



# LESSON STUDY

A Japanese Approach to Improving Mathematics  
Teaching and Learning



Clea Fernandez • Makoto Yoshida

# Improving Mathematics Teaching And Learning The Japanese Lesson Study Approach

**Masami Isoda**



## **Improving Mathematics Teaching And Learning The Japanese Lesson Study Approach:**

Lesson Study Clea Fernandez, Makoto Yoshida, 2012-09-10 Lesson study is a popular professional development approach in Japan whereby teachers collaborate to study content instruction and how students solve problems and reach for understanding in order to improve elementary mathematics instruction and learning in the classroom This book is the first comprehensive look at the system and process of lesson study in Japan It describes in detail the process of how teachers conducted lesson study how they collaborated in order to develop a lesson what they talked about during the process and what they looked at in order to understand deeply how students were learning Readers see the planning of a mathematics lesson as well as how much content knowledge the teachers have They observe students problem solving strategies and learn how Japanese teachers prepare themselves to identify those strategies and facilitate the students discussion Written for mathematics teachers educational researchers school administrators interested in teachers professional development and professional developers this landmark volume provides an in depth understanding of lesson study that can lead to positive changes in teachers professional development and in teaching and learning in the United States *Lesson Study* Clea Fernandez, Makoto Yoshida, 2004-07-22 Lesson study is a popular professional development approach in Japan whereby teachers collaborate to study content instruction and how students solve problems and reach for understanding in order to improve elementary mathematics instruction and learning in the classroom This book is the first comprehensive look at the system and process of lesson study in Japan It describes in detail the process of how teachers conducted lesson study how they collaborated in order to develop a lesson what they talked about during the process and what they looked at in order to understand deeply how students were learning Readers see the planning of a mathematics lesson as well as how much content knowledge the teachers have They observe students problem solving strategies and learn how Japanese teachers prepare themselves to identify those strategies and facilitate the students discussion Written for mathematics teachers educational researchers school administrators interested in teachers professional development and professional developers this landmark volume provides an in depth understanding of lesson study that can lead to positive changes in teachers professional development and in teaching and learning in the United States **The Mathematics Practitioner's Guidebook for Collaborative Lesson Research** Akihiko Takahashi, Geoffrey Wake, 2023-10-04 This resource provides mathematics educators with tools for conducting Collaborative Lesson Research CLR a form of Lesson Study developed out of the original Japanese Lesson Study and intended to improve student and teacher learning Renowned mathematics education researchers Akihiko Takahashi and Geoffrey Wake bring together educators across the US and UK with first hand experience using CLR in their schools Readers will learn the essentials for an impactful Lesson Study directly from the scholars who coined the term and benefit from the dual perspectives of math education researchers and teachers who have used CLR when reflecting on their own classroom pedagogy These contributors define CLR and provide examples of

successful CLR using real life case studies as well as introducing pathways for getting started and practical suggestions for implementation into different school environments Across these examples readers will understand the essence of Lesson Study considered as CLR and its important features be advised what participants in CLR should expect to do observing research lessons designing lessons teaching research lessons facilitating post lesson discussion etc and provide guidance and support with this enactment be advised on how to develop embed and sustain CLR communities preview potential outcomes over time from undertaking CLR Research lesson proposals and plans to support readers in understanding CLR are also included Ideal for practicing teachers teacher leaders teacher educators and professional developers involved in mathematics teaching this book offers first of its kind entry points for CLR Its combination of theory and practice will empower educators to implement this increasingly popular vehicle for understanding students learning of mathematics Japanese Lesson Study in Mathematics Masami Isoda,2007 In Before It s Too Late A Report to the Nation from the National Commission on Mathematics and Science Teaching for the 21st Century 2000 in the US the authors quote from James Stigler s conclusions from various videotape research studies of mathematics teaching The key to long term improvement in teaching is to figure out how to generate accumulate and share professional knowledge Japanese Lesson Study has proved to be one successful means This book supports the growing movement of lesson study to improve the quality of mathematics education from the original viewpoints of Japanese educators who have been engaging in lesson study in mathematics for professional development and curriculum implementation This book also illustrates several projects related to lesson study in other countries Developing Metacognitive Teaching Strategies Through Lesson Study Eric C. K. Cheng,Joanna K. M. Chan,2021-09-30 The book illustrates how Lesson Study can be applied to craft metacognitive teaching strategies to enhance students learning to learn competencies Based on the findings of an empirical study of a university funded teaching development project this book reports how to apply Lesson Study and Learning Study to enhance teachers metacognitive teaching competencies with a view to tackling the impacts and challenges created by and underlying the learning to learn curriculum The book allows readers to experience metacognitive learning by sorting the prior knowledge on the metacognition setting the goal and planning reading schedule checking their understanding and progress evaluating what they have or have not learned and reflected on their reading experience and feelings Readers can grasp the key concept underpinning metacognitive teaching including teaching strategies for developing students metacognitive abilities that include working on problem solving activities working on small collaborative groups making metacognitive and learning strategies explicit and encouraging students to reflect upon and talk about their learning Lesson Study Research and Practice in Mathematics Education Lynn C. Hart,Alice S. Alston,Aki Murata,2011-01-11 Lesson study is a professional development process that teachers engage in to systematically examine their practice with the goal of becoming more effective Originating in Japan lesson study has gained significant momentum in the mathematics education community in

recent years As a process for professional development lesson study became highly visible when it was proposed as a means of supporting the common practice of promoting better teaching by disseminating documents like standards benchmarks and nationally validated curricula While the body of knowledge about lesson study is growing it remains somewhat elusive and composed of discrete research endeavors As a new research area there is no coherent knowledge base yet This book will contribute to the field bringing the work of researchers and practitioners together to create a resource for extant work This book describes several aspects of Lesson Study amongst others it gives an historical overview of the concept it addresses issues related to learning and teaching mathematics it looks at the role of the teacher in the process The last two sections of the book look at how lesson Study can be used with preservice mathematics teachers and at university mathematics methods teaching

Selected Regular Lectures from the 12th International Congress on Mathematical Education Sung Je Cho,2015-07-16 This book comprises the full selected Regular Lectures from the Proceedings of the 12th International Congress on Mathematical Education ICME 12 which was held at COEX in Seoul Korea from July 8th to 15th 2012 ICME 12 brought together 4700 experts from 100 countries working to understand all of the intellectual and attitudinal challenges in the subject of mathematics education as a multidisciplinary research and practice These selected Regular Lectures present the work of fifty one prominent mathematics educators from all over the globe The Lectures cover a wide spectrum of topics themes and issues and aim to give direction to future research towards educational improvement in the teaching and learning of mathematics education This book is of particular interest to researchers teachers and curriculum developers in mathematics education

*Japanese Lesson Study in Mathematics* Masami Isoda,2007 In Before It s Too Late A Report to the Nation from the National Commission on Mathematics and Science Teaching for the 21st Century 2000 in the US the authors quote from James Stigler s conclusions from various videotape research studies of mathematics teaching The key to long term improvement in teaching is to figure out how to generate accumulate and share professional knowledge Japanese Lesson Study has proved to be one successful means This book supports the growing movement of lesson study to improve the quality of mathematics education from the original viewpoints of Japanese educators who have been engaging in lesson study in mathematics for professional development and curriculum implementation This book also illustrates several projects related to lesson study in other countries

*Lesson Study-based Teacher Education* Jongsung Kim,Nariakira

Yoshida,Shotaro Iwata,Hiromi Kawaguchi,2021-05-26 The philosophy of Lesson Study in Japan teacher ownership teacher professionalism student learning focused dialogue teacher collaboration and teacher professional community has attracted educators and researchers worldwide However Lesson Study does not have the same meaning as its original Japanese expression Jugyou Kenkyuu a combination of two Japanese words Jugyou meaning instruction or lesson s and Kenkyuu meaning study or research To bridge the gap between Jugyou Kenkyuu and Lesson Study and therefore maximize the potential of Lesson Study in the world this edited volume provides two mirrors for those who wish to reflect on and

implement Lesson Study within their own contexts One section discusses how Lesson Study is utilized in Japanese teacher education and how this system reproduces the very culture of Lesson Study The other section addresses case studies showcasing Lesson Study implementation in several countries such as the United States Germany Norway Peru and Uganda and discusses the opportunities and challenges that arise when Lesson Study based teacher education expands beyond Japan to the rest of the world This book will appeal to anyone interested in learning about Lesson Study

*Understanding Lesson Study for Mathematics* Rosa Archer, Siân Morgan, David Swanson, 2020-06-04 Using the latest research this book provides an insight into how learning in mathematics can be improved through a lesson study approach This highly practical resource explores the research and theory that underpins lesson study and shows the significant impact it can have on teacher development Divided into ten accessible main chapters that focus in depth on an individual mathematics lesson each chapter provides research and background to the lesson an outline of key features a detailed description and analysis of the lesson in practice post lesson discussions and reflections which generalise from the experience as well as links to helpful resources Some of the key topics explored include Fractions Proportional relationships Probability and statistics Geometry Modelling Algebra Dialogic reasoning Understanding Lesson Study for Mathematics is the perfect resource for all mathematics teachers trainee teachers and professional developers who are looking to develop the use of lesson study in their own practice or for those simply seeking new inspiring ideas for the mathematics classroom

*The Handbook of Mathematics Teacher Education: Volume 2*, 2008-01-01 The Handbook of Mathematics Teacher Education the first of its kind addresses the learning of mathematics teachers at all levels of schooling to teach mathematics and the provision of activity and programmes in which this learning can take place It consists of four volumes Volume 2 Tools and Processes in Mathematics Teacher Education focuses on the how of mathematics teacher education In this volume the authors share with the readers their invaluable experience in employing different tools in mathematics teacher education This accumulated experience could assist teacher educators researchers in mathematics education and those involved in policy decisions on teacher education in making decisions about both the tools and the processes to be used for various purposes in mathematics teacher education There are four sections The first describes and discusses four successful ways of using cases in mathematics teacher education including narratives mathematics case discussions video recordings and lesson studies The second presents predominant tools that are used in mathematics teacher education two textual tools written tasks and examples and two physical tools manipulatives and machines The third section suggests ways in which the accumulated research on common students ways of thinking contributes to the development of tools and processes in mathematics teacher education The last section provides critical response and general perspective raising questions such as How can the teaching of mathematics be used as a tool to promote general educational values What are the dimensions of proficient teaching The concluding chapter offers a provisional framework consisting of a set of seven dimensions of proficiency for teaching mathematics Together the

chapters provide various promising tools and processes for facilitating the acquisition of major proficiencies needed for teaching mathematics and principles that could guide the selection and use of such tools Bibliographical Information for the complete set VOLUME 1 Knowledge and Beliefs in Mathematics Teaching and Teaching Development Peter Sullivan Monash University Clayton Australia and Terry Wood Purdue University West Lafayette USA eds paperback 978 90 8790 541 5 hardback 978 90 8790 542 2 ebook 978 90 8790 543 9 VOLUME 2 Tools and Processes in Mathematics Teacher Education Dina Tirosh Tel Aviv University Israel and Terry Wood Purdue University West Lafayette USA eds paperback 978 90 8790 544 6 hardback 978 90 8790 545 3 ebook 978 90 8790 546 0 VOLUME 3 Participants in Mathematics Teacher Education Individuals Teams Communities and Networks Konrad Krainer University of Klagenfurt Austria and Terry Wood Purdue University West Lafayette USA eds paperback 978 90 8790 547 7 hardback 978 90 8790 548 4 ebook 978 90 8790 549 1 VOLUME 4 The Mathematics Teacher Educator as a Developing Professional Barbara Jaworski Loughborough University UK and Terry Wood Purdue University West Lafayette USA eds paperback 978 90 8790 550 7 hardback 978 90 8790 551 4 ebook 978 90 8790 552 1      Student Successes With Thinking Maps® David N. Hyerle, Larry Alper, 2011-01-28 This new edition presents eight powerful visual models that boost all learners metacognitive and critical thinking skills Updates include new research examples and applications      **Connecting Inquiry and Professional Learning in Education** Anne Campbell, Susan Groundwater-Smith, 2013-03-07 How might inquiry enhance the professional practice of student and practising teachers teacher educators and other practitioners What effect might this have on the learning of young people in and outside of the classroom Based on the findings of an international colloquium and drawing upon a range of practices from the UK USA Canada Europe and Australia this book is designed to make explicit the connections between Practitioner Inquiry and Teacher Professional Learning in Initial Teacher Education and Ongoing Teacher Professional Development Considering issues such as the relationship between practitioner inquiry and pedagogical content knowledge whether it is possible to scale up from small local and intensive innovations to more broadly based inquiry inquiry's role in professional identity both individual and communal prevailing socio political contexts and consequences for social policy formation It brings together writers who work in designing teacher education courses and those who are practice based researchers and policy makers Crucially many of these writers inhabit both spheres and their accounts of how they successfully combine their multiple roles will prove vital reading for all those involved in examining and improving practice leading to enhanced teacher professional learning      The 'Resource' Approach to Mathematics Education Luc Trouche, Ghislaine Gueudet, Birgit Pepin, 2019-11-29 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 Resources 2018 Conference Understanding teachers work through their interactions with resources for teaching held in Lyon France

*Leading Lesson Study* Jennifer Stepanek, Gary Appel, Melinda Leong, Michelle Turner Mangan, Mark Mitchell, 2006-12-20 Provides readers with a compelling rationale for the process offers experience tested tools and suggests ways to address commonly occurring challenges This book will assist teachers and those who support them in understanding and implementing all phases of lesson study from initial planning through sharing with others what was learned Dennis Sparks Executive Director National Staff Development Council A powerful teacher professional development process that focuses collaborative teams directly on the classroom and the perfect tool for teachers professional developers and team leaders Gives you everything you need to use lesson study to support teachers in thinking deeply about practice Roberta Jaffe Science Education Coordinator New Teacher Center University of California Santa Cruz Use this team centered approach to directly enhance teaching and learning in your school First introduced in Japan lesson study has gained enthusiastic advocates in US educational circles as a powerful collaborative approach that brings teachers together as researchers into the science and craft of teaching and learning in their classrooms Teachers work as teams to develop a lesson plan teach and observe the lesson to collect data on student learning and use their observations to refine their lesson Participants build their sense of professional authority while discovering effective practices that result in improved learning outcomes for their students This how to guide provides teachers administrators and team leaders with practical strategies models and tools The book leads a beginning team through the phases of the lesson study cycle and provides an experienced team with new perspectives Using examples from U S classrooms this handbook Encourages educators to generate and share knowledge Inspires a teacher researcher stance Illustrates both the process and substance of lesson study Encourages collaboration Provides guidelines for avoiding common pitfalls *Leading Lesson Study* is an excellent resource for both experienced and novice lesson study teams administrators who want to start a lesson study program and lesson study team facilitators such as instructional coaches and professional development providers

*How Chinese Teach Mathematics and Improve Teaching* Yeping Li, Rongjin Huang, 2013 *How Chinese Teach Mathematics and Improve Teaching* builds upon



existing studies to examine mathematics classroom instruction in China It combines contributions from Chinese scholars with commentary from key Western scholars to offer a truly systematic examination of some important and distinctive features of mathematics classroom instruction Viewing classroom instruction as part of teachers instructional practices this book goes beyond teachers in classroom instructional practice by also examining Chinese teachers approaches and practices in developing and improving teaching Through this unique approach How Chinese Teach Mathematics and Improve Teaching expands and unpacks the otherwise fragmented knowledge about Chinese practices in developing and carrying out mathematics classroom instruction     *Reclaiming Lesson Observation* Matt O'Leary,2016-09-19 *Reclaiming Lesson Observation* explores the latest practice thinking and research in lesson observation putting teacher learning at its heart Illustrated throughout with practical examples from a range of education settings each chapter contains a rich variety of state of the art evidence based case studies to demonstrate how new approaches to observation can be applied in practice The book is split into four easily accessible parts making the transition to ungraded models of lesson observation recent research studies in lesson observation peer observation coaching and mentoring innovations in observing classroom practice With a carefully chosen team of contributors from senior leaders and managers to classroom practitioners and education researchers this book provides an informed perspective on how to maximise the use of observation and most importantly implement proven successful schemes to improve the quality of teaching in the classroom *Reclaiming Lesson Observation* is for all practising educators who want to break free from the constraints of performative lesson observation to redefine and reclaim it as a powerful tool for teacher growth on which to build sustainable collaborative communities of teacher learning

**Studying Classroom Teaching as a Medium for Professional Development** National Research Council,Policy and Global Affairs,Board on International Scientific Organizations,U.S. National Commission on Mathematics Instruction,Division of Behavioral and Social Sciences and Education,Center for Education,Mathematical Sciences Education Board,2002-08-09 The Mathematical Sciences Education Board MSEB and the U S National Commission on Mathematics Instruction USNCMI took advantage of a unique opportunity to bring educators together In August 2000 following the Ninth International Congress on Mathematics Education ICME 9 in Makuhari Japan MSEB and USNCMI capitalized on the presence of mathematics educators in attendance from the United States and Japan by holding a two and a half day workshop on the professional development of mathematics teachers This workshop used the expertise of the participants from the two countries to develop a better more flexible and more useful understanding of the knowledge that is needed to teach well and how to help teachers to obtain this knowledge A major focus of the workshop was to discuss teachers opportunities in both societies using teaching practice as a medium for professional development Another focus of the workshop addressed practice by considering the records of teaching including videos of classroom lessons and cases describing teachers and their work These proceedings reflect the activities and discussion of the workshop using both print and video to enable others to

share in their experience      **Theory and Practice of Lesson Study in Mathematics** Rongjin Huang,Akihiko Takahashi,João Pedro da Ponte,2019-05-28 This book brings together and builds on the current research efforts on adaptation conceptualization and theorization of Lesson Study LS It synthesizes and illustrates major perspectives for theorizing LS and enriches the conceptualization of LS by interpreting the activity as it is used in Japan and China from historical and cultural perspectives Presenting the practices and theories of LS with practicing teachers and prospective teachers in more than 10 countries it enables the reader to take a comparative perspective Finally the book presents and discusses studies on key aspects of LS such as lesson planning post lesson discussion guiding theories connection between research and practice and upscaling Lesson Study which has originated in Asia as a powerful effective professional development model has spread globally Although the positive effects of lesson study on teacher learning student learning and curriculum reforms have been widely documented conceptualization of and research on LS have just begun to emerge This book including 38 chapters contributed by 90 scholars from 21 countries presents a truly international collaboration on research on and adaptation of LS and significantly advances the development of knowledge about this process Chapter 15 How Variance and Invariance Can Inform Teachers Enactment of Mathematics Lessons of this book is available open access under a CC BY 4 0 license at link [springer com](https://www.springer.com) Theory and Practice of Lesson Study in Mathematics An International Perspective shows that the power of Lesson Study to transform the role of teachers in classroom research cannot be explained by a simple replication model Here we see Lesson Study being successful internationally when its key principles and practices are taken seriously and are adapted to meet local issues and challenges Max Stephens Senior research fellow at TheUniversity of Melbourne It works Instruction improves learning improves Wide scale Enduring Deep impact Lesson study has it When something works as well as lesson study does while alternative systems for improving instruction fail or only succeed on small scale or evaporate as quickly as they show promise it is time to understand how and why lesson study works This volume brings the research on lesson study together from around the world Here is what we already know and here is the way forward for research and practice informed by research It is time to wake up and pay attention to what has worked so well on wide scale for so long Phil Dara A leading author of the Common Core State Standards of Mathematics in the U S      **International Handbook of Mathematics Teacher Education: Volume 1** ,2019-12-02 This second edition of the International Handbook of Mathematics Teacher Education builds on and extends the topics ideas in the first edition while maintaining the themes for each of the volumes Collectively the authors looked back beyond and within the last 10 years to establish the state of the art and continuing and new trends in mathematics teacher and mathematics teacher educator education and looked forward regarding possible avenues for teachers teacher educators researchers and policy makers to consider to enhance and or further investigate mathematics teacher and teacher educator learning and practice in particular The volume editors provide introductions to each volume that highlight the subthemes used to group related

chapters which offer meaningful lenses to see important connections within and across chapters Readers can also use these subthemes to make connections across the four volumes which although presented separately include topics that have relevance across them since they are all situated in the common focus regarding mathematics teachers Volume 1 Knowledge Beliefs and Identity in Mathematics Teaching and Teaching Development edited by Despina Potari and Olive Chapman 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 Thus as the first volume in the series it appropriately addresses central topics issues that provide an excellent beginning to engage in the field of mathematics education through the handbook Contributors are Jill Adler Mike Askew Maria Bartolini Bussi Anne Bennison Kim Beswick Olive Chapman Charalambos Charalambus Helen Chick Marta Civil Sandra Crespo Sean Delaney Silvia Funghi Marilyn Goos Roberta Hunter Barbara Jaworski Kim Koh Esther S Levenson Yeping Li Niamh O Meara JoengSuk Pang Randolph Phillipp Despina Potari Craig Pournara Stephen Quirke Alessandro Ramploud Tim Rowland John Zig Siegfried Naiqing Song Konstantinos Stouraitis Eva Thanheiser Collen Vale Hamsa Venkat and Huirong Zhang

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