem to help students in one grade but hurt in the long run. Features of this book include · Abundant grade-specific examples · Effective working plans for sustainability · Barrier-busting tips, to-dos, and try-it-outs · Practical templates and checklists · PLC prompts and discussion points When teachers unite across grades, students hit the ground running every year. Take the next step together as a team and help all your students build on existing understanding to find new success and most importantly, love learning and doing mathematics!
The Disorder of Mathematics Education Feb 07 2022 Research within a socio-political paradigm or “turn” has been gradually recognized and institutionalized as an important part of mathematics education. This book focuses on the neglected problems, tensions and contradictions evoked by this process. The authors

do this by challenging current regimes of truth about mathematics education; by identifying how recent technological developments challenge or suspend contemporary conceptions of mathematics education; by critiquing the ideological entanglement of mathematics, its education and schooling with capitalism; by self-reflective analyses of researchers' impacts on shaping what is and can be perceived as the practice of mathematics education (research); and by confronting main-stream mathematics education with socio-political contexts that are usually neglected. In this way, "mathematical rationality" becomes contextualized within contemporary society, where it reproduces itself through technologies, social practices, media and other spheres of social life.

Language and Mathematics Education May 30 2021 A volume in Research in Mathematics Education Series Editor Barbara J. Dougherty, Iowa State University Marketing description: Issues of language in mathematics learning and teaching are important for both practical and theoretical reasons. Addressing issues of language is crucial for improving mathematics learning and teaching for students who are bilingual, multilingual, or learning English. These issues are also relevant to theory: studies that make language visible provide a complex perspective of the role of language in reasoning and learning mathematics. What is the relevant knowledge base to consider when designing research studies that address issues of language in the learning and teaching of mathematics? What scholarly literature is relevant and can contribute to research? In order to address issues of language in mathematics education, researchers need to use theoretical perspectives that integrate current views of mathematics learning and teaching with current views on language, discourse, bilingualism, and second language acquisition. This volume contributes to the development of such integrated approaches to research on language issues in mathematics education by describing theoretical perspectives for framing the study of language issues and methodological issues to consider when designing research studies. The volume provides interdisciplinary reviews of the research literature from four very different perspectives: mathematics education (Moschkovich), Cultural-Historical-Activity Theory (Gutierrez, Sengupta-Irving, & Dieckmann), systemic functional linguistics (Schleppegrell), and assessment (Solano-Flores). This volume offers graduate students and researchers new to the study of language in mathematics education an introduction to resources for conceptualizing, framing, and designing research studies. For those already involved in examining language issues, the volume provides useful and critical reviews of the literature as well as recommendations for moving forward in designing research. Lastly, the volume provides a basis for dialogue across multiple research communities engaged in collaborative work to address these pressing issues."

Connecting Mathematics and Mathematics Education Feb 19 2023 This open access book features a selection of articles written by Erich Ch. Wittmann between 1984 to 2019, which shows how the “design science conception” has been continuously developed over a number of decades. The articles not only describe this conception in general terms, but also demonstrate various substantial learning environments that serve as typical examples. In terms of teacher education, the book provides clear information on how to combine (well-understood) mathematics and methods courses to benefit of teachers. The role of mathematics in mathematics education is often explicitly and implicitly reduced to the delivery of subject matter that then has to be selected and made palpable for students using methods imported from psychology, sociology, educational research and related disciplines. While these fields have made significant contributions to mathematics education in recent decades, it cannot be ignored that mathematics itself, if well understood, provides essential knowledge for teaching mathematics beyond the pure delivery of subject matter. For this purpose, mathematics has to be conceived of as an organism that is deeply rooted in elementary operations of the human mind, which can be seamlessly developed to higher and higher levels so that the full richness of problems of various degrees of difficulty, and different means of representation, problem-solving strategies, and forms of proof can be used in ways that are appropriate for the respective level. This view of mathematics is essential for designing learning environments and curricula, for conducting empirical studies on truly mathematical processes and also for implementing the findings of mathematics education in teacher education, where it is crucial to take systemic constraints into account.

Perspectives on Mathematics Education Apr 28 2021 BACOMET cannot be evaluated solely on the basis of its publications. It is important then that the reader, with only this volume on which to judge both the BACOMET activities and its major outcome to date, should know some thing of what preceded this

book's publication. For it is the story of how a group of educators, mainly tutors of student-teachers of mathematics, com mitted themselves to a continuing period of work and self-education. The concept of BACOMET developed during a series of meetings held in 1978-79 between the three editors, Bent Christiansen, Geoffrey Howson and Michael Otte, at which we expressed our concern about the contributions from mathematics education as a discipline to teacher education, both as we observed it and as we participated in it. The short time which was at the teacher-educator's disposal, allied to the limited knowledge and experience of the students on which one had to build, raised puzzling problems concerning priorities and emphases. The recognition that these problems were shared by educators from many different countries was matched by the fact that it would be fruitless to attempt to search for an internationally (or even nationally) acceptable solution to our problems. Different contexts and traditions rule this out.

Mathematics Curriculum in School Education Nov 04 2021 Mathematics curriculum, which is often a focus in education reforms, has not received extensive research attention until recently. Ongoing mathematics curriculum changes in many education systems call for further research and sharing of effective curriculum policies and practices that can help lead to the improvement of school education. This book provides a unique international perspective on diverse curriculum issues and practices in different education systems, offering a comprehensive picture of various stages along curriculum transformation from the intended to the achieved, and showing how curriculum changes in various stages contribute to mathematics teaching and learning in different educational systems and cultural contexts. The book is organized to help readers learn not only from reading individual chapters, but also from reading across chapters and sections to explore broader themes, including: Identifying what is important in mathematics for teaching and learning in different education systems; Understanding mathematics curriculum and its changes that are valued over time in different education systems; Identifying and analyzing effective curriculum practices; Probing effective infrastructure for curriculum development and implementation. Mathematics Curriculum in School Education brings new insights into curriculum policies and practices to the international community of mathematics education, with 29 chapters and four section prefaces contributed by 56 scholars from 14 different education systems. This rich collection is indispensable reading for mathematics educators, researchers, curriculum developers, and graduate students interested in learning about recent curriculum development, research, and practices in different education systems. It will help readers to reflect on curriculum policies and practices in their own education systems, and also inspire them to identify and further explore new areas of curriculum research for improving mathematics teaching and learning.

Mathematics Education in the Early Years Mar 16 2020 This book gives insights in the vivid research area of early mathematics learning. The collection of selected chapters mirrors the research topics presented at the fourth POEM conference in May 2018. Thematically, the volume reflects the importance of this evolving area of research, which has begun to attract attention in the spheres of education and public policy due to increased interest in early years learning. The research foci of the chapters comprise children’s mathematical reasoning, early years mathematics teaching, and the role of parents for children’s mathematical development. The 2018 conference included a wider range of researchers than previous years.

Math Lessons for a Living Education Level 3 Dec 13 2019 Teach math lessons through the creative means of a life storyProvide 36 weeks of instruction based on skill levels rather than grade levelsGuide students by the use of inexpensive manipulatives, including index cards, dried beans, and construction paper! We often tend to compartmentalize when teaching children. In real life, there aren’t artificial barriers between “subjects.” For example, when you are cooking or baking, you have to use the skills of reading, logical thinking, and measuring, just to name a few. In driving a car, you see and read road signs, read maps, and count miles. So why do we say to children, “This is math, this is language, this is about science and nature, and this is history”? The most natural and effective means to teach children is through life examples. Content, story, and the ability to show math in real life make a living math book!

Values and Valuing in Mathematics Education Jan 14 2020 This engaging open access book discusses how a values and valuing perspective can facilitate a more effective mathematics pedagogical experience, and allows readers to explore multiple applications of the values perspective across different education systems. It also clearly shows that teaching mathematics involves not only reasoning and feelings, but also students’ interactions with their cultural setting and

each other. The book brings together the work of world leaders and new thinkers in mathematics educational research to improve the learning and teaching of mathematics. Addressing themes such as discovering hidden cultural values, a multicultural society and methodological issues in the investigation of values in mathematics, it stimulates readers to consider these topics in cross-cultural ways, and offers suggestions for research and classroom practice. It is a valuable resource for scholars of mathematics education, from early childhood through to higher education and an inspiring read for all mathematics teachers.

Transitions in Mathematics Education Feb 24 2021 This book examines the kinds of transitions that have been studied in mathematics education research. It defines transition as a process of change, and describes learning in an educational context as a transition process. The book focuses on research in the area of mathematics education, and starts out with a literature review, describing the epistemological, cognitive, institutional and sociocultural perspectives on transition. It then looks at the research questions posed in the studies and their link with transition, and examines the theoretical approaches and methods used. It explores whether the research conducted has led to the identification of continuous processes, successive steps, or discontinuities. It answers the question of whether there are difficulties attached to the discontinuities identified, and if so, whether the research proposes means to reduce the gap – to create a transition. The book concludes with directions for future research on transitions in mathematics education.

Mathematics Education in the Digital Age Feb 13 2020 The wide availability of digital educational resources for mathematics teaching and learning is indisputable, with some notable genres of technologies having evolved, such as graphing calculators, dynamic graphing, dynamic geometry and data visualization tools. But what does this mean for teachers of mathematics, and how do their roles evolve within this digital landscape? This essential book offers an international perspective to help bridge theory and practice, including coverage of networking theories, curriculum design, task implementation, online resources and assessment. Mathematics Education in the Digital Age details the impacts this digital age has, and will continue to have, on the parallel aspects of learning and teaching mathematics within formal education systems and settings. Written by a group of international authors, the chapters address the following themes: Mathematics teacher education and professional development Mathematics curriculum development and task design The assessment of mathematics Theoretical perspectives and methodologies/approaches for researching mathematics education in the digital age This book highlights not only the complex nature of the field, but also the advancements in theoretical and practical knowledge that is enabling the mathematics education community to continue to learn in this increasingly digital age. It is an essential read for all mathematics teacher educators and master teachers.

Care in Mathematics Education Aug 21 2020 This book investigates the process of care in mathematics teaching. The author proposes transformative educational spaces in which learning mathematics, rather than consisting of a repetitive grind of exercises and facts, can become a part of learner identity. This book describes examples of mathematics teachings in a wide range of contexts and pedagogies, coordinated to identify common features where care for mathematical learning and thinking is combined with care for learners. Along with detailing caring mathematics education practices in alternative spaces, the author demonstrates similar practices alive even with the current mainstream spaces of acquisition and performance. Care is integrated through listening, and developing responsive and trusting relationships. It will be of interest to scholars of mathematics education, as well as pre-service and in-service teachers and teacher educators.

Latinos/as and Mathematics Education Nov 16 2022 This book that explores the mathematics education of Latinos/as in 13 original research studies. Each chapter represents research that grounds mathematics instruction for Latinos/as in the resources to be found in culture and language. By inverting the deficit perspective, this volume redresses the shortcomings found in the previous literature on Latino/a learners. Each study frames language (e.g. bilingualism) not as an obstacle to learning, but as a resource for mathematical reasoning. Other chapters explore the notion of cultural variation not as a liability but as a tool for educators to build upon in the teaching of mathematics. Specifically, the book reframes culture as a focus on the practices, objects, inscriptions, or people that connect mathematical concepts to student thinking and experiences, both in and out of school. The book's four sections divide the research: The first section of the book focuses on mathematic learning in classrooms, specifically exploring bilingual, Latino/a students; the second section explores Latino/a learners in

communities, including the role parents can play in advancing learning; the third section includes chapters focused on teacher professional growth; the final section concerns the assessment (and mis-assessment) of Latino/a learners. The research shared in this volume provides ample evidence that mathematics educators who choose to ignore language or culture in their pedagogy risk shortchanging their Latino/a students.

Mathematics Education Sep 14 2022 Winner of the AESA 2017 Critics' Choice Book Award Mathematics Education offers both undergraduates and starting-graduate students in education an introduction to the connections that exist between mathematics and a critical orientation to education. This primer shows how concepts like race, class, gender, and language have real effects in the mathematics classroom, and prepares current and future mathematics teachers with a more critical math education that increases accessibility for all students. By refocusing math learning towards the goals of democracy and social and environmental crises, the book also introduces readers to broader contemporary school policy and reform debates and struggles. Mark Wolfmeyer shows future and current teachers how critical mathematics education can be put into practice with concrete strategies and examples in both formal and informal educational settings. With opportunities for readers to engage in deeper discussion through suggested activities, Mathematics Education's pedagogical features include: Study Questions for Teachers and Students Text Boxes with Examples of Critical Education in Practice Annotated List of Further Readings Glossary

Mathematics in Physics Education Dec 25 2020 This book is about mathematics in physics education, the difficulties students have in learning physics, and the way in which mathematization can help to improve physics teaching and learning. The book brings together different teaching and learning perspectives, and addresses both fundamental considerations and practical aspects. Divided into four parts, the book starts out with theoretical viewpoints that enlighten the interplay of physics and mathematics also including historical developments. The second part delves into the learners' perspective. It addresses aspects of the learning by secondary school students as well as by students just entering university, or teacher students. Topics discussed range from problem solving over the role of graphs to integrated mathematics and physics learning. The third part includes a broad range of subjects from teachers' views and knowledge, the analysis of classroom discourse and an evaluated teaching proposal. The last part describes approaches that take up mathematization in a broader interpretation, and includes the presentation of a model for physics teachers' pedagogical content knowledge (PCK) specific to the role of mathematics in physics.

Mathematics Education and Culture Sep 02 2021

Critical Mathematics Education Jul 20 2020 Mathematics is traditionally seen as the most neutral of disciplines, the furthest removed from the arguments and controversy of politics and social life. However, critical mathematics challenges these assumptions and actively attacks the idea that mathematics is pure, objective, and value?neutral. It argues that history, society, and politics have shaped mathematics—not only through its applications and uses but also through molding its concepts, methods, and even mathematical truth and proof, the very means of establishing truth. Critical mathematics education also attacks the neutrality of the teaching and learning of mathematics, showing how these are value?laden activities indissolubly linked to social and political life. Instead, it argues that the values of openness, dialogicality, criticality towards received opinion, empowerment of the learner, and social/political engagement and citizenship are necessary dimensions of the teaching and learning of mathematics, if it is to contribute towards democracy and social justice. This book draws together critical theoretic contributions on mathematics and mathematics education from leading researchers in the field. Recurring themes include: The natures of mathematics and critical mathematics education, issues of epistemology and ethics; Ideology, the hegemony of mathematics, ethnomathematics, and real?life education; Capitalism, globalization, politics, social class, habitus, citizenship and equity. The book demonstrates the links between these themes and the discipline of mathematics, and its critical teaching and learning. The outcome is a groundbreaking collection unified by a shared concern with critical perspectives of mathematics and education, and of the ways they impact on practice.

Proof in Mathematics Education Sep 21 2020 Research on teaching and learning proof and proving has expanded in recent decades. This reflects the growth of mathematics education research in general, but also an increased emphasis on proof in mathematics education.

Technology in Mathematics Teaching Jun 30 2021 This book comprises chapters featuring a state of the art of research on digital technology in mathematics

education. The chapters are extended versions of a selection of papers from the Proceedings of the 13th International Conference on Technology in Mathematics Teaching (ICTMT-13), which was held in Lyon, France, from July 3rd to 6th. ICTMT-13 gathered together over one hundred participants from twenty countries sharing research and empirical results on the topical issues of technology and its potential to improve mathematics teaching and learning. The chapters are organised into 4 themed parts, namely assessment in mathematics education and technology, which was the main focus of the conference, innovative technology and approaches to mathematics education, teacher education and professional development toward the technology use, and mathematics teaching and learning experiences with technology. In 13 chapters contained in the book, prominent mathematics educators from all over the world present the most recent theoretical and practical advances on these themes This book is of particular interest to researchers, teachers, teacher educators and other actors interested in digital technology in mathematics education.

Meaning in Mathematics Education Aug 01 2021 What does it mean to know mathematics? How does meaning in mathematics education connect to common sense or to the meaning of mathematics itself? How are meanings constructed and communicated and what are the dilemmas related to these processes? There are many answers to these questions, some of which might appear to be contradictory. Thus understanding the complexity of meaning in mathematics education is a matter of huge importance. There are twin directions in which discussions have developed—theoretical and practical—and this book seeks to move the debate forward along both dimensions while seeking to relate them where appropriate. A discussion of meaning can start from a theoretical examination of mathematics and how mathematicians over time have made sense of their work. However, from a more practical perspective, anybody involved in teaching mathematics is faced with the need to orchestrate the myriad of meanings derived from multiple sources that students develop of mathematical knowledge. This book presents a wide variety of theoretical reflections and research results about meaning in mathematics and mathematics education based on long-term and collective reflection by the group of authors as a whole. It is the outcome of the work of the BACOMET (BAsic COmponents of Mathematics Education for Teachers) group who spent several years deliberating on this topic. The ten chapters in this book, both separately and together, provide a substantial contribution to clarifying the complex issue of meaning in mathematics education. This book is of interest to researchers in mathematics education, graduate students of mathematics education, under graduate students in mathematics, secondary mathematics teachers and primary teachers with an interest in mathematics.

Rethinking Mathematics Mar 28 2021 In this unique collection, more than 30 articles show how to weave social justice issues throughout the mathematics curriculum, as well as how to integrate mathematics into other curricular areas. Rethinking Mathematics offers teaching ideas, lesson plans, and reflections by practitioners and mathematics educators. This is real-world math-math that helps students analyze problems as they gain essential academic skills. This book offers hope and guidance for teachers to enliven and strengthen their math teaching. It will deepen students' understanding of society and help prepare them to be critical, active participants in a democracy. Blending theory and practice, this is the only resource of its kind.

A Mathematician's Lament Jun 11 2022 “One of the best critiques of current mathematics education I have ever seen.”—Keith Devlin, math columnist on NPR’s Morning Edition A brilliant research mathematician who has devoted his career to teaching kids reveals math to be creative and beautiful and rejects standard anxiety-producing teaching methods. Witty and accessible, Paul Lockhart’s controversial approach will provoke spirited debate among educators and parents alike and it will alter the way we think about math forever. Paul Lockhart, has taught mathematics at Brown University and UC Santa Cruz. Since 2000, he has dedicated himself to K-12 level students at St. Ann’s School in Brooklyn, New York.

Mathematics Education Dec 17 2022 Many in the mathematics community in the U.S. are involved in mathematics education in various capacities. This book highlights the breadth of the work in K-16 mathematics education done by members of US departments of mathematical sciences. It contains contributions by mathematicians and mathematics educators who do work in areas such as teacher education, quantitative literacy, informal education, writing and communication, social justice, outreach and mentoring, tactile learning, art and mathematics, ethnomathematics, scholarship of teaching and learning, and

mathematics education research. Contributors describe their work, its impact, and how it is perceived and valued. In addition, there is a chapter, co-authored by two mathematicians who have become administrators, on the challenges of supporting, evaluating, and rewarding work in mathematics education in departments of mathematical sciences. This book is intended to inform the readership of the breadth of the work and to encourage discussion of its value in the mathematical community. The writing is expository, not technical, and should be accessible and informative to a diverse audience. The primary readership includes all those in departments of mathematical sciences in two or four year colleges and universities, and their administrators, as well as graduate students. Researchers in education may also find topics of interest. Other potential readers include those doing work in mathematics education in schools of education, and teachers of secondary or middle school mathematics as well as those involved in their professional development.

Theories of Mathematics Education Nov 11 2019 Advances in Mathematics Education is a new and innovative book series published by Springer that builds on the success and the rich history of ZDM—The Inter- tional Journal on Mathematics Education (formerly known as Zentralblatt für - daktik der Mathematik). One characteristic of ZDM since its inception in 1969 has been the publication of themed issues that aim to bring the state-of-the-art on c- tral sub-domains within mathematics education. The published issues include a rich variety of topics and contributions that continue to be of relevance today. The newly established monograph series aims to integrate, synthesize and extend papers from previously published themed issues of importance today, by orienting these issues towards the future state of the art. The main idea is to move the ?eld forward with a book series that looks to the future by building on the past by carefully choosing viable ideas that can fruitfully mutate and inspire the next generations. Taking ins- ration from Henri Poincaré (1854–1912), who said “To create consists precisely in not making useless combinations and in making those which are useful and which are only a small minority.

The 'Resource' Approach to Mathematics Education Oct 23 2020 This edited volume will help educators better analyze methodological and practical tools designed to aid classroom instruction. It features papers that explore the need to create a system in order to fully meet the uncertainties and developments of modern educational phenomena. These have emerged due to the abundance of digital resources and new forms of collective work. The collected papers offer new perspectives to a rising field of research known as the Documentational Approach to Didactics. This framework was first created by the editors of this book. It seeks to develop a deeper understanding of mathematics teaching expertise. Readers will gain insight into how to meet the theoretical questions brought about by digitalization. These include: how to analyze teachers’ work when they prepare for their teaching, how to conceptualize the relationships between individual and collective work, and how to follow the related processes over the long term. The contributors also provide a comparative view in terms of contrasting selected phenomena across different educational cultures and education systems. For instance, they consider how differences in curriculum resources are available to teachers and how teachers make use of them to shape instruction. Coverage also considers the extent to which teachers make use of additional material, particularly those available through the global marketplace on the Internet. This book builds on works from the Re(s)sources 2018 Conference, Understanding teachers’ work through their interactions with resources for teaching, held in Lyon, France.

The Sociology of Mathematics Education May 18 2020 Until the 1960s, maths was studied as an academic subject in a desire to have more mathematicians. The current trend, however, has moved away from viewing maths as a purely intellectual endeavour and towards developing a more mathematically competent workforce and citizenry. This trend has seen a large increase in the number of maths schemes being produced by the major educational publishers, which attempt to make maths easier and more approachable by using language instead of symbols. So why do so many children still fail at maths? The author contends that to understand this, teachers need to analyze and evaluate the maths textbooks they are currently using. The author shows the reader how to systematically analyze and evaluate these textbooks. This interrogation of classroom resources, should have important implications for teaching strategies and for textbook design and use.

Encyclopedia of Mathematics Education Oct 15 2022 The Encyclopedia of Mathematics Education is a comprehensive reference text, covering every topic in the field with entries ranging from short descriptions to much longer pieces where the topic warrants more elaboration. The entries provide access to theories

and to research in the area and refer to the leading publications for further reading. The Encyclopedia is aimed at graduate students, researchers, curriculum developers, policy makers, and others with interests in the field of mathematics education. It is planned to be 700 pages in length in its hard copy form but the text will subsequently be up-dated and developed on-line in a way that retains the integrity of the ideas, the responsibility for which will be in the hands of the Editor-in-Chief and the Editorial Board. This second edition will include additional entries on: new ideas in the politics of mathematics education, working with minority students, mathematics and art, other cross-disciplinary studies, studies in emotions and mathematics, new frameworks for analysis of mathematics classrooms, and using simulations in mathematics teacher education. Existing entries will be revised and new entries written. Members of the international mathematics education research community will be invited to propose new entries. Editorial Board: Bharath Sriraman Melony Graven Yoshinori Shimizu Ruhama Even Michele Artigue Eva Jablonka Wish to Become an Author? Springer's Encyclopedia of Mathematics Education's first edition was published in 2014. The Encyclopedia is a "living" project and will continue to accept articles online as part of an eventual second edition. Articles will be peer-reviewed in a timely manner and, if found acceptable, will be immediately published online. Suggested articles are, of course, welcome. Feel encouraged to think about additional topics that we overlooked the first time around, and to suggest colleagues (including yourself!) who will want to write them. Interested new authors should contact the editor in chief, Stephen Lerman, at lermans@lsbu.ac.uk, for more specific instructions.

Democracy and Mathematics Education Mar 08 2022 In Democracy and Mathematics Education, Kurt Stemhagen and Catherine Henney develop a way of thinking about the nature and purposes of math that is inclusive, participatory, and thoroughly human. They use these ideas to create a school mathematics experience that can enhance students' math abilities and democratic potential. They locate mathematics' origins in human activity and highlight the rich but often overlooked links between mathematical activity and democratic, social practices. Democratic mathematics education foregrounds student inquiry and brings to light the moral dimensions of a discipline that has both remarkable utility and inevitable limitations. For math educators, the book's humanities approach helps to see the subject anew. For philosophers, it provides an important real world context for wrestling with perennial and timely questions, engaging democratic and evolutionary theory to transform school math. This alternative approach to mathematics and mathematics education provides a guide for how to use math to make democracy a larger part of school and wider social life. 2021 Winner of the AESA Critics' Choice Book Award.

Mathematics (Education) in the Information Age Apr 16 2020 This book brings together ideas from experts in cognitive science, mathematics, and mathematics education to discuss these issues and to present research on how mathematics and its learning and teaching are evolving in the Information Age. Given the ever-broadening trends in Artificial Intelligence and the processing of information generally, the aim is to assess their implications for how math is evolving and how math should now be taught to a generation that has been reared in the Information Age. It will also look at the ever-spreading assumption that human intelligence may not be unique—an idea that dovetails with current philosophies of mind such as posthumanism and transhumanism. The role of technology in human evolution has become critical in the contemporary world. Therefore, a subgoal of this book is to illuminate how humans now use their sophisticated technologies to chart cognitive and social progress. Given the interdisciplinary nature of the chapters, this will be of interest to all kinds of readers, from mathematicians themselves working increasingly with computer scientists, to cognitive scientists who carry out research on mathematics cognition and teachers of mathematics in a classroom.