

90th Annual International Conference, Grand Hyatt San Antonio, 22 – 25 April 2017

Pre-Conference Workshops: Saturday, April 22, 2017

Please note the following:

- **You must register for the Pre-conference Workshops with your Advance Conference Registration.**
- **You may only register for one workshop.**
- **Workshop #1 through #6 is scheduled from 8:00 am until 11:45am**
- **Workshop #7 is scheduled from 10:30am until 11:45am**
- **Conference registration will go live in mid-January 2017**

8:00 AM – 11:45 AM Pre-Conference Workshop #1: Equity and Ethics Committee

**Free
Maximum registration - 90**

Title: Glocalization and Sustainability of Science Education Research and Practice

Organizers: Enrique Lopez, Nam-Hwa Kang, Korea National University, Tasneem Anwar, Senetta Bancroft, Phillip Boda, Tamra-Kay Alisa Francis, Deniz Saribas, and Azam Saiqa

Abstract:

Globalization and sustainability in science education has increasingly received attention among educators, researchers, and policymakers. Cultivating a scientifically literate citizenry has been tied to the concepts of globalization and sustainability. As highlighted in NARST's conference theme description, glocalization represents a dual perspective which combines the ideals of globalization with the importance of localization. Pre-conference workshop participants will engage in constructive and meaningful dialogue with leading science education scholars about the influences of glocalization on educators, researchers, and policymakers' efforts to build and sustain scientific literacy within local contexts for a global citizenry. Through an equity and ethics lens, this workshop will pay special attention to understanding the concepts of glocalization, sustainability, and scientific literacy; exploring how these concepts have been used within science education practice, research, and policy; and critiquing the benefits and limitations glocalization and sustainability offer the science education community. Dialogue between and among workshop participants and leading science education scholars will be facilitated through round table and panel discussions.

8:00 AM – 11:45 AM **Pre-Conference Workshop #2: Research Committee**

Free
Maximum registration - 42

Title: Critical Youth Participatory Research in Science Education

Presenters: Angela Calabrese Barton, Edna Tan, Jrene Rahm, Christina Nazar, Kathleen Schenkel, Daniel Birmingham, Tara O'Neill, Takumi Sato, and Day Greenberg

Abstract:

New methodological approaches are needed to tackle the persistent inequalities in science education experienced predominantly by youth from historically marginalized communities (e.g. youth of color, youth from lower economic backgrounds). This pre-conference workshop will focus on facilitating dialog, challenging existing frameworks, and building capacity towards the use of critically-oriented youth participatory research methodologies in science education. A central goal of this pre-conference workshop is to critically explore, interrogate and expand what we know about youth participatory research practices in science education and what we need to know in order to advance its role in the field.

While youth participatory action research [YPAR is one of many forms of youth participatory methodologies] has been established within the field of educational research more broadly, youth participatory research methodologies are both underutilized and undertheorized in our field. Given this challenge, this pre-conference workshop will bring together diverse perspectives in our discussants who already do YPAR work in science education. Our goal with the workshop is to discuss: 1) principles of critical youth participatory research in science education; 2) the roles that youth can play in the research process, and 3) how their participation transforms the broader structures and outcomes of educational research (e.g. how researchers and teachers understand and seek to solve enduring problems of practice, emergent tensions across race, class gender and education levels, etc.) 4) what can participants do in their own work to be inclusive of youth participatory methodological approaches

8:00 AM – 11:45 AM **Pre-Conference Workshop #3: Research Committee**

Free
Maximum registration - 30

Title: Dialogical Argumentation as a Pedagogic and Mediating Tool for Harmonizing Students' Lifeworld with School Science

Presenters: Meshach Ogunniyi, Femi Otulaja, Christopher Diwu, Keith-Roy Langenhoven, and Cynthia Fakudze

Abstract:

A review of the extant literature in science education reveals that science is an enterprise whose epistemic structure is underpinned by an array of arguments and counter-arguments. In the same vein, though well-known is that indigenous knowledge systems (IKS) is underpinned by a variety of arguments and counter-arguments of different forms-drama, songs, proverbs, idioms, graphics, dance, storytelling, etc. The literature further shows that the deployment of argumentation as an instructional tool does indeed enhance students' awareness of and understanding of the Nature of Science (NOS) and nature of IKS (NOIKS) which in turn contributes to their development of critical thinking and decision-making skills.

Traditional argumentation frameworks used in science education are largely premised on the inductive-deductive and mechanistic scientific worldview. This implies that argumentation frameworks that do not conform to the scientific worldview are readily dismissed and normally disregarded. On the other hand, argumentation used in traditional or indigenous education embraces both logical and non-logical (not necessarily illogical) culturally embedded arguments.

8:00 AM – 11:45 AM **Pre-Conference Workshop #4: Research Committee**

Free
Maximum registration – 40

Title: Developing a Competitive Educational Research Proposal for the US National Science Foundation (NSF) Division of Research on Learning

Presenter: Michael Ford

Abstract:

This workshop aids researchers in submitting proposals to the NSF Division of Research on Learning in Formal and Informal Environments (DRL). The workshop focuses on: 1) funding programs and opportunities in DRL; 2) characteristics and significant changes in DRL's major programs; 3) NSF's proposal review process and merit review criteria; 4) characteristics of competitive proposals; and 5) common weaknesses of proposals.

8:00 AM – 11:45 AM **Pre-Conference Workshop #5: Research Committee**

Free
Maximum registration – 50

Title: Designing Adequately Powered Effectiveness Trials for Science Intervention Studies

Presenters: Joe Taylor, Jessaca Spybrook, and Susan Kowalski

Abstract:

Researchers often wish to be able to make causal links between an intervention and student or teacher outcomes. When researchers wish to make causal claims, they generally use either quasi-experimental or experimental designs comparing a treatment group to a comparison group. But how many participants does a researcher need for a given study? Accurately estimating the number of participants to detect an effect has huge implications for both the cost of a study and the responsible use of researcher dollars (often provided by taxpayers). Too many participants result in excessive costs, and too few participants can result in a failure to detect an important intervention effect. Accurately estimating the number of participants for a study is a critical and a sophisticated decision-making process, particularly when studying interventions in classroom contexts where students are nested within teacher, and teachers are nested within schools. To conduct an accurate power analysis, researchers need to know how to find and use a variety of power analysis parameters, including but not limited to an estimate of the expected effect size, an estimate of how similar clusters of participants are to one another (for example, how similar one class of students is to another class), and how much a researcher can expect to explain differences between groups using covariates such as pretest scores and demographic characteristics. To make power analyses even more difficult, these power analysis parameters that researchers need to use are just now becoming available for science outcomes through a combination of meta-analyses of effect sizes and statistical analyses of large state data sets.

In this workshop, we will focus on how to design and calculate the statistical power for effectiveness studies of science interventions. The workshop will focus on a variety of effectiveness trial designs, including those with and without nesting at multiple levels. The principles learned will apply to both experiments and quasi-experiments and therefore cover a wide variety of effectiveness trial designs. Participants will learn how to use the *Optimal Design Plus* Software, a *freely available* and user-friendly program for calculating the power for effectiveness trials. We will also share our recent research findings related to empirical estimates of design parameters specifically for effectiveness trials related to science outcomes. The workshop will combine short presentations of information with multiple opportunities for discussion and hands-on practice using the *Optimal Design Plus* Software. The target audience for this workshop is science education researchers interested in planning and conducting effectiveness trials. It will be of particular interest to any researcher who would like to submit a proposal of an effectiveness trial for federal funding. Funding agencies are demanding increasingly sophisticated arguments that any effectiveness trial will include a sufficient number of participants in order to detect a treatment effect, should that effect exist. Participants will leave the workshop with the skills to make those nuanced arguments.

8:00 AM – 11:45 AM **Pre-Conference Workshop #6: Publications Advisory Committee**

Free
Maximum registration – 30

Title: Scholarly Writing for Early Career Researchers

Presenters: Julie Luft, Angie Calabrese Barton, Bryan Brown, Zahara Hazari, Vanessa Kind, Danusa Munford, Marissa Rollnick, Wits University, and Bhaskar Upadhyay

Abstract:

An important part of a researcher's professional life is sharing scholarly work with colleagues. For many researchers, the first place to share work is at a conference; thus, learning to write conference papers is an essential part of entering the field. Conference papers can then lead to publications. For the new researcher, learning how to conceptualize, write, and revise research for publication can be challenging. To support some of NARST's newest members, the Publications Advisory Committee is sponsoring a pre-conference workshop on scholarly writing. The workshop will consist of panel and small group discussions about topics such as making choices about writing projects, selecting an appropriate journal, finding time to write, and responding to reviews. There will also be an opportunity for each participant to receive feedback (not detailed) on a piece of writing.

This workshop is designed for early career researchers (e.g., postdoctoral researchers, pre-tenure faculty members, researchers in non-tenure-granting institutions who received their doctoral degrees in the past 6 years) who are interested in exploring the process of writing for publication. Participants will have the option to submit a sample of pre-publication writing (e.g., a NARST conference paper) by April 3 for mentor and peer feedback. In addition, each participant will be asked to read and respond to at least two of their colleagues' papers prior to the workshop. This preparation will form the basis for small group discussions at the workshop. Please take these pre-workshop activities into consideration when deciding whether to register. If you have questions about whether this workshop is appropriate for you, please contact Alicia Alonzo (alonzo@msu.edu) before registering.

10:30 AM – 11:45 AM Pre-Conference Workshop #7: A NARST Board Sponsored Workshop

**Free
Maximum registration – 90**

Title: Making NARST transparent: Organization, Roles and Responsibilities

Organizers: Tali Tal, Technion, Katherine McNeill, Barbara Crawford, Selina Bartels, and John Tillotson

Abstract:

The goal of this workshop is to focus on how NARST works and how to advance your career through service to NARST. You can make a difference in our NARST community, by being involved as an active participant in the leadership of NARST. We will provide an overview of the structure and organization of NARST, as well as the various opportunities. This will include describing the responsibilities of different roles, such as Board Members, committee chairs and committee members. The audience will include new Board Members, committee chairs and members, as well as those new to NARST, including graduate students, international members, early career members and those looking to be more involved in NARST. After an initial overview, we will break into groups to discuss some of these possibilities and responsibilities in more depth for different roles. We would also like your input on how to make these opportunities more visible for the larger NARST community.