Volume 27, Number 3 • Fall 2023

ISSN: 1087-3430

Electronic Journal for Research in Science & Mathematics Education

Flagship Journal of the International Consortium for Research in Science & Mathematics Education (ICRSME)

The International Consortium for Research in Science & Mathematics Education (ICRSME) is seeking applications for Editor or Co-Editors for the *Electronic Journal for Research in Science & Mathematics Education* (*EJRSME*). The five-year term of editorship begins in 2024 and extends through 2028:

- 2024 - Incoming editors works alongside current editors
- 2025-2027 - Incoming editors assume full responsibility
- 2028 - Transition year for new editorial team

Transition years (first and fifth year) will ensure that incoming editors are familiar with all aspects of the online journal hosting system and are prepared for their role.

The ***Electronic Journal for Research in Science & Mathematics Education* (*EJRSME*)** is a peer-reviewed journal published quarterly by the International Consortium for Research in Science & Mathematics Education (ICRSME). EJRSME shares manuscripts relating to issues in science/mathematics education and science/mathematics teacher education from early childhood through the university level including informal science and environmental education. EJRSME reviews original science and mathematics education manuscripts that report meaningful research, present research methodology, develop theory, and explore new perspectives and teaching strategies.

To apply for the position, applicants must build an editorial team, consisting of, but not limited to, Editor(s), Managing Editor, and Copyeditor. The editorial team should have expertise in science/mathematics education or teacher education, as well as experience reviewing manuscripts for professional refereed educational journals. In addition, the editorial team will represent EJRSME at ICRSME Virtual Conferences and Consultations. The Editor(s) will meet quarterly with the Executive Directors of ICRSME.

Responsibilities of Editor(s):

- Maintain high academic standards for published manuscripts
- Publish four issues of the journal each year (Winter, Spring, Summer, Fall)
- Prepare and monitor reviewers for high quality
- Solicit manuscripts for the journal
- Screen submissions for relevance to journal and then assign manuscripts fitting the journal mission to an Associate Editor
- Consider reviews, decide disposition of manuscripts, and communicate decisions with authors
- Maintain communication between the journal and ICRSME
- Compile statistics and maintain files as appropriate for the journal
- Ensure that reviewers are thanked publicly on an annual basis
- Coordinate a "Publishing in *EJRSME*" session at ICRSME Consultations and Virtual Conferences

Full applications for the position are due by December 1, 2023 and must include:

- a cover letter of application that describes the applicant(s)' (1) experiences as an author, reviewer, or editor; (2) plan for building the editorial team (Managing Editor and Copy Editor); (3) commitment to and any prior involvement with ICRSME (consultations/virtual conferences, journal service, ICRSME newsletter, etc.); and (4) vision for the journal and operating procedures such as securing and preparing reviewers, and potential strategies for increasing visibility and possible revenue;
- full vita/vitae; and
- a statement detailing institutional support, if applicable.

Send application materials and questions to the current EJRSME Editors, Mark Bloom and Sarah Quebec Fuentes, at ICRSME.Consultation@gmail.com.

EJRSME
Electronic Journal for Research in Science & Mathematics Education

EDITORS
Mark A. Bloom, Science Education, *Dallas Baptist University*
Sarah Quebec Fuentes, Mathematics Education, *Texas Christian University*

MANAGING EDITOR
Morgan Jansing, *Texas Christian University*

COPY EDITOR
Audrey Meador, *West Texas A&M University*

ASSOCIATE EDITORS
Daniel Alston, *University of North Carolina at Charlotte*
Lisa Ann Borgerding, *Kent State University*
Danxia Chen, *Dallas Baptist University*
Matthew Perkins Coppola, *Purdue University*
Kimberly Figaro, *Dallas Baptist University*
Kathryn Green, *Clarke County School District*
Hayat Hokayem, *Texas Christian University*
Gabriela Jonas-Ahrend, *Paderborn University*
Ravinder Koul, *The Pennsylvania State University*
Stefanie Livers, *Missouri State University*
Eryn Maher, *Georgia Southern University*
Cherie McCollough, *Texas A&M University – Corpus Christi*
James A. Mendoza Álvarez, *University of Texas at Arlington*
Erin Peters-Burton, *George Mason University*
Christine Schnittka, *Auburn University*
Byung-In Seo, *Chicago State University*
Julie Westerlund, *Texas State University*
Robert Wieman, *Rowan University*
Dawn Woods, *Oakland University*

PUBLISHER
ICRSME, International Consortium for Research in Science & Mathematics Education

Cover designed by Dusty Crocker

CONTENTS

Volume 27 No. 3 | Fall 2023

RESEARCH / EMPIRICAL

Teachers' Evaluations of Geometry Problems That Use Visual Arts Contexts **1**
Gloriana González and Christine N. Rinkenberger

Utilizing Cognitive Load Theory and Bruner's Levels of Developmental Learning to Address Students' Struggles Related to Area of Polygons: A Pedagogical Action Research Study **20**
Beth Cory and Amy Ray

Investigating Large-Scale, High School Mathematics Achievement Through the Lens of the Cognitive Domains **35**
Lois George

The Teacher is Key to STEM Education for All: A Catalyst for Competitive Workforce and Economic Development **64**
David Devraj Kumar and Susannah L. Brown

Stakeholders' Conceptions of STEM and Elementary STEM Clubs Within a Community-University Partnership **75**
Richard Carlos L. Velasco and Rebecca Hite

Integrating Environmental Knowledge into a Short Interdisciplinary Course on Sustainability **96**
Pankaj Sharma, Eric D. Deemer, and Jane Lu Hsu

Predicting Preservice Teachers' Performance on the Science Core of the EC-6 TExES General Certification Examination **122**
Ruthanne Thompson, Naudin Alexis, and Pamela Esprivalo Harrell

ALL RIGHTS RESERVED
© International Consortium for Research in Science & Mathematics Education (ICRSME)
Electronic Journal for Research in Science & Mathematics Education (EJRSME)