Journal of Mathematics Education at Teachers College

Fall – Winter 2011

A CENTURY OF LEADERSHIP IN
MATHEMATICS AND ITS TEACHING

The *Journal of Mathematics Education at Teachers College* is a publication of the
Program in Mathematics and Education at Teachers College
Columbia University in the City of New York.

Dr. Robert Taylor was selected b y the Teachers College sponsored Teache rs for East Africa program to teach mathematics of Uganda's Makerere University. He re turned to TC as an instructor in the Department of Mathematics, Statistics, and Computing in Education where he developed an innovative programming language (FPL) intended to introduce educators to the then - new field of computer programming. His seminal work entitled *Computers: Tutor, Tool, Tutee* led to leadership in t he new fie ld of computers in education. Dr. Taylor completed 33 years as a member of the Teachers College faculty in 2009.

Dr. Carl N. Shuster com pleted the doctor ate at Teachers College in 1940 under the guidan ce of William David Reeve. Shuster j oined the TC faculty at Reeve's invitation and soon was recognized as the nation's leading advocate of the use of tradition al technology, especially measurement technology, in the mathematics classroom. Dr. Shuster served as President of the National Coun cil of Mathem atics from 1946 to 1 948 and concluded his career as Distinguished Professor of Math ematics at Trenton State University.

Aims and Scope

The *JMETC* is a re-creation of an earlier publication by the Teachers College Columbia University Program in Math ematics. As a peer-rev iewed, semi-annual journal, it is intended to provide dissemination opportunities for writers of practice-based or research contributions to the general field of mathematics education. Each issue of the *JMETC* will focus upon an educational theme. The themes planned for the 2012 Spr ing-Summer and 2012 Fall-Winter issues are: *Evaluation* and *Equity*, respectively.

JMETC readers are educators from pre K-12 through college and university levels, and fro m many different disciplines and job positio ns—teachers, principals, superintendents, professors of educ ation, and other leaders in education. Articles to app ear in the *JMETC* include r esearch reports, commentaries on practice, historical an alyses and responses to issues and recommendations of professional interest.

Manuscript Submission

JMETC seeks conversational manuscripts (2,500-3,000 words in length) that are insightful and helpful to mathemat ics educators. Artic les should contain fresh information, possibly research-based, that gives practical guidance readers can use to improve practice. Examples from classroom experience are encouraged. Articles must not h ave been a ccepted for publicat ion elsewhere. To keep the submission and review pro cess as efficient as possible, all manuscripts may be submitted electronically at www.tc.edu/jmetc.

Abstract and keywords. All manuscripts must include a n abstract with keywords. Abstracts d escribing the essence of the manuscr ipt should not exceed 150 words. Authors sho uld select key words from the menu on the manuscript submission system so that readers can search for the article after it is published. All inquiries and materials should be sub mitted to Ms. Krystle Hecker at P.O. Box 210, Teachers College Colu mbia University, 525 W. 120th St., New York, NY 10027 or at JMETC@tc.columbia.edu

Copyrights and Permissions

More Information is available online: www.tc.edu/jmetc

TABLE OF CONTENTS

TABLE OF CONTENTS, continued

ABOUT THE AUTHORS

Jonathan Rogness earned his doctorate in topology at the University of Minnesota and is now an assistant professor of mathematics at that school. He is well known for his beautiful mathematical visualizations, including an award-winning video, *Möbius Transformations Revealed*, which went viral online and has been viewed by nearly two million people. Professor Rogness loves to make complex mathematical ideas accessible to students of all ages and was recently named the new Director of the University of Minnesota's Mathematics Center for Educational Programs, which runs one of the nation's premier accelerated mathematics programs for middle school students.

Zhonghong Jiang is a professor of mathematics education at Texas State University. His research interests include the use of technology, problem solving, mathematical modeling, and the impact of these aspects on student learning and teacher preparation. His scholarship also focuses on developing instructional materials, working with students from underrepresented groups, and inservice teachers' professional development. He writes extensively on all these issues. Over the years, he has been the principal investigator or a co-principal investigator of many research grants funded by the National Science Foundation and other funding agencies.

Alexander White is an associate professor of mathematics education at Texas State University. He has research interests in mathematics education, statistics and mathematical finance. In mathematics education he has authored several papers concerning the ability of students entering calculus to visualize functions and work with graphs. He has worked on application of statistical models to assessment of educational systems in Central America. He is working on the development of a new middle school mathematics curriculum with Texas Mathworks, a center for mathematics education.

Alana Rosenwasser is a doctoral student in mathematics education at Texas State University. After earning her BS in mathematics, her interests turned to mathematics education while working at a local high school. She currently works as a graduate research assistant for the Dynamic Geometry in Classrooms Project. Her responsibilities for the project include assisting with instrument development, professional development, and curriculum development. Her dissertation, which uses data from the project, is about assessing conjecturing and proving ability. Her research interests include assessment, knowledge for teaching, and the development of reasoning abilities.

Michael Todd Edwards, edwardm2@muohio.edu, is co-director of the GeoGebra Institute of Ohio and co-editor of the Midwest GeoGebra Journal (www.ggbmidwest.com/journal). His professional interests focus on the use of technology in the teaching and learning of school mathematics with particular emphasis on dynamic mathematics software.

ABOUT THE AUTHORS

Dana C. Cox, dana.cox@muohio.edu, teaches prospective elementary and secondary teachers at Miami University in Oxford, Ohio. She is interested in curriculum design and the role of technology in the teaching and learning of mathematics.

Diane R. Murray is a Mathematics Education Ph.D. candidate at Teachers College, Columbia University. She is the Online Editor for the JMETC and is currently serving on the editorial board for the *Teachers College Mathematical Modeling Handbook* and is assisting in the preparation of its follow-up companion handbook focusing on assessment. For the past year, she has been a research assistant working with Dr. Alexander Karp and Dr. Erica Walker on an online teacher resource. Diane has taught mathematics courses at Manhattanville College and Lehman College. Her research interests include the history of mathematics education, technology use in the mathematics classroom, and the study of material objects in mathematics education.

Heather Gould is a Ph.D. candidate at Teachers College, Columbia University. She is currently serving as the editorial board chair for the *Teachers College Mathematical Modeling Handbook* and is assisting in the preparation of its companion handbook on mathematical modeling assessment. Her academic interests include mathematical modeling, pedagogical preparation of college mathematics instructors, and mathematics language acquisition.

Catherine Reimer is a career-changer, now teaching Algebra to eighth grade students at The School at Columbia. She recently graduated with a Masters in Secondary Mathematics Education from Teachers College, Columbia University. Prior to teaching mathematics, Catherine spent over seven years in the financial services industry working as a software developer and project manager at Bloomberg LP and BlackRock. Catherine earned her undergraduate degrees from Johns Hopkins University in both Computer Science and Applied Mathematics.

Kurt Kreith is Professor Emeritus of Mathematics at the University of California at Davis. He received his PhD at UC Berkeley under Frantisek Wolf and has combined his interest in pedagogy with an academic career in mathematics. In retirement he has served as acting co-director of the California Mathematics Project and as instructor in the California State Summer School for Mathematics and Science (Cosmos). He also offers a series of technology-based First Year Seminars at UC Davis dealing with basic number theory, cryptology, and global change. Together with G.D. Chakerian, he has written *Iterative Algebra and Dynamic Modeling* (Springer Verlag, 1999) and *Teaching Mathematics Using Technology* (McDougal Littell, 2002).

ABOUT THE AUTHORS

Kathleen Offenholley is an Assistant Professor of Mathematics at the Borough of Manhattan Community College, and a Steering Committee member of the CUNY Games Network, http://games.commons.gc.cuny.edu/, a group that connects educators from every campus and discipline within the City University of New York who are interested in games, simulations, and other forms of interactive teaching.

Sandra Y. Okita is an Assistant Professor of Technology and Education at Teachers College, Columbia University. She is the director of the Sociable Technology and Learning Lab (STL). Her work uses innovative technologies (robots, mixed reality devices, virtual reality environments) as a threshold to learning, instruction, and assessment. Other research areas include self-other monitoring, learning by teaching, learning by observation, in the domain of mathematics, biology, and science.

Azadeh Jamalian is a Ph.D. student in Cognitive Studies in Education program at Teachers College, Columbia University. Azadeh's research agenda is a hybrid of early mathematical education, gesture and its role on abstract thinking, and game design. She has been the main researcher and designer for many projects focusing on mathematics and technology—MathemAntics, Projo, and BoogieBash games are examples of such projects.

Alice Welt Cunningham is a graduate of Yale College and Harvard Law School and received her master's and doctoral degrees in Mathematics Education from Columbia University. Her teaching experience includes tax law; and junior high, high school, and college mathematics. She is currently Assistant Professor of Mathematics at Hostos Community College, City University of New York.

Olen Dias had earned her master's degree in Mathematics from Queens College, CUNY and doctoral degree in pure mathematics from the Graduate Center of City University of New York (CUNY). She taught as an adjunct in several campuses of CUNY for many years. Currently She is working as an Assistant Professor of Mathematics at Hostos Community College, CUNY.

Dr. Nieves Angulo is an Assistant Professor in the Mathematics Department, the Coordinator of the Engineering Program. Dr. Angulo has a pure B.A. and M.A. in Mathematics from Hunter College of CUNY, and an M.S and Ed.D in Mathematics Education from Columbia University. She strongly believes that students' mathematics achievements can be significantly improved if teachers in the classroom demystify the mathematics subject and are able to develop a community of learners.

ABOUT THE AUTHORS

Allen Wolmer is Head of the Mathematics Department at Yeshiva Atlanta High School in Atlanta, Georgia. He received his undergraduate degree in Civil Engineering from The Cooper Union and his M.S. degree in Engineering Mechanics from Columbia University School of Engineering. Mr. Wolmer was an Adjunct Mathematics Instructor at Georgia Perimeter College for over a decade before assuming his current position at Yeshiva Atlanta. Mr. Wolmer teaches a wide range of mathematics courses, from Algebra I through AP Calculus AB, all with a SMART Board. His professional interests focus on the effective use of classroom technologies, such as interactive whiteboards, to produce useful mathematics lessons in the high school and college classroom. Mr. Wolmer can be reached at AlWolmer@aol.com

Leonid Khazanov is an associate professor of mathematics at the Borough Of Manhattan Community College in NYC. He received his undergraduate degree in mathematics and mathematics education from the Pedagogical University of St. Petersburg, Russia and his Ed. D in mathematics education from Teachers College, Columbia University. At BMCC Leonid Khazanov teaches Precalculus, Calculus, and developmental mathematics courses. His professional interests within the field of mathematics education include examining students' misconceptions and finding productive approaches for resolving them. Dr. Khazanov can be reached at LKhazanov@bmcc.cuny.edu

Dino Sossi studies Instructional Technology and Media at Columbia University. He earned his Master of Philosophy degree at the University of Cambridge. Dino Sossi worked as a Producer/Video Journalist. His stories have aired on CNN, IFC, Discovery, MTV Canada, CBC, CTV and MuchMoreMusic and have included Grammy Award-winning artists Rod Stewart and Nelly Furtado as well as Grammy-nominated artists Nickelback, Ja Rule and Stephen Page of the Barenaked Ladies. He also produced stories involving The Doors and Sum 41. His documentary work has screened at film festivals in New York, Los Angeles as well as at the University of Pennsylvania, Cambridge (UK) and Columbia. He has previously worked at CNN and at "60 Minutes" at CBS on stories including Jeffrey Immelt (General Electric), Christine Lagarde (IMF) and Meryl Streep.

Shenetta Richardson obtained her Master of Arts in Computing in Education at Teachers College, Columbia University. Her interests in education include how effective technology will be used in the classroom and, if made available, how or if students will become dependent on technology to learn. Shenetta has a bachelor degree in Office Administration and a minor in Business Management from Alabama State University. She is currently working as a System Engineer at Columbia University working with videoconferencing, web casting, and programming the Columbia University telephone system, etc. It is also her goal and interest to assist others in learning to integrate computing technology skills into their lives so that they are prepared for the future.

Call for Papers

The "theme" of the fall issue of the *Journal of Mathematics Education at Teachers College* will be *Evaluation*. This "call for papers" is an invitation to mathematics education professionals, especially Teachers College students, alumni and friends, to submit articles of approximately 2500-3000 words describing research, experiments, projects, innovations, or practices related to evaluation in mathematics education. Articles should be submitted to Ms. Krystle Hecker at JMETC@tc.columbia.edu by January 21, 2012. The spring issue's guest editor, Ms. Heather Gould, will send contributed articles to editorial panels for "blind review." Reviews will be completed by February 1, 2012, and final drafts of selected papers are to be submitted by March 1, 2012. Publication is expected by April 15, 2012.

Call for Volunteers

This *Call for Volunteers* is an invitation to mathematics educators with experience in reading/writing professional papers to join the editorial/review panels for the spring 2012 and subsequent issues of *JMETC*. Reviewers are expected to complete assigned reviews no later than 3 weeks from receipt of the manuscripts in order to expedite the publication process. Reviewers are responsible for editorial suggestions, fact and citations review, and identification of similar works that may be helpful to contributors whose submissions seem appropriate for publication. Neither authors' nor reviewers' names and affiliations will be shared; however, editors'/reviewers' comments may be sent to contributors of manuscripts to guide further submissions without identifying the editor/reviewer.

If you wish to be considered for review assignments, please request a *Reviewer Information Form*. Return the completed form to Ms. Krystle Hecker at hecker@tc.edu or Teachers College Columbia University, 525 W 120th St., Box 210, New York, NY 10027.

Looking Ahead

Anticipated themes for future issues are:

Spring 2012	Evaluation
Fall 2012	Equity
Spring 2013	Leadership
Fall 2013	Modeling
Spring 2014	Teaching Aids

TO OBTAIN COPIES OF *JMETC*

To obtain additional copies of *JMETC*, please visit the *Journal*'s website www.tc.edu/jmetc. The cost per copy delivered nationally by first class mail is $5.00. Payment should be sent by check to *JMETC*, Teachers College Columbia University, 525 W 120th St., Box 210, New York, NY 10027.