

Knowing And Teaching Elementary Mathematics Teachers Understanding Fundamental In China The United States Liping Ma

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Beyond Classical Pedagogy Terry Wood 2014-04-04 The emergence of the National Council of Teachers of Mathematics Standards in 1989 sparked a sea change in thinking about the nature and quality of mathematics instruction in U.S. schools. Much is known about transmission forms of mathematics teaching and the influence of this teaching on students' learning, but there is still little knowledge about the alternative forms of instruction that have evolved from the recent widespread efforts to reform mathematics education. Beyond Classical Pedagogy: Teaching Elementary School Mathematics reports on the current state of knowledge about these new instructional practices, which differ in significant ways from the traditional pedagogy that has permeated mathematics education in the past. This book provides a research-based view of the nature of facilitative teaching in its relatively mature form, along with opposing views and critique of this form of pedagogy. The focus is on elementary school mathematics classrooms, where the majority of the reform-based efforts have occurred, and on the micro level of teaching (classroom interaction) as a source for revealing the complexity involved in teaching, teachers' learning, and the impact of both on children's learning. The work in elementary mathematics teaching is situated in the larger context of research on teaching. Research and insights from three disciplinary perspectives are presented: the psychological perspective centers on facilitative teaching as a process of teachers' learning; the mathematical perspective focuses on the nature of the mathematical knowledge teachers need in order to engage in this form of teaching; the sociological perspective attends to the interactive process of meaning construction as teachers and students create intellectual communities in their classrooms. The multidisciplinary perspectives presented provide the editors with the necessary triangulation to provide confirming evidence and rich detail about the nature of facilitative teaching. Audiences for this book include scholars in mathematics education and teacher education, teacher educators, staff developers, and classroom teachers. It is also appropriate as a text for graduate courses in mathematics education, teacher education, elementary mathematics teaching methods, and methods of research in mathematics education.

Helping Children Learn Mathematics National Research Council 2002-07-31 Results from national and international assessments indicate that school children in the United States are not learning mathematics well enough. Many students cannot correctly apply computational algorithms to solve problems. Their understanding and use of decimals and fractions are especially weak. Indeed, helping all children succeed in mathematics is an imperative national goal. However, for our youth to succeed, we need to change how we're teaching this discipline. Helping Children Learn Mathematics provides comprehensive and reliable information that will guide efforts to improve school mathematics from pre--kindergarten through eighth grade. The authors explain the five strands of mathematical proficiency and discuss the major changes that need to be made in mathematics instruction, instructional materials, assessments, teacher education, and the broader educational system and answers some of the frequently asked questions when it comes to mathematics instruction. The book concludes by providing recommended actions for parents and caregivers, teachers, administrators, and policy makers, stressing the importance that everyone work together to ensure a mathematically literate society.

Approaches to Learning and Teaching Mathematics Charlie Gilderdale 2017-08-31 A subject-specific guide for teachers to supplement professional development and provide resources for lesson planning. Approaches to learning and teaching Mathematics is the result of close collaboration between Cambridge University Press and Cambridge International Examinations. Considering the local and global contexts when planning and teaching an international syllabus, the title presents ideas for Mathematics with practical examples that help put theory into context. Teachers can download online tools for lesson planning from our website. This book is ideal support for those studying professional development qualifications or international PGCEs.

5 Principles of the Modern Mathematics Classroom Gerald Aungst 2015-10-09 Students pursue problems they're curious about, not problems they're told to solve. Creating a math classroom filled with confident problem solvers starts by introducing challenges discovered in the real world, not by presenting a sequence of prescribed problems, says Gerald Aungst. In this groundbreaking book, he offers a thoughtful approach for instilling a culture of learning in your classroom through five powerful, yet straightforward principles: Conjecture, Collaboration, Communication, Chaos, and Celebration. Aungst shows you how to Embrace collaboration and purposeful chaos to help students engage in productive struggle, using non-routine and unsolved problems Put each chapter's principles into practice through a variety of strategies, activities, and by incorporating technology tools Introduce substantive, lasting cultural changes in your classroom through a manageable, gradual shift in processes and behaviors Five Principles of the Modern Mathematics Classroom offers new ideas for inspiring math students by building a more engaging and collaborative learning environment. "Bravo! This book brings a conceptual framework for K-12 mathematics to life.

As a parent and as the executive director of Edutopia, I commend Aungst for sharing his 5 principles. This is a perfect blend of inspiring and practical. Highly recommended!" Cindy Johanson, Executive Director, Edutopia George Lucas Educational Foundation "Aungst ignites the magic of mathematics by reminding us what makes mathematicians so passionate about their subject matter. Grounded in research, his work takes us on a journey into classrooms so that we may take away tips to put into practice today." Erin Klein, Teacher, Speaker, and Author of Redesigning Learning Spaces Take a look at Gerald describe why you need this book!

Knowing and Teaching Elementary Mathematics Liping Ma 2010-03-26 Studies of teachers in the U.S. often document insufficient subject matter knowledge in mathematics. Yet, these studies give few examples of the knowledge teachers need to support teaching, particularly the kind of teaching demanded by recent reforms in mathematics education. Knowing and Teaching Elementary Mathematics describes the nature and development of the knowledge that elementary teachers need to become accomplished mathematics teachers, and suggests why such knowledge seems more common in China than in the United States, despite the fact that Chinese teachers have less formal education than their U.S. counterparts. The anniversary edition of this bestselling volume includes the original studies that compare U.S and Chinese elementary school teachers' mathematical understanding and offers a powerful framework for grasping the mathematical content necessary to understand and develop the thinking of school children. Highlighting notable changes in the field and the author's work, this new edition includes an updated preface, introduction, and key journal articles that frame and contextualize this seminal work.

A Focus on Fractions Marjorie M. Petit 2015-07-24 A Focus on Fractions is a groundbreaking effort to make the mathematics education research on how students develop their understanding of fraction concepts readily accessible and understandable to pre- and in-service K– 8 mathematics educators. Using extensive annotated samples of student work, as well as vignettes characteristic of classroom teachers' experiences, this book equips educators with the knowledge and tools to reveal students' thinking so that they can modify their teaching and improve student learning of fraction concepts. A Focus on Fractions 2nd edition includes sections on the Common Core State Standards for Mathematics and the Ongoing Assessment Project (OGAP) Fraction Framework integrated into each chapter as well as a new chapter on the OGAP Fraction Progression and how it can be used for formative assessment purposes. This updated edition assists teachers in translating research findings into their classroom practice by conveying detailed information about how students develop fraction understandings. Additional images and examples serve to flesh out and supplement the newly-introduced concepts in this updated and expanded edition. Special Features: Looking Back Questions at the end of each chapter provide teachers the opportunity to analyze student thinking and consider instructional strategies for their own students. Instructional Links help teachers relate concepts from the chapter to their own instructional materials and programs. Big Ideas frame the chapters and provide a platform for meaningful exploration of the teaching of fractions. Answer Key posted online offers extensive explanations of in-chapter questions. New sections devoted to the CCSSM and OGAP Fraction Progression are woven throughout the book as well as a new stand alone chapter on the OGAP Fraction Progression. The OGAP Fraction Framework is an all-new eResource, now available as a free download from the book's website: www.routledge.com/9781138816442.

Handbook of Research on the Global Empowerment of Educators and Student Learning Through Action Research Slapac, Alina 2021-05-07 The year 2020 brought an unprecedented worldwide health crisis through the COVID-19 pandemic that has been affecting all sectors, including education. There were questions surrounding the effectiveness of online trainings for teachers, online teaching practices, the motivation and engagement of students, and the quality of learning and education in these times. Action research emerged to address these concerns, being a systematic process of inquiry using reflection within a cyclical model of planning, acting, implementing, evaluating, and continuous reflection. This method of research is employed with the expertise and passion from educators to better enhance online practices and education while using authentic learning and experiences. Using collaboration, social advocacy, and action research, there is the opportunity to advance teaching for students, families, and communities without a physical context involved. The Handbook of Research on the Global Empowerment of Educators and Student Learning Through Action Research explores successful teaching and learning skills through the method of action research and intersects it with online learning in order to uncover best teaching practices in online platforms. This book showcases educational professionals' action research for solutions in advancing teaching and learning, the practical benefits of action research, recommendations for improving online teaching and learning, and a focus on professional growth as well as social justice advocacy. It highlights important topics including student learning, teacher collaboration, authentic learning, advocacy, and action research in both K-12 and higher education settings. This book is ideal for inservice and preservice teachers, administrators, teacher educators, practitioners, researchers, academicians, and students interested in how action research is improving and advancing knowledge on the best teaching practices for online education.

Teaching Mathematics at Secondary Level Tony Gardiner 2016-02-08 Teaching Mathematics is nothing less than a mathematical manifesto. Arising in response to a limited National Curriculum, and engaged with secondary schooling for those aged 11 ? 14 (Key Stage 3) in particular, this handbook for teachers will help them broaden and enrich their students' mathematical education. It avoids specifying how to teach, and focuses instead on the central principles and concepts that need to be borne in mind by all teachers and textbook authors—but which are little appreciated in the UK at present. This study is aimed at anyone who would like to think more deeply about the discipline of 'elementary mathematics', in England and Wales and anywhere else. By analysing and supplementing the current curriculum, Teaching Mathematics provides food for thought for all those involved in school mathematics, whether as aspiring teachers or as experienced professionals. It challenges us all to reflect upon what it is that makes secondary school mathematics educationally, culturally, and socially important.

One Size Fits Few Susan Ohanian 1999 Susan Ohanian recounts her quest to make sense of the Standards educational movement.

Answers to Your Biggest Questions About Teaching Elementary Math John J. SanGiovanni 2021-09-21 Your guide to grow and learn as a math teacher! Let's face it, teaching elementary math can be hard. So much about how we teach math today may look and feel different from how we learned it. Today, we recognize placing the student at the center of their learning increases engagement, motivation, and academic achievement soars. Teaching math in a student-centered way changes the role of the teacher from one who traditionally "delivers knowledge" to one who fosters thinking. Most importantly, we must ensure our practice gives each and every student the opportunity to learn, grow, and achieve at high levels, while providing opportunities to

develop their agency and authority in the classroom which results in a positive math identity. Whether you are a brand new teacher or a veteran, if you find teaching math to be quite the challenge, this is the guide you want by your side. Designed for just-in-time learning and support, this practical resource gives you brief, actionable answers to your most pressing questions about teaching elementary math. Written by four experienced math educators representing diverse experiences, these authors offer the practical advice they wish they received years ago, from lessons they've learned over decades of practice, research, coaching, and through collaborating with teams, teachers and colleagues—especially new teachers—every day. Questions and answers are organized into five areas of effort that will help you most thrive in your elementary math classroom: 1. How do I build a positive math community? 2. How do I structure, organize, and manage my math class? 3. How do I engage my students in math? 4. How do I help my students talk about math? 5. How do I know what my students know and move them forward? Woven throughout, you'll find helpful sidebar notes on fostering identity and agency; access and equity; teaching in different settings; and invaluable resources for deeper learning. The final question—Where do I go from here?— offers guidance for growing your practice over time. Strive to become the best math educator you can be; your students are counting on it! What will be your first step on the journey?

Mathematics Content for Elementary Teachers Douglas K. Brumbaugh 2004-09-22 THE book for elementary education mathematics content courses! Designed to help prospective teachers of elementary school mathematics learn content beyond the rote level, this text stimulates readers to think beyond just getting the problem right and fosters their development into thoughtful, reflective, self-motivated, life-long learners. It stresses the what and why of elementary school mathematics content. Hints are provided about how to teach the content but this is mostly left to courses and texts that are dedicated to that purpose. The text is organized around the National Council for Teachers of Mathematics' Principles and Standards for School Mathematics. The Standards dictate the basic sections of the text. Within each section, appropriate specific topics are developed, intertwined with technology, problem solving, assessment, equity issues, planning, teaching skills, use of manipulatives, sequencing, and much more. In addition, major focal points of the Standards are emphasized throughout: effective teachers of mathematics should be able to motivate all students to learn, should understand the developmental levels of how children learn, should concentrate on what children need to become active participants in the learning environment, and should be engaged in ongoing investigations of new mathematical concepts and teaching strategies. Mathematics Content for Elementary Teachers is based on several fundamental premises: *The focus of mathematics education should be on the process, not the answer. *Elementary teachers should know the mathematics content they are teaching, know more than the content they are teaching, and teach from the overflow of knowledge. *It is important for teachers to be flexible in allowing students to use different procedures--teaching from the "overflow of knowledge" implies knowing how to do a given operation more than one way and being willing to examine many different ways. *Teachers need to learn to carefully cover the topics to be taught, to reflect upon them, and to be able to organize them. To help prospective elementary teachers concentrate on the mathematics content they will be expected to teach and begin to build the foundation for the methods they will use, this text includes only elementary mathematics content and does not address middle school concepts. Pedagogical features: *The text is organized according to NCTM Standards. *An informal writing style speaks directly to readers and is geared to pre-service teachers. *Focus is given to multiple methods of problem solving at four developmental levels. *Questions, exercises, and activities are interspersed throughout each section rather than gathered at the end of each chapter. *Complete solutions for exercises are provided.

How People Learn National Research Council 2000-08-11 First released in the Spring of 1999, How People Learn has been expanded to show how the theories and insights from the original book can translate into actions and practice, now making a real connection between classroom activities and learning behavior. This edition includes far-reaching suggestions for research that could increase the impact that classroom teaching has on actual learning. Like the original edition, this book offers exciting new research about the mind and the brain that provides answers to a number of compelling questions. When do infants begin to learn? How do experts learn and how is this different from non-experts? What can teachers and schools do—with curricula, classroom settings, and teaching methods—to help children learn most effectively? New evidence from many branches of science has significantly added to our understanding of what it means to know, from the neural processes that occur during learning to the influence of culture on what people see and absorb. How People Learn examines these findings and their implications for what we teach, how we teach it, and how we assess what our children learn. The book uses exemplary teaching to illustrate how approaches based on what we now know result in in-depth learning. This new knowledge calls into question concepts and practices firmly entrenched in our current education system. Topics include: How learning actually changes the physical structure of the brain. How existing knowledge affects what people notice and how they learn. What the thought processes of experts tell us about how to teach. The amazing learning potential of infants. The relationship of classroom learning and everyday settings of community and workplace. Learning needs and opportunities for teachers. A realistic look at the role of technology in education.

The Math Teachers Know Brent Davis 2013-07-18 What sorts of mathematics competencies must teachers have in order to teach the discipline well? This book offers a novel take on the question. Most research is focused on explicit knowledge—that is, on the sorts of insights that might be specified, catalogued, taught, and tested. In contrast, this book focuses on the tacit dimensions of teachers' mathematics knowledge that precede and enable their competencies with formal mathematics. It highlights the complexity of this knowledge and offers strategies to uncover it, analyze it, and re-synthesize it in ways that will make it more available for teaching. Emerging from 10 years of collaborative inquiry with practicing teachers, it is simultaneously informed by the most recent research and anchored to the realities of teachers' lives in classrooms.

Debates in Mathematics Education Gwen Ineson 2020-06-15 This new and updated second edition of Debates in Mathematics Education explores the major issues that mathematics teachers encounter in their daily lives. By engaging with established and contemporary debates, this volume promotes and supports critical reflection and aims to stimulate both novice and experienced teachers to reach informed judgements and argue their point of view with deeper theoretical knowledge and understanding. Divided into five accessible sections, this book investigates and offers fresh insight into topics of central importance in mathematics education, with this second edition including new discussions and chapters on: Classic and contemporary issues of pedagogy, politics, philosophy and sociology of mathematics education International comparisons of achievement Digital

technologies for teaching Mastery in mathematics Pop culture and mathematics Whether mathematics can be harmful Designed to stimulate discussion and support you in your own research, writing and practice through suggested questions and activities throughout, Debates in Mathematics Education will be a valuable resource for any student or practising teacher, and those engaged in initial teacher education, continuing professional development or Master's level study. This book also has much to offer to those leading mathematics departments in schools and initial teacher education programmes, and to beginning doctoral students looking for a survey of the field of mathematics education research.

Phonics Pathways Dolores G. Hiskes 2010-05-11 Now in its ninth edition, Phonics Pathways (with help from Dewey the Bookworm™) teaches students of all ages the rudiments of phonics and spelling with an efficient, practical, and foolproof method. Written in an easy-to-use format, Phonics Pathways is organized by sounds and spelling patterns. The patterns are introduced one at a time and slowly built into syllables, words, phrases, and sentences. Printed in a large 8-1/2" x 11" lay-flat format for easy photocopying, Phonics Pathways is filled with illustrative examples, word lists, and practice readings that are 100 percent decodable. While appropriate for K-2 emergent readers, this award-winning book has also been used successfully with adolescent and adult learners, as well as second language learners and students with learning disabilities such as dyslexia. Dewey® and Dewey Decimal Classification® are proprietary trademarks of OCLC Online Computer Library Center, and are used with permission. Dewey the Bookworm™, Dewey D. System, Bookwormus Giganticus™, and the design mark of the character Dewey are trademarks of Dolores G. Hiskes and are also used with permission.

Knowing and Learning Mathematics for Teaching National Research Council 2001-02-25 There are many questions about the mathematical preparation teachers need. Recent recommendations from a variety of sources state that reforming teacher preparation in postsecondary institutions is central in providing quality mathematics education to all students. The Mathematics Teacher Preparation Content Workshop examined this problem by considering two central questions: What is the mathematical knowledge teachers need to know in order to teach well? How can teachers develop the mathematical knowledge they need to teach well? The Workshop activities focused on using actual acts of teaching such as examining student work, designing tasks, or posing questions, as a medium for teacher learning. The Workshop proceedings, Knowing and Learning Mathematics for Teaching, is a collection of the papers presented, the activities, and plenary sessions that took place.

Elementary Mathematics Pedagogical Content Knowledge James E. Schwartz 2008 Schwartz Powerful Ideas in Elementary Mathematics: Pedagogical Content Knowledge for Teachers, 1/e ISBN: 0205493750 "This book would be a great tool for helping [today's future elementary teachers] acquire a 'gut level' understanding of mathematics concepts." - Hester Lewellen, Baldwin-Wallace College, OH "The writing in this text is very clear and would easily be understood by the intended audience. The real-world examples put the various math concepts into a context that is easily understood. The vignettes at the beginning of each chapter are interesting and they get the reader to begin thinking about the math concepts that will follow. Each of the chapters seem to build on one another and the author often refers back to activities and concepts from previous chapters which is meaningful to the reader because it lets the reader know that the information they are learning builds their conceptual understanding of other mathematical concepts." - Melany L. Rish, University of South Carolina, Aiken Organized around five key concepts or "powerful ideas" in mathematics, this text presents elementary mathematics content in a concise and nonthreatening manner for teachers. Designed to sharpen teachers' mathematics pedagogical content knowledge, the friendly writing style and vignettes relate math concepts to "real life" situations so that they may better present the content to their students. The five "powerful ideas" (composition, decomposition, relationships, representation, and context) provide an organizing framework and highlight the interconnections between mathematics topics. In addition, the text thoroughly integrates discussion of the five NCTM process strands. Features: Icons highlighting the NCTM process standards appear throughout the book to indicate where the text relates to each of these. Practice exercises and activities and their explanations reinforce math concepts presented in the text and provide an opportunity for reflection and practice. Concise, conversational chapters and opening vignettes present math contents simply enough for even the most math-anxious pre-service teachers.

Key Concepts in Teaching Primary Mathematics Derek Haylock 2007-09-17 Covering the key principles and concepts in the teaching and learning of mathematics in primary schools, this text provides trainee and practising teachers with a quick and easy reference to what they need to know for their course, and in the classroom. The entries are arranged alphabetically, and each contains a brief definition, followed by an explanation and discussion, practical examples and annotated suggestions for further reading. Examples of the wide-ranging material include: Anxiety about mathematics; Assessment for Learning; Cognitive conflict; Concept learning; Creativity in mathematics; Differentiation; Equivalence; Explanation; Investigation; Low attainment; Making connections; Meaningful context; Mental calculation; Numeracy; Play as a context for learning mathematics; Problem-solving; Questioning; Talk.

Common Mistakes in Teaching Elementary Math—And How to Avoid Them Fuchang Liu 2017-03-27 Learn the most effective ways to teach elementary math, no matter how much experience you have with the subject. In this book, Fuchang Liu takes you through many common mistakes in math instruction and explains the misunderstandings behind them. He points out practices that should be avoided, helping you to adjust your lessons so that all students can achieve success. You'll discover how to... - Increase your confidence with core math principles and reasoning - Set your students on the path toward eventually developing more complex math skills - Improve student achievement by approaching problems in logical yet creative ways - Overcome common challenges faced by students and teachers - Teach problem solving for different learning styles Every chapter reconsiders well-established ways of teaching all areas of elementary math, from addition and subtraction to statistics and graphs. Helpful examples and tips are scattered throughout the book, offering revisions to the way these topics are often presented in the classroom. Also included are group study ideas for principals and instructional coaches so your school or district can work on the book together. With this practical guide, you'll be ready to help students truly develop their math understanding.

Critical Variables in Mathematics Education Edward Griffith Begle 1979

Beliefs: A Hidden Variable in Mathematics Education? G.C. Leder 2002 The twenty chapters in this book all focus on aspects of mathematical beliefs, from a variety of different perspectives. Current knowledge of the field is synthesized and existing boundaries are extended. The book is divided into three, partly overlapping, sections. The first concentrates on conceptualizations and measurement of beliefs, the second on research about teachers' beliefs, and the third on facets of students' beliefs about mathematics. A diversity of instruments is used for data collection, including surveys, interviews,

observations, and essay writing, as well as more innovative approaches. The volume is intended for researchers in the field, as well as for mathematics educators teaching the next generation of students. The book is also useful for those working in other subject disciplines, since many of the themes explored have relevance well beyond mathematics education.

Mathematics Teaching, Learning, and Liberation in the Lives of Black Children Danny Bernard Martin 2010-06-21 With issues of equity at the forefront of mathematics education research and policy, *Mathematics Teaching, Learning, and Liberation in the Lives of Black Children* fills the need for authoritative, rigorous scholarship that sheds light on the ways that young black learners experience mathematics in schools and their communities. This timely collection significantly extends the knowledge base on mathematics teaching, learning, participation, and policy for black children and it provides new framings of relevant issues that researchers can use in future work. More importantly, this book helps move the field beyond analyses that continue to focus on and normalize failure by giving primacy to the stories that black learners tell about themselves and to the voices of mathematics educators whose work has demonstrated a commitment to the success of these children.

Teacher Noticing: Bridging and Broadening Perspectives, Contexts, and Frameworks Edna O. Schack 2017-05-16 This book reflects on the continuing development of teacher noticing through an exploration of the latest research. The authors and editors seek to clarify the construct of teacher noticing and its related branches and respond to challenges brought forth in earlier research. The authors also investigate teacher noticing in multiple contexts and frameworks, including mathematics, science, international venues, and various age groups.

The Legacy of Felix Klein Hans-Georg Weigand 2018-12-11 This open access book provides an overview of Felix Klein's ideas, highlighting developments in university teaching and school mathematics related to Klein's thoughts, stemming from the last century. It discusses the meaning, importance and the legacy of Klein's ideas today and in the future, within an international, global context. Presenting extended versions of the talks at the Thematic Afternoon at ICME-13, the book shows that many of Klein's ideas can be reinterpreted in the context of the current situation, and offers tips and advice for dealing with current problems in teacher education and teaching mathematics in secondary schools. It proves that old ideas are timeless, but that it takes competent, committed and assertive individuals to bring these ideas to life. Throughout his professional life, Felix Klein emphasised the importance of reflecting upon mathematics teaching and learning from both a mathematical and a psychological or educational point of view. He also strongly promoted the modernisation of mathematics in the classroom, and developed ideas on university lectures for student teachers, which he later consolidated at the beginning of the last century in the three books on elementary mathematics from a higher standpoint.

Primary Mathematics for Trainee Teachers Marcus Witt 2014-11-19 With chapter sequencing following the new Curriculum, this book supports trainee Primary school teachers to make use of the opportunities presented in the new National Curriculum for effective and engaging Mathematics teaching. Covering all of the areas of the new Curriculum for primary mathematics and offering insight into effective teaching, this book helps students connect what they need to teach with how it can be taught. Exploring opportunities in the new curriculum for creative and imaginative teaching, it shows readers how to capitalize on opportunities to develop children's reasoning and problem solving skills. It explores how to make links between mathematics and children's lived experiences to enhance their learning and enables trainees to develop an ability to plan with discernment, making the most of existing thinking and research as well as building confidence in adapting and customizing ideas. Includes the full National Curriculum Programme of Study for Maths, key stages 1 and 2 as a useful reference for trainee teachers. Other books in this series include: *Primary Science for Trainee Teachers* and *Primary English for Trainee Teachers*

Mathematics for Elementary School Teachers Tom Bassarear 2015-01-01 **MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS, 6E** offers future teachers a comprehensive mathematics course designed to foster concept development through examples, investigations, and explorations. In this text, intended for the one- or two-semester course required of Education majors, Bassarear demonstrates that there are many paths to solving a problem, and sometimes problems have more than one solution. The author presents real-world problems—problems that require active learning in a method similar to how archaeologists explore an archaeological find: they carefully uncover the site, slowly revealing more and more of the structure. Visual icons throughout the main text allow instructors to easily connect content to the hands-on activities in the corresponding Explorations Manual. With this exposure, future teachers will be better able to assess student needs using diverse approaches. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Understanding Numbers in Elementary School Mathematics Hung-Hsi Wu 2011 This is a textbook for pre-service elementary school teachers and for current teachers who are taking professional development courses. By emphasizing the precision of mathematics, the exposition achieves a logical and coherent account of school mathematics at the appropriate level for the readership. Wu provides a comprehensive treatment of all the standard topics about numbers in the school mathematics curriculum: whole numbers, fractions, and rational numbers. Assuming no previous knowledge of mathematics, the presentation develops the basic facts about numbers from the beginning and thoroughly covers the subject matter for grades K through 7. Every single assertion is established in the context of elementary school mathematics in a manner that is completely consistent with the basic requirements of mathematics. While it is a textbook for pre-service elementary teachers, it is also a reference book that school teachers can refer to for explanations of well-known but hitherto unexplained facts. For example, the sometimes-puzzling concepts of percent, ratio, and rate are each given a treatment that is down to earth and devoid of mysticism. The fact that a negative times a negative is a positive is explained in a leisurely and comprehensible fashion.

Elementary Mathematics Specialists Maggie McGatha 2017

Understanding and Teaching Primary Mathematics Tony Cotton 2020-09-02 Written by an experienced teacher and teacher educator with widespread experience of teaching mathematics in the UK and internationally, *Understanding and Teaching Primary Mathematics* combines pedagogy and subject knowledge to build confidence and equip you with all the skills and know-how you need to successfully teach mathematics to children of any age. This fourth edition has been fully updated to reflect the latest research developments and initiatives in the field, including a brand-new chapter on 'Mastery and mathematics' and 'The Singapore approach' which reflects the current international interest in these approaches to learning and teaching mathematics. Extra features also include helpful callouts to the book's revised and updated companion website, which offers a shared site with a range of resources relevant to both this book and its companion volume, *Teaching for Mathematical Understanding*.

Stimulating, accessible and well-illustrated, with comprehensive coverage of subject knowledge and pedagogy, *Understanding and Teaching Primary Mathematics* is an essential purchase for trainee and practising teachers alike.

Encyclopedia of Mathematics Education Stephen Lerman 2020-02-07 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.

Learning to Teach Neville Bennett 2002-01-31 The *Leverhulme Primary Project* reported here provides for the first time evidence on what is actually happening in teacher education today and on how novice teachers learn their craft. The book looks in detail at the experience of all the student teachers on one post graduate primary teacher training course and of those responsible for them in their university and in schools. It tracks them as they work to acquire the appropriate subject and pedagogical knowledge and as their own beliefs about teaching develop during the course. A final section follows some of the students through their first year as qualified teachers. Teacher education is going through a period of radical change and more people than ever before now have some responsibility, whether in higher education or in school for the training of teachers. None of them can afford to ignore the fresh insights into how teachers are made contained in this book.

Building the Foundation: Whole Numbers in the Primary Grades Maria G. Bartolini Bussi 2018-03-29 This twenty-third ICMI Study addresses for the first time mathematics teaching and learning in the primary school (and pre-school) setting, while also taking international perspectives, socio-cultural diversity and institutional constraints into account. One of the main challenges of designing the first ICMI primary school study of this kind is the complex nature of mathematics at the early level. Accordingly, a focus area that is central to the discussion was chosen, together with a number of related questions. The broad area of Whole Number Arithmetic (WNA), including operations and relations and arithmetic word problems, forms the core content of all primary mathematics curricula. The study of this core content area is often regarded as foundational for later mathematics learning. However, the principles and main goals of instruction on the foundational concepts and skills in WNA are far from universally agreed upon, and practice varies substantially from country to country. As such, this study presents a meta-level analysis and synthesis of what is currently known about WNA, providing a useful base from which to gauge gaps and shortcomings, as well as an opportunity to learn from the practices of different countries and contexts.

The Teacher Development Continuum in the United States and China National Research Council 2010-10-28 In 1999, Liping Ma published her book *Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in the United States and China*, which probed the kinds of knowledge that elementary school teachers need to convey mathematical concepts and procedures effectively to their students. Later that year, Roger Howe, a member of the U.S. National Commission on Mathematics Instruction (USNC/MI), reviewed the book for the *Notices of the American Mathematical Society*, concluding that it 'has lessons for all educational policymakers.' Intrigued by the idea of superrank teachers, the USNC/MI sponsored a workshop entitled 'The Teacher Development Continuum in the United States and China'. The purpose of the workshop was to examine the structure of the mathematics teaching profession in the United States and China. The main presentations and discussion from the workshop are summarized in this volume.

Knowing and Teaching Elementary Mathematics Liping Ma 2010-03-26 Studies of teachers in the U.S. often document insufficient subject matter knowledge in mathematics. Yet, these studies give few examples of the knowledge teachers need to support teaching, particularly the kind of teaching demanded by recent reforms in mathematics education. *Knowing and Teaching Elementary Mathematics* describes the nature and development of the knowledge that elementary teachers need to become accomplished mathematics teachers, and suggests why such knowledge seems more common in China than in the United States, despite the fact that Chinese teachers have less formal education than their U.S. counterparts. The anniversary edition of this bestselling volume includes the original studies that compare U.S and Chinese elementary school teachers' mathematical understanding and offers a powerful framework for grasping the mathematical content necessary to understand and develop the thinking of school children. Highlighting notable changes in the field and the author's work, this new edition includes an updated preface, introduction, and key journal articles that frame and contextualize this seminal work.

Yes, but why? Teaching for understanding in mathematics Ed Southall 2021-04-07 Getting the right answers in maths is only half the problem. Understanding why what you're doing works is the part that often stumps students and teachers alike. The essential guide for mathematics teachers and those training to teach, *Yes, but why?* answers all your questions, and sheds light on the hidden connections between everything in mathematics at school. This second edition includes: · A new 'Test yourself' feature in every chapter · More coverage of the four operations · Enhanced discussion of fractions and proportionality · Downloadable figures for use in the classroom

MATHEMATICS FOR ELEMENTARY TEACHERS. (PRODUCT ID 23864410). MICHELLE. MANES 2018

Teaching Elementary Mathematics to Struggling Learners Bradley S. Witzel 2016-01-25 Packed with effective instructional strategies, this book explores why certain K-5 students struggle with math and provides a framework for helping these learners

succeed. The authors present empirically validated practices for supporting students with disabilities and others experiencing difficulties in specific areas of math, including problem solving, early numeracy, whole-number operations, fractions, geometry, and algebra. Concrete examples, easy-to-implement lesson-planning ideas, and connections to state standards, in particular the Common Core standards, enhance the book's utility. Also provided is invaluable guidance on planning and delivering multi-tiered instruction and intervention.

Second International Handbook of Mathematics Education Alan Bishop 2003-06-30 The Second International Handbook of Mathematics Education is an essential resource for students, researchers, teacher educators and curriculum policy makers in the field of mathematics education. It is a follow-up to the first Handbook, which laid down the base-line in many areas of the field of mathematics education. The first Handbook was published in 1996, covering research done prior to 1994. This Second Handbook: *covers the changes and developments that have occurred in the field since 1994; *has a section focusing on public policy and mathematics education; *is an essential reference to all those who shape educational policy.

The Effectiveness of Mathematics Teaching in Primary Schools Zhenzhen Miao 2017-07-06 The Effectiveness of Mathematics Teaching in Primary Schools: Lessons from England and China provides a unique insight into the mathematics classrooms of these two countries and arrives at a time when the world is eager to know how Chinese learners consistently excel at learning mathematics and other core subjects. Showcasing the kinds of teaching methods that work within and across countries, this book presents a rich collection of views, including those from teachers, their native colleagues, their foreign colleagues and the researcher, regarding the quality of mathematics teaching today. Interweaving scientific results about teaching and learning evaluations with multiple perspectives of various roles in and out of the classroom, Miao and Reynolds offer insights into how and why different approaches of teaching have led to different learning outcomes in mathematics internationally. Building on rigid and robust analyses of the most up-to-date data in England and China, the book indicates that it is through changing teaching rather than changing teachers that mathematics learning can be improved, because it is what teachers do in the classroom that really makes a big difference. Containing four decades of wisdom from the field of teaching effectiveness research, this book is essential reading for all who want to improve the quality of mathematics teaching worldwide. This book is particularly relevant for educational researchers, postgraduate students and teachers, as well as school leaders, policymakers and parents.

A Focus on Addition and Subtraction Caroline B. Eddy 2020-11-23 This innovative text offers a unique approach to making mathematics education research on addition, subtraction, and number concepts readily accessible and understandable to pre-service and in-service teachers of grades K–3. Revealing students' thought processes with extensive annotated samples of student work and vignettes characteristic of teachers' experiences, this book provides educators with the knowledge and tools needed to modify their lessons and improve student learning of additive reasoning in the primary grades. Based on research gathered in the Ongoing Assessment Project (OGAP), this engaging, easy-to-use resource features practical resources such as: A close focus on student work, including 150+ annotated pieces of student work, to help teachers improve their ability to recognize, assess, and monitor their students' errors and misconceptions, as well as their developing conceptual understanding; A focus on the OGAP Addition, Subtraction, and Base Ten Number Progressions, based on research conducted with hundreds of teachers and thousands of pieces of student work; In-chapter sections on how Common Core State Standards for Math (CCSSM) are supported by math education research; End-of-chapter questions to allow teachers to analyze student thinking and consider instructional strategies for their own students; Instructional links to help teachers relate concepts from each chapter to their own instructional materials and programs; An accompanying eResource, available online, offers an answer key to Looking Back questions, as well as a copy of the OGAP Additive Framework and the OGAP Number Line Continuum. A Focus on Addition and Subtraction marks the fourth installment of the popular A Focus on... collection, designed to aid the professional development of pre-service and in-service mathematics teachers. Following from previous volumes on ratios and proportions, multiplication and division, and fractions, this newest addition is designed to bridge the gap between what math education researchers know and what teachers need to know in order to better understand evidence in student work and make effective instructional decisions.