About the Contributors

**Eugene de Silva** has been an educator for over 25 years. As a professor of physics and chemistry, he developed the first online college physics programs under the auspices of Walters State Community College and the Board of Regents for the State of Tennessee. He established the National Accrediting Commission for Martial Arts (NACMA)- a registered charity- and Virginia Research Institute (VRI) – a non-profit organization in the United States in 2004. These foundations were set in place to spark the younger generation’s interest in furthering their education and research. He has been the President of the Tennessee Science Department Chairs Association since 2008. He is also the Chair of Institute of Physics UK/USA Branch (South Eastern USA). He is an Executive Member of the Tennessee Academy of Sciences. De Silva has written several books including textbooks in physics and chemistry and is an internationally recognized educator with his name entered in the Who’s Who in the World, Who’s Who in American Education, and Who’s Who in America. He developed the first Martial Arts educational degree in the world in 1993 when he was in the UK. He holds the highest Dan grade in martial arts and is the founder of an international charity known as The Society of Martial Arts, UK.

He, as a practitioner of martial arts, introduced a syllabus of teaching physics through martial arts in 2007. He introduced Physics Day in the USA, which has been in place since 2005 for high school students where mechanics section of physics is taught through martial arts. He has also won the “Innovative Teaching Award,” “Above and Beyond Award,” and has received recognition awards from the Tennessee Academy of Sciences, USA and the Institute of Chemistry, Sri Lanka. He is a chartered chemist, chartered scientist, and chartered physicist; he was also elected as a fellow of the Royal Society for the encouragement of Arts, Manufactures, and Commerce in recognition of his outstanding work in the field of education. The World Head of Family Sokeship Council also inducted him to the Hall of Fame in 2001 in Florida, USA. His novel teaching model, “START,” is now being introduced in the teaching of science through the Virginia Research Institute. He also holds two world records in breaking cinder blocks on different parts of his body.

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Judy Alhamisi is Assistant Professor and Coordinator of Elementary Education at Marygrove College in Detroit, Michigan. She is the coordinator of elementary education at Marygrove. Her primary research focus is teacher preparation, teacher effectiveness, and student achievement. Her recent publications have appeared in the Journal of the National Association for Alternative Certification, Tennessee Educational Leadership Journal, and Educational Facility Planner. In addition, Dr. Alhamisi has presented her research in national, state, and local educational conferences.

Nazir Amir is a Lead Teacher in Greenview Secondary School in Singapore. He recently completed his PhD at Nanyang Technological University, and his research explores the hybridization of Physics with Design and Technology. His publications include four peer-reviewed papers published in international journals and a chapter in the book of an international publisher. He was recently conferred the President’s Award for Teachers in Singapore.

Heather L. Barker has spent nearly a decade teaching at the elementary, middle, and high school levels. Her teaching experience includes single-grade and multi-grade classrooms in the United States as well as American schools located in Taiwan. She has a passion for environmental education and has taught in a variety of informal educational settings such as nature centers and outdoor schools. Heather holds a degree in elementary education, a masters degree in outdoor education, and is currently pursuing a doctorate in mathematics and science education at Middle Tennessee State University. A member of numerous professional associations, Heather has presented at regional and national academic conferences. She plans to be a professor of education and has a passion for mentoring pre-service teachers.

Tianxing Cai is a researcher in the Dan. F Smith Department of Chemical Engineering at Lamar University. Tianxing specialized in the research fields of modeling, simulation and optimization for the industrial operation, process safety, and environment protection. His major research is the development of optimization models (Linear Programming, Quadratic Constraint Programming, Nonlinear Programming, Mixed Integer Programming, Relaxed Mixed Integer Programming, Mixed Integer Quadratic Constraint Programming, Mixed Integer Nonlinear Programming, and Relaxed Mixed Integer Quadratic Constraint Programming) to realize the synthesis of energy and water systems, manufacturing planning and scheduling and plant wide optimization. Besides that, he also involves the software application of
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Aspen, HYSYS, ProII, MATLAB, and gPROMS to conduct simulation and optimization for the process design, environment impact reduction, and safety assessment.

Thomas Cheatham earned his Bachelor’s of Science from Campbellsville College in mathematics and his Masters of Science and PhD in mathematics from the University of Kentucky. Currently, he directs the Tennessee STEM Education Center at Middle Tennessee State University. Prior to that he was Dean of MTSU’s College of Basic and Applied Sciences and former Chair of the MTSU Computer Science Department. He has been recognized over the years for his excellent teaching in mathematics and computer science. His current research focuses on mathematics and science education.

Eugenie de Silva holds a Bachelors degree and Masters degree in Intelligence Studies with a concentration in Intelligence Analysis from the American Military University. She is a current student at the Harvard University Division of Continuing Education in the final stages of completing her Masters in Liberal Arts with a concentration in Legal Studies. She is also a current PhD student at the University of Leicester in England. She has given eight oral presentations at academic conferences in fields, such as teaching physics and chemistry, online software programs, biometrics, intelligence studies, and Denial and Deception (D&D). Her research is mainly multidisciplinary in nature. She also holds the world record for being the youngest person to graduate with a Bachelors degree in Intelligence Analysis at the age of 14.

Jennifer Donovan is a lecturer in Science Education at the University of Southern Queensland, Australia. From a BSc (Botany), she “fell” into teaching bringing skills acquired from teaching guitar for several years into the science classroom. The intended science career never eventuated, as she realised her love of engaging students with science concepts, processes, and skills. Her 14 years of school teaching was followed by 10 years of teaching anything from mosses to muscles and stars to cells at Edith Cowan and Curtin Universities. Following this were three years at the Curriculum Council as the Science Officer for Western Australia during the implementation of a new outcomes-focused curriculum framework. After that, another “fall” into research created a second passion. This culminated in a belated PhD studying the influence of the mass media on primary students’ understandings of genes and DNA. Recent research explores teaching atomic theory to primary students.

Nancy El-Farargy is an educationalist with scientific and healthcare underpinnings, and has interests in the delivery of science education for organizations and learners. She has delivered a number of presentations at a variety of conferences, and
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has published a range of articles on learning, teaching and development. She works within the UK National Health Service, and previously, she worked as a lecturer in science and healthcare. She obtained her PhD from the University of Glasgow, and has a range of interests in educational and workforce development.

**Grant Gardner** received a BS in Biological Sciences from Vanderbilt University and an MS in Zoology from North Carolina State University. As a masters student, he developed a love for teaching while serving as a graduate TA and became a community college biology instructor for several years. He became fascinated by research-based instructional strategies during his teaching tenure which led to completion of a PhD in Science Education from North Carolina State University. He currently is an Assistant Professor of Biology at Middle Tennessee State University, serving as faculty in the Math/Science Education PhD program. His research interests include understanding faculty implementation of research-based instructional strategies, student small group negotiation of motivation in classroom contexts, and interdisciplinary themes related to nanotechnology education.

**Blanche Jackson Glimps** is a Professor in the Department of Teaching and Learning in the College of Education at Tennessee State University. She has served as Chairperson of Education Departments and as a Vice President for Academic Affairs at different colleges and universities in the United States. She is involved in the preparation of teachers and teaches primarily special education courses. Among her research and writing interests include the following: spirituality and teaching, culturally responsive teaching, diversity issues, and the overrepresentation of specific ethnic and gender groups in special education classrooms in the United States.

**Carole Haeusler** is a lecturer in Science Education at the University of Southern Queensland, Australia. She began her career in the sciences, gaining a PhD in theoretical chemistry, but decided against a career in pure science, preferring rather to engage with students and teachers in science education. She has extensive teaching experience across a range of education sectors including lecturing in chemistry and science education, teaching secondary school chemistry and science, and consulting with schools in science curriculum and assessment. Her research interests are in the areas of science teachers’ education and science curriculum and assessment. Her current research project is investigating the capacity of elementary school children to understand atomic-molecular theory. This work has gained public recognition in Australia through an Australian university and federal government sponsored in an on-line forum called *The Conversation* and was selected to be presented at a symposium in the national capital, Canberra.
About the Contributors

Riikka Hofmann is a Research and Teaching Associate in the Faculty of Education, University of Cambridge. Her research interests focus on classroom interaction, learning through talk, innovations in teaching, student engagement, and professional learning. She teaches widely on educational and social science research methods and coordinates the Faculty’s post-graduate research methods courses. Prior to coming to Cambridge, Riikka studied and worked at the University of Helsinki and LMU Munich. Having completed her PhD in the Faculty in 2008, for the last 5 years Riikka has been involved with the ESRC-funded epiSTEMe project led by Kenneth Ruthven, Christine Howe, Neil Mercer, and Keith Taber.

Jeffrey Horner has been the Dean and Professor of Natural Sciences at Walters State Community College since 1995. He received his doctorate in Educational Leadership and Policy Analysis from East Tennessee State University in 2005. As the Dean of Natural Sciences at Walters State, he also received several academic awards in recognition of his contributions to the field, such as theWSCC Faculty of the Year and the “WOW” award for outstanding work in higher education. He has also presented many papers at domestic and international conferences in which he has focused on the necessity and importance of mobilization in education, in addition to discussing the challenge-based pedagogy. Since 2013, Dr. Horner has also been the consultant for the Tennessee Board of Regents (TBR) Office of Emerging Technologies and Mobilization. He was also the WSCC Fellow of TBR Teacher Preparation Partnership Project funded by the NSF for a three-year grant of about 1.25 million. He is currently an academic auditor for TBR and a member of the Chancellor’s Executive Council on Mobilization, TBR Mobile Executive Council, Regents Academic Leadership Institution, Leadership WSCC program, WSCC Executive Council on Mobilization, and WSCC Mobilization Team. Additionally, Dr. Horner also acts as a Merlot Biology Reviewer.

Christine Howe is a Professor of Education at the University of Cambridge, and Fellow of Lucy Cavendish College. She is a psychologist whose main research interests are children’s reasoning in science and mathematics, peer interaction and conceptual growth, and communication and social relations amongst children. She has published seven books and over 150 journal articles and book chapters. Christine has edited three academic journals and served on many editorial boards. She has been elected to the Academy of Social Sciences, and holds an Associate Fellowship of the British Psychological Society, whose Developmental Section she has chaired. She has contributed to research administration and policy making at the local, national and international levels.
Latoya N. Johnson received her PhD from the Interdisciplinary Program in Molecular and Cellular Biology from Tulane University in August 2006. She completed her postdoctoral research appointment at Emory University School of Medicine’s Alcohol and Lung Biology Program. She worked as a Science Writer/Editor with the National Home Office of the American Cancer Society, as a Program Coordinator in the Dean’s Office of the School of Medicine, and as an Adjunct Faculty Member for Grand Canyon University and Georgia Gwinnett College. Dr. Johnson presently works in the College of Health Sciences at Walden University teaching Public Health Biology and in the General Studies department at Beulah Heights University teaching Principles of Science.

Pamela L. Knox is Associate Vice Chancellor for Academic Affairs for the Tennessee Board of Regents. As the Associate Vice Chancellor, her system-wide responsibilities include leadership of initiatives in academics, research, and internationalization. Prior to joining the Board of Regents, she held faculty and administrative responsibilities at Middle Tennessee State University, Tennessee State University, Idaho State University, Oklahoma State University, University of Kansas, and Penn State University. Dr. Knox received her PhD in Psychology (Counseling Psychology) in 1984 from Virginia Commonwealth University after completing her internship at The University of Texas –Austin. She has published numerous professional journal articles and book chapters presenting extensively nationally and internationally. She is a tenured Professor at Tennessee State University and a Licensed Psychologist (Health Services Provider) in Tennessee.

Despo Ktoridou is currently an Associate Professor and Head of Management and the MIS Department at the University of Nicosia in Cyprus. Dr. Ktoridou holds a BSc (1991) and an MSc (1993) In Computer Engineering and a PhD (2000) in the field of Expert Systems from Saint Petersburg State Electrotechnical University in Russia. Dr. Ktoridou has worked as a Senior Computer Engineer for different organizations in Cyprus (1992 – 1999), from 2000 – 2007, as an Assistant Professor of Educational Technology and currently as an Associate Professor of MIS at the University of Nicosia. Dr. Ktoridou’s research focuses on areas of ICT-Information Communication Technologies application in education, Innovation, and Technology Management in Education and Business and Innovative Teaching Learning Pedagogies in Higher Education. Dr. Ktoridou has presented papers in numerous refereed international conferences and has published several papers in refereed journals. Dr. Ktoridou participated in EU and local funded programs and has been invited by foreign universities as a guest lecturer.
Stefanie Luthman holds an MSc and PhD in psychology from the University of Kiel, Germany. She has extensive experience in conducting survey studies and experiments in health psychology, media psychology, and education psychology. In the epiSTEMe project at the Faculty of Education in Cambridge, Stefanie investigated the effect of a teaching intervention on students’ attainment and attitudes towards math and science. Prior to her doctoral studies, Stefanie worked as a researcher in a project at the University of Lübeck, Germany, where she examined the effect of a public-health campaign on general practitioners’ attitudes towards screening and minimizing patients’ alcohol consumption. In her current position at Quantify Research in Stockholm, Stefanie has developed expertise in the field of breast cancer prognosis, economic evaluations of Alzheimer’s Disease treatments and cost-effectiveness studies of the prevention of domestic violence.

Neil Mercer is a Professor of Education at the University of Cambridge, where he is also the Chair of the Psychology and Education Group and Vice-President of the college Hughes Hall. Previously, he was Professor of Language and Communications at Open University. He is a psychologist with a particular interest in the development of children’s language and reasoning and in the effective use of talk for learning in school. His research with colleagues has generated the Thinking Together practical approach to classroom pedagogy, and he has worked extensively and internationally with teachers, researchers, and educational policy makers on improving talk for learning in schools. His most recent books are Exploring Talk in School (with Steve Hodgkinson), Dialogue and the Development of Children’s Thinking and Interthinking: putting talk to work (both with Karen Littleton).

Donald Nelson is a Professor of Mathematics and Chair of the Department of Mathematical Sciences at Middle Tennessee State University. He earned his undergraduate degree in mathematics from Mississippi College and a Masters of Arts and PhD from Vanderbilt University. His current research is in graph theory.

Chukwunyere E. Okezie is an Associate Professor of Education at Marygrove College in Detroit, Michigan. He received his doctorate from the University of Pittsburgh, with a concentration in social and comparative analysis in higher education. He is the former Chair of the Education Department at Marygrove College. He is also Coordinator of Secondary Education and the Griot Graduate Programs. His current research centers on culturally responsive teaching, Understanding by Design, African American males, and career changers.
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**Svetlana Perovic**, born in Niksic, Montenegro, 1978. Completed her elementary and high school in Niksic with great success. She graduated from the University of Novi Sad, Faculty of Technical Sciences, Department of Architecture and Civil Engineering, with an average grade of 9.00. Her graduation thesis was graded with a 10 (ten). At the same University, she completed an Academic Masters studies program and was awarded the title Master of Science (M.Sc.) in Architecture. Currently, she is a PhD student at the University of Novi Sad, in the field of “Modern Architecture and Urbanism.” Her PhD thesis is titled: Transdisciplinary research paradigm in sustainable development of the physical structure of the city. During 2007, was employed as a designer at the company “Reality” d.o.o. (Association for design, construction, and investment) in Podgorica. She has been a Teaching Assistant at the Faculty of Architecture in Podgorica since 2005. She has about 30 major original projects realized in the field of architectural design and urbanism. She is actively engaged in scientific research in the field of Architecture and Urbanism.

**Fran Riga** has taught science and mathematics in secondary schools in South Africa, Greece, and England. She is currently completing doctoral research in student learning in astronomy, and has been a research assistant in the Faculty of Education at the University of Cambridge where she has worked on projects such as: ASCEND (Able Students Collectively Exploring New Demands), Assessment in Secondary Schools, epiSTEMe, Pathway, and CamTalk. She has also contributed to academic publications associated with these projects. Her particular areas of interest are conceptual development and inquiry-based science education.

**Ginger Holmes Rowell** is Professor of Mathematics at Middle Tennessee State University where she primarily teaches graduate and undergraduate statistics courses. She earned a Bachelors of Science Degree in Mathematics with a concentration in Secondary Education from Birmingham Southern college. Her Masters of Arts in Mathematics and her PhD in Applied Mathematics are both from the University of Alabama in Huntsville. Her current research interest are in statistics education.

**Kenneth Ruthven** after teaching in schools in Scotland and England, Ken(neth) Ruthven joined the Faculty of Education at the University of Cambridge, where he is now Professor of Education. His research focuses on curriculum, pedagogy and assessment, especially in school mathematics and science, and particularly in the light of technology change. Information about his research and other professional activities can be found at http://ww.educ.cam.ac.uk/people/staff/ruthven/.
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**Brittany Smith** is a graduate student in Middle Tennessee State University’s Mathematics and Science Education PhD program, with a concentration in Mathematics Education. She earned a Master of Science and a Bachelor of Science both in mathematics from MTSU. Ms. Smith is a graduate research assistant studying factors that affect retention of STEM majors with a weak math background as part of MTSU’s National Science Foundation STEM Talent Expansion Project.

**Cindi Smith-Walters** is a biology professor at Middle Tennessee State University and co-directs their Center for Environmental Studies. Holding degrees in biology, curriculum and instruction, and environmental science, she has worked with thousands of young people, teachers, pre-service teachers and non-formal educators. A prolific grant-writer, author, and presenter, she is active in state and national committees and is a past president and Fellow of the Tennessee Academy of Science. Cindi has served on National Science Teachers Association committees including the Children’s Book Council and the *Journal of College Science Teaching*. Her latest book chapters include ‘Using Field Guides with your Child,’ and ‘Diversity of Life.’ Her awards include the MTSU Foundation Award for Excellence in Teaching and the Excellence in Public Service Award (twice), the Presidents’ Environmental Challenge Award received in a White House Ceremony, the Tennessee Environmental Education Association’s Distinguished Service Award, and as a National Project Learning Tree Outstanding Educator.

**D. Christopher Stephens** is a Professor of Mathematics at Middle Tennessee State University. He earned his Bachelor of Science degree in mathematics from Cumberland College in Kentucky. His Master of Science and PhD were earned at Vanderbilt University. His research and publications are in graph theory.

**R. Subramaniam** is an Associate Professor at the National Institute of Education in Nanyang Technological University. He has several research interests, with the principal ones being science education and science communication. He has over 100 publications, and these include papers in peer-reviewed international journals, refereed chapters in books of international publishers, and books by international publishers.

**Keith S. Taber** is a Reader in Science Education at the University of Cambridge, where he is currently chair of the Science, Technology, and Mathematics Education Academic Group. After graduating in chemistry, Keith Taber trained as a teacher of chemistry and physics. Whilst teaching in English comprehensive schools and a further education college, he studied part-time and obtained an MSc (with a dissertation project on girls’ underrepresentation in physics classes) and PhD (with a
thesis project on students’ conceptual understanding in chemistry). When he first moved to the Faculty of Education at Cambridge he was heavily involved in initial teacher education, but currently teaches educational research methods to graduate students. Dr Taber was seconded to the Royal Society of Chemistry for a year (2000-2001) as its Teacher Fellow and is the editor of the journal *Chemistry Education Research and Practice*.

**Elaine Bouldin Tenpenny** is an Associate Professor of Mathematics at Middle Tennessee State University (MTSU). She earned an undergraduate degree in Mathematics from David Lipscomb University and a Masters of Science in Mathematics from MTSU. She was recognized for her excellent teaching as the 1996 MTSU Teacher of the Year.

**Dana-Marie Thomas** earned a PhD in Public Policy and Administration with an emphasis in Epidemiology and Community Health from Virginia Commonwealth University. Dr. Thomas completed a postdoctoral fellowship in Nutrition Sciences at the University of Alabama at Birmingham (UAB) where her research focused on bio-behavioral factors that influence obesity-related traits, nutrigenomics, and cancer prevention and control. While at UAB, Dana-Marie was also a Scholar in the Health Disparities Training Program funded by the Morehouse School of Medicine and at UAB, by the Comprehensive Cancer Center and Minority Health and Research Center. During this training, Dr. Thomas examined the genetic contribution of taste as a potential marker of food preferences and micronutrient intake in women at high risk for cervical cancer. Dr. Thomas was also a postdoctoral trainee in the Department of Preventive Medicine/Vascular Biology and Hypertension Program supported by the NIH NRSA Institutional Training Grant. Dr. Thomas has expertise in healthcare policy analysis, genetic and biobehavioral markers of dietary compliance, biopsychosociocultural factors affecting weight related behaviors and cognitions, women’s health, and body image and quality of life. She holds a Masters in Tourism from Temple University with an emphasis in global health and a BS in Marketing from Morgan State University. Dr. Thomas has over 15 years of experience in human resource management and health policy. Previously, she served as Chief of Applied Research and Health Policy at the Transformational Development Consortium, LLC. Dr. Thomas has published in peer-reviewed academic journals specializing in public health. She has taught courses in public administration and health sciences at the graduate level and health administration at the undergraduate level. Currently, Dr. Thomas is an administrator in the School of Public Policy and Administration at Walden University. She is responsible for academic governance and the maintenance and enhancement of quality assurance and standards across academic programs.
About the Contributors

**Kristi L. Walters** is currently a Masters Candidate in Biology at East Carolina University in Greenville, NC. She expects to graduate in May 2014. Her thesis examines the significance of undergraduate students’ motivation to learn biology when designing collaborative learning groups and the impact on the students’ views and attitudes of science, perceptions of biology and biologists, and knowledge of biology. She has a Bachelors degree in Marine Biology from Roger Williams University in Bristol, RI and has taught natural science at aquariums, environmental education camps, and nature centers along the Atlantic coast for almost two decades. After she completes her degree, she hopes to teach biology at either the high school or college level. She resides in North Carolina with her extremely patient husband, two wonderful children, two spoiled dogs, a naughty cat, and a rather boring goldfish.

**K. Y. Williams** received his BS in Chemistry from Dillard University in his hometown of New Orleans, and one of his MS degrees in Biochemistry and Biophysics from Rensselaer Polytechnic Institute. His PhD research focused on Computational Models of Phytoestrogens, Mycoestrogens, and Diethylstilbestrol Derivates as Estrogens. His research earned him his Doctorate degree from Tulane University, also located in his hometown. He joined the University of Alabama at Birmingham Section on Statistical Genetics in June 2009. Where his research interests focused on genetic inheritance of various disorders, protein structure prediction, and drug development from environmental compounds. Dr. Williams joined the US Food and Drug Administration (US FDA) as an ORISE Fellow in September 2011 at the same time he became a faculty member at Walden University. His work within the US FDA focused on policy and genomics. In January 2013, Dr. Williams also became faculty at Kaplan University before heading to the Department of Defense – Defense Threat Reduction Agency.

**Jennifer Yantz** earned a Bachelors of Science and a Masters of Science in Mathematics from Middle Tennessee State University (MTSU). She also earned a PhD in Mathematics Education from MTSU. She was the 2013 Outstanding Doctoral Student in Mathematics and Science Education at MTSU. Her research is about student perceptions of the connections between arithmetic and algebra. She will be an Assistant Professor of Mathematics at Austin Peay State University in 2014.