

Volume 19 | Number 6 | 2015

Electronic Journal of Science Education

ISSN 1087-3430

Published by

Southwestern University
Georgetown, Texas

Texas Christian University
Fort Worth, Texas

www.ejse.southwestern.edu

Electronic Journal of Science Education

Editor of Regular Issues

Molly Weinburgh, Texas Christian University, United States

Editor of Special Issues

Michael Kamen, Southwestern University, United States

Associate Editors

Karen E. Bledsoe, Western Oregon University, United States

Sarah J. Carrier, North Carolina State University, United States

Mary U. Hanrahan, RMIT University, Australia

William J.F. Hunter, Illinois State University, United States

Murat Kahveci, Canakkale Onsekiz Mart University, Turkey

Paul Kelter, Northern Illinois University, United States

Nina A. Leonhardt, Suffolk County Community College, United States

Lisa Martin-Hansen, Georgia State University, United States

Laura McCord, Southwestern University, United States

Colette Murphy, Queen's University Belfast, United Kingdom

Martina Nieswandt, University of Massachusetts, United States

Rose Pringle, University of Florida, United States

Mike U. Smith, Mercer University School of Medicine, United States

Gail Tooker, State University of New York – Cortland, United States

Geeta Verma, University of Colorado- Denver, United States

Julie Westerlund, Texas State University, United States

BaoHui Zhang, Lingnan University, Hong Kong

Administrative Assistant

Murielle Wright, Texas Christian University, Texas

Editorial Review Board

Shehadeh Mustafa Abdo, An-Najah National University, Jordan

Emmanuel Edoja Achor, Benue State University, Nigeria

Kenneth Adu-Gyamfi, Mampong Technical College of Education, Ghana

Mohammed Ahmed, Oriental Institute of Science and Technology, India

Bayram Akarsu, Erciyes University, Turkey

Hilal Aktamış, Adnan Menderes University, Turkey

Electronic Journal of Science Education

Sulaiman Al-Balushi, Sultan Qaboos University, Oman
Abdulwali H. Aldahmash, King Saud University, Saudi Arabia
Tamer G. Amin, Lebanese American University, Lebanon
Vincent Amodeo, University of Albany, United States
Sumreen Asim, University of North Texas, United States
Yael M. Bamberger, Weizmann Institute of Science, Israel
Emmanuel Folorunso Bamidele, Obafemi Awolowo University, Nigeria
Lloyd H. Barrow, University of Missouri, United States
Stephen Bartos, Middle Tennessee State University, United States
Craig Berg, University of Wisconsin-Milwaukee, United States
Sumita Bhattacharyya, Nicholls State University, United States
Kimberly Bilica, University of Texas at San Antonio, United States
Ian Binns, University of North Carolina- Charlotte, United States
SueAnn Bottoms, Oregon State University, United States
Sherri L. Brown, University of Louisville, United States
Patrick Brown, DuBray Middle School- Fort Zumwalt School District, United States
Erica Brownstein, Oklahoma State University, United States
Dan Carpenter, Texas Tech University, United States
Marissa Tamar Cohen, St Francis College, United States
Michelle Cook, Clemson University, United States
Casey Creggan, Sam Houston State University, United States
Kent J. Crippen, University of Nevada- Las Vegas, United States
Jeanette Day, Eastern Connecticut State University, United States
Hasan Deniz, University of Nevada, United States
Michael Dias, Kennesaw State University, United States
Vanessa Dodo Seriki, University of Houston-Clear Lake, United States
Susan Edwards, Monash University, Australia
Mark Enfield, Elon University, United States
Eva Erdosne Toth, West Virginia University, United States
Allen Espinosa, Philippine Normal University, Philippine
Maria Evagorou, University of Nicosia, Cyprus
Barry Farris, Columbia University, United States
Kelly Feille, University of North Texas, United States
Marilyn Flier, Monash University, Australia
Andrea Foster, Sam Houston State University, United States
Wendy Frazier, George Mason University, United States
Wilson J. Gonzalez-Espada, Morehead State University, United States
Sumi Hagiwara, Montclair State University, United States
Sarah Anne Haines, Towson University, United States
Marie Hammer, Monash University, Australia

Electronic Journal of Science Education

Vincente Handa, West Visayas State University, Philippines
Pamela Esprivalo Harrell, University of North Texas, United States
Susan Hawkins, Indiana University, United States
Mary Hobbs, University of Texas, United States
Toni Ivey, Oklahoma State University, United States
Paul C. Jablon, Lesley University, United States
Leslie Jones, Valdosta State University, United States
Debra Junk, University of Texas Austin, United States
Ajda Kahveci, Canakkale Onsekiz Mart University, Turkey
Grant Kessler, Southwestern University, United States
Kenneth P. King, Roosevelt University, United States
Catherine M. Koehler, Southern Connecticut State University, United States
Mustafa Serdar Köksal, Inonu University, Turkey
Ravinder Koul, Pennsylvania State University, United States
Barbara G. Ladewski, Educational Innovations Consulting LLC, United States
Elina Lampert-Shepel, Mercy College, United States
Zane Laws, Cisco College, United States
Kimberly H. Lott, Utah State University, United States
Stephen Marble, Southwestern University, United States
Sue March, Monash University, Australia
Catherine Martin-Dunlop, Morgan State University, United States
Johanna Mazlo, University of North Carolina, United States
Madelon McCall, Baylor University, United States
Robin McCartney, University of Louisiana- Lafayette, United States
Thomas John McCloughlin, St. Patrick's College, Ireland
Cherie McCollough, Texas A&M University- Corpus Christi, United States
John McCullagh, Stranmillis University College, Belfast
Deb McGregor, University of Wolverhampton, United Kingdom
Suely A. Mello, Universidade Estadual Paulista/Marilia, Brazil
Scott Miller, Sam Houston State University, United States
James Minogue, North Carolina State University, United States
Suzanne Nesmith, Baylor University, United States
Prasart Nuangchalerm, Maharakham University, Thailand
George E. O'Brien, Florida International University, United States
Feral Ogan-Bekiroglu, Marmara University, Turkey
John C. Park, Baylor University, United States
Rod Parker-Rees, Plymouth University, United Kingdom
John Pecore, University of West Florida, United States
Deniz Peker, Columbus State University, United States
Gustavo Perez, University of North Texas, United States

Electronic Journal of Science Education

Dave Pinkerton, Western Colorado State University, United States
Kate Popejoy, University of North Carolina- Charlotte, United States
Sharon Price Schleigh, East Carolina University, United States
Ahmad Qablan, The Hashemite University, Jordan
Peter Rillero, Arizona State University, United States
Soleil Roper, Texas Tech University, United States
Melody Russell, Auburn University, United States
Andrea Sabatini-McLoughlin, Long Island University, United States
Shannon Sahabi, Texas Tech University, United States
Emine Sahin, Indiana University, United States
Yavuz Saka, Zonguldak Karaelmas University, Turkey
Dennis Showers, State University of New York – Geneseo, United States
Becky Sinclair, Texas A&M University – Commerce, United States
Cindi Smith-Walters, Middle Tennessee State University, United States
Jose Soto-Sonera, Universidad del Este, Puerto Rico
Mustafa Sözbilir, Ataturk University, Turkey
Karthigeyan Subramaniam, University of North Texas, United States
Michael Svec, Furman University, United States
M. O. Thirunarayanan, Florida International University, United States
Julie Thomas, Oklahoma State University, United States
Mustafa S. Topçu, Yüzüncü Yıl University, Turkey
Irina Verenikina, University of Wollongong, Australia
Peter Veronesi, The College at Brockport, United States
Bruce Waldrip, Monash University, Australia
Anita Welch, Emirates College for Advanced Education, United Arab Emirates
Yalcin Yalaki, Hacettepe University, Turkey