

ESERA 2019 Pre-Conference Workshop

- 1. Title of the workshop: Multicultural Science Education: What is it? Why do we need it? What does it look like?**
2. Contact information: kswade@memphis.edu
3. Requested maximum number of participants (absolute maximum of 40 persons, if not also offered as a parallel session): 20

4. Short description of relevant areas of expertise for each workshop facilitator

Katie Wade-Jaimes is an assistant professor at the University of Memphis. Her research focuses on equity and diversity in science education and preparing science teachers for multicultural classrooms. She has experience teaching in diverse settings throughout the United States.

Rachel King Askew is a graduate student at the University of Memphis. Her research focuses on preparing elementary teachers to teach science. She has experience teaching in culturally diverse classrooms in the United States.

5. Workshop abstract (for recruiting participants)

This session will begin a discussion around the importance of multicultural science education in schools today. We will consider various perspectives on science, including Western and non-Western ways of knowing and doing science, and begin envisioning how we can teach science in ways that acknowledge, incorporate, and sustain students' own cultures and backgrounds. Participants will engage in several activities designed to evaluate the current state of science education with respect to multiculturalism and brainstorm together ways to introduce/increase multiculturalism in science education.

6. Workshop description (*maximum 3 pages*)

Goals: Participants and facilitators will engage in discussion around multicultural education. Participants will critique current educational resources (science textbooks and classroom activities) in terms of multicultural education. Participants will be able to suggest revisions to common resources that broaden definitions of science.

Overall Description: This workshop is intended for teachers, researchers, and others interested in multicultural science education. It starts with an activity designed to get participants thinking about how science is presented and defined in popular culture and the impact these images of science can have on science education. Next, a discussion is started around the question “What is multicultural science education?” Participants will share their thoughts through an activity and the facilitators will present views of multicultural education and multicultural science education from relevant research. The facilitators will also present various views on science, including universalism, post-modern science, and non-western science traditions. After a short break, the focus will turn to school science, beginning with an introduction to the importance of school science and related materials in defining views of science for students. Participants will then participate in a series of activities and accompanying discussions evaluating science materials, including textbooks and classroom activities. Finally, participants will suggest revisions to commonly used science activities to align them with the goals of multicultural education. The session will close with final thoughts, questions, and goals from the participants.

Schedule and activities/roles:

- **(20 min) Introduction**
 - Activity: Analyzing images of science/scientists
 - Participants will examine at images of science and scientists from popular culture, including Google images, television shows, movies, magazines
 - Discussion: How does pop-culture present science/scientists? What impact does this have on science education?
 - Facilitators will lead a conversation around the popular representations of science/science education
- **(60 min) Defining “Multicultural Science Education”**
 - (30 min) Activity: Post-it note posters
 - Participants will answer the following questions on post-it notes and place them on the appropriate posters:
 - What is science?
 - What does “culture” mean?
 - What is the connection between culture and science?
 - What is “multiculturalism”?
 - Small groups of participants then pick one poster to read through comments and share the main themes
 - (30 min) Presentation and Discussion
 - Facilitators will present information on the following topics, drawing from current research (see reference list):
 - Defining multicultural education
 - Universalism vs. post-modernism in science

- Non-western science
- **(10 min) Break**
- **(100 min) Examining School Science**
 - (10 min): Introduction to school science
 - Facilitators will briefly present information about the current “official” goals of science education and the importance of such resources in defining science for students
 - (30 min) Activity: Textbook Analysis
 - Participants will be provided a textbook to evaluate using a template
 - Facilitators will lead a discussion based on the following questions:
 - How was science/scientists represented in your book?
 - From a multicultural perspective, what was included or missing from your book?
 - How might this impact students and their view of science?
 - (20 min) Presentation/Discussion: Science Curriculum
 - Facilitators will present different views on multicultural science education, including Banks (2010)’s continuum of approaches to multicultural education and Bennett’s (2007) goals for multicultural lessons
 - (20 min) Activity: Science Activity Evaluation
 - In small groups, participants will be given a brief description of a science activity that is labeled “multicultural” and decide which goals it addresses (Bennett, 2007) and where it falls on the continuum (Banks, 2010)
 - Groups will share their activity and thoughts with the larger group
 - (20 min) Activity: Science Activity Revisions
 - In small groups, participants will be given a common science activity and asked to brainstorm revisions to the activity
- **(15 min) Wrap-up, next steps, questions, etc.**
 - Participants will set goals for their own work in multicultural science education

Relevant Resources:

- Atwater, M. M. (2010). Dr. Geneva Gay: Multicultural Education for All Disciplines. *Science Activities: Classroom Projects and Curriculum Ideas*, 47, 160-162. doi:10.1080/00368121003753902
- Atwater, M. M. (2010). Multicultural Science Education and Curriculum Materials. *Science Activities*, 47, 103-108.
- Banks, J. A. (2010). Multicultural education: Characteristics and goals. In J. A. Banks & C. A. McGeeBanks (Eds.), *Multicultural education: Issues and perspectives (7th ed.)*. Hoboken, NJ: John Wiley & Sons, Inc.
- Bennett, C. (2007). *Comprehensive Multicultural Education: Theory and Practice*. London: Pearson.
- Ferguson, R. (2017). If Multicultural Science Education Standards’ Existed, What Would They Look Like? *Journal of Science Teacher Education*, 19, 547-564. doi:10.1007/s10972-008-9108-5
- Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of teacher education*, 53(2), 106-116.

- Gill, D. and Levidow, L. (1987). Racism in scientific innovation. *Anti-Racist Science Teaching*, London: Free Association Books.
- Krugly-Smolka, E. (2013). *Twenty-five years of multicultural science education: Looking backward, looking forward*. *Encounters/Encuentros/Rencontres on Education*, 14, 21-31.
- Lee, O., & Buxton, C. A. (2010). Diversity and Equity in Science Education: Research, Policy, and Practice. Multicultural Education Series. *Teachers College Press*.
- Luft, J. (1998). Multicultural Science Education: An Overview. *Journal of Science Teacher Education*, 9, 103-122.
- National Research Council. (2012). *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Washington, D.C.: The National Academies Press.
- Nieto, S. (2009). Multicultural education in the United States: Historical realities, ongoing challenges, and transformative possibilities. In *The Routledge international companion to multicultural education* (pp. 99-115). Routledge.
- Rodriguez, A. J. (1998). Strategies for Counterresistance: Toward Sociotransformative Constructivism and Learning to Teach Science for Diversity and for Understanding. *Journal of Research in Science Teaching*, 35, 589-622.