Resources in Education
Since its first publication, Teaching Secondary School Mathematics has established itself as one of the most respected and popular texts for both pre-service and in-service teachers. This new edition has been fully revised and updated to reflect the major changes brought about by the introduction of the Australian Curriculum: Mathematics, as well as discussing significant research findings, the evolution of digital teaching and learning technologies, and the implications of changes in education policies and practices. The mathematical proficiencies that now underpin the Australian curriculum – understanding, fluency, problem solving and reasoning – are covered in depth in Part 1, and a new section is devoted to the concept of numeracy. The chapter on digital tools and resources has been significantly expanded to reflect the growing use of these technologies in the classroom, while the importance of assessment is recognised with new material on assessment for learning and as learning, along with a consideration of policy development in this area. Important research findings on common student misconceptions and new and effective approaches for teaching key mathematical skills are covered in detail. As per the first edition readers will find a practical guide to pedagogical approaches and the planning and enactment of lessons together with enhanced chapters on teaching effectively for diversity, managing issues of inequality and developing effective relationships with parents and the community. This book is the essential pedagogical tool for every emerging teacher of secondary school mathematics. The text offers an excellent resource for all of those involved in the preparation of secondary mathematics teachers, with links to research literature, exemplars of classroom practices, and instructional activities that encourage readers to actively examine and critique practices within their own educational settings. Professor Glenda Anthony, Institute of Education, Massey University ‘A rich and engaging textbook that covers all of the important aspects of learning to become an effective secondary mathematics teacher. The second edition of this text is further enhanced with updated references to the Australian Curriculum, NAPLAN, STEM, current Indigenous, social justice and gender inequity issues, and the place of Australian mathematics curricula on the world stage.’ Dr Christine Ormond, Senior Lecturer, Edith Cowan University

The Second Handbook of Research on the Psychology of Mathematics Education

Mathematical Problem Solving

Roadmap to the Grade 10 FCAT Mathematics

Knowledge, Beliefs, and Identity in Mathematics Teaching and Teaching Development examines teacher knowledge, beliefs, identity, practice and relationships among them. These important aspects of mathematics teacher education continue to be the focus of extensive research and policy debate globally.

Pedagogy in Basic and Higher Education

This book takes a holistic approach to pedagogy and argues that the purpose of education is to educate the student’s whole personality including cognitive, social, and moral domains. The four sections and twelve chapters address the current pedagogical challenges in basic and higher education in international contexts. The authors describe the principles and practices through which meaningful education is promoted and enhanced in a variety of ways. The challenges educators face in their profession as well as ways to overcome them are elaborated on both theoretically and empirically. The book allows both researchers, teachers, and educational policy makers to reflect on current developments, challenges, and areas of development in educational institutions when aiming to support student growth and learning.

Research in Education

Since its establishment in 1976, PME (The International Group for the Psychology of Mathematics Education) is serving as a much sought after venue for scientific debate among those at the cutting edge of the field, as well as an engine for the development of research in mathematics education. A wide range of research activities conducted over the last ten years by PME members and their colleagues are documented and critically reviewed in this handbook, released to celebrate the Group’s 40 year anniversary milestone. The book is divided into four main sections: Cognitive aspects of learning and teaching content areas; Cognitive aspects of learning and teaching transverse areas; Social aspects of learning and teaching mathematics; and Professional aspects of teaching mathematics. The selection for each chapter of a team of at least two authors, mostly located in different parts of the world, ensured effective coverage of each field. High quality was further enhanced by the scrupulous review of early chapter drafts by two leaders in the relevant field. The resulting volume with its compilation of the most relevant aspects of research in the field, and its emphasis on trends and future developments, will be a rich and welcome resource for both mature and emerging researchers in mathematics education.
Research for Educational Change

The book comprises papers presented at the 7th International Conference on University Learning and Teaching (InCULTT) 2014, which was hosted by the Asian Centre for Research on University Learning and Teaching (ACRULeT) located at the Faculty of Education, Universiti Teknologi MARA, Shah Alam, Malaysia. It was co-hosted by the University of Hertfordshire, UK; the University of South Australia; the University of Ohio, USA; Taylor’s University, Malaysia and the Training Academy for Higher Education (AKPET), Ministry of Education, Malaysia. A total of 165 papers were presented by speakers from around the world based on the theme "Educate to Innovate in the 21st Century." The papers in this timely book cover the latest developments, issues and concerns in the field of teaching and learning and provide a valuable reference resource on university teaching and learning for lecturers, educators, researchers and policy makers.

Course and Curriculum Improvement Materials

Research for Educational Change presents ways in which educational research can fulfil its commitments to educational practice. Focussing its discussion within the context of mathematics education, it argues that while research-generated insights can have beneficial effects on learning and teaching, the question of how these effects are to be generated and sustained is far from evident. The question of how to turn research into educational improvement is discussed here in the context of learning and teaching hindered by poverty and social injustice. In the first part of the book, four teams of researchers use different methodologies while analysing the same corpus of data, collected in a South African mathematics classroom. In the second part, each of these teams makes a specific proposal about what can be done and how so that its research-generated insights have a tangible, beneficial impact on what is happening in mathematical classrooms. Combining two discourses – that of researchers speaking to one another, and that of researchers communicating their insights to those responsible for educational practice – the book deals with the perennial question of communication between those who study educational processes and those who are directly responsible for teacher education, educational research and classroom practices. This book will be key reading for postgraduates, researchers and academics in education and particularly in the areas of mathematics education, educational research, teacher education and classroom practice. It will also appeal to teacher educators, practitioners and undergraduate students interested in educational research.

Using Mobile Technologies in the Teaching and Learning of Mathematics

Private Secondary Schools

The purpose of this Open Access compendium, written by experienced researchers in mathematics education, is to serve as a resource for early career researchers in furthering their knowledge of the state of the field and disseminating their research through publishing. To accomplish this, the book is split into four sections: Empirical Methods, Important Mathematics Education Themes, Academic Writing and Academic Publishing, and a section Looking Ahead. The chapters are based on workshops that were presented in the Early Career Researcher Day at the 13th International Congress on Mathematical Education (ICME-13). The combination of presentations on methodological approaches and theoretical perspectives shaping the field in mathematics education research, as well as the strong emphasis on academic writing and publishing, offered strong insight into the theoretical and empirical bases of research in mathematics education for early career researchers in this field. Based on these presentations, the book provides a state-of-the-art overview of important theories from mathematics education and the broad variety of empirical approaches currently widely used in mathematics education research. This compendium supports early career researchers in selecting adequate theoretical approaches and adopting the most appropriate methodological approaches for their own research. Furthermore, it helps early career researchers in mathematics education to avoid common pitfalls and problems while writing up their research and it provides them with an overview of the most important journals for research in mathematics education, helping them to select the right venue for publishing and disseminating their work.

Posing and Solving Mathematical Problems


Mathematics and Technology

Mobile technologies influence the way that we interact with the world, the way that we live. We use them for communication, entertainment, information and research. In education settings, there has been substantial investment in mobile devices, often without a concomitant investment in developing pedagogy and practices. With mobile technologies evolving rapidly, and the number of educational apps growing, there is a need for research into how they facilitate mathematics learning. Such research is of particular importance regarding how such devices may be used to open up new ways of envisaging mathematics and mathematics education, and to help develop conceptual rather than procedural or declarative knowledge. This volume draws upon international research and reports on a range of research projects that have incorporated mobile technologies for mathematics education. It presents research on the use of mobile technologies, such as iPads, iPods, iPhones, Androids, and Tablets, across a diverse range of cultures, year levels and contexts. It examines the ways in which mobile technologies, including apps, might influence students' engagement, cognition, collaboration and attitudes, through the reshaping of the learning experience. In addition, the book presents appropriate ways to integrate mobile technologies into teaching and learning programmes. It is a significant reference book for those involved with teaching mathematics or using mobile technologies in education, while also offering insights and examples that are applicable to the use of digital technologies in education generally.

How PARCC’s False Rigor Stunts the Academic Growth of All Students. White Paper

This book celebrates the scholarly achievements of Prof. David A. Watkins, who has pioneered research on the psychology of Asian learners, and
helps readers grasp the cognitive, motivational, developmental, and socio-cultural aspects of Asian learners learning experiences. A wide range of empirical and review papers, which examine the characteristics of these experiences as they are shaped by both the particularities of diverse educational systems/cultural milieus and universal principles of human learning and development, are showcased. The individual chapters, which explore learners from fourteen Asian countries, autonomous regions, and/or economies, build on research themes and approaches from Prof. Watkins’ research work, and are proof of the broad importance and enduring relevance of his seminal psychological research on learners and the learning process.

Nuclear Science Abstracts

This 1990 book is aimed at teachers, mathematics educators and general readers who are interested in mathematics education from a psychological point of view.

Compendium for Early Career Researchers in Mathematics Education

Uses of Technology in Primary and Secondary Mathematics Education

Curriculum can be defined in a variety of ways. It might be viewed as a body of knowledge, a product, or a process. Curricula can differ as they are conceptualized from various theoretical perspectives to address the needs of teachers, students, and the context of schooling. One reason to study curriculum is “to reveal the expectations, processes and outcomes of students’ school learning experiences that are situated in different cultural and system contexts... further studies of curriculum practices and changes are much needed to help ensure the success of educational reforms in the different cultural and system contexts” (Kulm & Li, 2009, p. 709). This volume highlights international perspectives on curriculum and aims to broaden the wider mathematics education community’s understandings of mathematics curriculum through viewing a variety of ways that curricula are developed, understood, and implemented in different jurisdictions/countries. Within this volume, we define curriculum broadly as the set of mathematics standards or outcomes, the messages inherent in mathematics curriculum documents and resources, how these standards are understood by a variety of stakeholders, and how they are enacted in classrooms. The focus is on the written, implied, and enacted curriculum in various educational settings throughout the world.

Re-examining Pedagogical Content Knowledge in Science Education

Problem Solving in Mathematics Education

This special edition of the Educational Communications and Technology Yearbook Series bears a title of “Learning Environment and Design: Current and Future Impact”. It provides a timely forum to share theoretical and practical insights in both the local and international contexts in response to the fact that new media and technologies have infiltrated and shaped the learning environments from mere physical spaces into multifaceted possibilities, impacting the ways individuals teach and learn. Designs of learning environments to harness technologies appropriately to engage learners better, as well as the roles of learners and educators play in this changing learning environment, are examples of important global issues in the discourse of the contemporary educational developments. Having gathered a diverse collection of research papers written by scholars and practitioners in the fields of education, communication and humanities across Asia, Australasia, Europe and the United States, this book gives readers a cross-cultural background on the developments of technological designs and educational practices, investigating areas in redefining of quality education; online learning and blended learning; new media in education; gamification, AI, and innovative learning technologies. Aimed to catalyze knowledge exchanges and provide fresh views on interdisciplinary research, the book sheds light on how emerging technologies can be adapted in the fields of education and communication, so as to facilitate the current and future designs of learning environments to improve learners’ performances.

Debates in Mathematics Education

Contains abstracts in the field of mathematics education extracted from documents worldwide.

Education Systems Around the World

This book, "Education Systems Around the World", is a collection of reviewed and relevant research chapters that offer a comprehensive overview of recent developments in the field of social sciences and humanities. The book comprises single chapters authored by various researchers and edited by an expert active in the field of social studies and humanities. All chapters are unique but are united under a common research study topic. This publication aims to provide a thorough overview of the latest research efforts by international authors on social studies and humanities, and open new possible research paths for further novel developments.

International Perspectives on Mathematics Curriculum

This book speaks about physics discoveries that intertwine mathematical reasoning, modeling, and scientific inquiry. It offers ways of bringing together the structural domain of mathematics and the content of physics in one coherent inquiry. Teaching and learning physics is challenging because students lack the skills to merge these learning paradigms. The purpose of this book is not only to improve access to the understanding of natural phenomena but also to inspire new ways of delivering and understanding the complex concepts of physics. To sustain physics education in college classrooms, authentic training that would help develop high school students’ skills of transcending function modeling techniques to reason scientifically is needed and this book aspires to offer such training. The book draws on current research in developing students’ mathematical reasoning. It identifies areas for advancements and proposes a conceptual framework that is tested in several case studies designed using that framework. Modeling Newton’s laws using limited case analysis, Modeling projectile motion using parametric equations and Enabling covariational reasoning in Einstein formula for the photoelectric effect represent some of these case studies. A wealth of conclusions that accompany these case studies, drawn from the realities of classroom teaching, is to help physics teachers and researchers adopt these ideas in practice.

7th International Conference on University Learning and Teaching (InCULT 2014) Proceedings
Teaching Secondary School Mathematics

Mathematics and Cognition

Journal for Research in Mathematics Education

The advent of fast and sophisticated computer graphics has brought dynamic and interactive images under the control of professional mathematicians and mathematics teachers. This volume in the NATO Special Programme on Advanced Educational Technology takes a comprehensive and critical look at how the computer can support the use of visual images in mathematical problem solving. The contributions are written by researchers and teachers from a variety of disciplines including computer science, mathematics, mathematics education, psychology, and design. Some focus on the use of external visual images and others on the development of individual mental imagery. The book is the first collected volume in a research area that is developing rapidly, and the authors pose some challenging new questions.

Mathematical Modelling Education in East and West

The report of a panel assembled by the National Research Council to evaluate the statistics on the supply and demand for science and mathematics teachers concludes that the available data are inadequate and presents recommendations for improved data and further research. No index. Acidic paper. Annotation copyrighted by Book News, Inc., Portland, OR

The Psychology of Asian Learners

This ground-breaking book comprehensively addresses an area of major and sustained concern: how to improve the use of research evidence and enhance educators’ research engagement as a route to the improvement of educational practice. It focuses on the topic of knowledge brokering and mobilization in education, and its role in fostering evidence-informed practice. Divided into three sections, each addressing a different role of knowledge mobilizers, the book is based in clear evidentiary grounding. The chapters: Explore payoffs and challenges of connecting research to practice Provide recommendations in relation to practice and decision-making Present organized and professionally-enhancing tools, strategies and insights Written by internationally-recognized leaders and expert contributors, The Role of Knowledge Brokers in Education brings together extensive and global perspectives in an accessible yet comprehensive volume. This book is an invaluable resource for educational leaders worldwide who are interested in using or generating research for school improvement, as well as researchers, academics, and students in schools of education.

Canadian Books in Print

Peterson’s Private Secondary Schools is everything parents need to find the right private secondary school for their child. This valuable resource allows students and parents to compare and select from more than 1,500 schools in the U.S. and Canada, and around the world. Schools featured include independent day schools, special needs schools, and boarding schools (including junior boarding schools for middle-school students). Helpful information listed for each of these schools include: school’s area of specialization, setting, affiliation, accreditation, tuition, financial aid, student body, faculty, academic programs, social life, admission information, contacts, and more. Also includes helpful articles on the merits of private education, planning a successful school search, searching for private schools online, finding the perfect match, paying for a private education, tips for taking the necessary standardized tests, semester programs and understanding the private schools' admission application form and process.

The Role of Knowledge Brokers in Education

Discusses effective ways to improve mathematics skills and to perform well on the Florida Comprehensive Assessment Test (FCAT).


This book documents ongoing research and theorizing in the sub-field of mathematics education devoted to the teaching and learning of mathematical modelling and applications. Mathematical modelling provides a way of conceiving and resolving problems in people’s everyday lives as well as sophisticated new problems for society at large. Mathematical tradition in China that emphasizes algorithm and computation has now seen a renaissance in mathematical modelling and applications where China has made significant progress with its economy, science and technology. In recent decades, teaching and learning of mathematical modelling as well as contests in mathematical modelling have been flourishing at different levels of education in China. Today, teachers and researchers in China become keener to learn from their colleagues from Western countries and other parts of the world in research and teaching of mathematical modelling and applications. The book provides a dialogue and communication between colleagues from across the globe with new impetus and resources for mathematical modelling education and its research in both West and East with new ideas on modelling teaching and practices, inside and outside classrooms. All authors of this book are members of the International Community of Teachers of Mathematical Modelling and Applications (ICTMA), the peak research body into researching the teaching, assessing and learning of mathematical modelling at all levels of education from the early years to tertiary education as well as in the workplace. The book is of interest to researchers, mathematics educators, teacher educators, education administrators, policy writers, curriculum developers, professional developers, in-service teachers and pre-service teachers including those interested in mathematical literacy.

Exploiting Mental Imagery with Computers in Mathematics Education

Pedagogical Content Knowledge (PCK) has been adapted, adopted, and taken up in a diversity of ways in science education since the concept was introduced in the mid-1980s. Now that it is so well embedded within the language of teaching and learning, research and knowledge about the construct needs to be more useable and applicable to the work of science teachers, especially so in these times when standards and other
measures are being used to define their knowledge, skills, and abilities. Re-examining Pedagogical Content Knowledge in Science Education is organized around three themes: Re-examining PCK: Issues, ideas and development; Research developments and trajectories; Emerging themes in PCK research. Featuring the most up-to-date work from leading PCK scholars in science education across the globe, this volume maps where PCK has been, where it is going, and how it now informs and enhances knowledge of science teachers' professional knowledge. It illustrates how the PCK research agenda has developed and can make a difference to teachers' practice and students' learning of science.

Understanding Physics Using Mathematical Reasoning

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 training, continuing professional development or Masters 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.

Computer, Internet & Co. im Mathematik-Unterricht

X-kit Fet G10 Mathematics

This survey book reviews four interrelated areas: (i) the relevance of heuristics in problem-solving approaches – why they are important and what research tells us about their use; (ii) the need to characterize and foster creative problem-solving approaches – what type of heuristics helps learners devise and practice creative solutions; (iii) the importance that learners formulate and pursue their own problems; and iv) the role played by the use of both multiple-purpose and ad hoc mathematical action types of technologies in problem-solving contexts – what ways of reasoning learners construct when they rely on the use of digital technologies, and how technology and technology approaches can be reconciled.

International Handbook of Mathematics Teacher Education: Volume 1

This book collects recent research on posing and solving mathematical problems. Rather than treating these two crucial aspects of school mathematics as separate areas of study, the authors approach them as a unit where both areas are measured on equal grounds in relation to each other. The contributors are from a vast variety of countries and with a wide range of experience, it includes the work from many of the leading researchers in the area and an important number of young researchers. The book is divided in three parts, one directed to new research perspectives and the other two directed to teachers and students, respectively.

Contributed position papers

This book provides international perspectives on the use of digital technologies in primary, lower secondary and upper secondary school mathematics. It gathers contributions by the members of three topic study groups from the 13th International Congress on Mathematical Education and covers a range of themes that will appeal to researchers and practitioners alike. The chapters include studies on technologies such as virtual manipulatives, apps, custom-built assessment tools, dynamic geometry, computer algebra systems and communication tools. Chiefly focusing on teaching and learning mathematics, the book also includes two chapters that address the evidence for technologies’ effects on school mathematics. The diverse technologies considered provide a broad overview of the potential that digital solutions hold in connection with teaching and learning. The chapters provide both a snapshot of the status quo of technologies in school mathematics, and outline how they might impact school mathematics ten to twenty years from now.

Precalculus Science and Mathematics Teachers

This book contributes to the field of mathematical problem solving by exploring current themes, trends and research perspectives. It does so by addressing five broad and related dimensions: problem solving heuristics, problem solving and technology, inquiry and problem posing in mathematics education, assessment of and through problem solving, and the problem solving environment. Mathematical problem solving has long been recognized as an important aspect of mathematics, teaching mathematics, and learning mathematics. It has influenced mathematics curricula around the world, with calls for the teaching of problem solving as well as the teaching of mathematics through problem solving. And as such, it has been of interest to mathematics education researchers for as long as the field has existed. Research in this area has generally aimed at understanding and relating the processes involved in solving problems to students’ development of mathematical knowledge and problem solving skills. The accumulated knowledge and field developments have included conceptual frameworks for characterizing learners’ success in problem solving activities, cognitive, metacognitive, social and affective analysis, curriculum proposals, and ways to promote problem solving approaches.

Math Educ

For too many students, mathematics consists of facts in a vacuum, to be memorized because the instructor says so, and to be forgotten when the course of study is completed. In this all-too-common scenario, young learners often miss the chance to develop skills—specifically, reasoning skills—that can serve them for a lifetime. The elegant pages of Teaching Mathematical Reasoning in Secondary School Classrooms propose a more positive solution by presenting a reasoning- and decision-based approach to teaching mathematics, emphasizing the connections between ideas, or why math works. The teachers whose work forms the basis of the book create a powerful record of methods, interactions, and decisions (including dealing with challenges and impasses) involving this elusive topic. And because this approach shifts the locus of authority from the instructor to mathematics itself, students gain a system of knowledge that they can apply not only to discrete tasks relating to numbers, but also to the larger world of people and the humanities. A sampling of the topics covered: Whole-class discussion methods for teaching

**Teaching Mathematical Reasoning in Secondary School Classrooms**

In July 2010, the Massachusetts Board of Elementary and Secondary Education (BESE) voted to adopt Common Core's standards in English language arts (ELA) and mathematics in place of the state's own standards in these two subjects. The vote was based largely on recommendations by Commissioner of Education Mitchell Chester and then Secretary of Education Paul Reville, and on the conclusions in three studies comparing the state's standards with Common Core's, all financed directly or indirectly by the Bill & Melinda Gates Foundation, and all issued by organizations that are among the primary boosters of Common Core (Achieve, Inc., Thomas B. Fordham Institute, and Massachusetts Business Alliance for Education). Nevertheless, annual state testing for school and district accountability continued as part of the Massachusetts Comprehensive Assessment System (MCAS) mandated by the 1993 Massachusetts Education Reform Act (MERA). To accommodate the adoption of Common Core’s standards, tests were based on both the old standards and an annually increasing number of Common Core’s standards until 2015, when all of the pre-Common Core standards in ELA and mathematics were archived, and the MCAS tests were presumably only Common Core-based. After the vote to adopt Common Core’s standards in 2010, the state joined the testing consortium called Partnership for Assessment of Readiness for College and Careers (PARCC), funded by the United States Department of Education (USED) to develop common tests for its member states (about 25 initially), but with the costs for administering the tests to be borne by the states and local school districts. Since 2011, PARCC has been developing tests that BESE is expected to vote to adopt in the late fall of 2015 as the state's official Common Core-based tests in place of Common Core-based MCAS tests. (Indeed, the commissioner of education and his staff at the Department of Elementary and Secondary Education (DESE) have been implementing a transition to PARCC tests for several years.) BESE’s official vote will be guided, again, by the recommendations of the same commissioner of education (who now also chairs PARCC’s Governing Board), the current Secretary of Education James Peyser, and the conclusions reached in "external" studies comparing PARCC and MCAS tests as well as in about 20 studies directly authorized by PARCC. Two of the external studies are listed in the state’s 2015 application to the USED for a waiver from No Child Left Behind Act requirements and are by organizations that had originally recommended adoption of Common Core. One, issued by the Massachusetts Business Alliance for Education in February 2015, claims that PARCC tests predict college readiness better than MCAS tests did. A second, to be completed by the Fordham Institute and a partner, is to be issued in time for BESE's vote. A third, issued in mid-October 2015 by Mathematica Policy Research (and requested by the state's Executive Office of Education) claims both tests are equally predictive of college readiness, although its report has major shortcomings. This White Paper will be a fourth external report on the question BESE's vote will address; it is motivated by our interest in providing an analysis of how MCAS and PARCC assess reading and writing. Much less national attention has been paid to Common Core-based assessments of reading and writing than of mathematics, yet reading and writing skills are just as important to readiness for college and career as is mathematics. This White Paper's central recommendation is that Massachusetts use a testing system for K-12 that is much less costly, more rigorous academically, and much more informative about individual student performance, and with much less instructional time spent on test preparation and administration, than the current PARCC tests. Both the PARCC tests and the current MCAS tests in grade 10 are weak, albeit for different reasons, and neither indicates eligibility for a high school diploma, college readiness, or career readiness. In essence, these recommendations would ensure the legacy and future promise of MERA.